



NORTH CASCADES NATIONAL PARK
SERVICE COMPLEX

Mountain Lakes Fishery Management Plan



Environmental Impact Statement

VOLUME TWO
APPENDIXES AND
COMMENTS AND RESPONSES
JUNE 2008



North Cascades National Park Service Complex

Final Mountain Lakes Fishery Management Plan Environmental Impact Statement

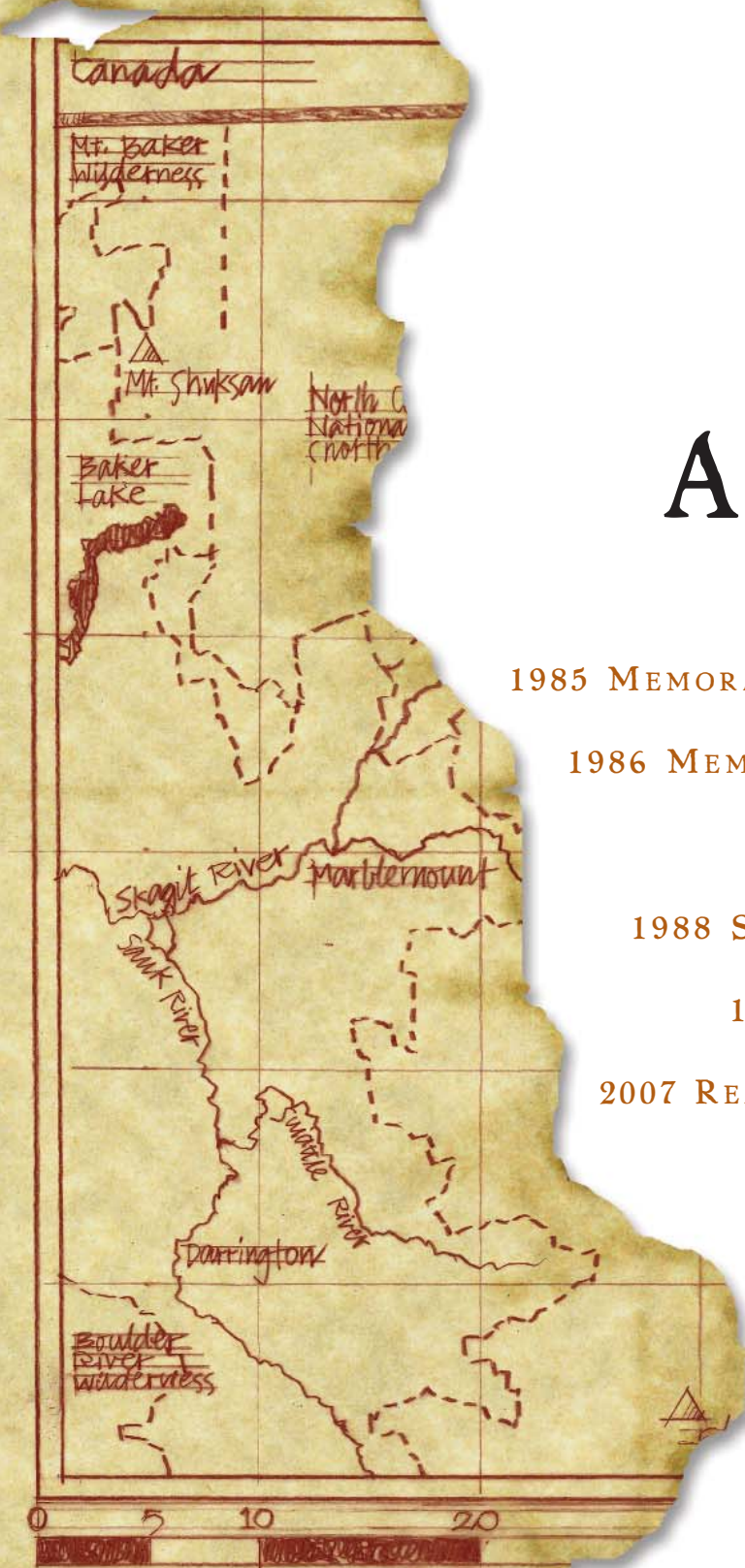
Volume Two

Appendixes and Comments and Responses on the Draft Plan/Environmental Impact Statement 2007

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Appendix A

1985 MEMORANDUM OF UNDERSTANDING,
1986 MEMORANDUM (POLICY WAIVER)
FROM WILLIAM MOTT, JR.,
1988 SUPPLEMENTAL AGREEMENT,
1991 CONSENT DECREE, AND
2007 REAFFIRMATION OF AGREEMENT

APPENDIX A:

1985 MEMORANDUM OF UNDERSTANDING,
1986 MEMORANDUM (POLICY WAIVER)
FROM WILLIAM MOTT, JR.,
1988 SUPPLEMENTAL AGREEMENT,
1991 CONSENT DECREE, AND
2007 REAFFIRMATION OF AGREEMENT

Agreement No. MU-9000-5-0004MEMORANDUM OF UNDERSTANDING
BetweenNational Park Service
and
State of Washington Department of GameArticle I. Background and Objectives

This Memorandum of Understanding is between the State of Washington Department of Game, acting through and by the Director, hereinafter referred to as the Department, and the National Park Service acting by and through the Regional Director of the Pacific Northwest Region, hereinafter referred to as the Service. Both the Department and the Service recognize a mutual concern and responsibility for the fisheries and wildlife resources found within the State and desire to cooperate for the protection and enhancement of such resources.

The purpose of this Memorandum of Understanding is to continue cooperative efforts in the management, protection, and enhancement of the fisheries and wildlife resources of mutual concern.

The general authority for this cooperation is contained within the National Park Legislative Authority:

- 16 USC, Chapter 1, Section 1a-1;
Chapter 5A, Sub-chapter I, Section 661;
Chapter 5B, Sec. 669;
Chapter 10B, Section 777.
- 43 CFR, Section 24.6.

Article II. Statements of Work

Recognizing a mutual concern and responsibility for the fisheries and wildlife resources found within the state of Washington:

A. The Service agrees:

1. To consult with the Department prior to initiating research projects or implementing plans, programs, or regulations affecting fish and wildlife species distribution, numbers or public use of fish and wildlife found within areas administered by the Service.
2. To practice those forms of management which will benefit fish and wildlife, and their habitats, and to maintain or restore their natural and historic distribution and abundance, consistent with the respective Service policies and park objectives.
3. To permit the harvest of fish and wildlife in accordance with applicable state laws and regulations of the Department in those areas under the jurisdiction of the Service which are open to hunting and/or fishing. It is recognized that some park regulations may vary for management purposes.



B. The Department agrees:

1. To consult with the Service before establishing or implementing research and management programs pertaining to fish and wildlife that may affect public use or other natural resources of the area administered by the Service.
2. To assist the Service in the maintenance or restoration of mutually-agreed-upon distribution and abundance of game fish and wildlife populations in Service areas, including the removal of excess animals by means that are consistent with Service and Department policies and objectives, subject to the provisions of paragraph C.1., below.

C. The Department and the Service mutually agree:

1. To consult concerning any proposals to transplant fish and wildlife to or from national parks within the state of Washington, and that any such transplants shall be by mutual agreement prior to any action by either the Service or the Department; the Department will provide the necessary coordination with other states, provinces, institutions, or other organizations, and for the disposition of wildlife transplanted from parks to other areas.
2. To establish Technical Study Task Forces composed of biologists, wildlife managers, and other professionals of both agencies, to resolve regional fish and wildlife problems and develop recommendations for long-range and annual fish and wildlife programs as needs are mutually identified,
3. To meet jointly at least annually to consider recommendations of the Technical Study Task Forces and other subjects of mutual interest. The Department will host meetings in odd-numbered years; the Service in even-numbered years.
4. To cooperate in joint enforcement of applicable game and/or fish laws and regulations relative to lands and waters administered by the Service, consistent with jurisdictions possessed by the Department and the Service.
5. To encourage the joint publication of press releases and the interchanges between parties of all pertinent agency policies and objectives, plans, statutes, rules and regulations, and other information as required for the wise use and perpetuation of regional fish, wildlife, and park resources.
6. To enter into working agreements as occasion demands for the use of lands, buildings, and other facilities owned and operated by either party hereto, for special projects.

7. To enter into supplemental agreements to this Memorandum of Understanding as necessary to carry out joint programs in the individual units administered by the Service.
8. That each and every provision of the Memorandum of Understanding is subject to the laws of the United States and the laws of the state of Washington and to the delegated authority in each instance.
9. That nothing in this Memorandum of Understanding shall be construed as obligating either party hereto to the expenditure of funds or for the future payment of money in excess of appropriations authorized by law.
10. That nothing contained herein shall be construed as limiting the responsibility and authority, as defined by law, of the Regional Director, National Park Service, and the Director, Washington Department of Game, in connection with the administration and protection of lands and resources under their respective administrations.

Article III. Term of Agreement

1. This Memorandum of Understanding supersedes all existing agreements between the Pacific Northwest Region of the National Park Service and the State of Washington, Department of Game, regarding cooperative efforts in the management, protection, and enhancement of the fisheries and wildlife resources of mutual concern.
2. This Understanding is effective on the date last shown on the signature page, and will remain in effect for five years from the date at which time it shall be reviewed to determine whether it shall be renewed, modified, or terminated. This agreement shall expire at the end of the specified term unless formally reaffirmed or rewritten if necessary. Amendments to this Memorandum of Understanding may be proposed by either party and shall become effective upon written approval by both parties.

Article IV. Key Officials

1. Key State of Washington Official:

Director, State of Washington Department of Game
600 North Capitol Way
Olympia, Washington 98504

2. Key National Park Service Official:

Regional Director, Pacific Northwest Region
National Park Service
Westin Building, Room 1920
2001 Sixth Avenue
Seattle, Washington 98121



Article V. Termination

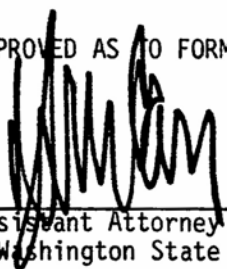
This Memorandum of Understanding shall remain in full force and effect unless cancelled by either party upon a written six (6)-month notice to the other party.

Article VI. Required Clauses

1. During the performance of this Agreement the participants agree to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin.
2. No member or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit.

In witness whereof, the parties hereto have executed this Memorandum:

APPROVED AS TO FORM:



Assistant Attorney General for
Washington State

National Park Service
Pacific Northwest Region
Seattle, Washington

State of Washington
Department of Game
Olympia, Washington

		
Regional Director	Date 7/8/85	Director
		Date AUG 15 1985





IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE

P.O. BOX 37127
WASHINGTON, D.C. 20013-7127Your
National Park Service
Reminds You...

"TAKE PRIDE IN AMERICA"

Memorandum

JUN 12 1986

To: ^{ACTING} Regional Director, Pacific Northwest Region

From: Director, National Park Service *WPM* William Penn Mott, Jr.

Subject: Fish Stocking, North Cascades National Park Complex

In your January 27, 1986, memorandum and in follow-up discussions, you requested that we provide you with a clear statement regarding National Park Service policy for management of fisheries resources in the North Cascades Complex. In developing our reply to your request, we have considered both information regarding the impact of introducing fish into naturally fish-free lakes and also the record of testimony concerning the establishment of the North Cascades Complex. Further, we have learned about and understand that there exists a highly articulate interest group supportive of stocking fish in the North Cascades Complex.

Our findings are as follows:

1. Fishing is an acceptable recreational activity in the park, provided it is done consistent with National Park Service Management Policies and with provisions of the General Management Plan and other approved plans.
2. Stocking of selected, naturally fish-free and other waters to create and maintain a recreational fishery in portions of the area encompassed by the North Cascades Complex is a practice that existed prior to creation of the park.
3. The act of stocking a naturally fish-free lake or stream is a human-induced disruption of a natural ecosystem, and is to be avoided in areas managed as natural zones.

Our conclusions are as follows:

1. For fishery management purposes, the waters of North Cascades National Park are to be aggregated into the following three categories:
 - (a) Natural Fish-free Waters - Waters that are to be managed as fish-free areas in the future.
 - (b) Self-sustaining Fish Population Waters - Waters that previously were stocked where we will allow the waters to continue to support a fish population without further stocking or revert to a fish-free condition.
 - (c) Continue to Stock Waters - Waters where fish stocking will be permitted for the purpose of enhancing recreational fishing activities.



2. All waters in North Cascades National Park that presently have no fish are not to be stocked with any kind of fish.
3. Park waters that are potential candidates for continued fish-stocking are to be reviewed to determine which waters warrant management as an enhanced recreational fishery, and for which continued fish-stocking is to be an acceptable action.
4. Those waters within the park that specifically are selected to be managed as enhanced recreational fishery waters are the only waters that may be stocked now or in the future. Fish stocking of these waters should be done only with fish species that are native to the park waters, if such species exist. If no native species exist, stocking should be limited to fish species that are native to the ecological region within which the park is found. However, use of such ecologically related non-native fish species must be restricted so that these species do not become established in natural zone waters in the park.

In summary, with the three above classes of waters (fish-free waters, self-sustaining fish population waters, and fish-stocked waters) we will provide for an enhanced recreational fishing experience in the park while at the same time assuring that we provide the opportunity for aquatic research under natural conditions. In this regard, it would be desirable for your office to develop ~~and implement~~ a research effort that (a) establishes current fish and aquatic habitat baseline conditions in park waters; (b) monitors carefully the impacts of this fish-stocking guidance on fish and other wildlife; and (c) determines changes over time referenced against current baseline conditions or against undisturbed natural conditions where they are known. These data will help provide an informed basis for determining whether changes in our fish-stocking management actions may be needed in the future.



SUPPLEMENTAL AGREEMENT
to
MEMORANDUM OF UNDERSTANDING
Between
National Park Service
and
State of Washington Department of Game (now Wildlife)

Article I. Background and Objectives

This Supplemental Agreement supplements the Memorandum of Understanding, Agreement No. MU-9000-5-0004 which was entered into between the Department of Game (now Wildlife) and the Pacific Northwest Region of the National Park Service, dated August 15, 1985, hereinafter referred to as the MOU. This Supplemental Agreement is between the Washington State Department of Wildlife (previously Game), acting through and by the Director, hereinafter referred to as the Department, and the National Park Service acting by and through the Regional Director of the Pacific Northwest Region, hereinafter referred to as the Service.

The purpose of this Supplemental Agreement is to establish a mutually agreed to list of lakes within the boundaries of North Cascades National Park which the Department will stock with fish as part of its fish management program.

Article II. Statements of Work

Recognizing the need to establish mutually agreed upon policy relating to fish stocking in lakes within North Cascades National Park and in keeping with Article II C 1 and 7 of the MOU, the Department and the Service mutually agree:

1. The Department shall be allowed to stock fish and/or provide fish for stocking in 40 lakes within the boundaries of North Cascades National Park as part of the Department's fish management program. These 40 lakes shall consist of those lakes previously agreed to by the Department and the Service as lakes currently being stocked (17), and lakes with self-sustaining populations (23). These are 40 of the lakes within North Cascades National Park which the Department and Service agree have been previously stocked. The 40 lakes that may be stocked are identified as such on Appendix A, which is attached hereto and incorporated herein by this reference.
2. Additions or deletions to the list of 40 lakes may be made only by mutual agreement of the Department and the Service. Research results will be considered in future decisions.



- 2 -

3. The Department shall, in consultation with the Service, provide annual plans to stock fish including number and species of fish, specific lakes, and the stocking frequency of each lake.

Article III. Term of Agreement

1. If the MOU expires or terminates, the parties intend that this Supplemental Agreement shall survive the termination of the MOU and shall continue in effect until terminated as provided herein.
2. This Supplemental Agreement shall first be subject to mutual review and evaluation by July 2000. The intent is to give this Agreement a 12-year life and that upon mutual review, the Agreement may be continued or modified based on information available at the time of review.

Article IV. Key Officials

1. Key State of Washington Official:

Director, Washington Department of Wildlife
600 North Capitol Way
Olympia, Washington 98504

2. Key National Park Service Official:

Regional Director, Pacific Northwest Region
National Park Service
83 South King Street, Suite 212
Seattle, Washington 98104

Article V. Termination

This Supplemental Agreement shall remain in full force and effect unless terminated by mutual consent of the Department and the Service.

Article VI. Required Clauses

1. During the performance of this Supplemental Agreement the participants agree to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin.

- 3 -

2. No member of or delegate to Congress, or resident federal Commissioner, shall be admitted to any share or part of this Supplemental Agreement or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Supplemental Agreement if made with a corporation for its general benefit.

In witness whereof, the parties hereto have executed this Supplemental Agreement:

State of Washington
Department of Wildlife
Olympia, Washington

National Park Service
Pacific Northwest Region
Seattle, Washington

Carl Smith
Director

7/11/88
Date

Charles H. Anderson 7/17/88
Regional Director Date

APPROVED AS TO FORM:

Daniel R. Allen 7/11/88
Assistant Attorney General for
Washington State
Attorney for Dept. of Wildlife



APPENDIX A

*STOCKING HISTORY = RECORD OR PRESENCE OF FISH/YEAR INTRODUCED

LAKE NAME: UPPER CASE indicates an official USGS lake name.
Lower Case indicates an unofficial lake name.

NPS AREA: NCNP (SU/ES)-South Unit of Park, East Slope
NCNP (SU/WS)-South Unit of Park, West Slope
NCNP (NU)-North Unit of Park

BT = BROOK TROUT
CT = COASTAL CUTTHROAT TROUT
IC = INTERIOR CUTTHROAT TROUT
GT = GOLDEN TROUT
RT = RAINBOW TROUT

LAKE NAME	LAKE CODE	NPS AREA	LOCATION			ELEVATION	SURFACE	STOCKING	SP. LAST
			S	T	R	FT.	AREA (AC)	HISTORY*	STOCKED
=====	=====	=====	----	----	----	----	-----	-----	-----
LAKES CURRENTLY BEING STOCKED									
1 JEANITA	DD-1	NCNP (NU)	29	38	13	908	1.3	GT61	GT86
2 Dicksud Lakes	LS-3	NCNP (NU)	32	37	10	479	3.6	CT60	IC83
3 Hi-Yu	M-1	NCNP (NU)	26	37	19	803	4.0	RT61	RT86
4 Nert	M-5	NCNP (NU)	10	37	10	554	2.5	GT65	GT86
5 Triumph	M-17	NCNP (NU)	21	37	11	652	4.0	RT51	RT85
6 THORTON LAKES	M-19	NCNP (NU)	14	37	11	682	12.4	RT41	GT86
7 THORTON LAKES	M-20	NCNP (NU)	23	37	11	452	58.1	RT41	IC76
8 COPPER	MC-6	NCNP (NU)	25	39	10	253	12.9	IC39	IC85
9 Kwanneum	MC-7	NCNP (NU)	3	34	10	105	16.6	CT66	RB83
10 Firn	MP-2	NCNP (NU)	30	39	13	476	5.1	RT68	IC83
11 NO NAME	PM 1	NCNP (SU)	21	39	13	842	10.9	RT46	RT85
12 Upper Bouck	DD-5	NCNP (SU/WS)	19	37	13	623	4.7	GT68	GT86
13 Wilcox Lakes	EP-5(1)	NCNP (SU/WS)	18	38	13	663	6.7	CT67	RT86
14 Sweetpea	ML-2	NCNP (SU/WS)	13	36	14	535	8.3	RT68	RB85
15 Torrent	ML-3	NCNP (SU/WS)	24	36	14	454	3.3	RT68	RB85
16 STILETTO	MR-1	NCNP (SU/ES)	6	34	18	798	9.9	CT66	IC83
17 HIDDEN	SS-1	NCNP (SU/WS)	25	35	12	536	60.2	RT48	RT85
LAKES WITH SELF-SUSTAINING POPULATIONS									
1 Dicksud Lakes	LS-2	NCNP (NU)	32	37	10	478	2.5	IC55	IC65
2 IPSOOT	LS-6	NCNP (NU)	8	37	10	532	8.9	IC36	IC61
3 BLOOM LAKES	LS-7	NCNP (NU)	27	38	10	4954	6.9	CT/BT37	CT/BT37
4 GREEN	M-4	NCNP (NU)	15	37	10	4305	79.2	RT46	IC67
5 Lower Berdeen	M-7	NCNP (NU)	11	37	10	4472	7.9	RT46	RT46
6 BERDEEN	M-8	NCNP (NU)	11	37	10	5004	125.5	RT46	IC85
7 BLOOM LAKES	M-11	NCNP (NU)	27	38	10	5064	13.8	RT38	GT60
8 Doug's Tarn	M-21	NCNP (NU)	3	37	11	3952	4.9	IC65	IC65
9 Quill Lakes	M-24(1)	NCNP (NU)	29	37	11	4534	1.2	RT61	RT61
10 Quill Lakes	M-24(2)	NCNP (NU)	29	37	11	4528	1.0	RT	RT
11 HANGING	MC-8	NCNP (NU)	38	40	10	4554	73.1	RT/CT	UNK.
12 BEAR	MC-12	NCNP (NU)	24	40	11	5804	25.1	IC67	IC67
13 Mad Eagle	MC-34	NCNP (NU)	7	40	11	5443	1.7	RT	RT
14 SKYMO	PM-3	NCNP (NU)	27	39	13	5279	10.6	IC68	IC68
15 SOURDOUGH	PM-12	NCNP (NU)	21	38	13	4626	27.7	BT35	BT35
16 DOUBTFUL	CP-1	NCNP (SU/ES)	36	35	14	5387	29.7	GT50	IC
17 Wilcox Lakes	EP-6	NCNP (SU/WS)	18	36	13	5138	9.1	RT/CT68	RB/CT68
18 Stout Lake Pond	EP-9(1)	NCNP (SU/WS)	23	36	12	5184	1.6	IC	IC PRESEN.
19 STOUT	EP-9(2)	NCNP (SU/WS)	24	36	12	5233	26.3	IC49	IC67
20 TRAPPER	GM-1	NCNP (SU/ES)	9	34	14	4167	145.7	CT49	IC68
21 MOKOGRAM	H-23	NCNP (SU/WS)	32	36	12	4843	31.4	CT32	RT86
22 DAGGER	MR-4	NCNP (SU/ES)	7	34	18	5512	8.9	IC34	IC34
23 KETTLING	MR-5	NCNP (SU/ES)	16	34	17	5378	9.8	IC/RT	IC/RT



APPENDIX A Page 2

*STOCKING HISTORY = RECORD OF PRESENCE OF FISH/YEAR INTRODUCED

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NCNP (SU/WS)-South Unit of Park, West Slope
NCNP (NU)-North Unit of Park

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LAKE NAME	LAKE CODE	NPS AREA	LOCATION			ELEVATION (FT.)	SURFACE AREA (AC)	STOCKING HISTORY*	SP. LAST STOCKED
			S	T	R				
=====	=====	=====	----	----	----	----	-----	-----	-----
LAKES WITH STOCKING HISTORY BUT PRESUMED FISHLESS									
1 Talus Tarn	M-6	NCNP (NU)	10	37	16	355	1.5	CT68	CT68
2 unnamed	M-13	NCNP (NU)	4	37	11	105	2.5	IC65	IC65
3 unnamed	M-14	NCNP (NU)	4	37	11	813	1.5	IC65	IC65
4 THORNTON LAKES	M-18	NCNP (NU)	14	37	11	643	30.6	IC68	IC68
5 BLUE LAKES	MC-1	NCNP (NU)	22	38	10	563	3.0	RT38	RT38
6 BLUE LAKES (Vista)	MC-2	NCNP (NU)	25	38	10	906	3.0	CT60	CT60
7 Redoubt	MC-11	NCNP (NU)	12	41	11	302	13.8	IC67	IC67
8 EAST (UPPER)	MC-14(1)	NCNP (NU)	2	39	12	564	2.0	RT67	RT67
9 EAST (LOWER)	MC-14(2)	NCNP (NU)	2	39	11	506	7.4	RT67	RT67
10 MIDDLE (UPPER)	MC-16(1)	NCNP (NU)	10	39	11	702	4.2	RT67	RT67
11 MIDDLE (LOWER)	MC-16(2)	NCNP (NU)	10	39	11	644	2.5	RT67	RT67
12 TAPTO (UPPER)	MC-17(1)	NCNP (NU)	9	39	11	730	9.9	IC60	IC60
13 TAPTO (MIDDLE)	MC-17(2)	NCNP (NU)	9	39	11	713	0.8	IC60	IC60
14 TAPTO (LOWER)	MC-17(3)	NCNP (NU)	9	39	11	590	5.3	IC60	IC60
15 TAPTO (WEST)	MC-17(4)	NCNP (NU)	9	39	11	6710	2.0	IC60	IC60
16 LAKE BEVEILLE	MC-21(1)	NCNP (NU)	3	39	11	5013	4.0	RT68	RT68
17 LAKE BEVEILLE	MC-21(2)	NCNP (NU)	3	39	11	5003	3.0	RT68	RT68
18 Wild	MC-27	NCNP (NU)	10	36	11	1582	11.3	RT67	RT67
19 AZURE	MP-9	NCNP (NU)	21	34	10	4059	88.0	GT61	GT61
20 SILVER	MS-1	NCNP (NU)	34	41	12	5769	161.0	GT61	GT61
21 unnamed	EP-10	NCNP (SU/WS)	21	36	13	5614	9.8	RT/CT67	RT/CT67
22 unnamed	EP-13	NCNP (SU/WS)	26	36	12	5389	2.1	RT67	RT67
23 unnamed	EP-14	NCNP (SU/WS)	24	36	12	5945	4.4	RT66	RT66
24 unnamed	PP-1	NCNP (SU/WS)	21	36	13	5345	17.5	RT/CT67	RT/CT67
25 Sourpuss	ML-1	NCNP (SU/WS)	10	36	14	4943	0.6	RT68	RT68
26 Vulcan	ML-4	NCNP (SU/WS)	35	36	14	5194	8.1	RT68	RT68



**REAFFIRMATION
 OF
 SUPPLEMENTAL AGREEMENT
 TO
 MEMORANDUM OF UNDERSTANDING
 Between
 National Park Service
 And
 State of Washington Department of Fish and Wildlife**

The Supplemental Agreement supplements the Memorandum of Understanding, Agreement No. MU-9000-5-0004 dated August 15, 1985. The purpose of the Supplemental Agreement is to establish a mutually agreed to list of lakes within the boundaries of North Cascades National Park which the Department of Fish and Wildlife will stock with fish as part of its fish management program.

Article III. Term of Agreement, item 2. states:

This Supplemental Agreement shall be subject to mutual review and evaluation by July 2000. The intent is to give this Agreement a 12-year life and that upon mutual review, the Agreement may be continued or modified based on information available at the time of review.

We the undersigned have reviewed and evaluated the Agreement and agree that it should continue in effect without modification through December 2004.

In witness whereof, the parties hereto have reaffirmed this Supplemental Agreement:

State of Washington
 Department of Fish and Wildlife
 Olympia, Washington

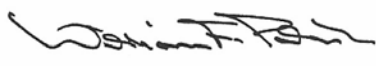
National Park Service
 North Cascades National Park
 Sedro Woolley, Washington



 Regional Director

5-29-02

 Date

 6-3-02

 Superintendent Date



SUPPLEMENTAL AGREEMENT
to
MEMORANDUM OF UNDERSTANDING
Between
National Park Service
and
State of Washington Department of Game (now Wildlife)

Article I. Background and Objectives

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Article II. Statements of Work

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2. Additions or deletions to the list of 40 lakes may be made only by mutual agreement of the Department and the Service. Research results will be considered in future decisions.



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3. The Department shall, in consultation with the Service, provide annual plans to stock fish including number and species of fish, specific lakes, and the stocking frequency of each lake.

Article III. Term of Agreement

1. If the MOU expires or terminates, the parties intend that this Supplemental Agreement shall survive the termination of the MOU and shall continue in effect until terminated as provided herein.
2. This Supplemental Agreement shall ~~not~~ be subject to mutual review and evaluation by July 2000. The intent is to give this Agreement a 12-year life and that upon mutual review, the Agreement may be continued or modified based on information available at the time of review.

Article IV. Key Officials

1. Key State of Washington Official:

Director, Washington Department of Wildlife
800 North Capitol Way
Olympia, Washington 98504

2. Key National Park Service Official:

Regional Director, Pacific Northwest Region
National Park Service
83 South King Street, Suite 212
Seattle, Washington 98104

Article V. Termination

This Supplemental Agreement shall remain in full force and effect unless terminated by mutual consent of the Department and the Service.

Article VI. Required Clauses

1. During the performance of this Supplemental Agreement the participants agree to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex,



- 3 -

2. No member of or delegate to Congress, or resident federal Commissioner, shall be admitted to any share or part of this Supplemental Agreement or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Supplemental Agreement if made with a corporation for its general benefit.

In witness whereof, the parties hereto have executed this Supplemental Agreement:

State of Washington
Department of Wildlife
Olympia, Washington

National Park Service
Pacific Northwest Region
Seattle, Washington

Curt Smith
Director

7/11/88
Date

Regional Director Date

APPROVED AS TO FORM:

Daniel Wilson 7/11/88
Assistant Attorney General for
Washington State
Attorney for Dept. of Wildlife



APPENDIX A

*STOCKING HISTORY = RECORD OR PRESENCE OF FISH/YEAR INTRODUCED

LAKE NAME: UPPER CASE Indicates an official USGS lake name.
Lower Case indicates an unofficial lake name.

NPS AREA: NCNP (SU/ES)-South Unit of Park, East Slope
NCNP (SU/WS)-South Unit of Park, West Slope
NCNP (NU)-North Unit of Park

BT = BROOK TROUT
CT = COASTAL CUTTHROAT TROUT
IC = INTERIOR CUTTHROAT TROUT
GT = GOLDEN TROUT
RT = RAINBOW TROUT

LAKE NAME	LAKE CODE	NPS AREA	LOCATION			ELEVATION	SURFACE	STOCKING	SP. LAST
			S	T	R	(FT.)	AREA (AC)	HISTORY*	STOCKED
=====	=====	=====	----	----	----	-----	-----	-----	-----
LAKES CURRENTLY BEING STOCKED									
1 JEANITA	DD-1	NCNP (NU)	29	38	13	4908	1.3	GT61	GT86
2 Diobsud Lakes	LS-3	NCNP (NU)	32	37	10	4479	3.6	CT60	IC83
3 Hi-Yu	M-1	NCNP (NU)	26	37	10	3803	4.0	RT61	RT86
4 Nert	M-5	NCNP (NU)	10	37	10	4554	2.5	GT65	GT86
5 Triumph	M-17	NCNP (NU)	21	37	11	3652	4.0	RT61	RT85
6 THORTON LAKES	M-19	NCNP (NU)	14	37	11	4682	12.4	RT41	GT86
7 THORTON LAKES	M-20	NCNP (NU)	23	37	11	4452	58.1	RT41	IC76
8 COPPER	MC-6	NCNP (NU)	25	39	10	5253	12.9	IC39	IC85
9 Kwahnesum	MC-7	NCNP (NU)	3	39	10	5105	16.6	CT66	RB83
0 Firn	MP-2	NCNP (NU)	30	39	13	5476	5.1	RT68	IC83
1 NO NAME	PM-1	NCNP (NU)	21	39	13	3842	10.9	RT46	RT85
2 Upper Bouck	DD-5	NCNP (SU/WS)	19	37	13	5023	4.7	GT68	GT86
3 Wilcox Lakes	EP-5(1)	NCNP (SU/WS)	18	36	13	5063	6.7	CT67	RT86
4 Sweetpea	ML-2	NCNP (SU/WS)	13	36	14	5535	8.3	RT68	RB85
5 Torment	ML-3	NCNP (SU/WS)	24	36	14	6454	3.3	RT68	RB85
6 STILETTO	MR-1	NCNP (SU/ES)	6	34	18	6798	9.9	CT66	IC83
7 HIDDEN	SB-1	NCNP (SU/WS)	25	35	12	5738	60.2	RT48	RT85
LAKES WITH SELF-SUSTAINING POPULATIONS									
1 Diobsud Lakes	LS-2	NCNP (NU)	32	37	10	4078	2.5	IC65	IC65
2 IPSOOT	LS-6	NCNP (NU)	8	37	10	4502	8.9	IC36	IC61
3 BLUM LAKES	LS-7	NCNP (NU)	27	38	10	4954	6.9	CT/BT37	CT/BT37
4 GREEN	M-4	NCNP (NU)	15	37	10	4305	79.2	RT46	IC67
5 Lower Berdeen	M-7	NCNP (NU)	11	37	10	4472	7.9	RT46	RT46
6 BERDEEN	M-8	NCNP (NU)	11	37	10	5004	125.5	RT46	IC85
7 BLUM LAKES	M-11	NCNP (NU)	27	38	10	5004	13.8	RT38	GT60
8 Doug's Tarn	M-21	NCNP (NU)	3	37	11	3952	4.9	IC65	IC65
9 Quill Lakes	M-24(1)	NCNP (NU)	29	37	11	4554	1.2	RT61	RT61
0 Quill Lakes	M-24(2)	NCNP (NU)	29	37	11	4528	1.0	RT	RT
1 HANGING	MC-8	NCNP (NU)	38	40	10	4554	73.1	RT/CT	UNK.
2 BEAR	MC-12	NCNP (NU)	24	40	11	5804	28.1	IC67	IC67
3 Mad Eagle	MC-34	NCNP (NU)	7	40	11	5443	1.7	RT	RT
4 SKYMO	PM-3	NCNP (NU)	27	39	13	5279	10.6	IC68	IC68
5 SOURDOUGH	PM-12	NCNP (NU)	21	38	13	4626	27.7	BT35	BT35
6 DOUBTFUL	CP-1	NCNP (SU/ES)	36	35	14	5387	29.7	GT50	IC
7 Wilcox Lakes	EP-6	NCNP (SU/WS)	18	36	13	5138	9.1	RT/CT68	RB/CT68
8 Stout Lake Pond	EP-9(1)	NCNP (SU/WS)	23	36	12	5184	1.6	IC	IC PRES.
9 STOUT	EP-9(2)	NCNP (SU/WS)	24	36	12	5233	26.3	IC49	IC67
0 TRAPPER	GM-1	NCNP (SU/ES)	9	34	14	4167	145.7	CT49	IC68
1 MONOGRAM	M-23	NCNP (SU/WS)	32	36	12	4843	31.4	CT32	RT86
2 DAGGER	MR-4	NCNP (SU/ES)	7	34	18	5512	8.9	IC34	IC34
3 KETTLING	MR-5	NCNP (SU/ES)	16	34	17	5378	9.8	IC/RT	IC/RT



*STOCKING HISTORY = RECORD OR PRESENCE OF FISH/YEAR INTRODUCED

LAKE NAME: UPPER CASE Indicates an official USGS lake name.
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NPS AREA: NCNP (SU/ES)-South Unit of Park, East Slope
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BT = BROOK TROUT
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GT = GOLDEN TROUT
RT = RAINBOW TROUT

LAKE NAME	LAKE CODE	NPS AREA	LOCATION			ELEVATION	SURFACE	STOCKING	SP. LAST
			S	T	R	(FT.)	AREA (AC)	HISTORY*	STOCKED
=====	=====	=====	----	----	----	=====	=====	=====	=====
LAKES WITH STOCKING HISTORY BUT PRESUMED FISHLESS									
1 Talus Tarn	M-6	NCNP (NU)	10	37	10	5355	1.5	GT68	GT68
2 unnamed	M-13	NCNP (NU)	4	37	11	5105	2.5	IC65	IC65
3 unnamed	M-14	NCNP (NU)	4	37	11	4813	1.5	IC65	IC65
4 THORTON LAKES	M-18	NCNP (NU)	14	37	11	5043	30.6	IC68	IC68
5 BLUM LAKES	MC-1	NCNP (NU)	22	38	10	5663	3.0	RT38	RT38
6 BLUM LAKES (Vista)	MC-2	NCNP (NU)	25	38	10	5906	3.0	GT60	GT60
7 Redoubt	MC-11	NCNP (NU)	12	41	11	5302	13.8	IC67	IC67
8 EAST (UPPER)	MC-14(1)	NCNP (NU)	2	39	12	5604	2.0	RT67	RT67
9 EAST (LOWER)	MC-14(2)	NCNP (NU)	2	39	11	5506	7.4	RT67	RT67
10 MIDDLE (UPPER)	MC-16(1)	NCNP (NU)	10	39	11	5702	4.2	RT67	RT67
11 MIDDLE (LOWER)	MC-16(2)	NCNP (NU)	10	39	11	5604	2.5	RT67	RT67
12 TAPTO (UPPER)	MC-17(1)	NCNP (NU)	9	39	11	5730	9.9	IC60	IC60
13 TAPTO (MIDDLE)	MC-17(2)	NCNP (NU)	9	39	11	5713	0.8	IC60	IC60
14 TAPTO (LOWER)	MC-17(3)	NCNP (NU)	9	39	11	5690	0.3	IC60	IC60
15 TAPTO (WEST)	MC-17(4)	NCNP (NU)	9	39	11	5710	2.0	IC60	IC60
16 LAKE REVEILLE	MC-21(1)	NCNP (NU)	3	39	11	5013	4.0	RT68	RT68
17 LAKE REVEILLE	MC-21(2)	NCNP (NU)	3	39	11	5003	3.0	RT68	RT68
18 Wild	MC-27	NCNP (NU)	10	38	11	4882	11.3	RT67	RT67
19 AZURE	MP-9	NCNP (NU)	21	38	10	4059	88.0	GT61	GT61
20 SILVER	MS-1	NCNP (NU)	34	41	12	6769	161.0	GT61	GT61
21 unnamed	EP-10	NCNP (SU/WS)	21	36	13	5614	9.8	RT/CT67	RT/CT67
22 unnamed	EP-13	NCNP (SU/WS)	26	36	12	5384	2.1	RT67	RT67
23 unnamed	EP-14	NCNP (SU/WS)	24	35	12	5945	4.4	RT66	RT86
24 unnamed	FP-1	NCNP (SU/WS)	21	36	13	5345	17.5	RT/CT67	RT/CT67
25 Sourpuss	ML-1	NCNP (SU/WS)	10	36	14	4843	0.6	RT68	RB68
26 Vulcan	ML-4	NCNP (SU/WS)	35	36	14	5194	8.1	RT68	RB86



APPENDIX B: CONSENT DECREE

1	CC TO JUDGE	FILED	ENTERED
2		LODGED	RECEIVED
3	APR 12 1991		
4	UNITED STATES DISTRICT COURT		
5	WESTERN DISTRICT OF WASHINGTON		
6	AT SEATTLE		
7	NORTH CASCADES CONSERVATION		
8	COUNCIL, a nonprofit		
9	Washington corporation,		
10	Plaintiff,		
11	v.		
12	MANUEL LUJAN, Secretary of the		
13	United States Department of the		
14	Interior, <u>et al.</u> ,		
15	Defendants.		
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The parties, plaintiff North Cascades Conservation Council, and the defendants, Manuel Lujan, Secretary of the United States Department of the Interior, James M. Ridenour, Director of the United States National Park Service, Charles H. Odegaard, Regional Director of the United States National Park Service, Pacific Northwest Region, and John R. Earnst, Superintendent of the North Cascades National Park Complex ("defendants"), having conferred with counsel and desiring to resolve this dispute between the parties without the intervention of the court, and in consideration of mutual promises, hereby stipulate and agree to undertake the actions set forth below.

CONSENT DECREE

1

ORIGINAL 31



1 suitability of the river for wild and scenic designation subject
2 to available funding. NPS review will be completed within one
3 year of the issuance of the Final EIS.

4 B. Environmental Learning Center: NPS planning for
5 this facility will undergo a separate NEPA review process and
6 will not be analyzed in the LCNRA EIS.

7 C. Fish Stocking NEPA Review: NPS will conduct a
8 NEPA review of the fish-stocking of naturally fish-free lakes
9 within NCNP upon the completion of on-going research; the review
10 will not be initially included in the LCNRA EIS, and may be
11 subject to either separate NEPA compliance or by tiering from
12 the LCNRA EIS. This review shall also evaluate management
13 measures to protect all natural stocks (such as gear
14 restrictions, size and catch limits, or "catch and release"
15 requirements).

16 D. Protection of Wetlands: NPS shall prohibit
17 development, including placement of rip-rap and road fill and
18 construction of structures, on federally owned wetlands within
19 LCNRA. Where rip-rap is absolutely necessary and the only
20 viable alternative for the protection of life or structures,
21 however, it may be employed along stream courses such as the
22 Stehekin River. Such necessary placement of rip-rap along
23 stream courses will occur only when appropriate permits have
24 been obtained from the United States Army Corps of Engineers,
25 and shall avoid "wetlands," defined under Section 404 of the
26 Corps' regulations as a marsh, swamp, or bog, wherever possible.

27
28
CONSENT DECREE

13




APPENDIXES/BIBLIOGRAPHY/GLOSSARY/INDEX


1 E. Additional Studies: NPS will continue to conduct
2 natural and cultural resource studies as necessary to manage the
3 LCNRA subject to available funding.

4 F. Limitation on Rip-Rapping: NPS will cease using
5 rip-rapping along the Stehekin River except when necessary along
6 with other emergency actions to protect life or structures, but
7 even in these instances, such emergency actions will not be
8 accomplished, if possible, in a long-term and irreversible
9 fashion.

10 G. Attorneys' Fees Awarded to Plaintiff: The parties
11 bound by this Decree agree that plaintiff is entitled, pursuant
12 to 28 U.S.C. § 2412(d), to an award of reasonable and
13 appropriate litigation expenses incurred by plaintiff in the
14 amount of \$39,170.30. This represents \$38,000.00 in attorneys'
15 fees and \$1170.30 in litigation costs.

16 Respectfully submitted this 10th day of
17 April, 1991.

18 
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20 Sierra Club Legal Defense Fund
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20 Assistant Attorney General
21 KENTON W. FULTON
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CONSENT DECREE

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5 Assistant U. S. Attorney
6 Western District of Washington
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9 Telephone: (206) 553-5196

ORDER

10 INASMUCH as the parties have consented to entry of the
11 foregoing Consent Decree and requested this Court's approval and
12 entry thereof; and

13 INASMUCH as good cause appears therefor,

14 THIS CONSENT DECREE IS HEREBY APPROVED AND ENTERED.

15 IT IS SO ORDERED.

16 DATED: 4-22-91

17 Carolyn R. Hume
18 UNITED STATES DISTRICT JUDGE

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REAFFIRMATION
 OF
 SUPPLEMENTAL AGREEMENT
 TO
 MEMORANDUM OF UNDERSTANDING
 Between
 National Park Service
 and
 State of Washington Department of Fish and Wildlife

This Supplemental Agreement supplements the Memorandum of Understanding, Agreement No. MU-9000-5-0004, dated August 15, 1985. The purpose of reaffirming the Supplemental Agreement is to establish a mutually agreed to list of lakes within the boundaries of North Cascades National Park which the Department of Fish and Wildlife will stock with fish as part of its fish management program.

Article III. Term of Agreement, item 2. states:

This Supplemental Agreement shall be subject to a mutual review and evaluation by July 2000. The intent is to give this Agreement a 12-year life and that upon mutual review, the Agreement may be continued or modified based on information available at the time of review.

We the undersigned have reviewed and evaluated the Agreement and agree that it should remain in effect without modification until either December 2007 or a Record of Decision is signed for the Mountain Lakes Fishery Management Plan/EIS, whichever comes first.

In witness whereof, the parties hereto have reaffirmed this Supplemental Agreement:

State of Washington
 Department of Fish and Wildlife
 Olympia, Washington

National Park Service
 North Cascades National Park service Complex
 Sedro-Woolley, Washington


 Regional Director 3/23/07 Date


 Superintendent 3/20/07 Date
 ACTING





Appendix B

TIMELINE OF EVENTS
RELATED TO FISH STOCKING IN THE
NORTH CASCADES COMPLEX

APPENDIX B: TIMELINE OF EVENTS RELATED TO FISH STOCKING IN THE NORTH CASCADES COMPLEX

The following is a summary of the events related to the history of the North Cascades Complex, fish stocking of mountain lakes in the North Cascades Complex, and litigation and agreements between the Washington Department of Fish and Wildlife (WDFW) and the National Park Service (NPS).

5,000 B.C. – Native Americans inhabited the area, living from the land by fishing, hunting, and gathering.

Late 1700s – The first Euro-Americans began to settle the area.

1814 – The first recorded crossing of the North Cascades by European fur trader, Alexander Ross.

1846 – The United States established title to the Oregon Territory.

1850s – Congress passed the *Homestead Act* and Donation Land Claim Laws to encourage settlement of the area.

Late 1800s – Lakes were first stocked with exotic trout by settlers for food and recreation.

1890s – Congress established two large forest reserves in the North Cascades region that were administered by the General Land Office of the Department of the Interior. Out of these reserves, Congress created Mount Rainier National Park in 1899, and the remaining land was later transferred to the administrative jurisdiction of the U.S. Forest Service, which established five national forests in the area.

1905 – President Roosevelt transferred jurisdiction of the forest reserves from the U.S. Department of the Interior to the newly created U.S. Forest Service.

1907 – The Washington National Forest was created.

1924 – The Washington National Forest was renamed Mount Baker National Forest.

1930s – Stocking had become an established practice in the North Cascades. The Washington Department of Fish and Game (now the Department of Fish and Wildlife) took over responsibility for stocking, which became a major component of its recreational fishing program. Also in the 1930s, recreational groups such as the Washington State Hi-Lakers and Trail Blazers, Inc. were formed. The groups' purpose was to experience and enhance fishing opportunities in the high mountain lakes by carrying out stocking programs. By 1969, the WDFW and fishing groups had stocked 75 lakes in what is now the North Cascades Complex. The lakes that were stocked were thought to be able to support fish populations.

1963 – President Kennedy ordered a review of the North Cascades region in order to determine the highest and best use of the area.

1968 – On October 2, the North Cascades National Park Service Complex was created from land previously included in the Mount Baker National Forest. The purpose and significance of the North Cascades Complex was essentially to preserve and protect lands and provide recreational opportunities for public enjoyment.

1969–1977 – Fish stocking dropped to only four permitted fish plants in the park and seven in the Ross Lake and Lake Chelan National Recreation Areas during this eight-year period.

1975 – The park superintendent instituted a policy that prohibited fish stocking in naturally barren (fish-free) lakes and would not stock those lakes into which native trout had been introduced, allowing naturally reproducing trout to remain. The policy would not affect the two national recreation areas. The superintendent received considerable anger and resistance from fishing groups (Hi-Lakers and Trail Blazers) and the Washington Department of Game, as well as political pressure from Senator Henry M. Jackson’s office (Louter 1998). In response, the superintendent proposed a policy variance that would consider stocking on a lake-by-lake basis and not include lakes containing reproducing (self-sustaining) populations or that were fishless at the time. The policy variance was made in hopes of appeasing the Washington Department of Game and possibly lead to a more formal memorandum of understanding between the two agencies. The superintendent also noted the possibility of complete negation of the original policy because some disgruntled anglers might illegally stock exotic species of fish in the high lakes to continue the fishery.

1979 – The NPS issued a management policy variance and entered into agreement with the Washington Department of Game that allowed stocking of nonnative trout to continue at regular intervals in selected lakes.

1985 – The NPS attempted to phase out stocking but received strong objection from the Department of Game. Intense public debate and congressional interest elevated the issue to a national level. Both agencies signed a Memorandum of Understanding (MOU) on August 15, 1985 (see appendix A for a copy of the MOU).

June 12, 1986 – The director of the NPS issued a policy statement that placed all mountain lakes in the North Cascades Complex into three categories: (1) natural fish-free waters, (2) self-sustaining fish population waters, and (3) continue-to-stock waters. The policy basically allowed fish stocking to occur in waters that currently had fish populations and allowed other waters to remain fish-free. It acknowledged that some lakes might be “potential candidates for continued fish stocking . . .” It called for a review to “determine which waters warrant management as an enhanced recreational fishery, and for which continued fish stocking is to be an acceptable action.” The statement suggested a research effort that would focus on the following: (1) establish current fish and aquatic habitat baseline conditions, (2) monitor impacts of fish stocking, and (3) determine changes over time referenced against current baseline or undisturbed natural conditions. The intent of the research would be to provide an informed basis for fish-stocking management in the future (see [appendix A](#) for a copy of the 1986 NPS memorandum [“policy waiver”]).

1987 – The Washington Department of Game (name changed to Department of Wildlife) announced plans to stock 12 lakes in the North Cascades Complex that were not approved by the NPS for fish stocking. The NPS responded with a warning that anyone caught stocking these lakes would be issued a violation notice and prosecuted in federal court. No stocking occurred.

1988 – A lawsuit was brought by the North Cascades Conservation Council against the NPS. The council alleged that the environmental assessment associated with the 1988 *General Management Plan* for the North Cascades Complex was not in compliance with the *National Environmental Policy Act* (NEPA).

July 12, 1988 – The Department of Wildlife dropped their 1987 and 1988 plans to stock fish. The NPS and the Department of Wildlife agreed to sign a 12-year Supplemental Agreement (see [appendix A](#)) to the 1985 MOU that allowed fish stocking to continue in 17 lakes and allowed self-sustaining fish populations to continue in 23 lakes while the NPS conducted research. It also stipulated that any additions or deletions to the list of lakes would be made only by mutual agreement and added the caveat that research results would be considered in future decisions.



1988 – The NPS initiated a long-term research effort through Oregon State University to evaluate the effects of fish stocking on native biota in mountain lakes.

November 16, 1988 – The *Washington Wilderness Act* was passed.

1991 – A Consent Decree (see [appendix A](#) for a copy) between the NPS and the North Cascades Conservation Council was signed. The Consent Decree, among many things, dictated that the “National Park Service conduct a NEPA review of the fish stocking of naturally fish-free lakes . . . upon completion of ongoing research.” It also stipulated that the review would evaluate management measures to protect all natural stocks.

2000 – The Washington Department of Fish and Wildlife (WDFW, formerly Department of Game and then Department of Wildlife) agreed to a proposal by the NPS to extend the project two years (to 2002) while the U.S. Geological Survey-Biological Resources Division (USGS-BRD) finished a final research report. The USGS-BRD research focused on the effects of fish stocking on naturally fish-free lakes. The first phase research report was completed in 1995, the second phase was completed in 1998, and the final phase was completed in July 2002.

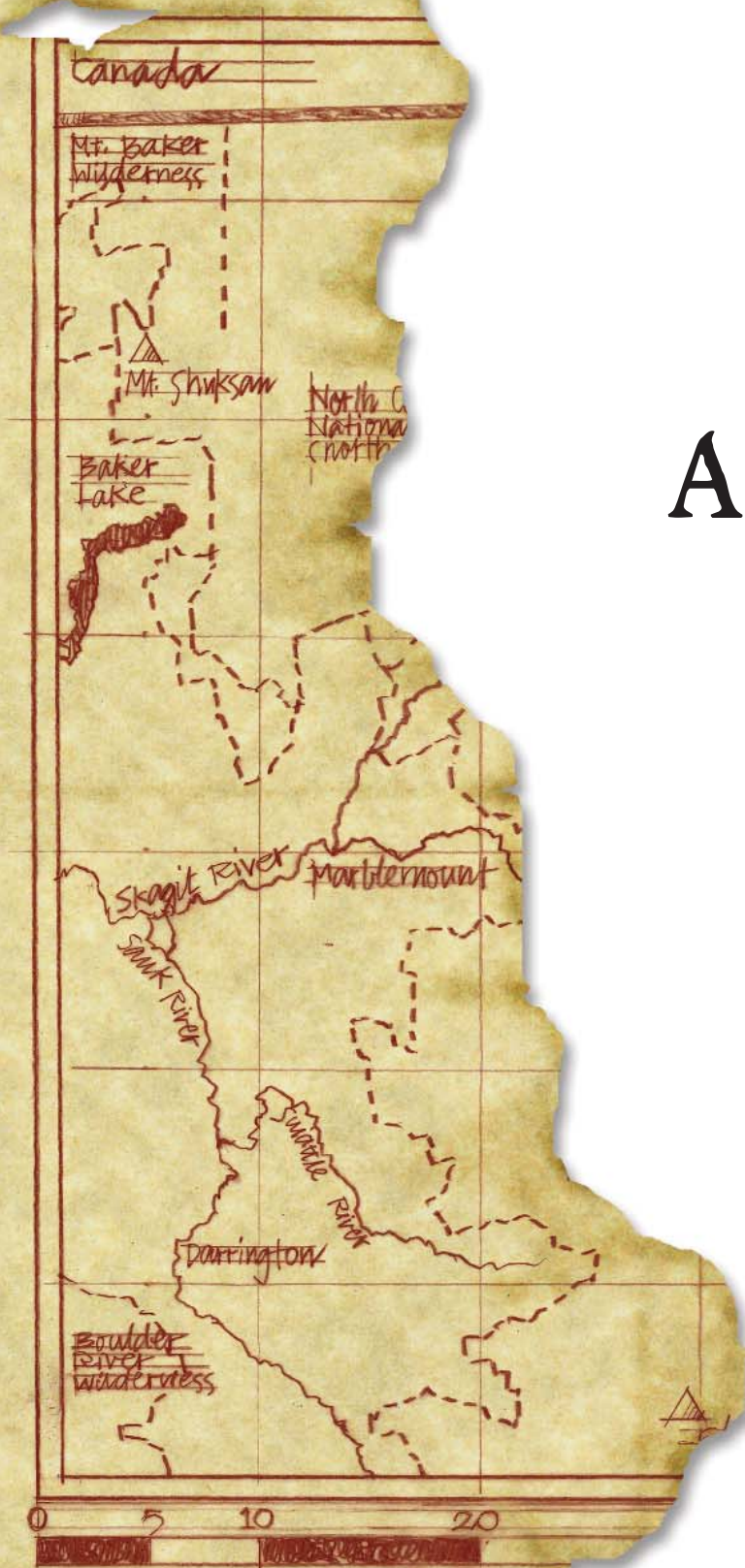
2002 – The NPS initiated development of this *Draft Mountain Lakes Fishery Management Plan / Environmental Impact Statement* (plan/EIS). Preparation of this document is guided by NPS policies, and it conforms to requirements of NPS *Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making*, and Handbook and NEPA. A letter from the WDFW to the North Cascades Complex superintendent reaffirms through 2004 the intent of the 1988 Supplemental Agreement to the 1985 MOU. The letter agrees to no changes in stocking (lakes, species, and frequency). The letter also agrees to collaborate with the NPS on an environmental assessment leading to a long-term fishery management plan.

2003 – Public Scoping formally began on January 16, 2003, with the *Federal Register* publication of the notice of intent to prepare the draft plan/EIS (*Federal Register* Vol. 68(11), pp. 2355–2356). In March 2003, the NPS and WDFW held four public scoping meetings to discuss issues and management alternatives for this draft plan/EIS. The public comment period ended on April 18, 2003. From April 2003 to April 2005, the NPS prepares the draft plan/EIS with input from the WDFW (the cooperating agency).

2004 – The 12-year Supplemental Agreement to the 1985 MOU expired. See “July 12, 1988” above for a description of the agreement.

2005 – The draft plan/EIS is distributed for agency and public review and comment in spring 2005.





Appendix C

SPECIAL STATUS SPECIES

APPENDIX C: SPECIAL STATUS SPECIES

TABLE C-1: THREATENED AND ENDANGERED FISH AND WILDLIFE IN THE NORTH CASCADES COMPLEX

Common Name	Latin Name	Status	
		Federal	State
American peregrine falcon	<i>Falco peregrinus anatum</i>	Species of concern	Endangered
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	Threatened
Black-backed woodpecker	<i>Picoides albolarvatus</i>		Candidate
Bull trout	<i>Salvelinus confluentus</i>	Threatened	Candidate
California wolverine	<i>Gulo gulo luteus</i>	Species of concern	Candidate
Canada lynx	<i>Lynx canadensis</i>	Threatened	Threatened
Cascades frog	<i>Rana cascadae</i>	Species of concern	
Chinook salmon	<i>Oncorhynchus tshawtscha</i>	Threatened	
Columbia spotted frog	<i>Rana luteiventris</i>	Species of concern	Candidate
Coho salmon	<i>Oncorhynchus kisutch</i>	Species of concern	Sensitive
Ferruginous hawk	<i>Buteo regalis</i>	Species of concern	Threatened
Flammulated owl	<i>Otus flammeolus</i> - eastside only		Candidate
Fringed myotis	<i>Myotis thysanodes</i>	Species of concern	
Golden eagle	<i>Aquila chrysaetos</i>		Candidate
Gray wolf	<i>Canus lupus</i>	Endangered	Endangered
Grizzly bear	<i>Ursus arctos</i>	Threatened	Endangered
Harlequin duck	<i>Histrionicus histrionicus</i>	Species of concern	
Keen's myotis	<i>Myotis keenii</i>		Candidate
Lewis' woodpecker	<i>Melanerpes lewis</i>		Candidate
Little willow flycatcher	<i>Empidonax traillii brewsteri</i>	Species of concern	
Long-eared myotis	<i>Myotis evotis</i>	Species of concern	
Long-legged myotis	<i>Myotis volans</i>	Species of concern	
Marbled murrelet	<i>Brachyramphus marmoratus marmoratus</i>	Threatened	Threatened
Merlin	<i>Falco columbarius</i>		Candidate
Northern goshawk	<i>Accipiter gentilis</i>	Species of concern	Candidate
Northern red-legged frog	<i>Rana aurora aurora</i>	Species of concern	
Northern spotted owl	<i>Strix occidentalis caurina</i> -	Threatened	Endangered
Olive-sided flycatcher	<i>Contopus borealis</i>	Species of concern	
Pacific fisher	<i>Martes pennanti pacifica</i>	Candidate	Endangered
Pileated woodpecker	<i>Dryocopus pileatus</i>		Candidate
Small-footed myotis	<i>Myotis ciliolabrum</i>	Species of concern	
Tailed frog	<i>Ascaphus truei</i>	Species of concern	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Species of concern	Threatened
Vaux's swift	<i>Chaetura vauxi</i>		Candidate
Western gray squirrel	<i>Sciurus griseus griseus</i>	Species of concern	Threatened
Western toad	<i>Bufo boreas</i>	Species of concern	Candidate
Westslope cutthroat trout	<i>Oncorhynchus clarki lewisi</i>	Species of concern	
Yuma myotis	<i>Myotis yumanensis</i>	Species of concern	





TABLE C-2: STATE OF WASHINGTON SPECIAL STATUS SPECIES

Scientific Name	Common Name	Wetland Rating	East or West	Elevation (feet)	Habitat	Blooming time	Washington State Status
Graminoids							
<i>Carex scirpoidea</i> var. <i>scirpoidea</i>	Canadian single spike sedge	FACU	Both	5,000–7,200	Moist meadows, streambanks, rocky slopes	July–August	Sensitive
<i>Carex scopulorum</i> var. <i>prionophylla</i>	Mountain sedge	FACW	East	4,600	Moist-wet meadows, lakeshores, streambanks	July–August	Watch
<i>Carex stylosa</i>	Long styled sedge	FACW	West	2,700–6,700	Marshes, streambanks, bogs, wet depressions, seeps	August–September	Sensitive
<i>Eleocharis atropurpurea</i>	Purple spike rush	OBL	East	500 in CA	Wet ground, lake shores	Annual, early spring	Possibly extirpated
<i>Eriophorum viridicarinarum</i>	Green keeled cottongrass	OBL	Both	2,000–6,600	Cold swamps and bogs	June–July	Sensitive
<i>Poa arctica</i> ssp. <i>arctica</i>	Gray's bluegrass	FACU	Both		Alpine ridges		Review group 2
Forbs							
<i>Agoseris elata</i>	Tall agoseris	UPL	Both	5,000–7,000	Open moist woods, rocky or talus, shrubby slopes	June–August	Sensitive
<i>Aster sibericus</i>	Arctic Aster	UPL	Both	4,000–7,200	Open rocky gravelly places at high elevation	July–August	Sensitive
<i>Astagalus arrectus</i>	Palouse milk vetch	UPL	East	1,000–4,000	Grassy hillsides, sagebrush flats openings in Ponderosa Pine or Douglas fir forest gravelly or sandy flats	Late April–June	Threatened
<i>Campanula lasiocarpa</i>	Alaska harebell	UPL	West	6,500–7,000	Rock crevices in alpine zones	July–August	Sensitive
<i>Cicuta bulbifera</i>	Bulb-bearing hemlock	OBL	Both	240–3,700	Edges of marshes, lakes, bogs, meadows shallow standing or slow moving water	August–September	Sensitive
<i>Cimicifuga elata</i>	Tall bubane	UPL	West	600–3,000	Moist shady woods in mature or old growth coniferous deciduous forest	May–August	Sensitive
<i>Coptis asplenifolia</i>	Spleenwort-leaved goldthread	FAC	West	0–3,000	Open rocky areas in moist coniferous forests	April–May	Sensitive
<i>Corydalis aurea</i>	Golden smoke	UPL	Both	300–6,000	Moist to dry well drained soil, gravelly open areas	May–July	Watch
<i>Cyperpedium faciculatum</i>	Clustered lady slipper	FACU	Both	1,200–5,000	Moist to dry and rocky open conifer forest	May–mid-June	Sensitive
<i>Cyperpedium parviflorum</i>	Yellow lady slipper	UPL	East	2,100–3,400	Bogs, seeps, margins of lakes and ponds, moist woods	May–June	Threatened

TABLE C-2: STATE OF WASHINGTON SPECIAL STATUS SPECIES (CONTINUED)

Scientific Name	Common Name	Wetland Rating	East or West	Elevation (feet)	Habitat	Blooming time	Washington State Status
Forbs (continued)							
<i>Dodecatheon pulchellum</i> var. <i>watsonii</i>	Few flowered shooting star	FACW	Both	5,500–7,500	Meadows and rock out crops subalpine and alpine	July	Watch
<i>Draba aurea</i>	Golden draba	UPL	Both	6,000–7,000	Open to forested slopes, to alpine meadows	June–August	Sensitive
<i>Epipactis gigantea</i>	Giant hellebore	OBL	Both	0–4,000	Streambanks, lake shores, seeps, springs	April–July	Watch
<i>Erigeron salsihii</i>	Salish fleabane	UPL	East	6,000–8,000	Dry alpine ridges	July–August	Sensitive
<i>Eritrichium nanum</i> var. <i>elongatum</i>	Pale forget-me-not	UPL	East	7,000–9,000	Open rocky places	June–August	Sensitive
<i>Erythronium revolutum</i>	Pink fawn lily	FAC	West	100–200	River banks, edge of woods, open or moderate shade	April–May	Sensitive
<i>Fritallaria camschatcensis</i>	Black lily	UPL	West	0–3,000	Moist to wet meadow, open, riparian areas, tide flats	May–June	Sensitive
<i>Galium kamtschaticum</i>	Boreal bedstraw	UPL	West	1,500–2,100	Moist coniferous forest, seeps and areas of standing water	July–August	Watch
<i>Gentiana glauca</i>	Glaucous gentian	FAC	Both	7,000–8,000	Tundra, dry to moist alpine areas	July–September	Sensitive
<i>Githopsis specuarioides</i>	Common blue-cup	UPL	Both	200–2,300	Dry, open places in foothill, areas of thin soils, talus slopes	April–June	Sensitive
<i>Hackelia hispida</i> var. <i>disjuncta</i>	Sagebrush stickseed	UPL	East	600–2,100	Cliffs rocky, talus slopes grasslands to open forest	May–June	Sensitive
<i>Hackelia venusta</i>	Showy stickseed	UPL	East	1,000–2,500	Dry loose granitic sand and crevices in granite or talus, Ponderosa pine forest	May–June	Endangered
<i>Hypericum majus</i>	Canadian St. John's wort	FACW-	Both	100–2,300	Along ponds and lakeshores, riparian areas	July–September	Sensitive
<i>Iliamna longisepala</i>	Longsepal globemallow	UPL	East	500–4,500	Sagebrush steppe, open hillsides, dry streams, open Ponderosa and Douglas fir forest	June–August	Sensitive
<i>Impatiens aurelia</i>	Orange balsam	FACW	Both	Low elevation	Moist shaded areas	June–August	Review group 2
<i>Limosella acaulis</i>	mudwort	OBL	Both	< 4000	Ponds edges, lakeshores, river edges in areas of slow moving water	May–November	Watch
<i>Listera borealis</i>	Northern twayblade	FACU	Both	3,000–6,500	Moist woods in moderate to deep shade, along streams, associated with old growth or old second growth	June–July	Watch
<i>Lobelia dortmanna</i>	Water lobelia	OBL	West	0–500	Shallow low elevation ponds and lakes	June–August	Threatened
<i>Loiseleurua procumbens</i>	Alpine Azalea	UPL	Both	6,300	Alpine slopes and subalpine meadows	July–August	Threatened



TABLE C-2: STATE OF WASHINGTON SPECIAL STATUS SPECIES (CONTINUED)

Scientific Name	Common Name	Wetland Rating	East or West	Elevation (feet)	Habitat	Blooming time	Washington State Status
Forbs (continued)							
<i>Mimulus pulsiferae</i>	Pulsifer's Monkey-Flower	UPL	East	1,000–2,000	Seasonally moist, open places in foothills, and openings in Ponderosa Pine/Douglas fir forest	June–July	Sensitive
<i>Mimulus suksdorfii</i>	Suksdorf's monkey flower	FAC-	East	2,000–4,000	Moist areas in sagebrush steppe/Ponderosa Pine forest	May–August	Sensitive
<i>Mimulus washingtonensis</i>	Washington monkey-flower	OBL	East	Low elevation	Wet to moist places at low elevation	May–September	Possibly extirpated
<i>Orthocarpus bracteosus</i>	Rosy owl's clover	UPL	Both	1,500–2,500	Moist meadows at low elevation in transition zone between wetland and upland	June–August	Endangered
<i>Parnassia kotzebuei</i> var. <i>kotzebuei</i>	Kotzebue's grass-of-parnassus	OBL	East	No data available	Alpine areas	July–September	Sensitive
<i>Penstemon eriantherus</i> var. <i>whitedii</i>	Fuzzy-tongued penstemon	UPL	East	3,500	Open sagebrush shrub, open areas in valleys and foothills	May–July	Sensitive
<i>Petrophyton cinerascens</i>	Chelan rockmat	UPL	East	800–1,800	Ledges and crevices of cliffs and rocky outcrops	July–August	Endangered
<i>Pinguicula vulgaris</i>	Common butterwort	OBL	Both	1,500–7,000	Moist seeps, meadows and talus slopes	July–August	Watch
<i>Plancherella obtusata</i>	Small northern bog orchid	FACW	Both	800–5,000	Moist places in forests, bogs, streambanks, marshes, meadows	June–July	Sensitive
<i>Pleuricospora fimbriolata</i>	Sierra sap	UPL	Both	1,000–4,000	Dry coniferous forest with little understory	July–August	Watch
<i>Polemonium viscosum</i>	Skunk polemonium	UPL	East		Open rocky place in high elevation, mostly above timberline	July–August	Sensitive
<i>Potamogeton obtusifolius</i>	Blunt leaved pondweed	OBL	West	50–2,000	Waters of lakes and slow moving streams	August–September	Sensitive
<i>Potentilla diversifolia</i> var. <i>perdissecta</i>	Diverse-leaved cinquefoil	UPL	West	6,500–8,000	Montane to alpine, rocky slopes, meadows and streambanks	June–August	Sensitive
<i>Ranunculus cooleyae</i>	Cooley's buttercup	FAC	West	1,500–6,000	Moist slopes and rock crevices	July–August	Sensitive
<i>Salix tweedyi</i>	Tweedy's willow	FACW-	East	5,200–7,200	Streambanks moist meadows in mid to high elevation meadows	June–July	Sensitive
<i>Salix vestita</i> var. <i>erecta</i>	Rock willow	FAC	East	High elevation	Open moist areas in springs or wetlands near or above timberline	July–September	Possibly extirpated
<i>Sanicula marilandica</i>	Black snake-root	UPL	East	2,900–5,200	Low moist ground, meadows, marsh edges, riparian flood plains	June–August	Sensitive

TABLE C-2: STATE OF WASHINGTON SPECIAL STATUS SPECIES (CONTINUED)

Scientific Name	Common Name	Wetland Rating	East or West	Elevation (feet)	Habitat	Blooming time	Washington State Status
Forbs (continued)							
<i>Saxifraga integrifolia</i> var. <i>apetala</i>	Swamp saxifrage	FACW	East	5,900–6,500	Vernally moist meadows, seeps and ephemeral streams	March–July	Watch
<i>Saxifraga rivularis</i>	Pygmy saxifrage	FACW	Both	5,500–7,000	Damp cliffs, shaded rock outcrops, talus near snow banks, moist meadows	July–August	Sensitive
<i>Saxifragopsis fragarioides</i>	Strawberry saxifrage	UPL	East	1,400–4,500	Crack and crevices on cliffs and rock outcrops in Ponderosa pine and Douglas fir forest	June–July	Threatened
<i>Silene seelyi</i>	Seely's silene	UPL	East	1,500–6,300	Cliffs and talus slopes	May–August	Sensitive
<i>Spiranthes porrifolia</i>	Western ladies tresses	UPL	Both	60–6,800	Meadows, seeps streams	May–August	Sensitive
<i>Swertia perennis</i>	Swertia	UPL	Both	4,000	Montane to subalpine meadows, streambanks	July–August	Review group 1
<i>Trifolium thompsonii</i>	Thompson's clover	UPL	East	140–4,000	Open to sparsely wooded sagebrush community, near edges of the Ponderosa pine zone	May–June	Threatened
<i>Utricularia minor</i>	Lesser bladderwort	OBL	Both	300–2,000	Shallow standing or slowly moving water	June–September	Review group 1
<i>Botrychium lanceolatum</i>	Lance-leafed moonwort	FACW	Both	760–6,000	Moist sites, alpine meadows	June–September	Watch
<i>Botrychium lunaria</i>	Common moonwort	FAC	Both	3,000–6,400	Moist open areas in meadows and forests	June–September	Watch
<i>Botrychium minganense</i>	moonwort	UPL	Both	2,000–5,700	Moist sites in deciduous and coniferous forest, subalpine sites	June–September	Watch
<i>Botrychium pedunculosum</i>	Stalked moonwort	UPL	Both	1,600–3,000	Moist wooded sites	June–September	Sensitive
<i>Botrychium pinnatum</i>	Northwestern moonwort	UPL	Both	2,100–6,500	Dry to moist forest, subalpine meadows and alpine ridge tops	June–September	Watch
<i>Boytrichium simplex</i>	Little moonwort	FAC	Both	5,000–7,000	Moist to dry meadows, bogs, swamps	June–September	Watch
<i>Cryptogramma stelleri</i>	Steller's rockbrake	UPL	East	3,000	Moist shaded cliffs, ledges, rocky slopes, often on limestone	June	Sensitive
<i>Lycopodiella inundata</i>	Bog clubmoss	FACW	West	1,500–6,400	Bogs, marshes, pond margins	July	Sensitive
<i>Lycopodium dendroideum</i>	Treelike clubmoss	FACU	Both	800–3,600	Rock outcrops, talus fields, moss and significant debris layer	June–July	Sensitive
<i>Pellea brachyptera</i>	Sierra cliff brake	UPL	East	770–2,200	Dry Rocky slopes, talus, outcrops in Douglas fir and Ponderosa Pine forest	August–September	Sensitive





United States Department of the Interior

NATIONAL PARK SERVICE
North Cascades National Park
Lake Chelan National Recreation Area
Ross Lake National Recreation Area
810 State Route 20
Sedro-Woolley, Washington 98284-1239

IN REPLY REFER TO:
L76

July 29, 2003

Tamara Black
U.S. Fish and Wildlife Service
Western Washington Office
510 Desmond Drive SE, Suite 102
Lacey, Washington, 98503

Dear Ms. Black:

The National Park Service (NPS), North Cascades National Park Service Complex (NOCA) and the Washington Department of Fish and Wildlife (WDFW) are currently collaborating on an Environmental Impact Statement (EIS) for mountain lakes fishery management. The EIS will include an assessment of non-native trout stocking and potential restoration of lakes with reproducing populations of non-native trout. The NPS is the lead agency, and WDFW is a Cooperating Agency. In accordance with Section 7 of the Endangered Species Act, we wish to begin informal consultation with your agency so that we may fully evaluate the potential effects of fisheries management actions on federally listed species.

The EIS formally began with publication of the enclosed Notice of Intent on January 16, 2003. Four public scoping meetings were held in March 2003, and we are now working on the Draft EIS. Based on results of internal and public scoping, we have defined the geographic scope of management actions considered in the EIS to include all *natural* (i.e. unregulated) mountain lakes, rivers and creeks in North Cascades National Park, Ross Lake National Recreation Area, and Lake Chelan National Recreation Area. The EIS will not govern fisheries management in NOCA reservoirs (Lake Chelan, Ross Lake, Diablo Lake, and Gorge Lake) or the Skagit River. These water bodies, however, along with those on adjacent lands will be considered in the watershed-based impact assessment.

We wish to request the most current list of Rare, Threatened and Endangered species that potentially inhabit NOCA, along with any pertinent critical habitat designations. We also understand that the westslope cutthroat trout is being petitioned for listing as Threatened throughout its range. We are very concerned about interbreeding of westslope cutthroat trout and non-native rainbow trout in the Stehekin river watershed, and wish to request any information that may help us in the biological evaluation process for the EIS.



For more technical information on the EIS, call or e-mail Roy Zipp, Natural Resource Specialist at 360-873-4590 extension 31; roy_zipp@nps.gov. You may also wish to visit the website at: www.nps.gov/noca/highlakes.htm.

Sincerely,

Daniel L. Allen
Resource Management Specialist



United States Department of the Interior

FISH AND WILDLIFE SERVICE
 Western Washington Fish and Wildlife Office
 510 Desmond Drive SE, Suite 102
 Lacey, Washington 98503
 Phone: (360) 753-9440 Fax: (360) 534-9331

AUG 26 2003

Dear Species List Requester:

We (U.S. Fish and Wildlife Service) are providing the information you requested to assist your determination of possible impacts of a proposed project to species of Federal concern. Attachment A includes the listed threatened and endangered species, species proposed for listing, candidate species, and/or species of concern that may be within the area of your proposed project.

Any Federal agency, currently or in the future, that provides funding, permitting, licensing, or other authorization for this project must assure that its responsibilities under section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act), are met. Attachment B outlines the responsibilities of Federal agencies for consulting or conferencing with us.

If both listed and proposed species occur in the vicinity of a project that meets the requirements of a major Federal action (i.e., "major construction activity"), impacts to both listed and proposed species must be considered in a biological assessment (BA) (section 7(c); see Attachment B). Although the Federal agency is not required, under section 7(c), to address impacts to proposed species if listed species are not known to occur in the project area, it may be in the Federal agency's best interest to address impacts to proposed species. The listing process may be completed within a year, and information gathered on a proposed species could be used to address consultation needs should the species be listed. However, if the proposed action is likely to jeopardize the continued existence of a proposed species, or result in the destruction or adverse modification of proposed critical habitat, a formal conference with us is required by the Act (section 7(a)(4)). The results of the BA will determine if conferencing is required.

The Federal agency is responsible for making a determination of the effects of the project on listed species and/or critical habitat. For a Federal agency determination that a listed species or critical habitat is likely to be affected (adversely or beneficially) by the project, you should request section 7 consultation through this office. For a "not likely to adversely affect" determination, you should request our concurrence through the informal consultation process.

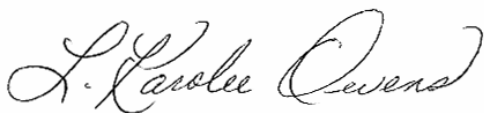
Candidate species and species of concern are those species whose conservation status is of concern to us, but for which additional information is needed. Candidate species are included as an advance notice to Federal agencies of species that may be proposed and listed in the future. Conservation measures for candidate species and species of concern are voluntary but recommended. Protection provided to these species now may preclude possible listing in the future.



For other federally listed species that may occur in the vicinity of your project, contact the National Marine Fisheries Service (NOAA Fisheries) at (360) 753-9530 to request a list of species under their jurisdiction. For wetland permit requirements, contact the Seattle District of the U.S. Army Corps of Engineers for Federal permit requirements and the Washington State Department of Ecology for State permit requirements.

Thank you for your assistance in protecting listed threatened and endangered species and other species of Federal concern. If you have additional questions, please contact Tami Black at (360) 753-4322 or Yvonne Dettlaff at (360) 753-9582.

Sincerely,



for Ken S. Berg, Manager
Western Washington Fish and Wildlife Office

Enclosure(s)

ATTACHMENT A

August 22, 2003

**LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES,
CRITICAL HABITAT, CANDIDATE SPECIES, AND SPECIES OF CONCERN
THAT MAY OCCUR IN WESTERN WASHINGTON
PREPARED BY
U.S. FISH AND WILDLIFE SERVICE
WESTERN WASHINGTON OFFICE**

(Revised July 14, 2003)

FWS REF: 1-3-03-SP-1754

SKAGIT COUNTY

LISTED

Wintering bald eagles (*Haliaeetus leucocephalus*) occur in the county from about October 31 through March 31.

There are 25 bald eagle communal winter night roosts located in the county.

There are eight bald eagle wintering concentrations located in the county in the following areas: Fidalgo Island; Guemes Island; Skagit River-S. Fork Nooksack River; Skagit River; Skagit-Sauk Rivers; Corkindale Staging Area; Illabot Creek Staging Areas; and Samish Bay.

There are 46 bald eagle nesting territories located in the county. Nesting activities occur from about January 1 through August 15.

Bull trout (*Salvelinus confluentus*) occur in the county.

Canada lynx (*Lynx canadensis*) may occur in the county.

Gray wolves (*Canis lupus*) may occur in the county.

Grizzly bears (*Ursus arctos* = *U. a. horribilis*) may occur in the county.

Marbled murrelets (*Brachyramphus marmoratus*) occur in the county.

Northern spotted owls (*Strix occidentalis caurina*) occur in the county throughout the year.

Major concerns that should be addressed in your biological assessment of the project impacts to listed species include:



1. Level of use of the project area by listed species;
2. Effect of the project on listed species' primary food stocks, prey species, and foraging areas in all areas influenced by the project; and
3. Impacts from project construction (i.e., habitat loss, increased noise levels, increased human activity) that may result in disturbance to listed species and/or their avoidance of the project area.

DESIGNATED

Critical habitat for the northern spotted owl has been designated in Skagit County.
Critical habitat for the marbled murrelet has been designated in Skagit County.

PROPOSED

None

CANDIDATE

Oregon spotted frog (*Rana pretiosa*)

SPECIES OF CONCERN

California wolverine (*Gulo gulo luteus*)
Cascades frog (*Rana cascadae*)
Long-eared myotis (*Myotis evotis*)
Long-legged myotis (*Myotis volans*)
Northern goshawk (*Accipiter gentilis*)
Olive-sided flycatcher (*Contopus cooperi*)
Pacific fisher (*Martes pennanti pacifica*)
Pacific lamprey (*Lampetra tridentata*)
Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)
Peregrine falcon (*Falco peregrinus*)
River lamprey (*Lampetra ayresi*)
Tailed frog (*Ascaphus truei*)
Western toad (*Bufo boreas*)

ATTACHMENT A

August 22, 2003

**LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES,
CRITICAL HABITAT, CANDIDATE SPECIES, AND SPECIES OF CONCERN
THAT MAY OCCUR IN WESTERN WASHINGTON**

**PREPARED BY
U.S. FISH AND WILDLIFE SERVICE
WESTERN WASHINGTON OFFICE**

(Revised July 14, 2003)

FWS REF: 1-3-03-SP-1754

WHATCOM COUNTY

LISTED

Wintering bald eagles (*Haliaeetus leucocephalus*) occur in the county from about October 31 through March 31.

There are 24 bald eagle communal winter night roosts located in the county.

There are six bald eagle wintering concentrations located in the county at Lummi Island, Nooksack River-Bellingham Bay, and along the Nooksack River.

There are 48 bald eagle nesting territories located in the county. Nesting activities occur from about January 1 through August 15.

Brown pelicans (*Pelecanus occidentalis*) occur in Lummi Bay in the county.

Bull trout (*Salvelinus confluentus*) occur in the county.

Canada lynx (*Lynx canadensis*) may occur in the county.

Gray wolves (*Canis lupus*) may occur in the county.

Grizzly bears (*Ursus arctos* = *U. a. horribilis*) may occur in the county.

Marbled murrelets (*Brachyramphus marmoratus*) occur in the county.

Northern spotted owls (*Strix occidentalis caurina*) occur in the county throughout the year.



Major concerns that should be addressed in your biological assessment of the project impacts to listed species include:

1. Level of use of the project area by listed species;
2. Effect of the project on listed species' primary food stocks, prey species, and foraging areas in all areas influenced by the project; and
3. Impacts from project construction (i.e., habitat loss, increased noise levels, increased human activity) that may result in disturbance to listed species and/or their avoidance of the project area.

DESIGNATED

Critical habitat for the northern spotted owl has been designated in Whatcom County.
Critical habitat for the marbled murrelet has been designated in Whatcom County.

PROPOSED

None

CANDIDATE

Yellow-billed cuckoo (*Coccyzus americanus*)

SPECIES OF CONCERN

California wolverine (*Gulo gulo luteus*)
Cascades frog (*Rana cascadae*)
Long-eared myotis (*Myotis evotis*)
Long-legged myotis (*Myotis volans*)
Northern goshawk (*Accipiter gentilis*)
Olive-sided flycatcher (*Contopus cooperi*)
Pacific fisher (*Martes pennanti pacifica*)
Pacific lamprey (*Lampetra tridentata*)
Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)
Peregrine falcon (*Falco peregrinus*)
River lamprey (*Lampetra ayresii*)
Tailed frog (*Ascaphus truei*)
Western gray squirrel (*Sciurus griseus griseus*)
Botrychium ascendens (triangular-lobed moonwort)

ATTACHMENT B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7(a) AND 7(c) OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED

SECTION 7(a) - Consultation/Conference

- Requires:
1. Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;
 2. Consultation with the U.S. Fish and Wildlife Service (FWS) when a Federal action may affect a listed endangered or threatened species to ensure that any action authorized, funded, or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after it has determined if its action may affect (adversely or beneficially) a listed species; and
 3. Conference with the FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or an adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Construction Projects *

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species that is/are likely to be affected by a construction project. The process is initiated by a Federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, please verify the accuracy of the list with the Service. No irreversible commitment of resources is to be made during the BA process which would result in violation of the requirements under Section 7(a) of the Act. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should (1) conduct an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within the FWS, National Marine Fisheries Service, state conservation department, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures; and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. Upon completion, the report should be forwarded to our Endangered Species Division, 510 Desmond Drive SE, Suite 102, Lacey, WA 98503-1273.

* "Construction project" means any major Federal action which significantly affects the quality of the human environment (requiring an EIS), designed primarily to result in the building or erection of human-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes Federal action such as permits, grants, licenses, or other forms of Federal authorization or approval which may result in construction.





**STATE OF WASHINGTON
DEPARTMENT OF FISH AND WILDLIFE**

Mailing Address: 600 Capitol Way N – Olympia, Washington 98501-1091 – (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building – 1111 Washington Street SE – Olympia, WA

July 18, 2003

Roy Zipp
North Cascades National Park
7280 Ranger Station Road
Marblemount, Washington 98267

Dear Mr. Zipp:

Enclosed is the information we discussed on the telephone on Wednesday, July 17, 2003. I included more than you probably need. The additional information may help you understand how we process Environmental Impact Statements (EISs). It does not mean that you will need to follow our procedures.

The two sections that concern you for the EIS you are preparing is the list of Elements of the Environment (WAC 197-11-444) and the approach to alternatives and mitigation expectations (WAC 197-11-442(5) and (6)). Remember, this is a non-project action as defined by SEPA because it is a programmatic EIS concerning the overall impacts from fish stocking in high lakes, rather than the actual stocking of a specific lake (a project action). There is a little more flexibility for a non-project action, but as I stated on the phone, often local issues may get overlooked in a NEPA document.

While some issues are not significant enough to be mentioned in a NEPA EIS, there may be some specific items that do cause concern. An obvious example would be if a National Park decided to spray Bt along their borders to prevent gypsy moth infestation. The County may have designated in their Comprehensive Plan a critical area along side one of those parks whereby they were protecting a prairie habitat that sustained state candidate butterflies. Another example is that the Park may decide to open access to tour groups, but the road into the park is a two-lane road by a school.

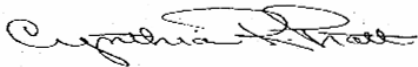
It doesn't look like this programmatic will trigger local issues, but look over the documents I have enclosed to be sure. I also sent information as to how SEPA adopts a NEPA document. If it is an EIS, it is fairly straight-forward in that, once determined that the NEPA EIS is adequate (and has not been appealed unfavorably or has not received a poor rating by EPA), then the adoption may be completed with a seven-day waiting period before action occurs. This means

Roy Zipp
July 18, 2003
Page 2

a review period is not necessary because the NEPA EIS has already been sent out for review. An Environmental Assessment, on the other hand, does require a SEPA review period (usually 14 days, but could be longer).

I hope this information will help you with the EIS. If you need to contact me, my phone number is (360) 902-2575. I can also be reached by e-mail at prattcrp@dfw.wa.gov. Please keep me informed as to the progress of the EIS. I will need to review it after it is final so that I can adopt it.

Sincerely,



Cynthia R. Pratt
SEPA/NEPA Coordinator
Habitat Program

Enclosures

cc: Rich Costello, RHPM, Region 4





United States Department of the Interior

NATIONAL PARK SERVICE

North Cascades National Park
Lake Chelan National Recreation Area
Ross Lake National Recreation Area
810 State Route 20
Sedro-Woolley, Washington 98284-9394

IN REPLY REFER TO:
N1423

August 8, 2005

Tom Sibley, Team Leader-North Puget Sound Team
NOAA Fisheries
Washington Habitat Branch
7600 Sand Point Way NE, Bldg 1
Seattle WA 98115

Dear Mr. Sibley:

Enclosed for your review is a Biological Assessment (BA) concerning potential impacts to chinook salmon and coho salmon.

The BA evaluates the potential impacts of the preferred alternative currently under consideration in the enclosed Draft Mountain Lakes Fishery Management Plan/EIS for management of the mountain lakes fishery in North Cascades National Park Service Complex. The BA follows the format of the Consultation Initiation Template provided on the NOAA Fisheries Northwest Region website.

The BA concludes that the preferred alternative identified in the Draft Plan/EIS may affect, but is not likely to adversely affect chinook salmon or coho salmon. Your concurrence with this determination is requested.

If you have any further questions, please contact Roy Zipp, Natural Resources Specialist (360-873-4590 ext. 31; roy_zipp@nps.gov).

Sincerely,

William F. Paleck
Superintendent

enclosures



Biological Assessment **Draft Mountain Lakes Fishery Management Plan/Environmental Impact Statement** **National Park Service, North Cascades National Park Service Complex** **August 3, 2005**

I. Background / History

This Biological Assessment concerns a Draft Mountain Lakes Fishery Management Plan/Environmental Impact Statement (Draft Plan/EIS) for North Cascades National Park Service Complex (North Cascades National Park, Ross Lake National Recreation Area and, Lake Chelan National Recreation Area), managed by the National Park Service (NPS).

The information contained in this Biological Assessment (BA) was obtained through best professional judgment of NPS staff, experts in fishery management, the U.S. Fish and Wildlife Service, the Washington Department of Fish and Wildlife (WDFW) and available literature. This BA evaluates potential impacts to Chinook salmon (Federally threatened; Puget Sound ESU) and Coho Salmon (Species of Concern; Georgia Straight/Puget Sound ESU). There is no critical habitat in the project area.

A. Project History

The practice of stocking trout and char in naturally fishless lakes has been taking place within the present day boundaries of North Cascades National Park Service Complex (hereinafter Complex) for more than a century. Fish stocking has been a contentious issue since the establishment of the Complex in 1968. Various NPS attempts to phase out stocking has been strongly resisted by the WDFW and various stakeholders. To resolve the longstanding controversy, the NPS and the WDFW (a cooperating agency) agreed to develop a comprehensive Mountain Lakes Fishery Management Plan in the fall of 2003. This timeframe coincided with the completion of more than a decade's worth of research by the USGS Biological Resources Division and Oregon State University into the ecological effects of non-native trout on mountain lakes in North Cascades Complex.

This project formally began on January 16, 2003 with the *Federal Register* publication of the Notice of Intent (NOI) to prepare an environmental impact statement (Federal Register Volume 68 (11), pp. 2355-2356). This BA is the first written correspondence submitted to NOAA Fisheries on this issue. The Draft Plan/EIS (Volumes I and II, Executive Summary, Maps of Project Area) are also included in this submittal.

B. Federal Action History (Discussion of Past Consultations Relevant to the Proposed Project)

In summer 2003 the NPS received from the U.S. Fish and Wildlife Service an up-to-date species list. At that time, coho salmon were listed as Candidate species. The Draft Plan/EIS reflects that outdated listing, however, the most recent listing as Species of Concern is reflected in this BA.

Informal consultation with the National Marine Fisheries Service (NOAA Fisheries) began in the summer of 2003 with a telephone conversation with Tom Sibley of the Habitat Conservation Division. Mr. Sibley recommended that the NPS evaluate impacts to Chinook salmon (threatened) and Coho salmon (at that time a candidate species). When asked if the National Marine Fisheries Service would like to receive a written request for their input, Mr. Sibley stated that the phone dialogue would suffice and pledged further technical assistance with the biological assessment, as needed.



Please refer to pp. 459-462 in Volume I of the attached for a complete description of past consultations with other agencies regarding this Plan.

II. Description of the Action and Action Area

A. Discussion of Federal Action and Legal Authority / Agency Discretion

Lead Agency: National Park Service (NPS), U.S. Department of the Interior

Cooperating Agency: Washington Department of Fish and Wildlife (WDFW)

The Draft Plan/EIS evaluates a range of alternatives and management actions for 91 naturally formed mountain lakes in the Complex that have undergone either documented or undocumented fish stocking activities. Under natural conditions, these 91 mountain lakes would be fishless. The Draft Plan/EIS assesses impacts that could result from continuation of the current management framework (the no-action alternative) or from implementation of any of the three proposed action alternatives. Upon conclusion of the Draft Plan/EIS and decision-making process, one of the four alternatives would become the “Mountain Lakes Fishery Management Plan” and guide future actions for a period of 15 years.

B. Description of the Project Purpose and Objectives

The purpose of the fishery management plan is to guide future actions by the NPS and WDFW that would conserve native biological integrity; provide a spectrum of recreational opportunities and visitor experiences, including sport fishing; and resolve the long-standing debate and conflicts over fish stocking in the 91 naturally fishless mountain lakes in the Complex.

Objectives:

- Obtain support from interested parties and groups to implement a new management plan for mountain lakes within the Complex should the governing agencies decide a new plan is needed.
- Advance the protection and rehabilitation of native biological integrity by maintaining native species abundance, viability, and sustainability. Provide a spectrum of recreational opportunities, including sport fishing, while minimizing impacts to the biological integrity of natural mountain lakes.
- Apply science and research in decision-making at multiple spatial scales that include landscape, watershed, lake cluster, and individual lakes.
- Provide to the public and interested parties full and open access to available information.

C. Project Descriptions; Activities to be Authorized, Funded, or Carried Out by the Federal Action Agency

This Draft Plan/EIS evaluates four alternatives for management of the 91 study area lakes in the Complex (table ES-3 in the submitted Draft Plan/EIS provides a summary comparison of the four alternatives). A description of the preferred alternative follows, including specific conservation measures intended to eliminate or minimize potential adverse effects to Chinook and Coho salmon.

ALTERNATIVE B: PROPOSED ADAPTIVE MANAGEMENT OF 91 LAKES UNDER A NEW MANAGEMENT FRAMEWORK

The following sections provide the essential elements of Alternative B, the preferred alternative. For further information, a detailed description of Alternative B is provided in the attached Draft Plan/EIS (Volume I, pp. 98-105).

The proposed management framework under alternative B would be to eliminate high densities of reproducing fish populations from lakes in the study area while allowing low densities of reproducing and stocked fish populations to remain in select lakes. Based on the best available science, some lakes could be restocked with low densities of nonreproducing fish once reproducing fish have been removed. Restocking would be allowed only where impacts on biological resources could be minimized. Lakes where critical information is missing would not be stocked until that information becomes available. An extensive monitoring program (see Volume II, Appendix F) would be implemented to adjust future management and to avoid unacceptable effects on native biota.

PROPOSED STOCKING PROGRAM

Fish stocking would only continue in lakes where biological integrity could be conserved according to the fishery management principles outlined in Volume I of the attached Draft Plan/EIS (Table 2, p. 56).

Proposed Species and Strains of Fish to be Stocked, Stocking Cycles, and Stocking Densities: In the short term, the WDFW would continue to stock Mount Whitney rainbow trout, whose habitat constraints and timing of spawning make them functionally incapable of reproducing in mountain lakes. Golden trout, coastal cutthroat trout (for lakes west of the Cascades Crest – “west-side lakes”), and intermountain cutthroat trout (for east-side lakes) would be stocked in lakes with low reproductive potential (for example, very limited spawning habitat) to diversify fishing opportunities. The WDFW is also currently developing a native Upper Skagit rainbow trout broodstock for west-side lakes, as well as developing genetically sterile (triploid) trout. The long-term goal would be to stock only genetically sterile fish to further minimize the risk of unwanted reproduction. The species and strains of fish to be stocked, stocking cycles, and proposed stocking densities for each lake are provided in Volume I, Table 6 (p. 68). Based on monitoring and adaptive management, the following may change: species and strains of fish to be stocked, stocking cycles, and densities stocked.

Specific Times of Year Proposed for Stocking: Lakes would be stocked during the ice-free period, which varies from year to year, but is generally between mid-July to mid-September. Stocking can start as early as May in lower elevation lakes or as late as the end of October in higher-elevation lakes that ice out later.

Proposed Stocking Methods: Lakes would be stocked either from the ground via backpack or from the air via fixed-wing aircraft. Whenever feasible, backpack stocking would be the preferred stocking method to minimize impacts on wilderness values. Under the backpack stocking method, WDFW personnel or approved volunteers would carry fry in plastic containers into the lake and release the fish by hand. Fixed-wing aircraft would be used for larger, remote lakes because it is difficult to keep fry alive in backpacks for extended periods, and lengthy travel times can increase fry mortality. The aircraft would be equipped with specialized chambers to carry fish. To ensure the correct lakes would be stocked, Global Positioning System (GPS) instrumentation and skilled, experienced personnel would be used to navigate to target lakes. Lakes would only be stocked under favorable weather conditions, and only lakes greater than 5 acres would be stocked by aircraft.

PROPOSED FISH REMOVAL (LAKE TREATMENT) PROGRAM

A number of mountain lakes in the Complex would be returned to their naturally fishless conditions using mechanical, chemical, and natural treatment methods of fish removal described



in Volume I of the attached Draft Plan/EIS (pp. 86-95). Removal of reproducing fish populations from some of the larger, deeper lakes may not be feasible (Table 8., p. 96). If so, these lakes would continue to provide residual sport-fishing opportunities for the foreseeable future, and the goal of complete removal might never be achieved. Following removal, some select lakes would be restocked with low densities of fish incapable of reproduction in order to prevent reestablishment of self-sustaining populations. Stocked fish would be native to the basin or sterile to minimize the potential impacts of downstream dispersal (Table 18 in the "Affected Environment" chapter pp. 172-173 provides more information on the fish that are considered native to the basin).

Conservation Measures:

- WDFW would adjust stocking frequencies and densities to avoid overstocking lakes and minimize the potential for downstream dispersal of fish from lakes into the surrounding watershed.
- WDFW would also work toward developing hatchery strains that are genetically triploid and incapable of reproducing in lakes or hybridizing with native fish in the surrounding basin.
- Reproducing populations of fish would be removed from select lakes (using mechanical and chemical methods) to reduce the potential the potential for downstream dispersal of fish from lakes into the surrounding watershed.
- Chemical methods of fish removal would be limited to the piscicide antimycin. Antimycin was selected because it rapidly degrades downstream of lakes. Rapid degradation would prevent harm to aquatic organisms downstream of the lakes.

D. Discussion of Known Ongoing and Previous Projects in the Action Area, if Available

The direct effects of ongoing fishery management actions (e.g. fish stocking) would be limited to the immediate vicinity of the lakes under consideration. Other ongoing activities in the action area include:

- The Skagit River Hydroelectric Project and its influence on Skagit River flows
- The Baker River Hydroelectric Project and its influence on the Baker River and Skagit River Flows
- Operations of the Marblemount Fish hatchery, operated by the WDFW
- Widespread, incremental declines in salmon habitat in the Skagit River watershed due to logging, farming, development, etc.

E. 'Project Area' and 'Action Area' Defined

Rationale: Nonnative trout and char dispersing downstream from mountain lakes into the surrounding watersheds could potentially compete with chinook and coho salmon for food, habitat and other limited resources.

Project Area: The immediate vicinity of the 91 mountain lakes (including their outlet streams) in the Complex with a history of fish stocking.

Action Area: The various creeks and rivers in the Complex, including the creeks and rivers (e.g. Skagit, Chilliwack, Baker rivers) that flow from the Complex.

i. Description of Project Footprint and all Areas Potentially Affected

Lakes that would undergo stocking and/or fish removal are described in the attached Draft Plan/EIS (see Table 5 pp. 66-67).

F. Maps of Project Area and Action Area

Please refer to the maps included with the attached Draft Plan/EIS.

III. Status of Species and Critical Habitat

A. Species Lists from the Services (NOAA Fisheries and USFWS)

A consultation letter was sent to the U.S. Fish and Wildlife Service, and a reply was received on August 15, 2003 (included in Volume II, Appendix C of the attached Draft Plan/EIS). The reply included county-based listings of federally listed species in the Complex. Based on this broad information and input from NPS biologists, a list of those special status fish and wildlife species that could possibly occur within the boundaries of the Complex was compiled. The list was then narrowed down further to a list of those special status species that would be expected in or near lakes or in nearby forests within the study area that could be affected by actions proposed in the various alternatives. These species are listed in Volume I, Table 20 p. 182 in the attached Draft Plan/EIS. There are no known species of federally listed plants in the Complex.

This Biological Assessment focuses exclusively on chinook and coho salmon, as these are the only species under the jurisdiction of NOAA fisheries that could potentially be affected by the management actions under consideration in the Draft Plan/EIS..

B. Description of Species

Chinook Salmon (*Oncorhynchus tshawytscha*) inhabit the Skagit River and its major tributaries, and smaller numbers are found in the Baker River drainage. Chinook salmon in the Complex are part of the Puget Sound ESU. The ecological nexus between Chinook salmon and the nonnative trout under consideration in the Draft Plan/EIS is questionable, given their vastly different life histories. Hybridization with trout is not known to occur. However, chinook salmon fry could be preyed upon or forced to compete with nonnative trout dispersing downstream from mountain lakes. Such competition, however, would take place against the backdrop of the widespread native introduced, and hatchery trout that share similar riverine habitats.

Coho Salmon: The Georgia Strait / Puget Sound ESU of Coho salmon (*Oncorhynchus kisutch*) found in North Cascades is a federal Species of Concern (Note: the Draft Plan/EIS lists coho as Candidate species; this will be updated in the final EIS to reflect its current status). Coho salmon inhabit most of the major west-side tributaries of the Complex, including the Skagit, Baker, and Chilliwack rivers and their lower-gradient tributaries. Less abundant than the sockeye, pink, and chum species, coho salmon spend their first year in the birth tributary and the next 18 months in the ocean before returning to spawn from November through early February. Since the young spend roughly one year in freshwater before smolting, they must compete with other native salmonids and, potentially, with introduced fish dispersing downstream from the mountain lakes. Hybridization has only been documented with hatchery strains of coho and with their close relative, the Chinook salmon, but not with nonnative rainbow, cutthroat, or char.

C. Critical Habitat Designation for each ESU/DPS (from Federal Register notice)

There is no critical habitat for coho salmon or chinook salmon in the Project Area.

IV. Environmental Baseline

A. Description of the Action Area and Project Area

Please refer to Section II.E.



B. Description of the Environmental Baseline

All five Pacific salmon species (pink, sockeye, chum, coho, and chinook) occur in the Complex in the Skagit River. These five species also occur in the Nooksack drainage outside the Complex. Coho and sockeye salmon can also be found in the Chilliwack drainage in the national park. Anadromous runs of coastal cutthroat trout, bull trout, steelhead trout, and Pacific lamprey are found in the west-side drainages of the national park.

Native fish populations have been affected by a variety of activities such as logging, commercial fishing, fish stocking, dams, and reservoirs. Prior to 1900, native anadromous and resident fish occupied primarily the low-gradient mainstream rivers and floodplain portions of their tributary streams in the Complex. West of the Cascade Crest, native fish and char spawned and reared in steeper gradient tributaries of the mainstream rivers as far upstream as the first barrier to fish migration. In most cases these barriers were a short distance from the main stream. With time, salmonid fish became established in naturally isolated tributary streams through stocking, downstream dispersal (from stocked fish populations in lakes), and from access gained by swimming around natural stream barriers when reservoirs were constructed and filled.

C. Detailed Description of Habitat Features that may be Affected by the Proposed Action

Continued fish stocking in the mountain lakes could maintain a steady source of non-native trout dispersing downstream into the creeks and rivers in the surrounding watersheds. Thus, young coho and chinook salmon in various tributaries downstream of the mountain lakes identified for continued stocking may be affected by the added competition of stocked fish dispersing downstream from the mountain lakes. To mitigate the potential risk of downstream dispersal, trout would be stocked at low densities. Under these circumstances, it is assumed that stocked trout would largely remain within the lakes or the immediate vicinity of the inlet and outlet streams to the lakes.

Removal of reproducing populations of non-native fish in the lakes would reduce the potential for downstream dispersal of non-native trout into the creeks and rivers in the surrounding watersheds. In contrast to stocked fish populations, reproducing populations of fish in the mountain lakes present a greater risk of dispersing downstream in larger numbers. This risk is due to the uncontrolled reproductive rates of fish in some of the lakes, and their ability to reproduce in large numbers that presumably exceed the carrying capacity of the lake. Under these circumstances, reproducing fish populations would provide a continuous source population of non-native trout dispersing into the surrounding watershed.

V. Effects of the Action

A. Direct Effects

No direct effects to Coho salmon or Chinook salmon are identified.

B. Indirect Effects

Up to 42 lakes would continue to have fish as a result of stocking or maintenance of reproducing populations of fish at low densities. Only fish incapable of reproducing and establishing self-sustaining populations in a lake would be stocked. Under these circumstances, it is assumed that downstream dispersal from stocked lakes would be substantially mitigated.



Twenty four lakes in the Baker and Skagit basins would be treated to remove fish or decrease fish abundance in lakes (list of lakes provided in Table G-5 in appendix G). Over time, the potential for adverse impacts to chinook and coho salmon from trout dispersing downstream of the lakes would be substantially reduced in these basins. One lake in the Skagit basin (Lower Thornton) would continue to have reproducing westslope cutthroat trout. Fish dispersing from Lower Thornton would not cause impacts on native Chinook salmon in that basin from competition and predation because chinook salmon are not likely to be in upstream reaches near the lake, and the fish abundance in Lower Thornton lakes would be maintained at low levels.

C. Effects from Interdependent and Interrelated Actions

None identified.

D. Effects from Ongoing Project Activities

Ongoing activities in the mountain lakes (i.e. Alternative A, Continued Current Management) would continue existing fishery management practices in 91 lakes in the study area. Fish occur in 62 of the 91 lakes. Twenty six of these lakes are currently stocked, and 36 of these lakes currently have reproducing populations of fish. The remaining 29 lakes are currently fishless and not actively managed for fish. A detailed description of the current fishery management program is provided on pp. 76-81 in Volume I of the attached DEIS. Tables ES-1 and ES-2 in Volume I of the attached DEIS provide lake by lake descriptions of current management actions.

WDFW would continue to adjust stocking frequencies and densities to avoid overstocking lakes and minimize the potential for downstream dispersal of fish from lakes into the surrounding watershed. WDFW would also work toward developing hatchery strains that are genetically triploid and incapable of reproducing in lakes or hybridizing with native fish in the surrounding basin. Ongoing project activities would not include fish removal.

E. Description of How the Environmental Baseline Would be Affected

Hybridization between nonnative fish and either chinook or coho salmon and is not known to occur. There is a slight possibility that if mature stocked fish continue to disperse from lakes into downstream drainages containing chinook or coho salmon, they may affect chinook or coho salmon through competition. The impact of competition is highly unlikely given that fish dispersing downstream from mountain lakes are not likely to colonize as far downstream as chinook or coho salmon are found. Predation is also unlikely because trout generally do not consume young fish but rather feed on aquatic and terrestrial insects.

F. If Critical Habitat is Designated, Discuss Effects of the Action on Essential Elements of Critical Habitat

--NA--

G. Use of Best Scientific and Commercially Available Data

An extensive database on the physical, chemical and biological conditions of the mountain lakes was compiled as part of the EIS process. These data are provided in the various Tables and Appendices of the Draft Plan/EIS. There are currently no data, however, on the degree to which trout disperse downstream of mountain lakes. Therefore, this impact analysis is largely based upon the professional opinion of various fishery management biologists from WDFW, the NPS and personnel under contract who assisted with the plan.



H. Effects Determination for Listed Species and Designated Critical Habitat

May Affect, Not Likely to Adversely Affect: Effects to coho salmon and chinook salmon are insignificant and/or discountable.

I. Summary

Assumptions: Fish in mountain lakes are not likely to disperse downstream if populations in the lakes have limited abundances and/or are not reproducing. .

This BA concludes that the preferred management alternative in the Draft Plan/EIS may affect, but is unlikely to adversely affect chinook or coho salmon given the limited potential for downstream dispersal, distinctly different life histories between salmon and trout, and lack of documented hybridization between salmon and trout.

J. Effect of the Proposed Action on Tribal Resources or Interests

No effects identified.

VI. Cumulative Effects

Not Applicable since this action is not likely to adversely affect chinook or coho salmon.

VII. Conclusions

This proposed action involves fish stocking and removal of reproducing fish populations in as many as 62 natural mountain lakes in North Cascades National Park Service Complex. These actions could indirectly affect chinook and coho salmon through predation and competition for food and habitat resources resulting from trout dispersing downstream from the mountain lakes. This BA concludes that the proposed action (Management Alternative B in the Draft Plan/EIS) may affect, but is unlikely to adversely affect chinook or coho salmon.

VIII. References

National Park Service, U.S. Department of the Interior. May 2005. Draft Mountain Lakes Fishery Management Plan/Environmental Impact Statement. Volume I. 506 pp.

National Park Service, U.S. Department of the Interior. May 2005. Draft Mountain Lakes Fishery Management Plan/Environmental Impact Statement. Volume II (Appendices). 320 pp.

National Park Service, U.S. Department of the Interior. May 2005. Maps 1 and 2.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

NMFS Tracking No:
2005/04525

September 16, 2005

William F. Paleck
National Park Service
North Cascades National Park
Lake Chelan National Recreation Area
Ross Lake National Recreation Area
810 State Route 20
Sedro-Wooley, Washington 98284-9394

Re: Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens
Fishery Conservation and Management Act Essential Fish Habitat Consultation
for the Mountain Lakes Fishery Management Plan. (HUC 1711000401 Upper
North Fork Nooksack, 17110005 Upper Skagit).

Dear Mr. Paleck:

This correspondence is in response to your request for consultation under the Endangered Species Act (ESA). The National Park Service (NPS) submitted a Biological Assessment (BA) for the above referenced project to the National Marine Fisheries Service (NMFS) on August 8, 2005. The NPS requested NMFS' concurrence with an effects determination "not likely to adversely affect" for Puget Sound (PS) Chinook salmon (*Oncorhynchus tshawytscha*) as provided under section 7(a)(2) of the ESA and its implementing regulations (50 CFR 402) for the action. PS Chinook salmon were listed as threatened under the ESA on March 24, 1999 (50 CFR 223 and 224). NMFS reviewed the BA and concurs with the effects determination for this project.

The NPS proposes to adopt a Mountain Lakes Fisheries Management Plan to manage fisheries in 91 lakes throughout the North Cascades National Park Service Complex (Complex). The purpose is to manage the lakes to minimize impacts to native species, including native fish populations downstream. An adaptive management program with extensive monitoring will be implemented to aid future management decisions. No future activities in the action area are dependent on this action.

Exotic (non-native) species have been introduced into Cascade mountain lakes for more than a century. Since 1933, the Washington State Department of Fisheries and Wildlife (WDFW) has stocked selective lakes in the Complex with non-native trout species for recreational fishing. Continued stocking has been a contentious issue since the creation of the Complex in 1968. The development of a management plan is intended to resolve the long standing controversy and establish a plan to minimize the impacts of non-native trout species on native biota.



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As requested in the BA, NMFS analysis considered the preferred alternative presented in the Environmental Impact Statement. That alternative proposes to eliminate high densities of reproducing non-native populations from lakes in the Complex while allowing low densities of reproducing and stocked fish populations to remain in select lakes. All lakes would be managed to minimize impacts on biological resources in the lakes and native fish populations downstream. An extensive monitoring program will be implemented to adjust future management and avoid unacceptable effects to native biota. Restocking of non-reproducing fish may occur in some lakes if available information indicates that impacts to native species will be minimized. Specific conservation measures proposed by WDFW include: (1) adjusting stocking densities and frequencies to avoid overstocking and minimize the potential for downstream dispersal, (2) developing hatchery strains that are genetically triploid and incapable of reproducing or hybridizing with native species, (3) removing populations of reproducing fish to reduce the potential for downstream dispersal, and (4) utilizing piscicides that degrade rapidly and will not disperse downstream.

NMFS expects the effects from the proposed project to have discountable effects because PS Chinook do not occur near any of the lakes. PS Chinook inhabit areas far downstream from the lakes and are unlikely to interact with the stocked fish. If some non-native fish disperse from the lakes to downstream areas, implementation of the proposed management plan will reduce the likelihood of interactions because: (1) the reduced population density of stocked fish will reduce the likelihood of downstream dispersal and (2) the increased use of non-reproducing fish will reduce the likelihood that self-sustaining populations of non-native fish species will become established.

If some non-native trout disperse downstream and interact with PS Chinook, the effects of that interaction are expected to be insignificant for PS Chinook. The potential effects identified by NPS are hybridization and predation. However, NMFS does not expect hybridization with PS Chinook to occur because there are no known instances of hybridization between PS Chinook and any of the introduced trout species. In the downstream areas occupied by PS Chinook, there are large populations of native trout. The few non-native trout that might disperse from the lakes are not expected to significantly alter the predation effects to PS Chinook juveniles.

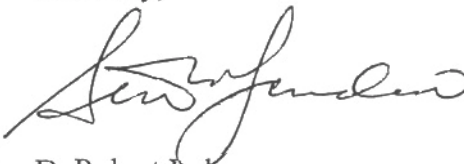
NMFS concurs with the effect determination of “may affect, not likely to adversely affect,” for PS Chinook. Concurrence is based on information in the BA and is contingent upon full implementation of the conservation measures described by the applicant and included in the administrative record.

This concludes informal consultation on these actions in accordance with 50 CFR 402.14(b)(1). The NPS must re-analyze these ESA consultations if: (1) new information reveals effects of the action(s) that may affect listed species in a way not previously considered; (2) the action(s) is modified in a manner that causes an effect to the listed species that was not previously considered; or (3) a new species is listed, or critical habitat designated, that may be affected by the identified actions(s).



Should you have any questions concerning this informal consultation for ESA or EFH, please contact Joel Moribe of the Washington State Habitat Office at (206) 526-4359 or at joel.moribe@noaa.gov.

Sincerely,



D. Robert Lohn
Regional Administrator

cc: Roy Zipp, Natural Resources Specialist, NPS





United States Department of the Interior

FISH AND WILDLIFE SERVICE

Western Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503



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AUG 18 2006

In Response Reply To:
1-3-06-I-0231

Memorandum

To: ^{WFP} Superintendent, North Cascades National Park Service Complex
Sedro-Woolley, Washington

From: ^{for} Manager, Western Washington Fish and Wildlife Office
Lacey, Washington *Ang Whiskey*

Subject: Concurrence with the effect determinations for federally-listed species that may be affected by Alternative B as described in the May 2005 Draft Environmental Impact Statement (DEIS) for the Mountain Lakes Fishery Management Plan proposed for the North Cascades National Park Service Complex (Park Complex)

This memorandum responds to your request under section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), for the U.S. Fish and Wildlife Service (Service) to concur with your determination of "may affect, not likely to adversely affect" for the threatened Coastal-Puget Sound distinct population segment of bull trout (*Salvelinus confluentus*), bald eagle (*Haliaeetus leucocephalus*), marbled murrelet (*Marmoratus marmoratus*) (murrelet), northern spotted owl (*Strix occidentalis caurina*) (spotted owl), Canada lynx (*Lynx canadensis*) (lynx), grizzly bear (*Ursus arctos horribilis*), and endangered gray wolf (*Canis lupus*) (wolf) for the subject action.

Your letter and accompanying DEIS containing the biological assessment (BA), dated May 2005, was received in the Service's Western Washington Fish and Wildlife Office on August 15, 2005. Due to workloads, the request was not assigned until March 23, 2006, and following a discussion on May 5, 2006, the decision was made to revise the BA to include an analysis of effects on bull trout critical habitat. The BA was subsequently amended on July 31, 2006, with this analysis.

Purpose and Need

Alternative B was designed to conserve native biological integrity, provide a spectrum of recreational opportunities and visitor experiences, including sport fishing, and resolve the debate over fish stocking in the naturally fishless mountain lakes in the Park Complex. This purpose

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arose out of a legal dispute involving a 1991 Consent Decree that included, in part, an agreement to complete the subject review.

There are 37 lakes in the Park Complex with reproducing populations of stocked native and nonnative fish that include rainbow trout (*Onchorynchus mykiss*), California golden trout (*O. m. aguabonita*), coastal cutthroat trout (*O. clarki clarki*), westslope cutthroat trout (*O. c. lewisi*), Yellowstone cutthroat trout (*O. c. bouvieri*), and brook trout (*Salvelinus fontinalis*). Alternative B represents a new management framework for 91 lakes in the Park Complex. Some management actions have been identified while others are being deferred until additional information is collected. A minimum of 19 lakes will be managed for recreational fishing. Depending upon the outcome of future, site-specific evaluations, up to 42 lakes could be managed under Alternative B to provide recreational fishing opportunities in the Park Complex, as provided by NPS policies and legal agreements, while simultaneously addressing the legacy-effects of the historical introductions of non-native fish that have resulted in reproducing populations within the Park Complex.

Alternative B includes an initial series of fish removal and fish stocking actions (treatments) over several years at the following seven mountain lakes: Middle No. 3 Blum Lake, Lower/West No. 4 Blum Lake, Diobsud No. 1 Lake, Diobsud Lower No. 2 Lake, Lower Triplet Lake, Upper Triplet Lake, and Upper Wilcox/Lillie Lake. As requested, these initial treatments will serve as the basis of this consultation and herein are considered as the "Project."

Based upon information in the DEIS, the methods, locations, and timing of the entire scope of management actions at this stage of the NEPA process for Alternative B are too uncertain to warrant a broader review of under the Act. To establish the needed level of certainty, an evaluation of the overall effectiveness of these initial treatments is necessary before implementing additional treatments. Therefore, a separate consultation will be required prior to the future treatments at other lakes under the selected Alternative following issuance of the Final EIS.

Based upon the proposal to implement a portion of Alternative B as described herein, the Service concurs with your determinations that the proposed action may affect, but is not likely to adversely affect the threatened and endangered species addressed below. This concurrence, as described in the following discussion, is based upon our conclusion that the effects of the Project on the federally-listed species are expected to be discountable or insignificant.

Bull trout

On November 1, 1999, the Service listed five distinct populations segments (DPSs) of bull trout within the coterminous United States as threatened: 1) Coastal-Puget Sound DPS, 2) Columbia River DPS, 3) Jarbidge River DPS, 4) St. Mary-Belly River DPS, and 5) Klarnath River DPS (Federal Register 64:58910). The factors contributing to the decline of bull trout populations identified in the listing rule include restriction of migratory routes by dams and other unnatural barriers; forest management, grazing, and agricultural practices; road construction; mining; introduction of nonnative species; and residential development resulting in adverse habitat



Superintendent

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modification, overharvest, and poaching (Bond 1992, Thomas 1992, Rieman and McIntyre 1993, Donald and Alger 1993, WDFW 1997).

Fish Removal Activities

Bull trout are not known to occur in any of the seven lakes proposed for treatment. The nearest known occurrence of bull trout is 2.5 mi downstream from Middle #3 Blum and Lower/West #4 Blum Lakes at Baker Lake and Baker River. Thus, the Service does not expect bull trout to be exposed to the proposed mechanical treatments (gillnets, electrofishing, fish traps, and spawning habitat exclusion) to eradicate: 1) cutthroat trout from Diobsud #1 Lake and Lower Diobsud #2 Lake, approximately 8 mi upstream on a tributary to the Skagit River, 2) cutthroat trout from Lower Triplet and Upper Triplet Lakes, in a side-drainage approximately 4 mi upstream of Lake Chelan, and 3) rainbow and cutthroat from Upper Wilcox/Lillie Lake, approximately 7 mi upstream on a tributary to the Skagit River.

Alternative B also includes chemical treatments at Middle #3 Blum and Lower/West #4 Blum Lakes to eradicate brook trout. Chemical treatments with antimycin are proposed in late summer or early fall (during low flows) as part of a 3-year effort that includes an initial lake assessment (year 1), treatment (year 2), and follow-up recovery monitoring of native organisms to evaluate the need for further chemical treatments (year 3). Gillnet sampling is proposed in the third year to evaluate the effectiveness of the chemical treatments.

Antimycin has properties that make it an effective piscicide with limited environmental consequences and limited toxicity risks to non-target species as documented in the DEIS. Lake detoxification is expected to occur naturally (the chemical readily oxidizes and degrades in turbulent streams) or through the proposed use of a neutralizing agent (potassium permanganate), and is known to have no adverse impacts on water quality or non-target organisms. Based upon the absence of bull trout from the lakes proposed for chemical treatments, the rapid degradation of antimycin, the use of a neutralizing agent to prevent the downstream movement of antimycin to where bull trout are known to occur, bull trout exposure to antimycin is not expected.

Fish Stocking Activities

Fish restocking is limited to three sites: Lower/West #4 Blum Lake, Diobsud #2 Lake, and Lower Triplet Lake. Restocked with non-reproducing rainbow trout (Mt. Whitney strain), fish will be transported in backpacks by hiking teams during the period mid-July to mid-September. The other four lakes will not be restocked with fish under Alternative B.

Generally, the risks of hybridization, competition, and/or predation warrant extreme caution when considering the introduction of non-native fish to waters connected to or directly utilized by bull trout. Of particular concern is the potential for natural or unauthorized, human-assisted dispersal of non-native species which can pose a risk to bull trout recovery under any management framework. However, bull trout hybridization from rainbow trout stocked under this action is considered discountable due to the proposal to restock lakes with non-reproducing rainbow trout. In addition, we know of no verified records of hybridization between bull trout and rainbow trout where the species co-occur.



There is some risk that adult or juvenile bull trout residing in Baker Lake or the Baker and Skagit Rivers could be exposed to additional predation or competition stressors if rainbow trout stocked in the Lower/West #4 Blum Lake (2.5 mi upstream) or in Diobsud #2 Lake (8 mi upstream) subsequently dispersed downstream. Bull trout are currently thought to be extirpated from Lake Chelan and the Stehekan River (US Fish and Wildlife Service 2002), but could be similarly exposed from fish restocking in Lower Triplet Lake (4 mi upstream) if bull trout become re-established in Lake Chelan or the Stehekan River.

The long distances (2.5 to 8 mi) between the fish stocking locations and where bull trout currently reside minimizes the likelihood that additional predation or competition from stocked rainbow trout will actually occur. If some rainbow trout disperse downstream from the fish stocking locations, the potential for an increase in competition to adult or juvenile bull trout or predation risk to bull trout fry is not expected to be measurable because rainbow trout are already resident in the Baker Lake, Baker River, Skagit River, Lake Chelan, and Stehekan River (Washington Department of Fish and Wildlife 2005). In addition, the use of non-reproducing rainbow trout for restocking ensures that any downstream migrants will not cause an increase in the number of spawning rainbow trout which could result in a competitive advantage for the rainbow trout population.

Bull Trout Critical Habitat

Critical habitat for the Coastal-Puget Sound DPS was proposed by the Service (69 Federal Register 35768 [June 25, 2004]) and designated under a single ruling (70 Federal Register 56212 [September 26, 2005] for the Klamath River, Columbia River, Coastal-Puget Sound, and Saint Mary-Belly River population segments on. No critical habitat was designated for the Jarbidge population segment. Rangewide, the Service designated 143,218 acres (57,958 ha) of reservoirs or lakes and 4,813 mi (7,745 km) of streams or shorelines as bull trout critical habitat.

As part of the September 26 listing, 29 stream reaches with the Park Complex were designated bull trout critical habitat. Based upon the nature and location of the Project, you have determined the proposed action will have “no effect” on bull trout critical habitat. Although there is no requirement for the Service to concur with a “no effect” determination, we agree with your determination. However, the responsibility for a “no effect” determination remains with the National Park Service.

Terrestrial Species

Fish removal activities include the use of a light-duty helicopter (Bell Jet Ranger or Hughes 500) during daylight hours. Two round-trip flights are proposed for each lake – one in late June to transport equipment into the seven lakes and another in late September to retrieve the equipment. Based on the timing of the helicopter flights, bald eagles, murrelets, spotted owls, lynx, and wolves involved in breeding activities may be affected by the above-ambient sound generated by the helicopter. The Project is not expected to result in the removal of important seasonal habitats for these species.



Superintendent, North Cascades National Park Service Complex

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All seven lakes are located above 4,000 ft elevation and the helicopter will fly to each lake at a much higher altitude. As a result, the potential exposure of terrestrial species to high-intensity sound from helicopter flights will be limited to the approach and departure flight paths immediately adjacent to each lake. Ground-time is estimated at less than 30 minutes for each round-trip.

Bald Eagle

Wintering, roosting, and foraging sites of non-nesting bald eagles are not known to occur in the Park Complex. Therefore, non-nesting bald eagles are not expected to be exposed to Project activities.

There is only one bald eagle nest known to occur in the Park Complex and it is located near the upper-end of Lake Chelan. The nearest helicopter use for fish removal activities will be at Upper and Lower Triplet Lakes, approximately 6 mi from the breeding home range of the bald eagle pair.

The potential exposure of the nesting bald eagle pair or nestlings to helicopter sound is limited to the late-June helicopter flight – the late-September flight is after the bald eagle breeding season. However, considering helicopter flights will occur at an altitude exceeding 4,000 ft and the landing sites will be at a distance exceeding 6 mi, adverse behavioral responses such as a prolonged deterrence or incessant flushing from nest, or delayed feeding of young due to the helicopter operation, is extremely unlikely to occur.

Marbled Murrelet

The Marbled Murrelet Recovery Plan (U.S. Fish and Wildlife Service 1997) identified six Conservation Zones throughout the listed range of the species: Puget Sound (Conservation Zone 1), Western Washington Coast Range (Conservation Zone 2), Oregon Coast Range (Conservation Zone 3), Siskiyou Coast Range (Conservation Zone 4), Mendocino (Conservation Zone 5), and Santa Cruz Mountains (Conservation Zone 6). The proposed action will occur in Conservation Zone 1, encompassing all the waters of Puget Sound and most waters of the Strait of Juan de Fuca south of the U.S.–Canadian border and extending inland 50 mi from the Puget Sound to the north Cascade Mountains and the northern and eastern sections of the Olympic Peninsula.

Murrelets are limited to the northwest portion of the Park Complex and are known to nest up to approximately 4,000 ft elevation. Four lakes (Middle #3 Blum Lake, Lower/West #4 Blum Lake, Diobsud #1 Lake, and Diobsud #2 Lake) occur within the northwest portion of the Park Complex but all four lakes are located at an elevation above 5,000 ft. Although murrelet nesting surveys have not been conducted in the vicinity of these four lakes, the Service expects murrelet nesting is extremely unlikely to occur due to the high elevation. The proposal to maintain high altitude flight paths well above 4,000 ft is an additional factor contributing to the Service's conclusion that adverse effects from the high intensity helicopter sound to nesting murrelets are extremely unlikely to occur.



Spotted owl

Nesting and non-nesting spotted owls are known to occur in several locations within the Park Complex. However, with suitable habitat for the species extending up to a maximum of 4,000 ft elevation, the risk of spotted owls being exposed to helicopter sound occurring above 5,000 ft elevation is extremely low. The potential for effects to spotted owls is further reduced by the proposal to maintain high altitude flights to and from each lake. Thus, the Service concludes that adverse effects to this species are extremely unlikely to occur from high intensity helicopter sound.

Canada lynx

Lynx occur in five geographic regions in the United States – Cascade Mountains, Northern Rocky Mountains, Southern Rocky Mountains, Great Lakes, and Northeast. The Park Complex occurs in the Cascade Mountains Region. Each Region has been sub-divided into management units called Lynx Analysis Units (LAU). Lynx Analysis Units are intended to provide the smallest scaled unit (25 – 50 mi²) where the effects of management actions on lynx habitat can be evaluated and monitored. The size and location of LAUs do not represent actual lynx home ranges, but rather they approximate theoretical lynx home ranges based upon available habitat for the species.

Breeding and non-breeding lynx are expected to occur in the northeastern area of the Park Complex, where subalpine forests are comprised of subalpine fir (primary vegetation type) with lodgepole pine (secondary vegetation type) and Engelmann spruce associations. Subalpine fir associations generally occur above 4,000 ft in the east Cascade Mountains.

With the lynx breeding season culminating in August and the distribution of lynx habitat limited to the northeastern area of the Park Complex, the consideration of potential effects from the Project on breeding lynx is limited to the first flights scheduled for late-June at Upper and Lower Triplet Lake. Non-breeding lynx could be exposed to above-ambient sound during either flight while breeding lynx potentially could be denning adjacent to these two lakes and would be exposed to the helicopter sound on the approach, landing, and departure, a duration of less than 30 minutes.

Research on lynx response to human disturbance and small-scale habitat modifications is rare and any information on this subject is largely anecdotal. Mowat et al. (1999) suggests lynx may readily adapt to habitat modification, based upon the species response to large-scale fires in the boreal forest where the lynx continues to successfully persist. Koehler and Brittell (1990) and Koehler and Aubrey (1994) suggest small silvicultural or natural openings (less than 100 m across) will not inhibit lynx movement. Similarly, an adverse response in the species from human-caused disturbance and prolonged human presence does not seem to occur either (Staples 1995, Mowat et al. 1999), with evidence that lynx acclimate quickly to moderate levels of snowmobile use and motorized road use within their home territories (Mowat et al. 1999). Based upon this species information, the species response to the proposed helicopter use is expected to be insignificant.



Superintendent, North Cascades National Park Service Complex

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Grizzly bear

The Park Complex is part of the North Cascades Ecosystem (NCE), one of the six designated recovery zones for the grizzly bear in the United States. The NCE is subdivided into Bear Management Units (BMU) and each BMU is scaled to approximate the size of a female grizzly bear home range to facilitate planning for recovery and management actions. Bear Management Units do not represent actual home ranges of grizzly bears, but rather they approximate theoretical grizzly bear home ranges based upon available habitat.

Grizzly bears, though rarely verified in the Park Complex or NCE, could occur anywhere within the Park Complex. The Project will occur in the Welker BMU (Diobsud #1 Lake, Lower Diobsud #2 Lake, Middle #3 Blum Lake, and Lower/West #4 Blum Lake), Thunder BMU (Upper Wilcox/Lillie Lake), and Upper Chelan BMU (Upper and Lower Tripplet Lakes).

The habitat associations of grizzly bears vary seasonally so each BMU is managed during the non-denning period to provide spring habitat as well as summer/fall habitat. The availability of suitable spring habitat is considered limiting for grizzly bears in the NCE. All the affected BMUs in this action contain the minimum spatial requirements for core grizzly bear habitat during the spring and summer/fall seasons.

The potential for exposure to high-intensity sound is greatest during the summer/fall period when the second flight is scheduled in September. Grizzly bears are expected to be present in high-elevation habitat at that time. Exposure to high-intensity sound during the spring period is not expected because the location of the seven lakes is in summer/fall habitat. In the rare event that grizzly bears in summer/fall habitat are exposed, the affected individuals would be expected to displace to adjacent habitat with no meaningful effect on the normal behavior patterns because the availability of summer/fall habitat is not limiting in the Park Complex and duration of the exposure is short-term. These factors provide the opportunity for bears to readily resume their normal behaviors without significant disruption.

Gray wolf

Washington does not have designated areas for wolf recovery but where wolf recovery efforts occur in other States they emphasize the social and biological factors associated with minimizing the risk of mortality due to interactions with humans and livestock. Land management activities which maintain wolf prey base abundance is also an important component for wolf recovery.

Although a historical resident in Washington, wolves are an extremely rare species in Washington based upon the occurrence of few verified reports. The most recent verified wolf sighting in Washington occurred in 2002 near the Park Complex. To date, no active den or rendezvous sites have been verified. While the occurrence of transient wolves in the Park Complex could result in the exposure of the species to high-intensity sound from helicopter operations, this is extremely unlikely to occur due to the rare occurrence of the species.



Superintendent, North Cascades National Park Service Complex

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Conclusion

Pursuant to the regulations implementing the Act, this letter concludes informal consultation for the effects of the Project on the above-mentioned species and designated critical habitat. This action should be reanalyzed if: 1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation, 2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation, or 3) a new species is listed or critical habitat is designated that may be affected by this Project.

Finally, we commend you for your proposal, particularly the elimination of brook trout and reproducing fish stocks. Brook trout threaten the persistence of some native char subpopulations in the Coastal-Puget Sound bull trout Interim Recovery Unit through competition and hybridization. Eliminating these concerns should benefit bull trout recovery.

If you have any questions regarding this letter or our joint responsibilities under the Act, please contact Mr. Kevin Shelley at (360) 753-4368 or Mr. Marc Whisler at (360) 753-4410, of my staff.

cc:

WDFW, Olympia, WA (J. Konig)
USFWS, Wenatchee, WA (J. Gonzalez)
NMFS, Lacey, WA (M. Longenbaugh)



Superintendent, North Cascades National Park Service Complex

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Literature Cited

- Bond, C.E. 1992. Notes on the nomenclature and distribution of the bull trout and the effects of human activity on the species. Pages 1-4 *In*: Howell, P.J. and D.V. Buchanan, eds. Proceedings of the Gearhart Mountain bull trout workshop. Oregon Chapter of the American Fisheries Society, Corvallis, OR.
- Donald, D.B. and D.J. Alger. 1993. Geographic distribution, species displacement, and niche overlap for lake trout and bull trout in mountain lakes. *Canadian Journal of Zoology* 71:238-247.
- Koehler, G.M., and J.D. Brittell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. *Journal of Forestry* 88(10):10-14.
- Koehler, G.M., and K.B. Aubry. 1994. Pages 74-98 *in* L.F. Ruggiero et al., tech. eds. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. General Technical Report RM-254. 184 pp.
- Mowat, G., K.G. Poole, and M. O'Donoghue. 1999. Ecology of lynx in northern Canada and Alaska. Chapter 9 *in* L.F. Ruggiero, K.B. Aubrey, S.W. Buskirk, et al., tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- Rieman, B.E. and J.D. McIntyre. 1993. Demographic and habitat requirements for conservation of bull trout. US Forest Service, Intermountain Research Station. General Technical Report INT-302.
- Staples, W.R. 1995. Lynx and coyote diet and habitat relationships during a low hare population on the Kenai Peninsula, Alaska. M.S. Thesis. University of Alaska, Fairbanks.
- Thomas, G. 1992. Status of bull trout in Montana. Report prepared for Montana Department of Fish, Wildlife and Parks, Helena, Montana.
- US Fish and Wildlife Service. 1997. Recovery plan for the threatened marbled murrelet (*Brachyramphus marmoratus*) in Washington, Oregon, and California. Portland, Oregon. 203 pp.
- US Fish and Wildlife Service. 2002. Chapter 22, Upper Columbia Recovery Unit, Washington. 113 p. *In*: US Fish and Wildlife Service. Bull Trout (*Salvelinus confluentus*) Draft Recovery Plan. Portland, Oregon.



Superintendent, North Cascades National Park Service Complex

10

Washington Department of Fish and Wildlife (WDFW). 1997. *Washington Department of Fish and Wildlife hatcheries program. Operations program - Lewis river complex for January 1, 1997 to December 31, 1997.* Washington Department of Fish and Wildlife, Olympia, WA.

Washington Department of Fish and Wildlife (WDFW). 2005. *Priority habitats and species database. Geographic information system digital data.* Olympia, Washington. Note: these data are subject to WDFW sensitive data policies.



Bull Trout Critical Habitat: Supplemental Biological Assessment for Mountain Lakes Fishery Management Plan/ Final Environmental Impact Statement

Introduction

This document addresses the potential impacts to Bull Trout Critical Habitat that could result from implementation of the preferred alternative in the *Mountain Lakes Fishery Management Plan/Draft Environmental Impact Statement for North Cascades National Park Service Complex* (plan/DEIS). This analysis is needed because the U.S. Fish and Wildlife Service designated Bull Trout Critical Habitat (BTCH) after publication and public review of the plan/DEIS and thus there was no analysis of potential impacts to critical habitat in Biological Assessment portion of the plan/DEIS.

Background

Bull Trout (*Salvelinus confluentus*, Federally Threatened) inhabit many creeks, streams, and several of the reservoirs in North Cascades. Indeed, the running waters of North Cascades are one of the last remaining strongholds for Bull trout throughout its entire range (Mark Downen, WDFW Inland Fisheries Biologist, personal communication).

The U.S. Fish and Wildlife Service in September 2005 designated critical habitat for bull trout (*Salvelinus confluentus*) in 29 stream reaches within North Cascades National Park and Ross Lake National Recreation Area (table C-3). The Final Rule designating Bull Trout Critical Habitat (FWS 2005) identified eight primary constituent elements for freshwater bull trout critical habitat. These elements include:

1. Water temperatures that support bull trout use (ideally from 36–59°F).
2. Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities and instream structures.
3. Substrates of sufficient amount, size and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival.
4. A natural hydrograph, including peak, high, low, and base flows within historic ranges.
5. Springs, seeps groundwater sources and subsurface water to contribute to water quality and quantity as a cold water source.
6. Migratory corridors with minimal physical, biological or water quality impediments.
7. An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
8. Permanent water of sufficient quantity and quality such that normal reproduction, growth and survival are not inhibited.



Table C-3 lists the various running waters with designated critical habitat within North Cascades National Park Service Complex. All reaches are part of the Unit 28: Puget Sound designated unit. A map is provided in Attachment C.

TABLE C-3: DESIGNATED BULL TROUT CRITICAL HABITAT IN NORTH CASCADES NATIONAL PARK SERVICE COMPLEX

Water Body Name	Stream Endpoint			
	Latitude	Longitude	Latitude	Longitude
Alma Creek	48.600 N.	121.361 W.	48.590 N.	121.355 W.
Bacon Creek	48.586 N.	121.394 W.	48.681 N.	121.462 W.
Baker River	48.534 N.	121.735 W.	48.821 N.	121.427 W.
Bald Eagle Creek	48.800 N.	121.464 W.	48.797 N.	121.448 W.
Bear Creek	48.965 N.	121.387 W.	48.966 N.	121.382 W.
Big Beaver Creek	48.773 N.	121.045 W.	48.842 N.	121.210 W.
Brush Creek	48.913 N.	121.423 W.	48.909 N.	121.422 W.
Chilliwack River	49.000 N.	121.410 W.	48.878 N.	121.486 W.
Crystal Creek	48.787 N.	121.501 W.	48.791 N.	121.509 W.
Depot Creek	48.997 N.	121.323 W.	48.986 N.	121.292 W.
Devils Creek	48.825 N.	121.042 W.	48.819 N.	121.001 W.
Diobsud Creek	48.559 N.	121.411 W.	48.576 N.	121.432 W.
East Fork of Bacon Creek	48.661 N.	121.433 W.	48.713 N.	121.416 W.
Easy Creek	48.889 N.	121.457 W.	48.882 N.	121.455 W.
Goodell Creek	48.672 N.	121.264 W.	48.778 N.	121.351 W.
Indian Creek	48.947 N.	121.397 W.	48.935 N.	121.394 W.
Little Beaver Creek	48.912 N.	121.064 W.	48.878 N.	121.322 W.
Little Chilliwack River	48.993 N.	121.407 W.	48.962 N.	121.477 W.
Newhalem Creek	48.671 N.	121.254 W.	48.663 N.	121.251 W.
Panther Creek	48.708 N.	120.975 W.	48.631 N.	120.977 W.
Pierce Creek	48.774 N.	121.060 W.	48.766 N.	121.072 W.
Roland Creek	48.762 N.	121.027 W.	48.770 N.	120.997 W.
Ruby Creek	48.737 N.	121.046 W.	48.707 N.	120.916 W.
Silver Creek	48.972 N.	121.092 W.	48.981 N.	121.188 W.
Skagit River	48.387 N.	122.366 W.	49.000 N.	121.078 W.
Stetattle Creek	48.717 N.	121.148 W.	48.727 N.	121.154 W.
Sulphide Creek	48.777 N.	121.532 W.	48.789 N.	121.551 W.
Thunder Creek	48.712 N.	121.105 W.	48.563 N.	121.026 W.

Proposed Actions

Lead Agency: National Park Service (NPS), U.S. Department of the Interior

Cooperating Agency: Washington Department of Fish and Wildlife (WDFW)

The preferred alternative (alternative B) in the plan/DEIS involves stocking of select lakes to continue to maintain a recreational fishery where impacts to biological integrity can be minimized. This alternative also proposes to use gillnets, spawning ground exclusion and application of Antimycin-A to eliminate high densities of reproducing fish populations from lakes in the Complex while allowing low densities of reproducing and stocked fish populations to remain in select lakes. Some lakes could be restocked with low densities of nonreproducing fish once reproducing fish have been removed. Restocking would be



allowed only where impacts on biological resources could be minimized. Lakes lacking data would not be stocked until further information becomes available. An extensive monitoring program would be adopted to adjust future management and to avoid unacceptable effects on native biota. A complete description is provided in the plan/DEIS.

The scope of this proposal includes actions related to fish stocking and actions related to fish removal in the first seven lakes targeted for fish removal treatments. Additional consultation with the Service regarding fish removal treatments in other lakes will be pursued should the first round of fish removal prove successful and additional funding become available for further fish removal in other lakes selected for treatment.

Impact Analysis

The proposed stocking program will have no effect on the eight constituent elements for BTCH because fishery management actions will be limited to the immediate vicinity of the lakes. There will be no physical, chemical or biological impacts on the BTCH reaches downstream of the lakes to be stocked as these reaches are separated by substantial distances and elevation and, in all cases, there are barriers such as water falls and steep gradients that prevent bull trout (and all other fish) from migrating upstream.

Fish removal activities involving gill nets and habitat exclusion (e.g., cobbling over spawning grounds) will have no effect on BTCH because those activities will take place strictly within the lakes and the immediate vicinity of the outlet streams of the lakes.

Fish removal will also include application of the piscicide antimycin-A. Antimycin-A is a potent yet ephemeral piscicide derived from the mold *Streptomyces*. Antimycin kills trout and char by irreversibly blocking cellular respiration (Lennon and Berger 1970). Antimycin has been selected for this project due to its low impacts to invertebrates, low application rates (parts per billion) and self-neutralization (i.e. oxidation) in turbulent streams with 100 to 300 feet of elevation loss (Bruce Rosenlund, USFWS Biologist, pers. comm.).

Antimycin-A is proposed for use on two lakes (Middle and Lower Blum Lakes) that contain self-sustaining populations of brook trout (*Salvelinus fontinalis*). Antimycin will be applied at a 4–8 p.p.b. concentration using a motorized inflatable raft (e.g., zodiac) The Blum Lakes drain into Blum Creek and then into the Baker River, a BTCH-listed reach. During antimycin treatment, the outlet stream concentration will be monitored with bioassays (live cars with trout) placed at regular intervals downstream of the lakes. Mortality in live cars will be monitored to determine the efficacy of treatment and antimycin attenuation. Potassium permanganate drip stations may be used as an extra precaution to neutralize antimycin should downstream concentrations fail to attenuate with distance. Use of potassium permanganate (an oxidizer) is an extra precaution that probably is not necessary because antimycin rapidly degrades in turbulent outlet streams over relatively short distances (Bruce Rosenlund, U.S. Fish and Wildlife Service, pers. comm.).

The Blum Lakes are approximately 3 stream miles and 4,250 feet upslope from the Baker River. The outlet stream consists of a series of steep cascades barren of fish until reaching the lower gradient of the valley floor. The large distance and elevation decline between the Blum Lakes will ensure degradation of antimycin near the headwaters of the outlet stream and well upstream of the Baker River BCTH, resulting in no effect to the BCTH constituent elements.

Hybridization between brook trout and bull trout often occurs when larger bull trout males drive off smaller brook trout males and fertilize the eggs of brook trout females (Behnke 2002). Removal of brook



trout populations in watersheds containing bull trout is one element of the *Draft Recovery Plan* for the Coastal-Puget Sound distinct population segment of bull trout. Should antimycin treatment prove successful, removal of brook trout from Blum Lakes will eliminate this source population and reduce the potential for downstream dispersal of brook trout into the Baker River. This action may have an indirect, beneficial effect on bull trout constituent elements six, seven and eight by reducing competition for food resources and minimizing the potential for hybridization and introgression between brook trout and bull trout in the BCTH-designated reach of the Baker River (Mark Downen, pers. comm.).

Conclusion

Fish stocking and fish removal as proposed in alternative B in the draft plan/EIS will have no effect on BCTH. Removal of reproducing populations of brook trout in the Blum Lakes may have an indirect, beneficial effect on BCTH in the Baker River by removing source populations of brook trout and reducing the potential for competition and/or hybridization.

References

Department of the Interior, Fish and Wildlife Service
2005 50 CFR Part 17: Endangered and Threatened Wildlife Plants; Designation of Critical Habitat for the Bull Trout; Final Rule. September 26.

Lennon, R.E. and B.L. Berger
1970 A Resume on Field Application of Antimycin A to Control Fish. U.S. Department of the Interior, Bureau of Sport Fisheries, Fish and Wildlife Investigations in Fish Control, 40: 1-19.

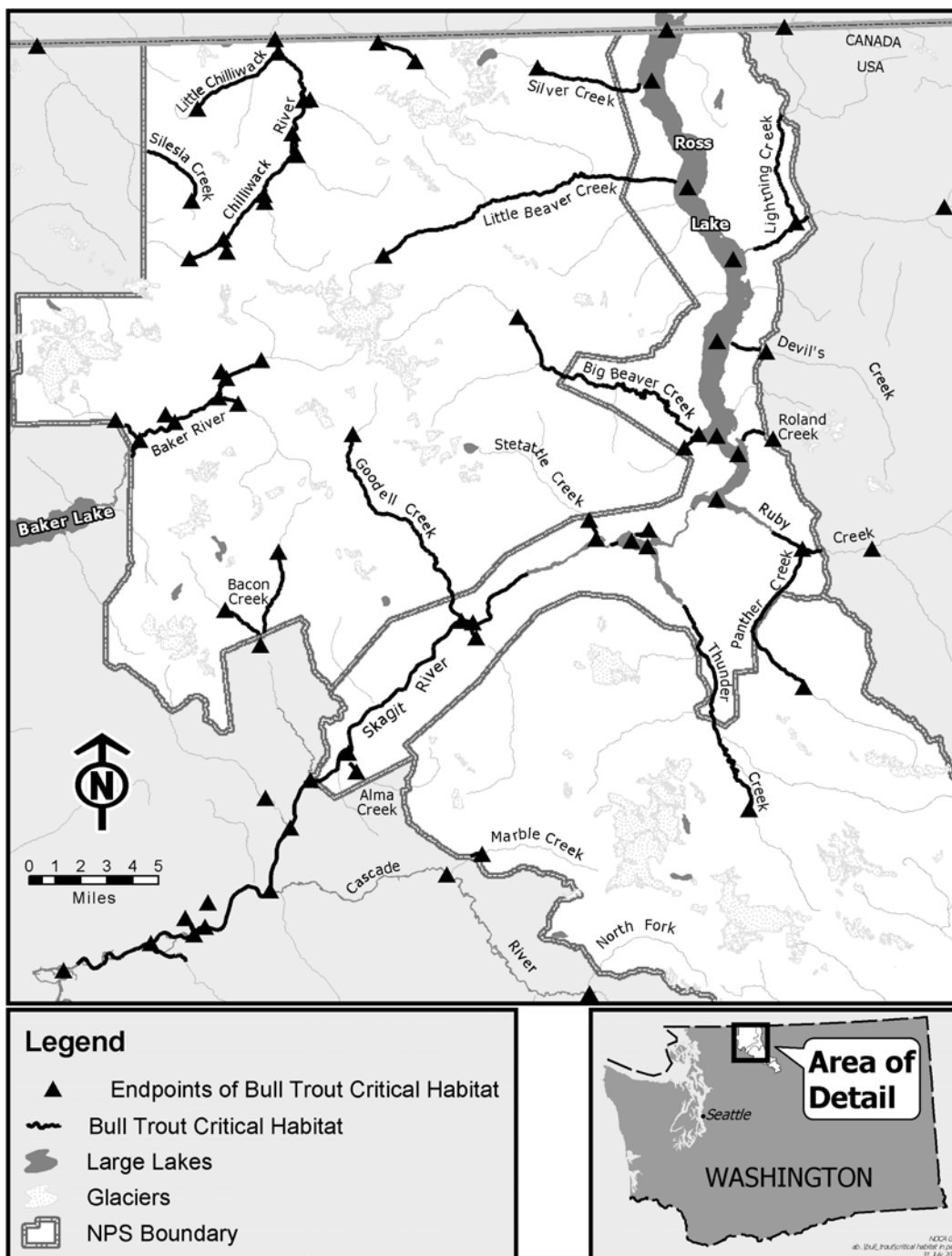
Personal Communication

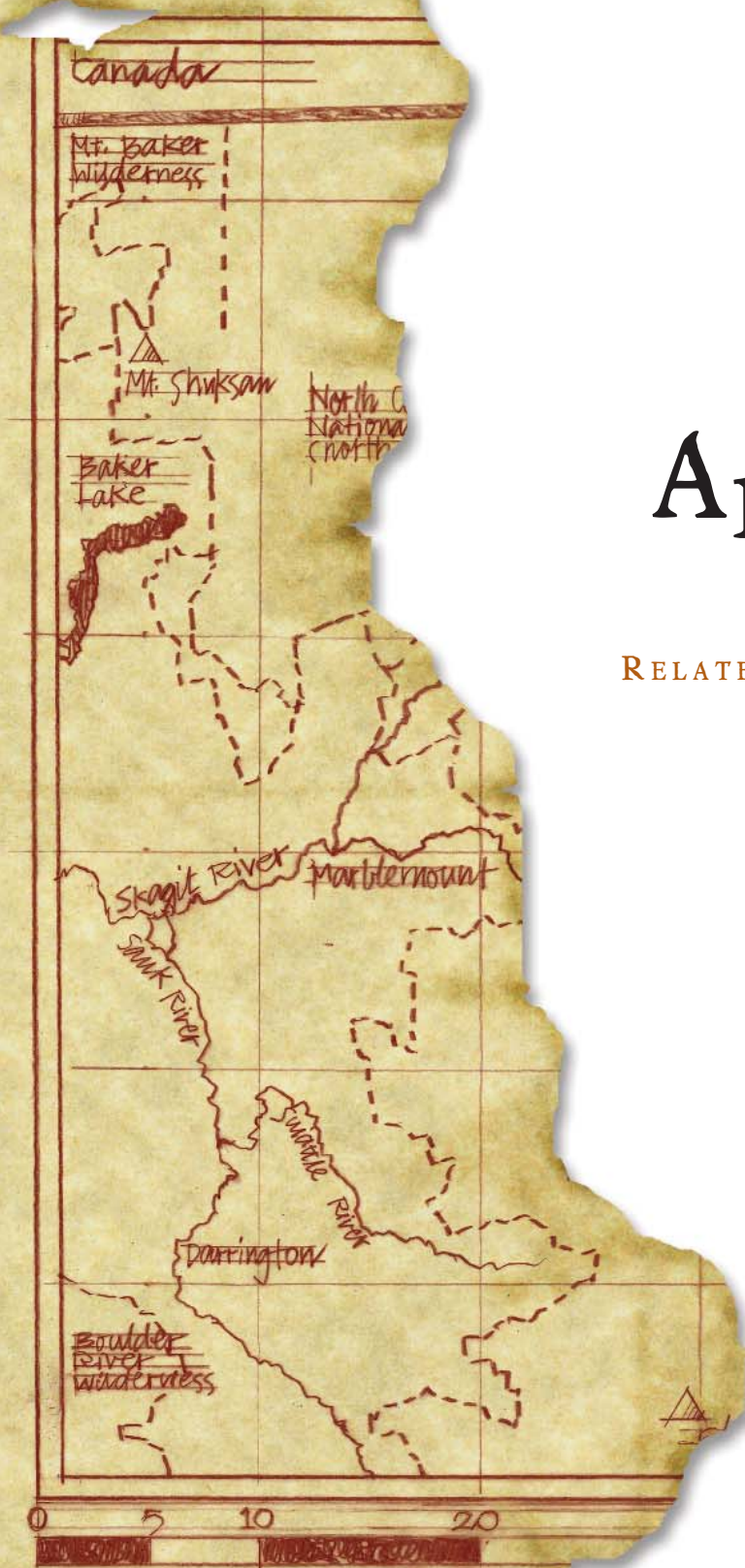
Downen, Mark. Inland Fishery Biologist, Washington Department of Fish and Wildlife (WDFW). Personal Communication. Mr. Downen is representing the WDFW as a Cooperating Agency in preparation of the Mountain Lakes Fishery Management Plan/EIS. He has extensive first-hand knowledge on the status of native and non-native fish in North Cascades, including bull trout.

Rosenlund, Bruce. Fishery Biologist USFWS. Personal Communication. Mr. Rosenlund is the authority on fish removal using antimycin. He recommended methods of application, and assisted with estimating treatment costs.



Attachment C: Bull Trout Critical Habitat in North Cascades National Park and Ross Lake National Recreation Area





Appendix D

RELATED REGULATIONS, POLICIES,
LAWS, AND LEGISLATION

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APPENDIX D: RELATED REGULATIONS, POLICIES, LAWS, AND LEGISLATION

GENERAL LAWS RELATING TO NPS MANAGEMENT

This section is intended to highlight the existing laws, regulations, and National Park Service (NPS) management policies that specifically relate to the issues surrounding this *North Cascades National Park Service Complex Draft Mountain Lakes Fishery Management Plan / Environmental Impact Statement* (plan/EIS).

1. National Parks Omnibus Management Act of 1998 (16 USC § 5931, et. seq.)

16 USC§ 5931, Purposes

The purposes of this title are

(1) to more effectively achieve the mission of the National Park Service; (2) to enhance management and protection of national park resources by providing clear authority and direction for the conduct of scientific study in the National Park System and to use the information gathered for management purposes; (3) to ensure appropriate documentation of resource conditions in the National Park System; (4) to encourage others to use the National Park System for study to the benefit of park management as well as broader scientific value, where such study is consistent with the Act of August 25, 1916 (commonly known as the *National Park Service Organic Act*); and (5) to encourage the publication and dissemination of information derived from studies in the National Park System.

16 USC § 5932, Research mandate

The Secretary is authorized and directed to assure that management of units of the National Park System is enhanced by the availability and utilization of a broad program of the highest quality science and information.

16 USC § 5936, Integration of study results into management decisions

The Secretary shall take such measures as are necessary to assure the full and proper utilization of the results of scientific study for park management decisions. In each case in which an action undertaken by the National Park Service may cause a significant adverse effect on a park resource, the administrative record shall reflect the manner in which unit resource studies have been considered. The trend in the condition of resources of the National Park System shall be a significant factor in the annual performance evaluation of each superintendent of a unit of the National Park System.

2. 1978 Redwood Amendment, which added these words to the NPS Organic Act (16 USC § 1a-1)

Congress further reaffirms, declares, and directs that the promotion and regulation of the various areas of the National Park System, as defined in section 2 of this Act, shall be consistent with and founded in the purpose established by the first section of the Act of August 25, 1916, to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.



3. Code of Federal Regulations

36 CFR § 1.2, Applicability and scope

(a) The regulations contained in this chapter apply to all persons entering, using, visiting, or otherwise within:

(1) The boundaries of federally owned lands and waters administered by the National Park Service; (2) The boundaries of lands and waters administered by the National Park Service for public-use purposes pursuant to the terms of a written instrument; (3) Waters subject to the jurisdiction of the United States located within the boundaries of the National Park System, including navigable waters and areas within their ordinary reach (up to the mean high water line in places subject to the ebb and flow of the tide and up to the ordinary high water mark in other places) and without regard to the ownership of submerged lands, tidelands, or lowlands;

(d) The regulations contained in parts 2 through 5, part 7, and part 13 of this section shall not be construed to prohibit administrative activities conducted by the National Park Service, or its agents, in accordance with approved general management and resource management plans, or in emergency operations involving threats to life, property, or park resources.

36 CFR § 1.5, Closures and public use limits

(a) Consistent with applicable legislation and Federal administrative policies, and based upon a determination that such action is necessary for the maintenance of public health and safety, protection of environmental or scenic values, protection of natural or cultural resources, aid to scientific research, implementation of management responsibilities, equitable allocation and use of facilities, or the avoidance of conflict among visitor use activities, the superintendent may:

(1) Establish, for all or a portion of a park area, a reasonable schedule of visiting hours, impose public use limits, or close all or a portion of a park area to all public use or to a specific use or activity. (2) Designate areas for a specific use or activity, or impose conditions or restrictions on a use or activity. (3) Terminate a restriction, limit, closure, designation, condition, or visiting hour restriction imposed under paragraph (a)(1) or (2) of this section.

(b) Except in emergency situations, a closure, designation, use or activity restriction or condition, or the termination or relaxation of such, which is of a nature, magnitude and duration that will result in a significant alteration in the public use pattern of the park area, adversely affect the park's natural, aesthetic, scenic or cultural values, require a long-term or significant modification in the resource management objectives of the unit, or is of a highly controversial nature, shall be published as rulemaking in the Federal Register.

(c) Except in emergency situations, prior to implementing or terminating a restriction, condition, public use limit or closure, the superintendent shall prepare a written determination justifying the action. That determination shall set forth the reason(s) the restriction, condition, public use limit or closure authorized by paragraph (a) has been established, and an explanation of why less restrictive measures will not suffice, or in the case of a termination of a restriction, condition, public use limit or closure previously established under paragraph (a), a determination as to why the restriction is no longer necessary and a finding that the termination will not adversely impact park resources. This determination shall be available to the public upon request.

(d) To implement a public use limit, the superintendent may establish a permit, registration, or reservation system. Permits shall be issued in accordance with the criteria and procedures of § 1.6 of this chapter.

(e) Except in emergency situations, the public will be informed of closures, designations, and use or activity restrictions or conditions, visiting hours, public use limits, public use limit procedures, and the termination or relaxation of such, in accordance with § 1.7 of this chapter.

(f) Violating a closure, designation, use or activity restriction or condition, schedule of visiting hours, or public use limit is prohibited.

36 CFR § 1.7, Public notice

(a) Whenever the authority of § 1.5(a) is invoked to restrict or control a public use or activity, to relax or revoke an existing restriction or control, to designate all or a portion of a park area as open or closed, or to require a permit to implement a public use limit, the public shall be notified by one or more of the following methods:

(1) Signs posted at conspicuous locations, such as normal points of entry and reasonable intervals along the boundary of the affected park locale. (2) Maps available in the office of the superintendent and other places convenient to the public. (3) Publication in a newspaper of general circulation in the affected area. (4) Other appropriate methods, such as the removal of closure signs, use of electronic media, park brochures, maps and handouts.

(b) In addition to the above-described notification procedures, the superintendent shall compile in writing all the designations, closures, permit requirements and other restrictions imposed under discretionary authority. This compilation shall be updated annually and made available to the public upon request.

FEDERAL LAWS AND NPS MANAGEMENT POLICIES RELATING TO FISH STOCKING (EXOTIC SPECIES)

1. Code of Federal Regulations

36 CFR § 2.1, Preservation of natural, cultural and archeological resources

(a) Except as otherwise provided in this chapter, the following is prohibited:

(1) Possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state: (i) Living or dead wildlife or fish, or the parts or products thereof, such as antlers or nests.

(2) Introducing wildlife, fish or plants, including their reproductive bodies, into a park area ecosystem.

2. NPS Management Policies

4.1.5 Restoration of Natural Systems

The Service will re-establish natural functions and processes in human-disturbed components of natural systems in parks unless otherwise directed by Congress. Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to protect park developments or visitor safety. Impacts to natural systems resulting from human disturbances include the introduction of exotic species; the contamination of air, water, and soil; changes to hydrologic patterns and sediment transport; the acceleration of erosion and sedimentation; and the disruption of natural processes. The Service will seek to return human-disturbed areas



to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological-community structure and function. Efforts may include, for example:

- Removal of exotic species;
- Removal of contaminants and non-historic structures or facilities;
- Restoration of abandoned mineral lands, abandoned or unauthorized roads, areas over-grazed by domestic animals, or disrupted natural waterways and/ or shoreline processes;
- Restoration of areas disturbed by NPS administrative, management, or development activities (such as hazard tree removal, construction, or sand and gravel extraction) or by public use;
- Restoration of natural soundscapes; and
- Restoration of native plants and animals.

When park development is damaged or destroyed and replacement is necessary, the development will be replaced or relocated so as to promote the restoration of natural resources and processes.

(See Decision-making Requirements to Avoid Impairments 1.4.7; Restoration of Native Plant and Animal Species 4.4.2.2; Management of Natural Landscapes 4.4.2.4; Siting Facilities to Avoid Natural Hazards 9.1.1.6. Also see Director's Order #18: Wildland fire Management)

4.4.1.1 Plant and Animal Population Management Principles

The individual plants and animals found within parks are genetically parts of species populations that may extend across both park and non-park lands. As local populations within a group of populations naturally fluctuate in size, they become vulnerable to natural or human-caused extirpation during periods when their numbers are low. The periodic disappearance of local populations is common in some species, and the regional persistence of these species depends upon the natural recolonization of suitable habitat by individuals from the remaining local populations. Thus, providing for the persistence of a species in a park may require maintaining a number of local populations, often both within and outside the park.

In addition, some populations of vertebrate and invertebrate animals, such as bats, caribou, warblers, marine turtles, frogs, salmon, whales, and butterflies, migrate at regular intervals into and out of parks. For these migratory populations, the parks provide only one of the several major habitats they need, and survival of the species in parks also depends on the existence and quality of habitats outside the parks. The Service will adopt park resource preservation, development, and use management strategies that are intended to maintain the natural population fluctuations and processes that influence the dynamics of individual plant and animal populations, groups of plant and animal populations, and migratory animal populations in parks.

In addition to maintaining all native plant and animal species and their habitats inside parks, the Service will work with other land managers to encourage the conservation of the



populations and habitats of these species outside parks whenever possible. To meet its commitments for maintaining native species in parks, the Service will cooperate with states, tribal governments, the U.S. Fish and Wildlife Service, and the National Marine fisheries Service, as appropriate, to:

- Participate in local and regional scientific and planning efforts, identify ranges of populations of native plants and animals, and develop cooperative strategies for maintaining or restoring these populations in the parks;
- Suggest mutually beneficial harvest regulations for lands and waters outside the parks for populations that extend across park boundaries, such as resident deer or fishes; for short-distance seasonal migrant populations, such as elk or fishes; or for long-distance migrant populations, such as salmon;
- Develop data, through monitoring, for use in plant and animal management programs (such as local land management decision-making for assessing resident plant and animal population trends, and in international management negotiations for such far-ranging seasonal migrants as geese, whales, and marine turtles);
- Present information about species life cycles, ranges, and population dynamics in park interpretive programs for use in increasing public awareness of management needs for all species, both resident and migrant, that occur in parks; and
- Prevent the introduction of exotic species into units of the National Park System, and remove populations of these species that have already become established in parks.

4.4.3 Harvest of Plants and Animals by the Public

Public harvesting of designated species of plants and animals, or their components, may be allowed in park units when:

- Hunting, trapping, subsistence use, or other harvesting is specifically authorized by statute or regulation and not subsequently prohibited by regulation;
- Harvest of certain plant parts or unoccupied seashells for personal consumption or use is specifically authorized by the superintendent in accordance with 36 CFR 2.1(c)(1);
- Recreational fishing is not specifically prohibited; or
- Commercial fishing is specifically authorized by statute or regulation.

Where harvesting is allowed and subject to NPS control, the Service will allow harvesting only when the monitoring requirement contained in section 4.4.2 and the criteria in section 4.4.2.1, above, have been met, and the Service has determined that the harvesting will not unacceptably impact park resources or natural processes, including the natural distributions, densities, age-class distributions, and behavior of:

- Harvested species;
- Native species that the harvested species use for any purpose; or



- Native species that use the harvested species for any purpose.

The Service will manage harvesting programs, and any associated habitat management programs intended to restore and maintain habitats supporting harvested plant or animal populations, to conform with applicable federal and state regulations and in consultation and cooperation, as appropriate, with individual states or tribal governments.

Habitat manipulation for harvested species may include the restoration of a disturbed area to its natural condition so it can become self-perpetuating, but will not include the artificial manipulation of habitat to increase the numbers of a harvested species above its natural range in population levels.

The Service may encourage the intensive harvesting of exotic species in certain situations when needed to meet park management objectives.

In some situations, the Park Service may stock native or exotic animals for recreational harvesting purposes, but only when such stocking will not impair park natural resources or processes, and:

- The stocking is of fish into constructed large reservoirs or other significantly altered large water bodies and the purpose is to provide for recreational fishing; or
- Such stocking is in a national recreation area or preserve that has historically been stocked (in these situations, stocking only of the same species may be continued); or
- Congressional intent for stocking is expressed in statute or a House or Senate report accompanying a statute.

The Service will not stock waters that are naturally barren of harvested aquatic species.

4.4.4 Management of Exotic Species

Exotic species will not be allowed to displace native species if displacement can be prevented.

4.4.4.1 Introduction or Maintenance of Exotic Species

In general, new exotic species will not be introduced into parks. In rare situations, an exotic species may be introduced or maintained to meet specific, identified management needs when all feasible and prudent measures to minimize the risk of harm have been taken, and it is:

- A closely related race, subspecies, or hybrid of an extirpated native species; or
- An improved variety of a native species in situations in which the natural variety cannot survive current, human-altered environmental conditions; or Used to control another, already-established exotic species; or
- Needed to meet the desired condition of a historic resource, but only where it is prevented from being invasive by such means as cultivating (for plants), or tethering, herding, or pasturing (for animals). In such cases, the exotic species used must be known to be historically significant, to have existed in the park during the park's

period of historical significance, or to have been commonly used in the local area at that time; or

- An agricultural crop used to maintain the character of a cultural landscape; or
- Necessary to provide for intensive visitor use in developed areas, and both of the following conditions exist:
 - Available native species will not meet park management objectives; and
 - The exotic species is managed so it will not spread or become a pest on park or adjacent lands; or
- A sterile, non-invasive plant that is used temporarily for erosion control; or
- Directed by law or expressed legislative intent.

Domestic livestock such as cattle, sheep, goats, horses, mules, burros, reindeer, and llamas are exotic species that are maintained in some parks for purposes of commercial herding, pasturing, grazing, or trailing; for recreational use; or for administrative use for maintaining the historic scene or supporting park operations. The policies applicable to the grazing of commercial domestic livestock are discussed in chapter 8, section 8.6.8. The Service will phase out the commercial grazing of livestock whenever possible, and will manage recreational and administrative uses of livestock to prevent those uses from unacceptably impacting park natural resources.

4.4.4.2 Removal of Exotic Species Already Present

All exotic plant and animal species that are not maintained to meet an identified park purpose will be managed—up to and including eradication—if (1) control is prudent and feasible, and (2) the exotic species:

- Interferes with natural processes and the perpetuation of natural features, native species or natural habitats; or
- Disrupts the genetic integrity of native species; or
- Disrupts the accurate presentation of a cultural landscape; or
- Damages cultural resources; or
- Significantly hampers the management of park or adjacent lands; or
- Poses a public health hazard as advised by the U.S. Public Health Service (which includes the Centers for Disease Control and the NPS Public Health Program); or
- Creates a hazard to public safety.

High priority will be given to managing exotic species that have, or potentially could have, a substantial impact on park resources, and that can reasonably be expected to be successfully controllable. Lower priority will be given to exotic species that have almost no impact on park resources or that probably cannot be successfully controlled.



The decision to initiate management should be based on a determination that the species is exotic. For species determined to be exotic and where management appears to be feasible and effective, superintendents should (1) evaluate the species' current or potential impact on park resources; (2) develop and implement exotic species management plans according to established planning procedures; (3) consult, as appropriate, with federal and state agencies; and (4) invite public review and comment, where appropriate. Programs to manage exotic species will be designed to avoid causing significant damage to native species, natural ecological communities, natural ecological processes, cultural resources, and human health and safety.

(Also see Executive Order # 13112 (Invasive Species))

FEDERAL LAWS AND NPS MANAGEMENT POLICIES RELATING TO WILDERNESS AREAS

1. The Wilderness Act (16 USC § 1131, et. seq.)

16 USC § 1131

(a) it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas", and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness; and no Federal lands shall be designated as "wilderness areas" except as provided for in this Act or by a subsequent Act.

(c) Definition of wilderness. A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

16 USC § 1133, Use of wilderness areas

(a) Purposes of national forests, national park system, and national wildlife refuge system; other provisions applicable to national forests, Superior National Forest, and national park system. The purposes of this Act are hereby declared to be within and supplemental to the purposes for which national forests and units of the national park and national wildlife refuge systems are established and administered and—

(3) Nothing in this Act shall modify the statutory authority under which units of the national park system are created. Further, the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner



lower the standards evolved for the use and preservation of such park, monument, or other unit of the national park system in accordance with the Act of August 25, 1916, the statutory authority under which the area was created, or any other Act of Congress which might pertain to or affect such area, including, but not limited to, the Act of June 8, 1906 (34 Stat. 225); section 3(2) of the Federal Power Act; and the Act of August 21, 1935 (49 Stat. 666)

(b) Agency responsibility for preservation and administration to preserve wilderness character; public purposes of wilderness areas. Except as otherwise provided in this Act each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

(c) Prohibition provisions: commercial enterprise, permanent or temporary roads, mechanical transports, and structures or installations; exceptions: area administration and personal health and safety emergencies. Except as specifically provided for in this Act and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

(d) Special provisions. The following special provisions are hereby made:
 (1) Aircraft or motorboats; fire, insects, and diseases. Within wilderness areas designated by this Act the use of aircraft or motorboats, where these uses have already become established, may be permitted to continue subject to such restrictions as the Secretary of Agriculture deems desirable. In addition, such measures may be taken as may be necessary in the control of fire, insects, and diseases, subject to such conditions as the Secretary deems desirable.
 (2) Mineral activities, surveys for mineral value. Nothing in this Act shall prevent within national forest wilderness areas any activity, including prospecting, for the purpose of gathering information about mineral or other resources, if such activity is carried on in a manner compatible with the preservation of the wilderness environment. Furthermore, in accordance with such program as the Secretary of the Interior shall develop and conduct in consultation with the Secretary of Agriculture, such areas shall be surveyed on a planned, recurring basis consistent with the concept of wilderness preservation by the [United States] Geological Survey and the [United States] Bureau of Mines to determine the mineral values, if any, that may be present; and the results of such surveys shall be made available to the public and submitted to the President and Congress.

(6) State water laws exemption. Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(7) State jurisdiction of wildlife and fish in national forests. Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the national forests.



2. NPS Management Policies Relating to Wilderness Areas

6.1 General Statement

The National Park Service will manage wilderness areas for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness. Management will include the protection of these areas, the preservation of their wilderness character, and the gathering and dissemination of information regarding their use and enjoyment as wilderness. The purpose of wilderness in the national parks includes the preservation of wilderness character and wilderness resources in an unimpaired condition and, in accordance with the Wilderness Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

6.3.1 Wilderness Resource Management, General Policy

For the purposes of applying these policies, the term “wilderness” will include the categories of eligible, study, proposed, recommended, and designated wilderness. Potential wilderness may be a subset of any of these five categories. The policies apply regardless of category except as otherwise provided herein. In addition to managing these areas for the preservation of the physical wilderness resources, planning for these areas must ensure that the wilderness character is likewise preserved. This policy will be applied to all planning documents affecting wilderness. The National Park Service will take no action that would diminish the wilderness eligibility of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed. Until that time, management decisions will be made in expectation of eventual wilderness designation. This policy also applies to potential wilderness, requiring it to be managed as wilderness to the extent that existing non-conforming conditions allow. The National Park Service will apply the principles of civic engagement and cooperative conservation as it determines the most appropriate means of removing the temporary, nonconforming conditions that preclude wilderness designation from potential wilderness. All management decisions affecting wilderness will further apply the concept of “minimum requirement” for the administration of the area regardless of wilderness category. The only exception is for areas that have been found eligible, but for which, after completion of a wilderness study, the Service has not proposed wilderness designation. However, those lands will still be managed to preserve their eligibility for designation.

6.3.4.3 Environmental Compliance

Proposals having the potential to impact wilderness resources will be evaluated in accordance with NPS procedures for implementing the National Environmental Policy Act. Those procedures include the use of categorical exclusions, environmental assessments (EAs), or environmental impact statements (EISs). Administrative actions impacting wilderness must be addressed in either the environmental assessment or environmental impact statement accompanying the approved wilderness management plan or as a separate environmental compliance document. Managers contemplating the use of aircraft or other motorized equipment or mechanical transportation within wilderness must consider impacts to the character, esthetics, and traditions of wilderness before considering the costs and efficiency of the equipment. In evaluating environmental impacts, the National Park Service will take into account (1) wilderness characteristics and values, including the primeval character and influence of the wilderness; (2) the preservation of natural conditions (including the lack of man-made noise); and (3) assurances that there will be outstanding opportunities for solitude, that the public will be provided with a primitive and unconfined type of recreational experience, and that wilderness will be preserved and used in an unimpaired condition.

Managers will be expected to appropriately address cultural resources management considerations in the development and review of environmental compliance documents impacting wilderness resources.

6.3.5 Minimum Requirement

All management decisions affecting wilderness must be consistent with the minimum requirement concept. This concept is a documented process used to determine if administrative actions, projects, or programs undertaken by the Service or its agents and affecting wilderness character, resources, or the visitor experience are necessary, and if so how to minimize impacts. The minimum requirement concept will be applied as a two-step process that determines:

- Whether the proposed management action is appropriate or necessary for administration of the area as wilderness and does not cause a significant impact to wilderness resources and character in accordance with the Wilderness Act, and the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized.
- In accordance with this policy, superintendents will apply the minimum requirement concept in the context of wilderness stewardship planning, as well as to all other administrative practices, proposed special uses, scientific activities, and equipment use in wilderness. The only exception to the minimum requirement policy is for eligible areas that the Service has not proposed for wilderness designation. However, those lands will still be managed to preserve their eligibility. When determining minimum requirements, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness resources or character is unavoidable, only those actions that preserve wilderness character and/ or have localized, short-term adverse impacts will be acceptable.

Although park managers have flexibility in identifying the method used to determine minimum requirement, the method used must clearly weigh the benefits and impacts of the proposal, document the decision-making process, and be supported by an appropriate environmental compliance document. Parks must develop a process to determine minimum requirement until the plan is finally approved. Parks will complete a minimum requirement analysis on those administrative practices and equipment uses that have the potential to impact wilderness resources or values. The minimum requirement concept cannot be used to rationalize permanent roads or inappropriate or unlawful uses in wilderness.

Administrative use of motorized equipment or mechanical transport will be authorized only:

- If determined by the superintendent to be the minimum requirement needed by management to achieve the purposes of the area, including the preservation of wilderness character and values, in accordance with the Wilderness Act; or
- In emergency situations (for example, search and rescue, homeland security, law enforcement) involving the health or safety of persons actually within the area. Such management activities will also be conducted in accordance with all applicable regulations, policies, and guidelines and, where practicable, will be scheduled to avoid creating adverse resource impacts or conflicts with visitor use.

While actions taken to address search and rescue, homeland security and law enforcement issues are subject to the minimum requirement concept, preplanning or programmatic



planning should be undertaken whenever possible to facilitate a fast and effective response and reduce paperwork.

6.3.7 Natural Resources Management

The National Park Service recognizes that wilderness is a composite resource with interrelated parts. Without natural resources, especially indigenous and endemic species, a wilderness experience would not be possible. Natural resources are critical, defining elements of the wilderness resource, but they need to be managed within the context of the whole ecosystem. Natural resource management plans will be integrated with, and cross-reference, wilderness management plans. Pursuing a series of independent component projects in wilderness, such as single-species management, will not necessarily accomplish the overarching goal of wilderness management. Natural resources management in wilderness will include and be guided by a coordinated program of scientific inventory, monitoring, and research.

The principle of non-degradation will be applied to wilderness management, and each wilderness area's condition will be measured and assessed against its own unimpaired standard. Natural processes will be allowed, insofar as possible, to shape and control wilderness ecosystems. Management should seek to sustain the natural distribution, numbers, population composition, and interaction of indigenous species. Management intervention should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and influences originating outside of wilderness boundaries.

Management actions, including the restoration of extirpated native species, the alteration of natural fire regimes, the control of invasive alien species, the management of endangered species, and the protection of air and water quality, should be attempted only when the knowledge and tools exist to accomplish clearly articulated goals.

6.3.10.2 Trails in Wilderness

Trails will be permitted within wilderness when they are determined to be necessary for resource protection and/ or for providing for visitor use for the purposes of wilderness. The identification and inventory of the wilderness trail system will be included as an integral part of the wilderness management plan or other appropriate planning document. Trails will be maintained at levels and conditions identified within the approved wilderness management plan or other planning document. Trail maintenance structures (such as water bars, gabions) may be provided, under minimum requirement protocols, where they are essential for resource preservation, or where significant safety hazards exist during normal use periods. Historic and/ or prehistoric trails will be administered in keeping with approved cultural resource and wilderness management plan requirements.

Borrow pits are not permitted in wilderness areas, with the exception of small-quantity use of borrow material for trails, which must be in accordance with an minimum requirements analysis.

6.4 Wilderness Use Management

The National Park Service will encourage and facilitate those uses of wilderness that are in keeping with the definitions and purposes of wilderness and do not degrade wilderness resources and character. Appropriate restrictions may be imposed on any authorized activity in the interest of preserving wilderness character and resources or to ensure public safety.

When resource impacts or demands for use exceed established thresholds or capacities, superintendents may limit or redirect use. If these actions are determined to be the minimally required level of management, physical alterations, public education, general regulations, special regulations, permit systems, and the local restrictions, public use limits, closures, and designations implemented under the discretionary authority of the superintendent (36 CFR 1.5 and Part 13; 43 CFR Part 36 for Alaska units), may all be used in managing use and protecting wilderness.

6.4.1 Wilderness Use Management, General Policy

Park visitors need to accept wilderness on its own unique terms. Accordingly, the National Park Service will promote education programs that encourage wilderness users to understand and be aware of certain risks, including possible dangers arising from wildlife, weather conditions, physical features, and other natural phenomena that are inherent in the various conditions that comprise a wilderness experience and primitive methods of travel. The National Park Service will not modify the wilderness area to eliminate risks that are normally associated with wilderness, but it will strive to provide users with general information concerning possible risks, any recommended precautions, related user responsibilities, and applicable restrictions and regulations, including those associated with ethno-graphic and cultural resources.

6.4.3 Recreational Use Management in Wilderness

Recreational uses of NPS wilderness are generally those traditionally associated with wilderness and identified by Congress in the legislative record for the development of the Wilderness Act and in keeping with the language provided by sections 2(a) and 2(c) of the act itself (16 USC 1131 (a) and (c)). These recreational uses of wilderness will be of a type and nature that ensures that its use and enjoyment (1) will leave it unimpaired for future use and enjoyment as wilderness, (2) provides for the protection of the area as wilderness, and (3) provides for the preservation of wilderness character. Recreational uses in NPS wilderness areas will be of a nature that enables the areas to retain their primeval character and influence; protects and preserves natural conditions; leaves the imprint of man's work substantially unnoticeable; provides outstanding opportunities for solitude or primitive and unconfined types of recreation; and preserves wilderness in an unimpaired condition.

6.4.3.1 Recreation Use Evaluation

Recreational uses—particularly new and emerging activities, that compromise the stated purposes and definitions of wilderness or unduly impact the wilderness resource or the visitor experience within wilderness—will be evaluated to determine if these uses are appropriate, or should be limited or disallowed through use of the superintendent's compendium in 36 CFR 1.5. Evaluation or re-evaluation should be accomplished within wilderness management plans or similar implementation plans. Recreational uses that do not meet the purposes and definitions of wilderness should be prohibited in NPS wilderness.

Significant changes in patterns or increased levels of use will not be authorized by special permit, administrative discretion, or authorities under the superintendents' compendia, except in cases where sufficient information exists to adequately determine there is no significant impact on wilderness resources and values, including visitor experiences. These increased levels of use and changes in patterns of existing use will normally not qualify for a categorical exclusion under the *National Environmental Policy Act*. Decisions regarding significant changes in patterns and new levels of use will require environmental analysis and review, including opportunity for public comment, in accordance with NEPA requirements of NEPA.



6.4.3.3 Use of Motorized Equipment

Public use of motorized equipment or any form of mechanical transport will be prohibited in wilderness except as provided for in specific legislation. Operating a motor vehicle or possessing a bicycle in designated wilderness outside Alaska is prohibited (see NPS regulations in 36 CFR 4.30(d)(1)).

However, section 4(d)(1) of the Wilderness Act (16 USC 1133(d)(1)) authorizes the Secretary—where legislation designating the wilderness specifically makes this provision applicable—to allow the continuation of motorboat and aircraft use under certain circumstances in which those activities were established prior to wilderness designation. Section 4(d)(1) gives the Secretary the discretion to manage and regulate the activity in accordance with the Wilderness Act, the NPS Organic Act, and individual park enabling legislation. As authorized, the National Park Service will administer this use to be compatible with the purpose, character, and resource values of the particular wilderness area involved. The use of motorized equipment by the public in wilderness areas in Alaska is governed by applicable provisions of the *Alaska National Interest Lands Conservation Act*, NPS regulations in 36 CFR Part 13, and Department of the Interior regulations in 43 CFR Part 36. The specific conditions under which motorized equipment may be used by the public will be outlined in each park's wilderness management plan.

6.4.6 Existing Private Rights

Wilderness designation does not extinguish valid existing private rights (for example, fee-simple interest, less-than-fee-simple interest, valid mineral operations, rights-of-way, grazing permits). The validity of private rights within wilderness must be determined on a case-by-case basis. Valid private rights in wilderness must be administered in keeping with the specific conditions and requirements of the valid right.

3. NPS Management Policies Relating to Recreational Use

8.2.2 Recreational Activities

The National Park Service will manage recreational activities according to the criteria listed in sections 8.1 and 8.2 (and 6.4 in wilderness areas). Examples of the broad range of recreational activities that take place in parks include, but are not limited to, boating, camping, bicycling, fishing, hiking, horseback riding and packing, outdoor sports, picnicking, scuba diving, cross-country skiing, caving, mountain and rock climbing, earth caching, and swimming. Many of these activities support the federal policy of promoting the health and fitness of the general public, as set forth in Executive Order 13266. However, not all of these activities will be appropriate or allowable in all parks; that determination must be made on the basis of park-specific planning. Service-wide regulations addressing aircraft use, off-road bicycling, hang gliding, off-road vehicle use, personal watercraft, and snowmobiling require that special, park-specific regulations be developed before these uses may be allowed in parks. (The *Alaska National Interest Lands Conservation Act* statutory provisions (e.g., section 1110(a)) and regulatory provisions in 36 CFR Part 13 and 43 CFR 36.11(h) apply to snowmobile, motorboat, aircraft, and other means of access in units of the national park system in Alaska.)

The Service will monitor new or changing patterns of use or trends in recreational activities and assess their potential impacts on park resources. A new form of recreational activity will not be allowed within a park until a superintendent has made a determination that it will be appropriate and not cause unacceptable impacts. Restrictions placed on recreational uses that have been found to be appropriate will be limited to the minimum necessary to protect park

resources and values and promote visitor safety and enjoyment. Sounds that visitors encounter affect their recreational and/or educational experience. Many park visitors have certain expectations regarding the sounds they will hear as part of their experience. The type of park unit (for example, national battlefield, national seashore, national recreation area, national park) and its specific features often help shape those expectations. In addition to expectations of muted to loud sounds associated with nature (such as wind rustling leaves, elk bugling, waves crashing on a beach), park visitors also expect sounds reflecting our cultural heritage (such as cannons firing, native drumming, music) and sounds associated with people visiting their parks (such as children laughing, park interpretive talks, motors in cars and motorboats).

Park managers will (1) identify what levels and types of sounds contribute to or hinder visitor enjoyment, and (2) monitor, in and adjacent to parks, noise-generating human activities—including noise caused by mechanical or electronic devices—that adversely affect visitor opportunities to enjoy park soundscapes. Based on this information, the Service will take action to prevent or minimize those noises that adversely affect the visitor experience or that exceed levels that are acceptable to or appropriate for visitor uses of parks.

8.2.2.5 Fishing

Recreational fishing will be allowed in parks when it is authorized or not specifically prohibited by federal law provided that it has been determined to be an appropriate use per section 8.1 of these policies. When fishing is allowed, it will be conducted in accordance with applicable federal laws and treaty rights, and nonconflicting state laws and regulations. The Service will manage fishing activities to achieve management objectives. Before the Service issues regulations or other restrictions, representatives of appropriate tribes and state and federal agencies will be consulted to ensure that all available scientific data is considered in the decisionmaking process. Any such regulations or other restrictions will be developed with public involvement and in consultation with fish and wildlife management agencies as appropriate, consistent with departmental policy at 43 CFR Part 24, and as described in section 4.4.3 For NPS units in Alaska, fishing will additionally be managed in accordance with the *Alaska National Interest Lands Conservation Act*.

Commercial fishing will be allowed only when specifically authorized by federal law or treaty right.

PARK SPECIFIC LEGISLATION

1. Enabling Legislation

North Cascades National Park (16 U.S.C. § 90)

In order to preserve for the benefit, use, and inspiration of present and future generations certain majestic mountain scenery, snow fields, glaciers, alpine meadows, and other unique natural features in the North Cascade Mountains of the State of Washington, there is hereby established, subject to valid existing rights, the North Cascades National Park (hereinafter referred to in this Act as the “park”). The park shall consist of the lands, waters, and interests therein within the area designated “national park” on the map entitled “Proposed Management Units, North Cascades, Washington,” numbered NP-CAS-7002, and dated October 1967. The map shall be on file and available for public inspection in the office of the Director, National Park Service, Department of the Interior, and in the office of the Chief, Forest Service, Department of Agriculture.



Ross Lake National Recreation Area (16 U.S.C. § 90a)

In order to provide for the public outdoor recreation use and enjoyment of portions of the Skagit River and Ross, Diablo, and Gorge Lakes, together with the surrounding lands, and for the conservation of the scenic, scientific, historic, and other values contributing to public enjoyment of such lands and waters, there is hereby established, subject to valid existing rights, the Ross Lake National Recreation Area (hereinafter referred to in this Act as the “recreation area”). The recreation area shall consist of the lands and waters within the area designated “Ross Lake National Recreation Area” on the map referred to in section 101 of this Act.

Lake Chelan National Recreation Area (16 U.S.C., § 90b)

In order to provide for the public outdoor recreation use and enjoyment of portions of the Stehekin River and Lake Chelan, together with the surrounding lands, and for the conservation of the scenic, scientific, historic, and other values contributing to public enjoyment of such lands and waters, there is hereby established, subject to valid existing rights, the Lake Chelan National Recreation Area (hereinafter referred to in this Act as the “recreation area”). The recreation area shall consist of the lands and waters within the area designated “Lake Chelan National Recreation Area” on the map referred to in section 101 of this Act.

2. Washington Parks Wilderness Act of 1988 (100 P.L. 668)

An Act

To designate wilderness within Olympic National Park, Mount Rainier National Park, and North Cascades National Park Service Complex in the State of Washington, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the “Washington Park Wilderness Act of 1988”.

TITLE II: NORTH CASCADES NATIONAL PARK SERVICE COMPLEX WILDERNESS SEC. 201. DESIGNATION

(a) WILDERNESS. -- In furtherance of the purposes of the Wilderness Act, certain lands in the North Cascades National Park, Ross Lake National Recreation Area, and Lake Chelan National Recreation Area, Washington, which –

(1) comprise approximately six hundred and thirty-four thousand six hundred and fourteen acres of wilderness, and approximately five thousand two hundred and twenty-six acres of potential wilderness additions, and (2) are depicted on a map entitled “Wilderness Boundary, North Cascades National Park Service Complex, Washington”, numbered 168-60-186 and dated August 1988, are hereby designated as wilderness and therefore as components of the National Wilderness Preservation System. Such lands shall be known as the Stephen Mather Wilderness.

Sec. 205. Renewable Natural Resource Use in Recreation Areas

Section 402(a) of the Act of October 2, 1968 (82 Stat. 928; 16 U.S.C. 90c-1) is hereby amended to read as follows:

“The Secretary shall administer the recreation areas in a manner which in his judgment will best provide for (1) public outdoor recreation benefits and (2) conservation of scenic, scientific, historic, and other values contributing to public enjoyment. Within that portion of the Lake Chelan National Recreation Area which is not designated as wilderness, such management, utilization, and disposal of renewable natural resources and the continuation of existing uses and developments as will promote, or are compatible with, or do not significantly impair public recreation and conservation of the scenic, scientific, historic, or other values contributing to public enjoyment, are authorized. In administering the recreation areas, the Secretary may utilize such statutory authorities pertaining to the administration of the national park system, and such statutory authorities otherwise available to him for the conservation and management of natural resources as he deems appropriate for recreation and preservation purposes and for resource development compatible therewith. Within the Ross Lake National Recreation Area the removal and disposal of trees within power line rights-of-way are authorized as necessary to protect transmission lines, towers, and equipment;”: Provided, That to the extent practicable, such removal and disposal of trees shall be conducted in such a manner as to protect scenic viewsheds.”

Sec. 206. Mineral Resource Use in Recreation Areas

Section 402(b) of the Act of October 2, 1968 (82 Stat. 928; 16 U.S.C. 90c-1b) is hereby amended to read as follows:

“The lands within the recreation areas, subject to valid existing rights, are hereby withdrawn from all forms of appropriation or disposal under the public land laws, including location, entry, and patent under the United States mining laws, and disposition under the United States mineral leasing laws: Provided, however, That within that portion of the Lake Chelan National Recreation Area which is not designated as wilderness, sand, rock and gravel may be made available for sale to the residents of Stehekin for local use so long as such sale and disposal does not have significant adverse effects on the administration of the Lake Chelan National Recreation Area.”

WASHINGTON STATE FISHING REGULATIONS

The following information is a summary of the 2004 Washington State freshwater fishing regulations. The entire pamphlet can be found at, <http://www.wa.gov/wdfw/fish/regs/fishregs.htm>

GENERAL RULES

- A fishing license is required for all persons 15 years or older; licenses must be carried when fishing.
- Catch record cards are required for everyone fishing for: Salmon, Sturgeon, Steelhead, Dungeness Crab, and Halibut.
- There is a prohibition against using live fish for game fish bait.
- There is a prohibition against using any chemical irritant to harvest fish.

FRESHWATER RULES

- Hook and line angling only. Barbed or barbless hooks may be used, and a hook may be single, double, or treble, but not more than one line with up to three hooks per angler may be used.



- Single barbless hooks are required in areas designated as ‘fly fishing only’ or ‘selective gear rules.’
- All fishing gear must be kept in immediate control and may not be left unattended while fishing. Rodholders may be used but the rod must be easily removed without delay; rod may be left in holder while playing the fish. Downriggers may be used if the line releases from the downrigger while playing and landing the fish.
- A club or dipnet may be used to assist landing a legal fish taken by legal gear. A gaff hook may not be used.
- It is unlawful to chum or broadcast any substance to attract game fish, unless specifically authorized by special rules.
- Where use of bait is prohibited, or where lures or flies are used voluntarily, game fish may be caught and released until the daily limit is retained. If any fish has swallowed the hook or is hooked in the gill, eye, or tongue, it should be kept if legal to do so.

SEASONS

- Freshwater areas are open 24 hours per day when open.
- Lakes, ponds, and reservoirs are open to fishing for game fish (except Dolly Varden/Bull Trout and grass carp) year-round.
- Rivers, streams, and beaver ponds are open to fishing for game fish (except Dolly Varden/Bull Trout and grass carp) June 1 to October 31.
- An ‘open’ listing does not authorize anglers to trespass on private property.

STATEWIDE FRESHWATER SPECIES RULES

- *Cutthroat, Lake, and Golden Trout*
 - In rivers, streams and beaver ponds minimum size is 8 inches. Daily limit is two. When fishing with bait, all trout (except steelhead) equal to or greater than the minimum size are counted as part of the daily limit whether kept or released.
 - In lakes, ponds and reservoirs no minimum size. Daily limit is five. When fishing with bait, all trout (except steelhead) equal to or greater than the minimum size are counted as part of the daily limit whether kept or released.
- *Eastern Brook Trout*
 - In rivers no minimum size. Daily limit is five. Anglers may keep up to five Eastern Brook Trout, but no more than five trout total, and no more than two can be other trout species.
- *Dolly Varden/Bull Trout*
 - When listed as open under the special rules, count as part of the trout combined daily limit for rivers and lakes.



WESTSIDE RIVERS SPECIAL RULES

Special Regulations

Water	Season	Species	Catch Limit ^{a,b}	Minimum Size	Special Regulations
Big Beaver Creek (Beaver ponds and tributary streams)	July 1 – Oct 31	All gamefish ^c	—	—	Catch and release only.
From 1/4 mile marker upstream					Selective Gear Rules ^d
Big Beaver Creek (Beaver ponds and tributary streams) (Ross Lake to 1/4 mile upstream)	Closed Waters				
Cascade River	June 1 – Feb 29	Trout ^e	2	14 inches	Legal to retain Dolly Varden/bull trout as part of the Trout catch limit.
		Dolly Varden	—	20 inches	
		Other gamefish	Statewide	Statewide	
Hozomeen Lake	July 1 – Oct 31	All gamefish	Statewide	Statewide	
Newhalem Ponds	Closed Waters				
Nooksack River	Nov 1 – Mar 15	Trout	2	14 inches	Wild steelhead release.
Ross Lake	July 1 – Oct 31	Trout	3	13 inches	Selective Gear Rules, except motors allowed.
		All gamefish	Statewide	Statewide	All tributaries are closed from lake to 1 mile upstream, except see special rules for Big Beaver Creek and Ruby Creek.
Ruby Creek	Closed Waters				
Skagit River (Bacon Creek to Gorge Powerhouse)	June 1 – Feb 29	Trout	2	14 inches	Legal to retain Dolly Varden/bull trout as part of the catch limit.
		Dolly Varden	—	20 inches	All species night closure and non-buoyant lure restriction July 1 – Nov 30.
		Steelhead	—	—	
		Other gamefish	Statewide	Statewide	
Skagit River (Gorge Powerhouse to Dam)	Closed Waters				
Stehekin River (Mouth to Agnes Creek)	Mar 1 – June 30	All gamefish	0	—	Game fish catch and release only, Selective Gear Rules.
	July 1 – Oct 31	Trout	2	15 inches	Release Cutthroat, Selective Gear Rules.
		Other gamefish	Statewide	Statewide	Selective Gear Rules.
Stetattle Creek	Closed Waters				
Trapper Lake	Year around	Trout	2	None	
		Other gamefish	Statewide	Statewide	

Notes:

a. Possession limit for game fish is two daily limits in any form.

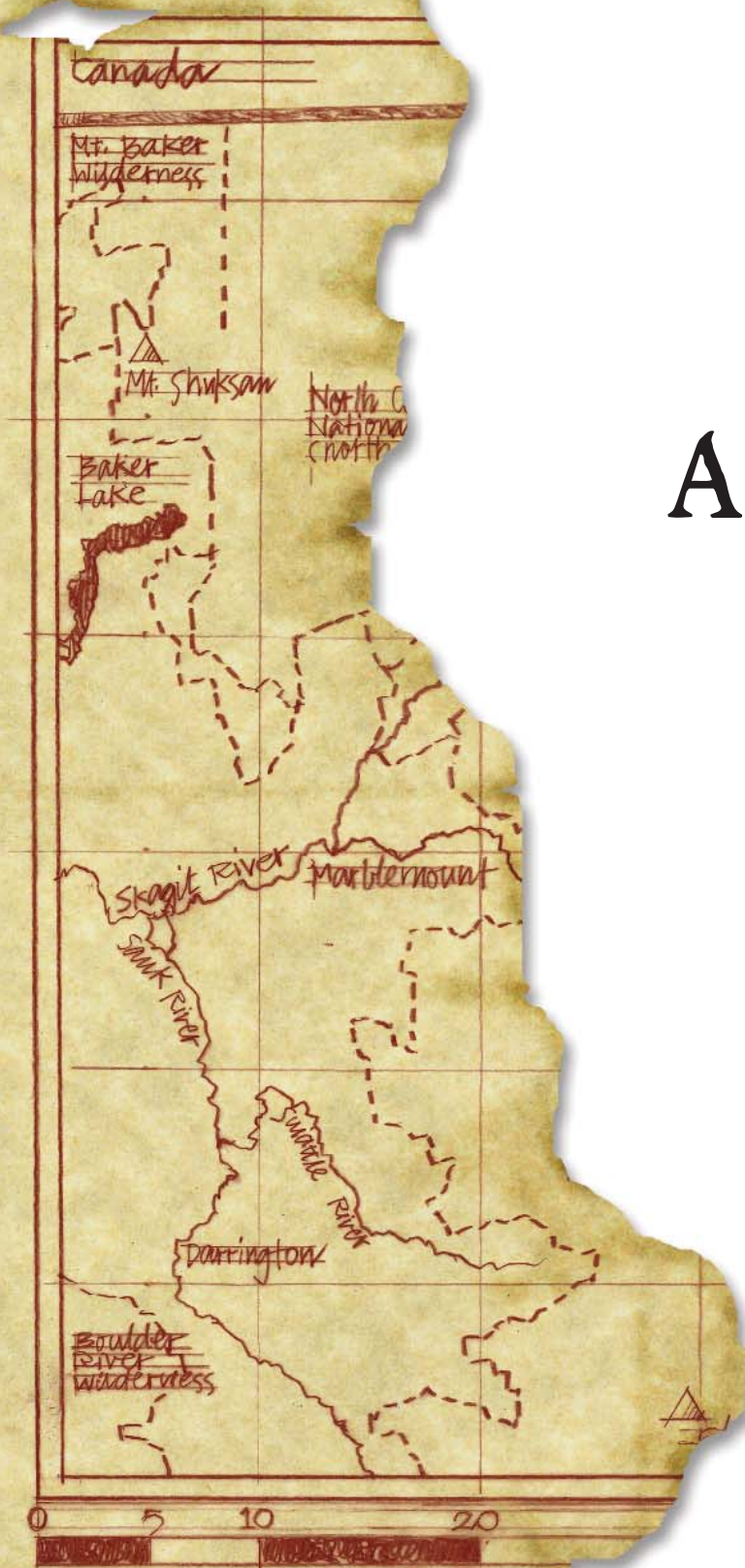
b. The combined daily limit for anglers that fish in both rivers and lakes on the same day is five trout. In the combined daily limit, only two trout may be from rivers, except as provided for Eastern brook trout.

c. Game fish = bass, tiger muskellunge, walleye, whitefish, burbot, catfish, crappie, northern pike, peamouth chub, perch, suckers, sunfish, bullfrogs, and all trout.

d. Selective Gear Rules = Only unscented artificial flies or lures with one single barbless hook are allowed. Up to a total of three artificial flies or lures containing single barbless hooks may be used. Bait is prohibited; fish may be released until the daily limit is retained. No one may fish from any floating device equipped with a motor except where specifically allowed under Special Rules for individual waters. If any fish has swallowed the hook or is hooked in the gill, eye, or tongue, it should be kept if legal to do so.

e. Trout = grayling, kokanee, brown, rainbow, golden, cutthroat, and lake.





Appendix E

ATTRIBUTES TABLE

APPENDIX E: ATTRIBUTES TABLE

Reproducing Species/Strain Present – Species/strain of trout currently present and reproducing in lake. Subspecies or strain (stock) of trout species is indicated if known.

Stocked Species/Strain Present – Species/strain of stocked trout currently present in lake, but not reproducing. Assuming an approximate maximum life span of 10 years (range of 7–14 years), trout planted after 1993 (stocked in 1994 or later) are likely to currently (2003) be present in lake.

Stocked Species Scheduled for Stocking – Species/strain scheduled for planting under current WDFW management plan. Subspecies or strain (stock) of trout species is indicated if known.

Stocked Species/Strains Historically Present – All of the species/strains of trout historically planted in lake. Subspecies or strain (stock) of trout species is indicated if known.

Outside Range of Caudata – Lake is either outside range of salamander species native to North Cascades Complex or in alpine habitat without necessary habitat components to sustain a population of long-toed or northwestern salamanders.

Within Range of AMMA – Lake is within the range of distribution for long-toed salamanders and has appropriate habitat. Perennial lakes that are within the range of northwestern salamanders and have suitable habitat are assumed (with rare exceptions) to not contain a population of long-toed salamanders.

Within Range of AMGR – Lake is within the range of distribution for northwestern salamanders, has appropriate habitat, and is perennial.

AMMA or AMGR Present – Species was observed during amphibian survey of lake.

Index of Connectivity – An index of connectivity based on weighted calculations of potential salamander breeding lake (lakes within range of salamander distribution and having appropriate habitat) density (lakes/acre) within a target lake's basin (major tributary basin), Documented salamander breeding Lakes within 6 kilometers (km) (maximum colonization distance) of target lake, and number of potential salamander lakes with 0.6 km (maximum dispersal distance) of target lake. Lakes with an index of 0.7–0.9 have high connectivity; lakes with an index of 0.4–0.6 have moderate connectivity; lakes with an index of 0–0.3 have poor connectivity; and lakes with less than 0.0 index of connectivity can be considered isolated.

Abbreviations of Species/Strain Names

<i>Oncorhynchus</i>	This designation is used where trout of the genus <i>Oncorhynchus</i> have been stocked, but the species was not recorded.
OC = <i>Oncorhynchus clarki</i>	This is a generic designation used for cutthroat trout where the subspecies or strain is not known. Usually these fish are Twin Lake strain westslope cutthroat.
OCB = <i>Oncorhynchus clarki bouvieri</i>	Large spotted interior cutthroat trout subspecies (Yellowstone cutthroat trout) native to the Yellowstone River and Upper Snake River (above Shoshone Falls) drainages. Hatcheries in Montana were the usual broodstock source for this species. A common local name for these fish is "Montana Blackspot."
OCC = <i>Oncorhynchus clarki clarki</i>	Coastal cutthroat trout. Usually, these fish are of the "Tokul Creek" hatchery strain.
OCL = <i>Oncorhynchus clarki lewisi</i>	Westslope cutthroat trout, strain unknown. A common local name for these fish is "intermontane" cutthroat trout. This subspecies of cutthroat trout is native to the east side of the Cascade Mountains; the west sides of the Rocky Mountains from the Snake River (below Shoshone Falls), north; and the east sides of the Rocky Mountains north of the Yellowstone River.
OCL(TL) = <i>Oncorhynchus clarki lewisi</i>	Twin Lake strain westslope cutthroat. This wild strain of westslope cutthroat from Twin Lakes in Chelan County, Washington, has been the primary source of westslope cutthroat trout broodstock planted in the Cascade and Olympic mountains of Washington since 1915.
OCB(HL) = <i>Oncorhynchus clarki bouvieri</i>	Henry Lake, Idaho wild strain of Yellowstone cutthroat.
OCLxOM	Westslope cutthroat/rainbow hybrid.
OM = <i>Oncorhynchus mykiss</i>	This is a generic designation used for rainbow trout where the subspecies or strain is not known.
OM(MW) = <i>Oncorhynchus mykiss</i>	Mount Whitney strain rainbow trout. This hatchery strain of rainbow is not known to spawn in Washington mountain lakes.

APPENDICES

OM(PL) = <i>Oncorhynchus mykiss</i>	Packwood Lake strain rainbow trout. This wild strain of rainbow from Packwood Lake in Lewis County, Washington, was the primary source of rainbow trout broodstock in Washington from 1917 to 1934.
OM(ST) = <i>Oncorhynchus mykiss</i>	Steelhead trout (anadromous rainbow trout).
OM(STAC) = <i>Oncorhynchus mykiss</i>	South Tacoma strain of hatchery rainbow trout.
OM(KAM) = <i>Oncorhynchus mykiss gairdneri</i>	Kamloops trout are a wild strain of resident interior "redband" rainbow trout from British Columbia, Canada. Most Kamloops rainbow trout planted in Washington mountain lakes are probably derived from a wild broodstock in Pennask Lake, British Columbia.
OM(HG) = <i>Oncorhynchus mykiss</i>	Hagerman strain rainbow trout. This hatchery strain of rainbow is obtained from Hagerman, Idaho.
OM(RL) = <i>Oncorhynchus mykiss irideus</i>	Ross Lake rainbow trout are a wild strain of resident coastal rainbow trout native to Ross Lake, Washington.
OMA = <i>Oncorhynchus mykiss aquabonita</i>	Subspecies of rainbow trout.
SF = <i>Salvelinus fontinalis</i>	Brook trout are a char native to eastern North America. This fish is often called "Eastern" brook trout in the west, where the name was historically used to distinguish them from rainbow trout (which were originally also "brook trout").



TABLE E-1: ATTRIBUTES OF 91 LAKES, INCLUDING CURRENT AND PROPOSED MANAGEMENT

Azure			
NPS lake code: MP-09-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	North Gorge/Diablo Lakes	Year initially stocked	1938
Secondary Drainage 2	Stetattle Creek	Year last stocked	1961
Elevation	4,055 feet	Current stocking method	—
UTM_E	628433.3125	Outside range of Caudata	Yes
UTM_N	5402997.5000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County (CO)	Whatcom	AMMA present	—
Maximum Depth	344.5 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	8,543.31 feet	AMGR present	—
Lake or pond surface area	91.6 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	8.5°C	Forest	0%
TKN – median	—	Shrub	12%
Fishing potential (based on Trailblazer data)	Fair	Meadow	2%
Shoreline development (ratio between perimeter and surface area)	1.207	Talus	31%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	55%
Inflow type	Ephemeral	Vegetation zone	Alpine
Number of outflow streams	1	Cross-country zone	Elephant Butte
Isolated from any other lake or pond within 2,000 feet	No	Camp name	—
Lake shares drainage with other lakes (other lakes denoted)	Yes (MP-08-01, DD-01-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	7,968 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	3.1 miles
Species/strains historically present	OM, OMA	Number of overnight visitors to cross-country zone annually	37
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—

Battalion			
NPS lake code: MLY-02-01			
Current management: Has reproducing fish and is stocked; located in Lake Chelan NRA and managed by WDFW.			
Major Drainage	Stehekin	Stocking density (fish/acre)	50
Secondary Drainage 1	Company Creek	Year initially stocked	1978
Secondary Drainage 2	Battalion Creek	Year last stocked	1996
Elevation	5,340 feet	Current stocking method	Backpack; fixed-wing aircraft
UTM_E	663973.5000	Outside range of Caudata	—
UTM_N	5356903.7500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	No
Maximum Depth	15.6 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,096.46 feet	AMGR present	No
Lake or pond surface area	6.3 acres	Number of times stocked since?	4
Median Epilimnetic (surface) water temperature	12.2°C	Forest	9%
TKN – median	0.035 mg/L	Shrub	39%
Fishing potential (based on Trailblazer data)	Fair	Meadow	20%
Shoreline development (ratio between perimeter and surface area)	1.130	Talus	32%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Perennial	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Battalion
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MLY-01-01)	Camp type	—
Index of connectivity	0.0	Distance to closest lake	826 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OM	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.2 miles
Species/strains historically present	OM,OM(MW)	Number of overnight visitors to cross-country zone annually	0
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	0



Bear			
NPS lake code: MC-12-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	—
Secondary Drainage 1	Bear Creek	Year initially stocked	1967
Secondary Drainage 2	Upper Bear Creek	Year last stocked	1967
Elevation	5,795 feet	Current stocking method	—
UTM_E	623700.4375	Outside range of Caudata	Yes
UTM_N	5422478.5000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	151.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	4,960.63 feet	AMGR present	—
Lake or pond surface area	25.7 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	11.4°C	Forest	0%
TKN – median	0.012 mg/L	Shrub	30%
Fishing potential (based on Trailblazer data)	Good	Meadow	6%
Shoreline development (ratio between perimeter and surface area)	1.324	Talus	63%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	8	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Bear Mountain
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Bear Creek
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-45-01, MC-47-01, Chilliwack Lake)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	9,023 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	Yes
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	3.7 miles
Species/strains historically present	OCL(TL)	Number of overnight visitors to cross-country zone annually	30
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	3



Berdeen			
NPS lake code: M-08-01			
Current management: Has reproducing fish and is stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	50
Secondary Drainage 1	Bacon Creek	Year initially stocked	1946
Secondary Drainage 2	Upper Bacon Creek	Year last stocked	1995
Elevation	5,000 feet	Current stocking method	Fixed-wing aircraft*
UTM_E	613080.4250	Outside range of Caudata	Yes
UTM_N	5396745.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	215 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	16,571.52 feet	AMGR present	—
Lake or pond surface area	126.7 acres	Number of times stocked since?	7
Median Epilimnetic (surface) water temperature	9.3°C	Forest	0%
TKN – median	—	Shrub	20%
Fishing potential (based on Trailblazer data)	Good	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.990	Talus	54%
Inlet or outlet	Yes	Bedrock	26%
Number of inflow streams	6	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Berdeen
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-09-01, M-05-01, M-06-01, M-07-01, M-04-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	223 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	4.3 miles
Species/strains historically present	OCL(TL), OM, OM(MW)	Number of overnight visitors to cross-country zone annually	48
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	5

Note:

* Has not been stocked in the recent past, but contains reproducing populations of fish.



Berdeen, Lower			
NPS lake code: M-07-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Bacon Creek	Year initially stocked	1946
Secondary Drainage 2	Upper Bacon Creek	Year last stocked	1946
Elevation	4,460 feet	Current stocking method	—
UTM_E	612074.7188	Outside range of Caudata	—
UTM_N	5395790.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	36.1 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,201.44 feet	AMGR present	No
Lake or pond surface area	7.5 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	2°C	Forest	0%
TKN – median	0.02 mg/L	Shrub	53%
Fishing potential (based on Trailblazer data)	Good	Meadow	21%
Shoreline development (ratio between perimeter and surface area)	1.089	Talus	26%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	Perennial	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Berdeen
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-08-01, M-06-01, M-05-01, M-04-01, M-09-01)	Camp type	—
Index of connectivity	0.4	Distance to closest lake	768 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	4.3 miles
Species/strains historically present	OCL(TL), SF, OM	Number of overnight visitors to cross-country zone annually	48
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	5

Berdeen, Upper			
NPS lake code: M-09-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Bacon Creek	Year initially stocked	Not applicable
Secondary Drainage 2	Upper Bacon Creek	Year last stocked	Not applicable
Elevation	5,050 feet	Current stocking method	—
UTM_E	—	Outside range of Caudata	Yes
UTM_N	—	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	—	AMGR present	—
Lake or pond surface area	9.5 acres	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	63%
Fishing potential (based on Trailblazer data)	—	Meadow	7%
Shoreline development (ratio between perimeter and surface area)	—	Talus	30%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Berdeen
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	—	Camp type	—
Index of connectivity	—	Distance to closest lake	—
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OCL(TL)	Number of overnight visitors to cross-country zone annually	48
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	5



Blum, Largest/Middle, No. 3			
NPS lake code: M-11-01			
Current management: Has reproducing fish and is stocked; located in the north unit of the national park.			
Major Drainage	Baker	Stocking density (fish/acre)	50
Secondary Drainage 1	Baker River	Year initially stocked	1938
Secondary Drainage 2	Blum Creek	Year last stocked	1994
Elevation	5,030 feet	Current stocking method	Backpack; fixed-wing aircraft; unknown
UTM_E	610685.1250	Outside range of Caudata	—
UTM_N	5400563.5000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Unknown
Maximum Depth	42 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,218.50 feet	AMGR present	—
Lake or pond surface area	12.9 acres	Number of times stocked since?	4
Median Epilimnetic (surface) water temperature	11°C	Forest	0%
TKN – median	—	Shrub	47%
Fishing potential (based on Trailblazer data)	Good	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.211	Talus	53%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Blum
Isolated from any other lake or pond within 2,000 feet	No	Camp name	BLC01
Lake shares drainage with other lakes (other lakes denoted)	Yes (LS-07-01)	Camp type	Cross-country
Index of connectivity	0.3	Distance to closest lake	275 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	OM	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	2.5 miles
Species/strains historically present	SF, OM(MW), OM, OMA	Number of overnight visitors to cross-country zone annually	37
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	4

Blum, Lower/West, No. 4			
NPS lake code: LS-07-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Baker	Stocking density (fish/acre)	—
Secondary Drainage 1	Baker River	Year initially stocked	1934
Secondary Drainage 2	Blum Creek	Year last stocked	1934
Elevation	4,940 feet	Current stocking method	—
UTM_E	610273.3750	Outside range of Caudata	—
UTM_N	5400321.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	No
Maximum Depth	25.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,978.35 feet	AMGR present	No
Lake or pond surface area	6.4 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	12.9°C	Forest	0%
TKN – median	0.02 mg/L	Shrub	30%
Fishing potential (based on Trailblazer data)	Good	Meadow	70%
Shoreline development (ratio between perimeter and surface area)	1.059	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	2	Cross-country zone	Blum
Isolated from any other lake or pond within 2,000 feet	No	Camp name	BLC01
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-11-01)	Camp type	Cross-country
Index of connectivity	0.2	Distance to closest lake	275 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	SF	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	2.5 miles
Species/strains historically present	SF	Number of overnight visitors cross-country zone annually	37
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	4



Blum, Small/North, No. 2			
NPS lake code: MC-01-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Baker	Stocking density (fish/acre)	—
Secondary Drainage 1	Baker River	Year initially stocked	1938
Secondary Drainage 2	Blum Creek	Year last stocked	1938
Elevation	5,620 feet	Current stocking method	—
UTM_E	618360.9063	Outside range of Caudata	—
UTM_N	5391721.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	10 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	544.62 feet	AMGR present	No
Lake or pond surface area	0.9 acre	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	19.5°C	Forest	0%
TKN – median	0.06 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	None	Meadow	44%
Shoreline development (ratio between perimeter and surface area)	1.421	Talus	56%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	4	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Blum
Isolated from any other lake or pond within 2,000 feet	No	Camp name	BLC01
Lake shares drainage with other lakes (other lakes denoted)	No (MC-01-02?, MC-02-01?)	Camp type	Cross-country
Index of connectivity	0.3	Distance to closest lake	7 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	2.5 miles
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	37
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—

Blum, Vista/Northwest, No. 1			
NPS lake code: MC-02-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Baker	Stocking density (fish/acre)	—
Secondary Drainage 1	Baker River	Year initially stocked	1968
Secondary Drainage 2	Blum Creek	Year last stocked	1968
Elevation	5,900 feet	Current stocking method	—
UTM_E	610568.0625	Outside range of Caudata	—
UTM_N	5401157.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	35 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	967.85 feet	AMGR present	No
Lake or pond surface area	2.7 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	11.0°C	Forest	0%
TKN – median	0.04 mg/L	Shrub	37%
Fishing potential (based on Trailblazer data)	None	Meadow	14%
Shoreline development (ratio between perimeter and surface area)	1.382	Talus	49%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Blum
Isolated from any other lake or pond within 2,000 feet	No	Camp name	BLC01
Lake shares drainage with other lakes (other lakes denoted)	No (MC-01-01?, MC-01-02?)	Camp type	Cross-country
Index of connectivity	0.3	Distance to closest lake	372 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	2.5 miles
Species/strains historically present	OMA	Number of overnight visitors to cross-country zone annually	37
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Bouck, Lower			
NPS lake code: DD-04-01			
Current management: Has reproducing fish; located in Ross Lake NRA.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	South Gorge Lake	Year initially stocked	1939
Secondary Drainage 2	Bouck Creek	Year last stocked	1947
Elevation	3,850 feet	Current stocking method	—
UTM_E	633736.0938	Outside range of Caudata	—
UTM_N	5393719.5000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	63.2 feet	Within range of AMGR (northwestern salamander)	Yes
Perimeter	2,851.05 feet	AMGR present	Unknown
Lake or pond surface area	10.8 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	11.2°C	Forest	60%
TKN – median	0.04 mg/L	Shrub	18%
Fishing potential (based on Trailblazer data)	Good	Meadow	22%
Shoreline development (ratio between perimeter and surface area)	1.172	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Perennial	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Bouck
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (DD-05-01, DD-03-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	1,282 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OCL	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	1.2 miles
Species/strains historically present	OC, OCL	Number of overnight visitors to cross-country zone annually	11
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	1



Bouck, Upper			
NPS lake code: DD-05-01			
Current management: Stocked; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	60
Secondary Drainage 1	South Gorge Lake	Year initially stocked	1968
Secondary Drainage 2	Bouck Creek	Year last stocked	1999
Elevation	5,030 feet	Current stocking method	Backpack
UTM_E	634995.6250	Outside range of Caudata	—
UTM_N	5393470.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	29 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,132.55 feet	AMGR present	No
Lake or pond surface area	5.5 acres	Number of times stocked since?	6
Median Epilimnetic (surface) water temperature	10.5°C	Forest	23%
TKN – median	0.06 mg/L	Shrub	17%
Fishing potential (based on Trailblazer data)	Fair	Meadow	20%
Shoreline development (ratio between perimeter and surface area)	1.232	Talus	41%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Bouck
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (DD-04-01, DD-03-01)	Camp type	—
Index of connectivity	0.2	Distance to closest lake	1,282 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OMA	Line of sight distance to trail	1.9 miles
Species/strains historically present	OMA	Number of overnight visitors to cross-country zone annually	11
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	1



Bowan			
NPS lake code: MR-12-01			
Current management: Stocked; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	125
Secondary Drainage 1	Rainbow Creek	Year initially stocked	1983
Secondary Drainage 2	Bowan Creek	Year last stocked	2002
Elevation	6,495 feet	Current stocking method	Backpack
UTM_E	669404.4375	Outside range of Caudata	—
UTM_N	5363995.2500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	13.1 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,017.06 feet	AMGR present	No
Lake or pond surface area	1.5 acres	Number of times stocked since?	4
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	0.085 mg/L	Shrub	24%
Fishing potential (based on Trailblazer data)	Fair	Meadow	76%
Shoreline development (ratio between perimeter and surface area)	1.135	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Rainbow Ridge
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Bowan
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-16-01, MR-11-01, MR-15-01, MR-15-02, MR-14-01, . . .)	Camp type	Hiker
Index of connectivity	0.4	Distance to closest lake	5,508 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	2.5 miles
Species/strains historically present	OM(MW)	Number of overnight visitors to cross-country zone annually	6
Stocking frequency (years of cycle)	6	Number of anglers annually (based on 10% assumption of total visitors)	1

Coon			
NPS lake code: MM-10-01			
Current management: Stocked; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	90
Secondary Drainage 1	Coon Creek	Year initially stocked	1915
Secondary Drainage 2		Year last stocked	2000
Elevation	2,172 feet	Current stocking method	Fixed-wing aircraft; unknown
UTM_E	660536.6563	Outside range of Caudata	—
UTM_N	5361590.2500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	19 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,038.06 feet	AMGR present	No
Lake or pond surface area	11.3 acres	Number of times stocked since?	16
Median Epilimnetic (surface) water temperature	16.6°C	Forest	29%
TKN – median	0.147 mg/L	Shrub	13%
Fishing potential (based on Trailblazer data)	Good	Meadow	58%
Shoreline development (ratio between perimeter and surface area)	1.219	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Low forest
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	High Bridge/Bullion
Lake shares drainage with other lakes (other lakes denoted)	Yes (GM-02-01, MM-06-01, MM-07-01, MM-08-01, MLY-0101, . . .)	Camp type	Auto
Index of connectivity	-0.2	Distance to closest lake	16,637 feet
Observed fish reproduction	—	Accessible by horseback	Yes
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	Yes
Stocked spp/strain present	OCL(TL)	Line of sight distance to trail	0 mile
Species/strains historically present	OCL(TL), SF, OM, OCL	Number of overnight visitors to nearest camp annually	306
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	31



Copper			
NPS lake code: MC-06-01			
Current management: Stocked; located in the north unit of the national park. In August 2004, Copper Lake was found fishless, possibly due to disease.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	65
Secondary Drainage 1		Year initially stocked	1937
Secondary Drainage 2		Year last stocked	1998
Elevation	5,263 feet	Current stocking method	Fixed-wing aircraft; unknown
UTM_E	610362.1875	Outside range of Caudata	—
UTM_N	5401594.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	67.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,630.58 feet	AMGR present	No
Lake or pond surface area	12.9 acres	Number of times stocked since?	9
Median Epilimnetic (surface) water temperature	10.3°C	Forest	0%
TKN – median	0.0315 mg/L	Shrub	37%
Fishing potential (based on Trailblazer data)	Fair	Meadow	5%
Shoreline development (ratio between perimeter and surface area)	1.350	Talus	59%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	0	Cliff	0%
Inflow type	Subsurface	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Copper Lake
Lake shares drainage with other lakes (other lakes denoted)	No	Camp type	Hiker
Index of connectivity	-1.4	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	Yes
Stocked spp/strain present	OM(MW), OCC	Line of sight distance to trail	1.9 miles
Species/strains historically present	SF, OC, OCC, OCL(TL), OM(MW)	Number of overnight visitors to nearest camp annually	268
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	27



Dagger			
NPS lake code: MR-04-01			
Current management: Has reproducing fish; located in the south unit of the national park.			
Major Drainage	Stehekin	Stocking density (fish/acre)	—
Secondary Drainage 1	Bridge Creek	Year initially stocked	1934
Secondary Drainage 2	East Fork Bridge Creek	Year last stocked	1934
Elevation	5,508 feet	Current stocking method	—
UTM_E	673404.1250	Outside range of Caudata	—
UTM_N	5370807.2500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	No
Maximum Depth	15.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,188.98 feet	AMGR present	No
Lake or pond surface area	8.2 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	12.3°C	Forest	3%
TKN – median	0.015 mg/L	Shrub	36%
Fishing potential (based on Trailblazer data)	Good	Meadow	60%
Shoreline development (ratio between perimeter and surface area)	1.508	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	CP	Vegetation zone	High forest
Number of outflow streams	—	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Dagger Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-01-01, MR-02-01, MR-03-01)	Camp type	Hiker/stock
Index of connectivity	0.5	Distance to closest lake	1,455 feet
Observed fish reproduction	Yes	Accessible by horseback	Yes
Observed spawning habitat present	Yes	Trailhead outside the park	Yes
Reproducing species present	OC	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OC	Number of overnight visitors to nearest camp annually	164
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	16



Dee Dee, Upper			
NPS lake code: MR-15-01			
Current management: Stocked; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	50
Secondary Drainage 1	Rainbow Creek	Year initially stocked	1983
Secondary Drainage 2		Year last stocked	1999
Elevation	6,303 feet	Current stocking method	Backpack
UTM_E	674007.5313	Outside range of Caudata	—
UTM_N	5363620.7500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	No
Maximum Depth	89.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,825.46 feet	AMGR present	No
Lake or pond surface area	12.2 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	7.4°C	Forest	0%
TKN – median	0.015 mg/L	Shrub	14%
Fishing potential (based on Trailblazer data)	Good	Meadow	6%
Shoreline development (ratio between perimeter and surface area)	1.482	Talus	80%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	Subsurface	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Dee Dee Lakes
Isolated from any other lake or pond within 2,000 feet	No	Camp name	DDC05, DDC01, DDC01S
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-15-02, MR-18-01, MR-11-01, MR-12-01, MR-16-01)	Camp type	Cross-country
Index of connectivity	0.2	Distance to closest lake	88 feet
Observed fish reproduction	—	Accessible by horseback	Yes
Observed spawning habitat present	Yes	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	Yes
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM, OM(MW)	Number of overnight visitors to cross-country zone annually	38
Stocking frequency (years of cycle)	10	Number of anglers annually (based on 10% assumption of total visitors)	4

Dee Dee/Tamarack, Lower			
NPS lake code: MR-15-02			
Current management: Has reproducing fish and a portion of the fish stocked in MR-15-01 drop down into MR-15-02; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	50
Secondary Drainage 1	Rainbow Creek	Year initially stocked	Unknown
Secondary Drainage 2		Year last stocked	Unknown
Elevation	6,260 feet	Current stocking method	—
UTM_E	674044.8750	Outside range of Caudata	—
UTM_N	5363845.0000	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	No
Maximum Depth	9.8 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	718.50 feet	AMGR present	No
Lake or pond surface area	0.8 acre	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	7.1°C	Forest	16%
TKN – median	0.005 mg/L	Shrub	29%
Fishing potential (based on Trailblazer data)	Fair	Meadow	39%
Shoreline development (ratio between perimeter and surface area)	1.105	Talus	16%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	Perennial	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Dee Dee Lakes
Isolated from any other lake or pond within 2,000 feet	No	Camp name	DDC02, DDC03, DDC04, DDC06
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-15-01, MR-18-01, MR-11-01, MR-12-01, MR-16-01)	Camp type	Cross-country
Index of connectivity	0.2	Distance to closest lake	88 feet
Observed fish reproduction	No ** No reproduction according to the Technical Advisory Committee	Accessible by horseback	Yes
Observed spawning habitat present	No	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	Yes
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	—
Species/strains historically present	OM(MW), OCL(TL)	Number of overnight visitors to cross-country zone annually	38
Stocking frequency (years of cycle)	10	Number of anglers annually (based on 10% assumption of total visitors)	4



Despair, Lower			
NPS lake code: M-14-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Goodell Creek	Year initially stocked	1965
Secondary Drainage 2	Lower Goodell Creek	Year last stocked	1965
Elevation	4,820 feet	Current stocking method	—
UTM_E	620043.5000	Outside range of Caudata	Yes
UTM_N	5398225.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	1,089.24 feet	AMGR present	—
Lake or pond surface area	1.7 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	43%
Fishing potential (based on Trailblazer data)	None	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.121	Talus	57%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Despair
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	No	Camp type	—
Index of connectivity	—	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	3.7 miles
Species/strains historically present	OC	Number of overnight visitors to cross-country zone annually	49
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—

Despair, Upper			
NPS lake code: M-13-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Goodell Creek	Year initially stocked	1965
Secondary Drainage 2	Lower Goodell Creek	Year last stocked	1965
Elevation	5,100 feet	Current stocking method	—
UTM_E	619681.0938	Outside range of Caudata	Yes
UTM_N	5398278.2500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	1,591.21 feet	AMGR present	—
Lake or pond surface area	2.1 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	None	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.483	Talus	100%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Alpine
Number of outflow streams	—	Cross-country zone	Despair
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-21-01, M-16-01, MC-27-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	1,129 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Repro species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	3.7 miles
Species/strains historically present	OC	Number of overnight visitors to cross-country zone annually	49
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Diobsud, No. 1, separate, not connected			
NPS lake code: LS-01-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Diobsud Creek	Year initially stocked	1960
Secondary Drainage 2	Upper Diobsud Creek	Year last stocked	1990
Elevation	4,220 feet	Current stocking method	—
UTM_E	607860.4688	Outside range of Caudata	—
UTM_N	5388784.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	11.2 feet	Within range of AMGR (northwestern salamander)	Yes
Perimeter	846.46 feet	AMGR present	Yes
Lake or pond surface area	1 acre	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	14.1°C	Forest	0%
TKN – median	0.08 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Fair	Meadow	76%
Shoreline development (ratio between perimeter and surface area)	1.143	Talus	24%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	0	Cliff	0%
Inflow type	—	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Bacon Peak
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (LS-02-01, LS-03-01, LS-03-FS, LS-12-01)	Camp type	—
Index of connectivity	0.4	Distance to closest lake	1,300 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	3.1 miles
Species/strains historically present	OCL(TL)	Number of overnight visitors to cross-country zone annually	34
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	3



Diobsud, No. 2, Lower			
NPS lake code: LS-02-01			
Current management: Has reproducing fish and is stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	70
Secondary Drainage 1	Diobsud Creek	Year initially stocked	1960
Secondary Drainage 2	Upper Diobsud Creek	Year last stocked	1990
Elevation	4,220 feet	Current stocking method	Backpack; fixed-wing aircraft
UTM_E	607813.8125	Outside range of Caudata	—
UTM_N	5388931.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	17.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,404.20 feet	AMGR present	No
Lake or pond surface area	3.1 acres	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	13.7°C	Forest	0%
TKN – median	0.06 mg/L	Shrub	47%
Fishing potential (based on Trailblazer data)	Good	Meadow	53%
Shoreline development (ratio between perimeter and surface area)	1.076	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Bacon Peak
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (LS-01-01, LS-03-01, LS-03-FS, LS-12-01)	Camp type	—
Index of connectivity	0.5	Distance to closest lake	420 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	3.1 miles
Species/strains historically present	OCL(TL), OM(MW)	Number of overnight visitors to cross-country zone annually	34
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	3



Diobsud, No. 3, Upper			
NPS lake code: LS-03-01			
Current management: Stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	80
Secondary Drainage 1	Diobsud Creek	Year initially stocked	1960
Secondary Drainage 2	Upper Diobsud Creek	Year last stocked	1997
Elevation	4,420 feet	Current stocking method	Backpack; fixed-wing aircraft; unknown
UTM_E	607400.7813	Outside range of Caudata	—
UTM_N	5389244.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	17.1 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,538.71 feet	AMGR present	No
Lake or pond surface area	3.9 acres	Number of times stocked since?	7
Median Epilimnetic (surface) water temperature	14.8°C	Forest	0%
TKN – median	0.0545 mg/L	Shrub	24%
Fishing potential (based on Trailblazer data)	Good	Meadow	76%
Shoreline development (ratio between perimeter and surface area)	1.056	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Bacon Peak
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (LS-02-01, LS-01-01, LS-03-FS, LS-12-01)	Camp type	—
Index of connectivity	0.5	Distance to closest lake	420 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	0 mile
Species/strains historically present	OCL(TL), OM(MW)	Number of overnight visitors to cross-country zone annually	34
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	3

Doubtful			
NPS lake code: CP-01-01			
Current management: Has reproducing fish; located in the south unit of the national park.			
Major Drainage	Stehekin	Stocking density (fish/acre)	—
Secondary Drainage 1	Upper Stehekin	Year initially stocked	1950
Secondary Drainage 2	Stehekin Headwaters	Year last stocked	1962
Elevation	5,385 feet	Current stocking method	—
UTM_E	644384.0625	Outside range of Caudata	Yes
UTM_N	5370621.0000	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	—
County	Chelan	AMMA present	No
Maximum Depth	68.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	4,770.34 feet	AMGR present	No
Lake or pond surface area	30.2 acres	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	10.9°C	Forest	0%
TKN – median	0.0185 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Fair	Meadow	55%
Shoreline development (ratio between perimeter and surface area)	1.174	Talus	34%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	7	Cliff	11%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Pelton Basin Camp
Lake shares drainage with other lakes (other lakes denoted)	Yes (CP-02-01, GM-01-01)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	2,323 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	OC, OM, OMxOC	Trail to lake	Yes
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OC, OM	Number of overnight visitors to nearest camp annually	441
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	44



Doug's Tarn			
NPS lake code: M-21-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Goodell Creek	Year initially stocked	1965
Secondary Drainage 2	Lower Goodell Creek	Year last stocked	1965
Elevation	3,951 feet	Current stocking method	—
UTM_E	620338.5000	Outside range of Caudata	Yes
UTM_N	5397650.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	10.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,948.82 feet	AMGR present	No
Lake or pond surface area	5 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	11.2°C	Forest	10%
TKN – median	0.01 mg/L	Shrub	53%
Fishing potential (based on Trailblazer data)	Good	Meadow	29%
Shoreline development (ratio between perimeter and surface area)	1.177	Talus	7%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	8	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Despair
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-13-01, M-16-01, MC-27-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	1,129 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OC	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	3.1 miles
Species/strains historically present	OC	Number of overnight visitors to cross-country zone annually	49
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	5



East Lake, Lower			
NPS lake code: MC-14-02			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	—
Secondary Drainage 1	Northwest Ross Lake	Year initially stocked	1967
Secondary Drainage 2	Upper Little Beaver Creek	Year last stocked	1967
Elevation	5,460 feet	Current stocking method	—
UTM_E	622451.6563	Outside range of Caudata	Yes
UTM_N	5416393.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	2,378.61 feet	AMGR present	No
Lake or pond surface area	8 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	15.6°C	Forest	0%
TKN – median	—	Shrub	57%
Fishing potential (based on Trailblazer data)	Poor	Meadow	25%
Shoreline development (ratio between perimeter and surface area)	1.134	Talus	18%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	8	Cliff	0%
Inflow type	PE	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Bear Mountain
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-14-01, MC-22-01, MC-16-02, MC-15-01, . . .)	Camp type	—
Index of connectivity	—	Distance to closest lake	340 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OC	Number of overnight visitors to cross-country zone annually	30
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



East Lake, Upper			
NPS lake code: MC-14-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	—
Secondary Drainage 1	Northwest Ross Lake	Year initially stocked	1967
Secondary Drainage 2	Upper Little Beaver Creek	Year last stocked	1967
Elevation	5,595 feet	Current stocking method	—
UTM_E	621986.9688	Outside range of Caudata	Yes
UTM_N	5416670.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	2,063.65 feet	AMGR present	—
Lake or pond surface area	6.2 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	Fair	Meadow	12%
Shoreline development (ratio between perimeter and surface area)	1.119	Talus	88%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Bear Mountain
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-14-02, MC-22-01, MC-16-02, MC-15-01, . . .)	Camp type	—
Index of connectivity	—	Distance to closest lake	340 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	1.2 miles
Species/strains historically present	OC	Number of overnight visitors to cross-country zone annually	34
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Firn			
NPS lake code: MP-02-01			
Current management: Has limited population of reproducing fish and is stocked; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	50
Secondary Drainage 1	Big Beaver Creek	Year initially stocked	1968
Secondary Drainage 2	Thirtynine Mile Creek	Year last stocked	2000
Elevation	5,472 feet	Current stocking method	Backpack; fixed-wing aircraft
UTM_E	635626.3135	Outside range of Caudata	Yes
UTM_N	5410361.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	37.7 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,599.08 feet	AMGR present	No
Lake or pond surface area	5.7 acres	Number of times stocked since?	4
Median Epilimnetic (surface) water temperature	12.6°C	Forest	0%
TKN – median	—	Shrub	8%
Fishing potential (based on Trailblazer data)	Good	Meadow	7%
Shoreline development (ratio between perimeter and surface area)	2.045	Talus	85%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Prophet
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	39-Mile
Lake shares drainage with other lakes (other lakes denoted)	Yes (MP-05-01, MP-06-06, MP-06-01, MP-06-02, MP-06-03, . . .)	Camp type	Hiker/stock
Index of connectivity	—	Distance to closest lake	4,985 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	Yes
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.9 miles
Species/strains historically present	OCL(TL), OM(MW), OM	Number of overnight visitors to cross-country zone annually	3
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	0



Green			
NPS lake code: M-04-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Bacon Creek	Year initially stocked	1946
Secondary Drainage 2	Upper Bacon Creek	Year last stocked	1947
Elevation	4,261 feet	Current stocking method	—
UTM_E	610200.6563	Outside range of Caudata	—
UTM_N	5394060.2500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Unknown
Maximum Depth	153.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	9,202.76 feet	AMGR present	No
Lake or pond surface area	80 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	8.7°C	Forest	0%
TKN – median	—	Shrub	71%
Fishing potential (based on Trailblazer data)	Good	Meadow	10%
Shoreline development (ratio between perimeter and surface area)	1.391	Talus	19%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	5	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	2	Cross-country zone	Berdeen
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MP-05-01, MP-06-01, MP-07-01, MP-08-01, MP-09-01)	Camp type	—
Index of connectivity	0.4	Distance to closest lake	4,258 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	OCL(TL), OM, OCLxOM	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	4.3 miles
Species/strains historically present	OCL(TL), OM	Number of overnight visitors to cross-country zone annually	48
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	5



Green Bench Lake			
NPS lake code: LS-04-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Bacon Creek	Year initially stocked	Unknown
Secondary Drainage 2	Bacon Creek	Year last stocked	Unknown
Elevation	4,870 feet	Current stocking method	—
UTM_E	609985.0625	Outside range of Caudata	Yes
UTM_N	5393136.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	21.5 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,250.66 feet	AMGR present	—
Lake or pond surface area	3.9 acres	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	10.5°C	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	Fair	Meadow	9%
Shoreline development (ratio between perimeter and surface area)	1.537	Talus	13%
Inlet or outlet	No	Bedrock	78%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Alpine
Number of outflow streams	—	Cross-country zone	Berdeen
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	No	Camp type	—
Index of connectivity	—	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	4.3 miles
Species/strains historically present	OC	Number of overnight visitors to cross-country zone annually	48
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Hanging			
NPS lake code: MC-08-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	—
Secondary Drainage 1	Chilliwack River	Year initially stocked	Unknown
Secondary Drainage 2		Year last stocked	Unknown
Elevation	4,522 feet	Current stocking method	—
UTM_E	613307.3438	Outside range of Caudata	—
UTM_N	5428243.7500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Unknown
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	8,077.43 feet	AMGR present	—
Lake or pond surface area	88.8 acres	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	—	Forest	20%
TKN – median	—	Shrub	14%
Fishing potential (based on Trailblazer data)	Good	Meadow	8%
Shoreline development (ratio between perimeter and surface area)	1.159	Talus	58%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	High forest
Number of outflow streams	—	Cross-country zone	Little Chilliwack
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Little Chilliwack
Lake shares drainage with other lakes (other lakes denoted)	Yes (Chilliwack Lake, MC-07-01)	Camp type	Hiker
Index of connectivity	NA	Distance to closest lake	4,356 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	Yes
Reproducing species present	OM	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	1.9 miles
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	5
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	1



Hidden			
NPS lake code: SB-01-01			
Current management: Has limited population of reproducing fish and is also stocked; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	20, 40
Secondary Drainage 1	Cascade River	Year initially stocked	1946
Secondary Drainage 2	North Fork Cascade River	Year last stocked	2001
Elevation	5,733 feet	Current stocking method	Backpack; fixed-wing aircraft; unknown
UTM_E	633941.4063	Outside range of Caudata	Yes
UTM_N	5372785.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	258.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	7,844.49 feet	AMGR present	—
Lake or pond surface area	61.7 acres	Number of times stocked since?	11
Median Epilimnetic (surface) water temperature	7.2°C	Forest	0%
TKN – median	—	Shrub	30%
Fishing potential (based on Trailblazer data)	Good	Meadow	2%
Shoreline development (ratio between perimeter and surface area)	1.350	Talus	69%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	5	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Hidden Lake
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (SB-03-01, SB-03-02, EP-14-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	56 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OM, OMA	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	0.6 mile
Species/strains historically present	OMA, OM(KAM), OM, OM(MW)	Number of overnight visitors to cross-country zone annually	112
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	11



Hidden Lake Tarn			
NPS lake code: EP-14-01			
Current management: Stocked; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	40
Secondary Drainage 1	Cascade River	Year initially stocked	1966
Secondary Drainage 2	North Fork Cascade River	Year last stocked	2002
Elevation	5,830 feet	Current stocking method	Backpack
UTM_E	634043.8125	Outside range of Caudata	Yes
UTM_N	5373554.2500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	—
Maximum Depth	42.7 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,050.53 feet	AMGR present	—
Lake or pond surface area	4.9 acres	Number of times stocked since?	5
Median Epilimnetic (surface) water temperature	12.8°C	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	Good	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.248	Talus	100%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Alpine
Number of outflow streams	1	Cross-country zone	Hidden Lake
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (SB-01-01, SB-03-02, SB-03-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	5,180 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.2 miles
Species/strains historically present	OM, OM(HG), OM(MW)	Number of overnight visitors to cross-country zone annually	112
Stocking frequency (years of cycle)	6	Number of anglers annually (based on 10% assumption of total visitors)	11



Hi-Yu			
NPS lake code: M-01-01			
Current management: Stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	100
Secondary Drainage 1	Bacon Creek	Year initially stocked	1961
Secondary Drainage 2	Upper Bacon Creek	Year last stocked	2001
Elevation	3,830 feet	Current stocking method	Backpack; unknown
UTM_E	613062.5625	Outside range of Caudata	—
UTM_N	5390848.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	18 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,646.98 feet	AMGR present	No
Lake or pond surface area	3.6 acres	Number of times stocked since?	6
Median Epilimnetic (surface) water temperature	16.4°C	Forest	0%
TKN – median	0.06 mg/L	Shrub	44%
Fishing potential (based on Trailblazer data)	Good	Meadow	56%
Shoreline development (ratio between perimeter and surface area)	1.168	Talus	0%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	0	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Bacon Peak
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	No	Camp type	—
Index of connectivity	0.2	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	2.5 miles
Species/strains historically present	OM, OM(MW)	Number of overnight visitors to cross-country zone annually	34
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	3



Hozomeen			
NPS lake code: HM-02-01			
Current management: Has reproducing fish; located in Ross Lake NRA.			
Major Drainage	Ross	Stocking density (fish/acre)	—
Secondary Drainage 1	Northeast Ross Lake	Year initially stocked	Unknown
Secondary Drainage 2	Hozomeen Creek	Year last stocked	Unknown
Elevation	2,823 feet	Current stocking method	—
UTM_E	643801.4375	Outside range of Caudata	—
UTM_N	5424707.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	66.7 feet	Within range of AMGR (northwestern salamander)	Yes
Perimeter	10,823.49 feet	AMGR present	Yes
Lake or pond surface area	97.4 acres	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	17.4°C	Forest	95%
TKN – median	0.101 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Good	Meadow	3%
Shoreline development (ratio between perimeter and surface area)	1.482	Talus	2%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	Perennial	Vegetation zone	Low forest
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Hozomeen Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (HM-03-01, Ross Lake)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	4,961 feet
Observed fish reproduction	Yes	Accessible by horseback	Yes
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	SF	Trail to lake	Yes
Stocked spp/strain present	—	Line of sight distance to trail	0 mile
Species/strains historically present	SF	Number of overnight visitors to nearest camp annually	280
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	28



Ipsoot			
NPS lake code: LS-06-01			
Current management: Has reproducing fish; located in the north unit of the national park.			
Major Drainage	Baker	Stocking density (fish/acre)	—
Secondary Drainage 1	Baker River	Year initially stocked	1936
Secondary Drainage 2	Hidden Creek	Year last stocked	1961
Elevation	4,460 feet	Current stocking method	—
UTM_E	607515.5625	Outside range of Caudata	—
UTM_N	5396239.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	50.8 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,401.57 feet	AMGR present	No
Lake or pond surface area	8.9 acres	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	19.7°C	Forest	0%
TKN – median	—	Shrub	73%
Fishing potential (based on Trailblazer data)	Good	Meadow	27%
Shoreline development (ratio between perimeter and surface area)	1.087	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	7	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Berdeen
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (LS-01-01, LS-02-01, LS-03-01, LS-12-01)	Camp type	—
Index of connectivity	0.3	Distance to closest lake	7,652 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OCB	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	2.5 miles
Species/strains historically present	OCL(TL), OM	Number of overnight visitors to cross-country zone annually	48
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	5



Jeanita			
NPS lake code: DD-01-01			
Current management: Has limited population of reproducing fish and is stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	75
Secondary Drainage 1	North Gorge/Diablo Lakes	Year initially stocked	1961
Secondary Drainage 2	Stetattle Creek	Year last stocked	1986
Elevation	4,904 feet	Current stocking method	Backpack; unknown
UTM_E	636844.2188	Outside range of Caudata	—
UTM_N	5400636.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	8 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,161.42 feet	AMGR present	No
Lake or pond surface area	1.4 acres	Number of times stocked since?	4
Median Epilimnetic (surface) water temperature	12.7°C	Forest	0%
TKN – median	0.06 mg/L	Shrub	25%
Fishing potential (based on Trailblazer data)	Fair	Meadow	62%
Shoreline development (ratio between perimeter and surface area)	1.331	Talus	13%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	5	Cliff	0%
Inflow type	Mixed	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Sourdough
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Sourdough
Lake shares drainage with other lakes (other lakes denoted)	Yes (DD-03-01, MP-08-01, MP-09-01)	Camp type	Hiker
Index of connectivity	-0.5	Distance to closest lake	4,592 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	OMA	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OMA	Number of overnight visitors to cross-country zone and nearest camp annually	92
Stocking frequency (years of cycle)	7	Number of anglers annually (based on 10% assumption of total visitors)	9

Kettling			
NPS lake code: MR-05-01			
Current management: Has reproducing fish; located in the south unit of the national park.			
Major Drainage	Stehekin	Stocking density (fish/acre)	—
Secondary Drainage 1	Bridge Creek	Year initially stocked	Unknown
Secondary Drainage 2	Kettling Creek	Year last stocked	Unknown
Elevation	5,375 feet	Current stocking method	—
UTM_E	667808.8750	Outside range of Caudata	—
UTM_N	5368447.500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	23 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,627.95 feet	AMGR present	No
Lake or pond surface area	9.9 acres	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	11.4°C	Forest	60%
TKN – median	0.055 mg/L	Shrub	35%
Fishing potential (based on Trailblazer data)	Good	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.129	Talus	5%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	Mixed	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Kettling
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-06-01, MR-09-01, MR-01-01, MR-04-01)	Camp type	—
Index of connectivity	0.5	Distance to closest lake	417 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	Yes
Reproducing species present	OC, OM, OMxOC	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	1.2 miles
Species/strains historically present	IC, OM, OMxOC	Number of overnight visitors to cross-country zone annually	7
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	1



Kwahnesum			
NPS lake code: MC-07-01			
Current management: Stocked; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	100
Secondary Drainage 1	Chilliwack River	Year initially stocked	1983
Secondary Drainage 2	Little Chilliwack River	Year last stocked	1998
Elevation	5,102 feet	Current stocking method	Backpack; fixed-wing aircraft
UTM_E	613584.6563	Outside range of Caudata	—
UTM_N	5419305.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	104.3 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,559.71 feet	AMGR present	No
Lake or pond surface area	16.4 acres	Number of times stocked since?	5
Median Epilimnetic (surface) water temperature	12.3°C	Forest	18%
TKN – median	0.05 mg/L	Shrub	13%
Fishing potential (based on Trailblazer data)	Fair	Meadow	23%
Shoreline development (ratio between perimeter and surface area)	1.076	Talus	46%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	4	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Little Chilliwack
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Little Chilliwack
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-08-01)	Camp type	Hiker
Index of connectivity	-0.9	Distance to closest lake	11,104 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	0 mile
Species/strains historically present	OM(MW)	Number of overnight visitors to cross-country zone annually	5
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	1



McAlester			
NPS lake code: MR-10-01			
Current management: Has reproducing fish; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	—
Secondary Drainage 1	Bridge Creek	Year initially stocked	1941
Secondary Drainage 2	McAlester Creek	Year last stocked	1976
Elevation	5,507 feet	Current stocking method	—
UTM_E	672011.0938	Outside range of Caudata	—
UTM_N	5366347.5000	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	23 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,034.78 feet	AMGR present	No
Lake or pond surface area	13.2 acres	Number of times stocked since?	5
Median Epilimnetic (surface) water temperature	13°C	Forest	57%
TKN – median	0.045 mg/L	Shrub	9%
Fishing potential (based on Trailblazer data)	Good	Meadow	29%
Shoreline development (ratio between perimeter and surface area)	1.127	Talus	5%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	CP	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	McAlester Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-23-02, MR-09-01, MR-25-01)	Camp type	Hiker/stock
Index of connectivity	0.7	Distance to closest lake	3,483 feet
Observed fish reproduction	Yes	Accessible by horseback	Yes
Observed spawning habitat present	Yes	Trailhead outside the park	Yes
Reproducing species present	OCL(TL)	Trail to lake	Yes
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OC, OM, OCL(TL)	Number of overnight visitors to nearest camp annually	372
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	37



Middle, Lower			
NPS lake code: MC-16-02			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	—
Secondary Drainage 1	Northwest Ross Lake	Year initially stocked	1967
Secondary Drainage 2	Upper Little Beaver Creek	Year last stocked	1967
Elevation	5,595 feet	Current stocking method	—
UTM_E	620974.6250	Outside range of Caudata	Yes
UTM_N	5415831.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	8 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,414.04 feet	AMGR present	No
Lake or pond surface area	2.9 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	3.4°C	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	Poor	Meadow	69%
Shoreline development (ratio between perimeter and surface area)	1.121	Talus	31%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	CP	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Middle Lakes
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Twin Rocks
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-16-01?, MC-14-01, MC-14-02, MC-22-01, . . .)	Camp type	Hiker/stock
Index of connectivity	—	Distance to closest lake	696 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	13
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Middle, Upper			
NPS lake code: MC-16-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	—
Secondary Drainage 1	Northwest Ross Lake	Year initially stocked	1967
Secondary Drainage 2	Upper Little Beaver Creek	Year last stocked	1967
Elevation	5,700 feet	Current stocking method	—
UTM_E	620725.6875	Outside range of Caudata	Yes
UTM_N	5416001.7500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	25.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,856.96 feet	AMGR present	—
Lake or pond surface area	4.5 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	7.9°C	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	Poor	Meadow	14%
Shoreline development (ratio between perimeter and surface area)	1.184	Talus	86%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Middle Lakes
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Twin Rocks
Lake shares drainage with other lakes (other lakes denoted)	No (MC-16-02?)	Camp type	Hiker/stock
Index of connectivity	—	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	13
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Monogram			
NPS lake code: M-23-01			
Current management: Stocked with nonreproducing fish. Reproduction is not expected to occur in the lake; however, reproduction status should be confirmed; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	70
Secondary Drainage 1	Cascade River	Year initially stocked	1932
Secondary Drainage 2	Monogram Creek	Year last stocked	1995
Elevation	4,873 feet	Current stocking method	Backpack; fixed-wing aircraft; unknown
UTM_E	613869.7813	Outside range of Caudata	—
UTM_N	5397481.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	122 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,066.27 feet	AMGR present	No
Lake or pond surface area	29.1 acres	Number of times stocked since?	10
Median Epilimnetic (surface) water temperature	12.3°C	Forest	0%
TKN – median	0.023 mg/L	Shrub	66%
Fishing potential (based on Trailblazer data)	Good	Meadow	34%
Shoreline development (ratio between perimeter and surface area)	1.214	Talus	0%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Monogram Lake
Lake shares drainage with other lakes (other lakes denoted)	No (M-23-11?)	Camp type	Hiker
Index of connectivity	0.9	Distance to closest lake	65 feet
Observed fish reproduction	Yes. Reproduction has been observed in the past, but currently no reproduction is expected to occur in this lake.	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	Yes
Reproducing species present	OCL(TL)	Trail to lake	Yes
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	—
Species/strains historically present	OMB, OC, OCL(TL), OM, OM(MW)	Number of overnight visitors to nearest camp annually	94
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	9

Monogram Tarn			
NPS lake code: M-23-11			
Current management: Undoc. Stocking; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Cascade River	Year initially stocked	Unknown
Secondary Drainage 2	Monogram Creek	Year last stocked	Unknown
Elevation	4,860 feet	Current stocking method	—
UTM_E	626686.8750	Outside range of Caudata	—
UTM_N	5379316.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Skagit	AMMA present	No
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	—	AMGR present	No
Lake or pond surface area	—	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	—	Forest	—
TKN – median	—	Shrub	—
Fishing potential (based on Trailblazer data)	None	Meadow	—
Shoreline development (ratio between perimeter and surface area)	—	Talus	—
Inlet or outlet	No	Bedrock	—
Number of inflow streams	—	Cliff	—
Inflow type	CP	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Monogram Lake
Lake shares drainage with other lakes (other lakes denoted)	No (M-23-01?)	Camp type	Hiker
Index of connectivity	0.8	Distance to closest lake	65 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	Yes
Stocked spp/strain present	OCL(TL)	Line of sight distance to trail	—
Species/strains historically present	OCL(TL)	Number of overnight visitors to nearest camp annually	94
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	9



Nert			
NPS lake code: M-05-01			
Current management: Stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	50
Secondary Drainage 1	Bacon Creek	Year initially stocked	1968
Secondary Drainage 2	Upper Bacon Creek	Year last stocked	1993
Elevation	4,556 feet	Current stocking method	Backpack; unknown
UTM_E	610336.1875	Outside range of Caudata	—
UTM_N	5395532.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	29.5 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,811.02 feet	AMGR present	No
Lake or pond surface area	3.6 acres	Number of times stocked since?	4
Median Epilimnetic (surface) water temperature	15.8°C	Forest	0%
TKN – median	0.084 mg/L	Shrub	35%
Fishing potential (based on Trailblazer data)	None	Meadow	53%
Shoreline development (ratio between perimeter and surface area)	1.296	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	12%
Inflow type	Ephemeral	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Berdeen
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-07-01, M-06-01, M-04-01, M-08-01, M-09-01)	Camp type	—
Index of connectivity	0.2	Distance to closest lake	2,674 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	3.7 miles
Species/strains historically present	OMA, OM(MW)	Number of overnight visitors to cross-country zone annually	48
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	5



Noisy Creek, Upper			
NPS lake code: LS-14-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Baker	Stocking density (fish/acre)	—
Secondary Drainage 1	Noisy Creek	Year initially stocked	1960
Secondary Drainage 2	Noisy Creek	Year last stocked	1960
Elevation	3,660 feet	Current stocking method	—
UTM_E	606791.6875	Outside range of Caudata	—
UTM_N	5391069.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	Yes
Perimeter	518.37 feet	AMGR present	Unknown
Lake or pond surface area	0.3 acre	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	39%
Fishing potential (based on Trailblazer data)	None	Meadow	61%
Shoreline development (ratio between perimeter and surface area)	1.335	Talus	0%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	High forest
Number of outflow streams	—	Cross-country zone	Bacon Peak
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	No	Camp type	—
Index of connectivity	—	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OC	Number of overnight visitors to cross-country zone annually	34
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



No Name			
NPS lake code: PM-01-01			
Current management: Stocked; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	70
Secondary Drainage 1	West Ross Lake	Year initially stocked	1947
Secondary Drainage 2	No Name Creek	Year last stocked	1993
Elevation	3,843 feet	Current stocking method	Backpack; unknown
UTM_E	638530.6875	Outside range of Caudata	Yes
UTM_N	5412328.000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	31.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,339.24 feet	AMGR present	—
Lake or pond surface area	7.5 acres	Number of times stocked since?	5
Median Epilimnetic (surface) water temperature	7.6°C	Forest	5%
TKN – median	0.021 mg/L	Shrub	58%
Fishing potential (based on Trailblazer data)	Good	Meadow	37%
Shoreline development (ratio between perimeter and surface area)	1.156	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	4	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Prophet
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (Ross Lake)	Camp type	—
Index of connectivity	—	Distance to closest lake	6,663 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	3.7 miles
Species/strains historically present	OM(MW), OM	Number of overnight visitors to cross-country zone annually	3
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	0



Panther Potholes, Lower			
NPS lake code: RD-05-02			
Current management: Stocked; located in Ross Lake NRA.			
Major Drainage	Skagit	Stocking density (fish/acre)	100
Secondary Drainage 1	Thunder Creek	Year initially stocked	1935
Secondary Drainage 2	Lower Thunder Creek	Year last stocked	1994
Elevation	3,375 feet	Current stocking method	Backpack; fixed-wing aircraft
UTM_E	644431.5313	Outside range of Caudata	—
UTM_N	5391174.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	17.2 feet	Within range of AMGR (northwestern salamander)	Yes
Perimeter	662.73 feet	AMGR present	Yes
Lake or pond surface area	0.5 acres	Number of times stocked since?	9
Median Epilimnetic (surface) water temperature	17.4°C	Forest	52%
TKN – median	0.06 mg/L	Shrub	21%
Fishing potential (based on Trailblazer data)	Fair	Meadow	18%
Shoreline development (ratio between perimeter and surface area)	1.225	Talus	8%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	CP	Vegetation zone	Low forest
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Fourth of July
Lake shares drainage with other lakes (other lakes denoted)	Yes (RD-05-01)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	6 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OCC	Line of sight distance to trail	0 mile
Species/strains historically present	OCC(HL), OCL(TL), OCC, CT	Number of overnight visitors to nearest camp annually	342
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	34



Panther Potholes, Upper			
NPS lake code: RD-05-01			
Current management: Fishless; located in Ross Lake NRA.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Thunder Creek	Year initially stocked	1979
Secondary Drainage 2	Lower Thunder Creek	Year last stocked	1988
Elevation	3,380 feet	Current stocking method	—
UTM_E	644490.5938	Outside range of Caudata	—
UTM_N	5391197.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	9.4 feet	Within range of AMGR (northwestern salamander)	Yes
Perimeter	383.86 feet	AMGR present	Yes
Lake or pond surface area	0.2 acre	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	17.8°C	Forest	0%
TKN – median	0.125 mg/L	Shrub	37%
Fishing potential (based on Trailblazer data)	Poor	Meadow	34%
Shoreline development (ratio between perimeter and surface area)	1.161	Talus	30%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	0	Cliff	0%
Inflow type	—	Vegetation zone	Low forest
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Fourth of July
Lake shares drainage with other lakes (other lakes denoted)	Yes (RD-05-02)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	6 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0 mile
Species/strains historically present	OCB(HL), OCL(TL)	Number of overnight visitors to nearest camp annually	342
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Pegasus			
NPS lake code: EP-10-01			
Current management: Fishless; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Thunder Creek	Year initially stocked	1967
Secondary Drainage 2	McAllister Creek	Year last stocked	1981
Elevation	5,620 feet	Current stocking method	—
UTM_E	637882.5938	Outside range of Caudata	Yes
UTM_N	5383096.7500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	2,851.05 feet	AMGR present	—
Lake or pond surface area	10.9 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	37%
Fishing potential (based on Trailblazer data)	Poor	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.167	Talus	63%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Alpine
Number of outflow streams	—	Cross-country zone	Klawatti
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (FP-01-01, EP-02-01, EP-11-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	399 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OC, OM, OM(MW)	Number of overnight visitors to cross-country zone annually	193
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Pond Southeast of Kettling Lakes			
NPS lake code: MR-09-01			
Current management: Stocked; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	50
Secondary Drainage 1	Bridge Creek	Year initially stocked	1988
Secondary Drainage 2	Kettling Creek	Year last stocked	1998
Elevation	5,945 feet	Current stocking method	Backpack
UTM_E	668974.3125	Outside range of Caudata	—
UTM_N	5366745.5000	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	16.1 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,722.44 feet	AMGR present	No
Lake or pond surface area	4.7 acres	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	0.014 mg/L	Shrub	63%
Fishing potential (based on Trailblazer data)	Good	Meadow	7%
Shoreline development (ratio between perimeter and surface area)	1.077	Talus	30%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Kettling
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-10-01, MR-25-01, MR-23-02)	Camp type	—
Index of connectivity	0.7	Distance to closest lake	5,563 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.2 miles
Species/strains historically present	OC, OM(MW)	Number of overnight visitors to cross-country zone annually	7
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	1



Quill, Lower			
NPS lake code: M-24-02			
Current management: Stocked with nonreproducing fish. Limited reproduction has been observed in the past and needs to be verified. Located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	25
Secondary Drainage 1	Damnation Creek	Year initially stocked	1961
Secondary Drainage 2	Damnation Creek	Year last stocked	2002
Elevation	4,510 feet	Current stocking method	Backpack
UTM_E	618451.7813	Outside range of Caudata	—
UTM_N	5391771.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Unknown
Maximum Depth	18 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	731.63 feet	AMGR present	—
Lake or pond surface area	1 acre	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	38%
Fishing potential (based on Trailblazer data)	Good	Meadow	30%
Shoreline development (ratio between perimeter and surface area)	1.045	Talus	33%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Despair
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	No (M-24-01?)	Camp type	—
Index of connectivity	0.0	Distance to closest lake	48 feet
Observed fish reproduction	Yes. Stocked with nonreproducing fish. Limited reproduction has been observed in the past and needs to be verified.	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OM* reproducing status needs to be verified	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	2.5 miles
Species/strains historically present	OM, OM(MW)	Number of overnight visitors to cross-country zone annually	49
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	5



Quill, Upper			
NPS lake code: M-24-01			
Current management: Stocked with nonreproducing fish. Limited reproduction has been observed in the past and needs to be verified. Located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	25
Secondary Drainage 1	Damnation Creek	Year initially stocked	1961
Secondary Drainage 2	Damnation Creek	Year last stocked	2002
Elevation	4,510 feet	Current stocking method	Backpack
UTM_E	626976.5000	Outside range of Caudata	—
UTM_N	5379435.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Skagit	AMMA present	Unknown
Maximum Depth	10 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	4,744.09 feet	AMGR present	—
Lake or pond surface area	1.2 acres	Number of times stocked since?	5
Median Epilimnetic (surface) water temperature	20°C	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	Good	Meadow	50%
Shoreline development (ratio between perimeter and surface area)	1.053	Talus	50%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	7	Cliff	0%
Inflow type	Ephemeral or CP	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Despair
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	No (M-24-02?)	Camp type	—
Index of connectivity	0.0	Distance to closest lake	48 feet
Observed fish reproduction	Yes. Stocked with nonreproducing fish. Limited reproduction has been observed in the past and needs to be verified.	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	OM	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.2 miles
Species/strains historically present	OM, OM(MW)	Number of overnight visitors to cross-country zone annually	49
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	5

Rainbow			
NPS lake code: MR-14-01			
Current management: Has reproducing fish; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	—
Secondary Drainage 1	Rainbow Creek	Year initially stocked	Unknown
Secondary Drainage 2	North Fork Rainbow Creek	Year last stocked	Unknown
Elevation	5,630 feet	Current stocking method	—
UTM_E	667416.1875	Outside range of Caudata	—
UTM_N	5363307.0000	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	107.6 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,303.81 feet	AMGR present	No
Lake or pond surface area	15.5 acres	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	13.1°C	Forest	24%
TKN – median	0.045 mg/L	Shrub	33%
Fishing potential (based on Trailblazer data)	Good	Meadow	42%
Shoreline development (ratio between perimeter and surface area)	1.135	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	Mixed	Vegetation zone	High Forest
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Rainbow Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-13-01, MR-13-02)	Camp type	Hiker
Index of connectivity	0.5	Distance to closest lake	580 feet
Observed fish reproduction	Yes	Accessible by horseback	Yes
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	OM(PL)	Trail to lake	Yes
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OM(PL)	Number of overnight visitors to nearest camp annually	132
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	13



Rainbow, Upper (North)			
NPS lake code: MR-13-01			
Current management: Fishless (last stocked in 1988); located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	50
Secondary Drainage 1	Rainbow Creek	Year initially stocked	1984
Secondary Drainage 2	North Fork Rainbow Creek	Year last stocked	1988
Elevation	5,900 feet	Current stocking method	Backpack; unknown
UTM_E	666789.5313	Outside range of Caudata	—
UTM_N	5363271.2500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	7.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	718.50 feet	AMGR present	No
Lake or pond surface area	0.6 acre	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	15.7°C	Forest	0%
TKN – median	0.0525 mg/L	Shrub	38%
Fishing potential (based on Trailblazer data)	Poor	Meadow	33%
Shoreline development (ratio between perimeter and surface area)	1.216	Talus	29%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	0	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Rainbow Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-14-01, MR-13-02)	Camp type	Hiker
Index of connectivity	0.4	Distance to closest lake	580 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM(PL), OM(MW)	Number of overnight visitors to nearest camp annually	132
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	—



Rainbow, Upper (South)			
NPS lake code: MR-13-02			
Current management: Stocked; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	70
Secondary Drainage 1	Rainbow Creek	Year initially stocked	1984
Secondary Drainage 2	North Fork Rainbow Creek	Year last stocked	1996
Elevation	5,865 feet	Current stocking method	Backpack; fixed-wing aircraft; unknown
UTM_E	666823.4688	Outside range of Caudata	—
UTM_N	5363115.0000	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	24.1 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,683.07 feet	AMGR present	No
Lake or pond surface area	3.6 acres	Number of times stocked since?	5
Median Epilimnetic (surface) water temperature	10.6°C	Forest	0%
TKN – median	0.029 mg/L	Shrub	8%
Fishing potential (based on Trailblazer data)	Poor	Meadow	18%
Shoreline development (ratio between perimeter and surface area)	1.203	Talus	74%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Perennial	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Rainbow Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-14-01, MR-13-01)	Camp type	Hiker
Index of connectivity	0.4	Distance to closest lake	593 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM(PL), OM(MW)	Number of overnight visitors to nearest camp annually	132
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	13



Rainbow, Upper (West)			
NPS lake code: MM-11-01			
Current management: Stocked; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	50
Secondary Drainage 1	Rainbow Creek North Stehekin River	Year initially stocked	1988
Secondary Drainage 2	North Fork Rainbow Creek	Year last stocked	1989
Elevation	6,473 feet	Current stocking method	Backpack; fixed-wing aircraft
UTM_E	666407.3438	Outside range of Caudata	Yes
UTM_N	5363463.7500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	—
County	Chelan	AMMA present	No
Maximum Depth	27.6 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,804.46 feet	AMGR present	No
Lake or pond surface area	3.5 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	13.4°C	Forest	0%
TKN – median	0.017 mg/L	Shrub	13%
Fishing potential (based on Trailblazer data)	Poor	Meadow	16%
Shoreline development (ratio between perimeter and surface area)	1.296	Talus	60%
Inlet or outlet	Yes	Bedrock	11%
Number of inflow streams	1	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Rainbow Lake
Lake shares drainage with other lakes (other lakes denoted)	No	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	Yes
Observed spawning habitat present	—	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM(MW)	Number of overnight visitors to nearest camp annually	132
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	13

Redoubt			
NPS lake code: MC-11-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	—
Secondary Drainage 1	Chilliwack River	Year initially stocked	1967
Secondary Drainage 2	Depot Creek	Year last stocked	1967
Elevation	5,300 feet	Current stocking method	—
UTM_E	623611.1250	Outside range of Caudata	Yes
UTM_N	5425716.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	45.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,487.53 feet	AMGR present	No
Lake or pond surface area	18.4 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	9.3°C	Forest	0%
TKN – median	0.05 mg/L	Shrub	4%
Fishing potential (based on Trailblazer data)	Poor	Meadow	3%
Shoreline development (ratio between perimeter and surface area)	1.099	Talus	94%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Depot
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-35-01, MC-34-02, MC-34-01, MS-04-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	547 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	3.1 miles
Species/strains historically present	OCL(TL)	Number of overnight visitors to cross-country zone annually	20
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Reveille, Lower			
NPS lake code: MC-21-02			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	—
Secondary Drainage 1	Chilliwack River	Year initially stocked	1968
Secondary Drainage 2	Indian Creek	Year last stocked	1968
Elevation	4,995 feet	Current stocking method	—
UTM_E	619726.3438	Outside range of Caudata	Yes
UTM_N	5417184.2500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	9.8 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,669.95 feet	AMGR present	—
Lake or pond surface area	4.4 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	13.8°C	Forest	15%
TKN – median	0.003 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Poor	Meadow	43%
Shoreline development (ratio between perimeter and surface area)	1.123	Talus	41%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Perennial	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Bear Mountain
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-21-01, MC-21-04, MC-50-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	11 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	2.5 miles
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	30
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—

Reveille, Upper			
NPS lake code: MC-21-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	—
Secondary Drainage 1	Chilliwack River	Year initially stocked	1968
Secondary Drainage 2	Indian Creek	Year last stocked	1968
Elevation	4,995 feet	Current stocking method	—
UTM_E	619587.8750	Outside range of Caudata	Yes
UTM_N	5417070.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	16.4 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,273.62 feet	AMGR present	No
Lake or pond surface area	3.4 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	8°C	Forest	0%
TKN – median	0.02 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Poor	Meadow	4%
Shoreline development (ratio between perimeter and surface area)	1.672	Talus	96%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Subsurface	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Bear Mountain
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-21-02, MC-21-04, MC-50-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	11 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	2.5 miles
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	30
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Ridley			
NPS lake code: HM-03-01			
Current management: Stocked; located in Ross Lake NRA.			
Major Drainage	Ross	Stocking density (fish/acre)	50
Secondary Drainage 1	Northeast Ross Lake	Year initially stocked	1975
Secondary Drainage 2	Hozomeen Creek	Year last stocked	2000
Elevation	3,140 feet	Current stocking method	Backpack
UTM_E	644253.3750	Outside range of Caudata	—
UTM_N	5423441.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	35.1 feet	Within range of AMGR (northwestern salamander)	Yes
Perimeter	2,782.15 feet	AMGR present	Yes
Lake or pond surface area	10.9 acres	Number of times stocked since?	9
Median Epilimnetic (surface) water temperature	18.2°C	Forest	100%
TKN – median	0.194 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Good	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.140	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Low forest
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Willow Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (HM-02-01, Ross Lake)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	4,961 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW), OM(RL)	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM(MW), OM(MW)	Number of overnight visitors to nearest camp annually	32
Stocking frequency (years of cycle)	3	Number of anglers annually (based on 10% assumption of total visitors)	3



Sky			
NPS lake code: EP-13-01			
Current management: Fishless; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Newhalem Creek	Year initially stocked	1968
Secondary Drainage 2	Newhalem Creek	Year last stocked	1968
Elevation	5,380 feet	Current stocking method	—
UTM_E	632819.1563	Outside range of Caudata	Yes
UTM_N	5381596.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	1,085.96 feet	AMGR present	—
Lake or pond surface area	10.9 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	37%
Fishing potential (based on Trailblazer data)	Poor	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.053	Talus	63%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Stout Lake
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (EP-15-01, EP-09-01, EP-09-02)	Camp type	—
Index of connectivity	—	Distance to closest lake	2,200 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	45
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Skymo			
NPS lake code: PM-03-01			
Current management: Has reproducing fish and is stocked; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	50
Secondary Drainage 1	West Ross Lake	Year initially stocked	1968
Secondary Drainage 2	Skymo Creek	Year last stocked	1998
Elevation	5,277 feet	Current stocking method	Backpack; fixed-wing aircraft; unknown
UTM_E	639305.3438	Outside range of Caudata	—
UTM_N	5410778.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	No
Maximum Depth	20 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,750 feet	AMGR present	No
Lake or pond surface area	10.8 acres	Number of times stocked since?	4
Median Epilimnetic (surface) water temperature	11.1°C	Forest	0%
TKN – median	0.04 mg/L	Shrub	28%
Fishing potential (based on Trailblazer data)	Good	Meadow	14%
Shoreline development (ratio between perimeter and surface area)	1.541	Talus	58%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Prophet
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (PM-04-01, PM-02-01, Ross Lake)	Camp type	—
Index of connectivity	0.5	Distance to closest lake	82 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	—
Reproducing species present	OCL	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	2.5 miles
Species/strains historically present	OC, OM(MW)	Number of overnight visitors to cross-country zone annually	3
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	0



Sourdough			
NPS lake code: PM-12-01			
Current management: Has reproducing fish and is stocked; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	100
Secondary Drainage 1	Pierce Creek	Year initially stocked	1993
Secondary Drainage 2		Year last stocked	1998
Elevation	4,623 feet	Current stocking method	Fixed-wing aircraft; unknown
UTM_E	637939.7500	Outside range of Caudata	—
UTM_N	5402168.2500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Unknown
Maximum Depth	107 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	5,045.93 feet	AMGR present	—
Lake or pond surface area	27.6 acres	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	14.7°C	Forest	6%
TKN – median	—	Shrub	51%
Fishing potential (based on Trailblazer data)	Good	Meadow	12%
Shoreline development (ratio between perimeter and surface area)	1.298	Talus	31%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	6	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Sourdough/Trail
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Sourdough
Lake shares drainage with other lakes (other lakes denoted)	Yes (Ross Lake)	Camp type	Hiker
Index of connectivity	-0.5	Distance to closest lake	5,272 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	SF	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.2 miles
Species/strains historically present	SF, OM(MW)	Number of overnight visitors to cross-country zone or nearest camp annually	92
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	9



Sourpuss			
NPS lake code: ML-01-01			
Current management: Fishless; located in the south unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	—
Secondary Drainage 1	Ruby Creek	Year initially stocked	1968
Secondary Drainage 2	Panther Creek	Year last stocked	1968
Elevation	4,835 feet	Current stocking method	—
UTM_E	649358.8125	Outside range of Caudata	Yes
UTM_N	5385817.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	No
Maximum Depth	3.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,856.96 feet	AMGR present	No
Lake or pond surface area	2 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	7.8°C	Forest	0%
TKN – median	0.03 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Poor	Meadow	70%
Shoreline development (ratio between perimeter and surface area)	1.781	Talus	30%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Perennial	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Ragged Ridge
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (ML-02-01, ML-03-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	6,589 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	2.5 miles
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	28
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—

Stiletto			
NPS lake code: MR-01-01			
Current management: Stocked; located in the south unit of the national park.			
Major Drainage	Stehekin	Stocking density (fish/acre)	50
Secondary Drainage 1	Bridge Creek	Year initially stocked	1966
Secondary Drainage 2	East Fork Bridge Creek	Year last stocked	1995
Elevation	6,795 feet	Current stocking method	Backpack; fixed-wing aircraft
UTM_E	673284.4063	Outside range of Caudata	Yes
UTM_N	5372325.7500	Caudata survey done	—
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	—
County	Chelan	AMMA present	—
Maximum Depth	85.3 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,680.45 feet	AMGR present	—
Lake or pond surface area	9.9 acres	Number of times stocked since?	6
Median Epilimnetic (surface) water temperature	6.1°C	Forest	0%
TKN – median	0.07 mg/L	Shrub	42%
Fishing potential (based on Trailblazer data)	Fair	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.152	Talus	58%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	4	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Stiletto
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-04-01, MR-02-01, MR-03-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	1,455 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	0.6 mile
Species/strains historically present	OMA, OCL(TL), OM(MW)	Number of overnight visitors to cross-country zone annually	57
Stocking frequency (years of cycle)	6	Number of anglers annually (based on 10% assumption of total visitors)	6



Stout			
NPS lake code: EP-09-02			
Current management: Reproducing population of OCL is being replaced through stocking with OCC located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	100
Secondary Drainage 1	Newhalem Creek	Year initially stocked	1953
Secondary Drainage 2	Newhalem Creek	Year last stocked	1967
Elevation	5,215 feet	Current stocking method	Backpack; unknown
UTM_E	633112.7188	Outside range of Caudata	Yes
UTM_N	5383417.2500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	—
Maximum Depth	175.5 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	4,169.95 feet	AMGR present	—
Lake or pond surface area	25.2 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	5.4°C	Forest	5%
TKN – median	—	Shrub	45%
Fishing potential (based on Trailblazer data)	Good	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.122	Talus	50%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	4	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Stout Lake
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (EP-09-01, EP-13-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	100 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	OCL	Trail to lake	No
Stocked spp/strain present	OCC	Line of sight distance to trail	1.9 miles
Species/strains historically present	OCC, OCL	Number of overnight visitors to cross-country zone annually	45
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	5



Stout, Lower			
NPS lake code: EP-09-01			
Current management: Has reproducing fish; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Newhalem Creek	Year initially stocked	NA
Secondary Drainage 2	Newhalem Creek	Year last stocked	NA
Elevation	5,190 feet	Current stocking method	—
UTM_E	632806.7813	Outside range of Caudata	Yes
UTM_N	5383341.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	No
Maximum Depth	8.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	862.86 feet	AMGR present	No
Lake or pond surface area	1 acre	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	13.2°C	Forest	0%
TKN – median	0.04 mg/L	Shrub	35%
Fishing potential (based on Trailblazer data)	Good	Meadow	55%
Shoreline development (ratio between perimeter and surface area)	1.188	Talus	10%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Stout Lake
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (EP-09-02, EP-13-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	100 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	OCL	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OCL	Number of overnight visitors to cross-country zone annually	45
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	5



Sweet Pea			
NPS lake code: ML-02-01			
Current management: Stocked; located in the south unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	40
Secondary Drainage 1	Ruby Creek	Year initially stocked	1968
Secondary Drainage 2	Panther Creek	Year last stocked	1999
Elevation	5,540 feet	Current stocking method	Backpack; unknown
UTM_E	651671.9375	Outside range of Caudata	Yes
UTM_N	5384916.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	No
Maximum Depth	92 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,123.36 feet	AMGR present	No
Lake or pond surface area	10.3 acres	Number of times stocked since?	5
Median Epilimnetic (surface) water temperature	6.5°C	Forest	0%
TKN – median	0.01 mg/L	Shrub	23%
Fishing potential (based on Trailblazer data)	Poor	Meadow	10%
Shoreline development (ratio between perimeter and surface area)	1.316	Talus	35%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	5	Cliff	31%
Inflow type	East	Vegetation zone	High forest
Number of outflow streams	1	Cross-country zone	Ragged Ridge
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (ML-03-01, ML-01-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	807 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.9 miles
Species/strains historically present	OM(MW), OM	Number of overnight visitors to cross-country zone annually	28
Stocking frequency (years of cycle)	6	Number of anglers annually (based on 10% assumption of total visitors)	3

Talus Tarn			
NPS lake code: M-06-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Bacon Creek	Year initially stocked	1968
Secondary Drainage 2	Upper Bacon Creek	Year last stocked	1980
Elevation	5,355 feet	Current stocking method	—
UTM_E	610710.9375	Outside range of Caudata	—
UTM_N	5396502.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	11.8 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,217.19 feet	AMGR present	No
Lake or pond surface area	1.5 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	11.7°C	Forest	0%
TKN – median	0.018 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	None	Meadow	10%
Shoreline development (ratio between perimeter and surface area)	1.337	Talus	90%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Subsurface	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Berdeen
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-07-01, M-04-01, M-05-01, M-08-01, M-09-01)	Camp type	—
Index of connectivity	0.2	Distance to closest lake	2,998 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	3.7 miles
Species/strains historically present	OMA	Number of overnight visitors to cross-country zone annually	48
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Tapto, Lower			
NPS lake code: MC-17-03			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	—
Secondary Drainage 1	Chilliwack River	Year initially stocked	1960
Secondary Drainage 2	Brush Creek	Year last stocked	1960
Elevation	5,700 feet	Current stocking method	—
UTM_E	619691.6250	Outside range of Caudata	Yes
UTM_N	5415382.5000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	518.37 feet	AMGR present	—
Lake or pond surface area	0.4 acre	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	16%
Fishing potential (based on Trailblazer data)	Poor	Meadow	22%
Shoreline development (ratio between perimeter and surface area)	1.144	Talus	63%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Whatcom
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-17-02, MC-17-01, MC-17-04)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	63 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OCL(TL)	Number of overnight visitors to nearest camp annually	211
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—

Tapto, Middle			
NPS lake code: MC-17-02			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	—
Secondary Drainage 1	Chilliwack River	Year initially stocked	1960
Secondary Drainage 2	Brush Creek	Year last stocked	1960
Elevation	5,730 feet	Current stocking method	—
UTM_E	619647.8125	Outside range of Caudata	Yes
UTM_N	5415481.5000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	18 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	938.32 feet	AMGR present	—
Lake or pond surface area	1.2 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	12.9°C	Forest	0%
TKN – median	0.02 mg/L	Shrub	58%
Fishing potential (based on Trailblazer data)	Poor	Meadow	42%
Shoreline development (ratio between perimeter and surface area)	1.141	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Tapto Lakes/Trail
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Whatcom
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-17-01, MC-17-03, MC-17-04)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	55 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	64
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Tapto, Upper			
NPS lake code: MC-17-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Chilliwack	Stocking density (fish/acre)	—
Secondary Drainage 1	Chilliwack River	Year initially stocked	1960
Secondary Drainage 2	Brush Creek	Year last stocked	1960
Elevation	5,750 feet	Current stocking method	—
UTM_E	619638.3125	Outside range of Caudata	Yes
UTM_N	5415689.2500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	43 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,677.17 feet	AMGR present	—
Lake or pond surface area	10.2 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	0.008 mg/L	Shrub	28%
Fishing potential (based on Trailblazer data)	Poor	Meadow	10%
Shoreline development (ratio between perimeter and surface area)	1.131	Talus	62%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Tapto Lakes/Trail
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Whatcom
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-17-02, MC-17-03, MC-17-04)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	55 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OCL(TL)	Number of overnight visitors to cross-country zone annually	64
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—

Tapto, West			
NPS lake code: MC-17-04			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Chilliwick	Stocking density (fish/acre)	—
Secondary Drainage 1	Chilliwick River	Year initially stocked	1960
Secondary Drainage 2	Brush Creek	Year last stocked	1960
Elevation	5,660 feet	Current stocking method	—
UTM_E	619300.4375	Outside range of Caudata	Yes
UTM_N	5415633.0000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	14.1 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,348.43 feet	AMGR present	—
Lake or pond surface area	2.3 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	11.7°C	Forest	0%
TKN – median	0.024 mg/L	Shrub	15%
Fishing potential (based on Trailblazer data)	Poor	Meadow	85%
Shoreline development (ratio between perimeter and surface area)	1.196	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Whatcom
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-17-03, MC-17-02, MC-17-01)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	1,700 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OCL(TL)	Number of overnight visitors to nearest camp annually	211
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Thornton, Lower			
NPS lake code: M-20-01			
Current management: May have limited population of reproducing fish and is also stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	50
Secondary Drainage 1	Thornton Creek	Year initially stocked	1941
Secondary Drainage 2		Year last stocked	1998
Elevation	4,486 feet	Current stocking method	Backpack; fixed-wing aircraft; unknown
UTM_E	623160.9688	Outside range of Caudata	—
UTM_N	5393495.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	108.3 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	6,204.07 feet	AMGR present	No
Lake or pond surface area	55.1 acres	Number of times stocked since?	11
Median Epilimnetic (surface) water temperature	12.2°C	Forest	0%
TKN – median	0.053 mg/L	Shrub	77%
Fishing potential (based on Trailblazer data)	Good	Meadow	6%
Shoreline development (ratio between perimeter and surface area)	1.130	Talus	13%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	4%
Inflow type	CP	Vegetation zone	High forest
Number of outflow streams	—	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Thornton Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-19-01, MC-20-01)	Camp type	Hiker
Index of connectivity	-0.3	Distance to closest lake	327 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	No
Reproducing species present	OCL(TL)	Trail to lake	Yes
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	—
Species/strains historically present	OM, OM(ST), OM(MW), OMA, OCC, OCL(TL)	Number of overnight visitors to nearest camp annually	203
Stocking frequency (years of cycle)	6	Number of anglers annually (based on 10% assumption of total visitors)	20

Thornton, Middle			
NPS lake code: M-19-01			
Current management: Stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	50
Secondary Drainage 1	Thornton Creek	Year initially stocked	1941
Secondary Drainage 2		Year last stocked	1997
Elevation	4,700 feet	Current stocking method	Backpack; unknown
UTM_E	622610.1250	Outside range of Caudata	Yes
UTM_N	5394101.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	78.7 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	3,080.71 feet	AMGR present	No
Lake or pond surface area	11.9 acres	Number of times stocked since?	10
Median Epilimnetic (surface) water temperature	8.2°C	Forest	0%
TKN – median	0.035 mg/L	Shrub	5%
Fishing potential (based on Trailblazer data)	Fair	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.207	Talus	82%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	4	Cliff	13%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Thornton Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-20-01, M-18-01)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	327 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	Yes
Stocked spp/strain present	OMA	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM, OM(ST), OMA	Number of overnight visitors to nearest camp annually	203
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	20



Thunder			
NPS lake code: RD-02-01			
Current management: Fishless (last stocked 10 years ago); located in Ross Lake NRA.			
Major Drainage	Skagit	Stocking density (fish/acre)	50
Secondary Drainage 1	Thunder Creek	Year initially stocked	1947
Secondary Drainage 2		Year last stocked	1992
Elevation	1,350 feet	Current stocking method	—
UTM_E	639270.1875	Outside range of Caudata	—
UTM_N	5395295.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	—
Maximum Depth	24.6 feet	Within range of AMGR (northwestern salamander)	Yes
Perimeter	3,047.90 feet	AMGR present	Yes
Lake or pond surface area	6.8 acres	Number of times stocked since?	28
Median Epilimnetic (surface) water temperature	15.3°C	Forest	42%
TKN – median	0.012 mg/L	Shrub	42%
Fishing potential (based on Trailblazer data)	Fair	Meadow	15%
Shoreline development (ratio between perimeter and surface area)	1.583	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Low forest
Number of outflow streams	0	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	No	Camp type	—
Index of connectivity	—	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OCL(TL), OCC, OM, OM(MW), OM(STAC)	Number of overnight visitors to cross-country zone annually	0
Stocking frequency (years of cycle)	3,5	Number of anglers annually (based on 10% assumption of total visitors)	—

Tiny			
NPS lake code: MC-15-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	—
Secondary Drainage 1	Northwest Ross Lake	Year initially stocked	Unknown
Secondary Drainage 2	Upper Little Beaver Creek	Year last stocked	Unknown
Elevation	6,100 feet	Current stocking method	—
UTM_E	621312.6563	Outside range of Caudata	Yes
UTM_N	5416078.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	6 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	492.13 feet	AMGR present	No
Lake or pond surface area	0.3 acre	Number of times stocked since?	—
Median Epilimnetic (surface) water temperature	17°C	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	Poor	Meadow	50%
Shoreline development (ratio between perimeter and surface area)	1.210	Talus	50%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	Subsurface	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Middle Lakes
Isolated from any other lake or pond within 2,000 feet	No	Camp name	Twin Rocks
Lake shares drainage with other lakes (other lakes denoted)	Yes (MC-16-02, MC-14-01, MC-14-02, MC-22-01, . . .)	Camp type	Hiker/stock
Index of connectivity	—	Distance to closest lake	696 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	1.2 miles
Species/strains historically present	OC	Number of overnight visitors to cross-country zone annually	13
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Torment			
NPS lake code: ML-03-01			
Current management: Stocked; located in the south unit of the national park.			
Major Drainage	Ross	Stocking density (fish/acre)	40
Secondary Drainage 1	Ruby Creek	Year initially stocked	1985
Secondary Drainage 2	Panther Creek	Year last stocked	1995
Elevation	6,560 feet	Current stocking method	Backpack
UTM_E	651475.3750	Outside range of Caudata	Yes
UTM_N	5384099.2500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	No
Maximum Depth	49.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,653.54 feet	AMGR present	No
Lake or pond surface area	3.6 acres	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	14.1°C	Forest	0%
TKN – median	0.04 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Good	Meadow	5%
Shoreline development (ratio between perimeter and surface area)	1.183	Talus	95%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	4	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Ragged Ridge
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (ML-02-01, ML-01-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	807 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.9 miles
Species/strains historically present	OM(MW)	Number of overnight visitors to cross-country zone annually	28
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	3

Trapper			
NPS lake code: GM-01-01			
Current management: Has reproducing fish; located in the south unit of the national park.			
Major Drainage	Stehekin	Stocking density (fish/acre)	—
Secondary Drainage 1	Upper Stehekin River	Year initially stocked	1948
Secondary Drainage 2		Year last stocked	1968
Elevation	4,165 feet	Current stocking method	—
UTM_E	647784.5313	Outside range of Caudata	Yes
UTM_N	5366904.0000	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	—
County	Chelan	AMMA present	No
Maximum Depth	160.8 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	11,597.77 feet	AMGR present	No
Lake or pond surface area	147.2 acres	Number of times stocked since?	9
Median Epilimnetic (surface) water temperature	8°C	Forest	21%
TKN – median	0.019 mg/L	Shrub	43%
Fishing potential (based on Trailblazer data)	Poor	Meadow	12%
Shoreline development (ratio between perimeter and surface area)	1.292	Talus	24%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	3	Cliff	0%
Inflow type	Perennial	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Trapper inlet and outlet
Lake shares drainage with other lakes (other lakes denoted)	Yes (CP-01-01, CP-02-01)	Camp type	Cross-country
Index of connectivity	—	Distance to closest lake	6,331 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OC	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OC	Number of overnight visitors to nearest camp annually	90
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	9



Triplet, Lower			
NPS lake code: SM-02-01			
Current management: Has reproducing fish; located in Lake Chelan NRA.			
Major Drainage	Lake Chelan	Stocking density (fish/acre)	—
Secondary Drainage 1	Four Mile Creek	Year initially stocked	1972
Secondary Drainage 2		Year last stocked	1972
Elevation	6,331 feet	Current stocking method	—
UTM_E	681338.0938	Outside range of Caudata	—
UTM_N	5351529.0000	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	No
Maximum Depth	7.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,341.86 feet	AMGR present	No
Lake or pond surface area	2.2 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	17.5°C	Forest	0%
TKN – median	0.06 mg/L	Shrub	48%
Fishing potential (based on Trailblazer data)	Fair	Meadow	46%
Shoreline development (ratio between perimeter and surface area)	1.214	Talus	6%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Perennial	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Triplet Lakes
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (SM-02-02, SM-01-01)	Camp type	—
Index of connectivity	-0.2	Distance to closest lake	332 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	No
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OCL(TL)	Number of overnight visitors to cross-country zone annually	9
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	1

Triplet, Upper			
NPS lake code: SM-02-02			
Current management: Has reproducing fish; located in Lake Chelan NRA.			
Major Drainage	Lake Chelan	Stocking density (fish/acre)	—
Secondary Drainage 1	Four Mile Creek	Year initially stocked	1972
Secondary Drainage 2		Year last stocked	1972
Elevation	6,551 feet	Current stocking method	—
UTM_E	681644.5625	Outside range of Caudata	Yes
UTM_N	5351352.2500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	—
County	Chelan	AMMA present	No
Maximum Depth	12.5 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,459.97 feet	AMGR present	No
Lake or pond surface area	2.3 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	19.7°C	Forest	0%
TKN – median	0.03 mg/L	Shrub	35%
Fishing potential (based on Trailblazer data)	Good	Meadow	33%
Shoreline development (ratio between perimeter and surface area)	1.278	Talus	31%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Triplet Lakes
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (SM-02-01, SM-01-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	332 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	Yes	Trailhead outside the park	—
Reproducing species present	OCL(TL)	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OCL(TL)	Number of overnight visitors to cross-country zone annually	9
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	1



Triumph			
NPS lake code: M-17-01			
Current management: Stocked; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	20, 70
Secondary Drainage 1	Goodell Creek	Year initially stocked	1961
Secondary Drainage 2		Year last stocked	2002
Elevation	3,685 feet	Current stocking method	Backpack
UTM_E	618692.8438	Outside range of Caudata	—
UTM_N	5392884.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	Yes
County	Whatcom	AMMA present	Yes
Maximum Depth	20.5 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,768.37 feet	AMGR present	No
Lake or pond surface area	4.3 acres	Number of times stocked since?	7
Median Epilimnetic (surface) water temperature	17.1°C	Forest	0%
TKN – median	—	Shrub	7%
Fishing potential (based on Trailblazer data)	Good	Meadow	21%
Shoreline development (ratio between perimeter and surface area)	1.159	Talus	72%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	4	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Despair
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-15-01)	Camp type	—
Index of connectivity	0	Distance to closest lake	5,274 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	3.7 miles
Species/strains historically present	OMA, OM(MW)	Number of overnight visitors to cross-country zone annually	49
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	5

Unnamed			
NPS lake code: FP-01-01			
Current management: Fishless; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Thunder Creek	Year initially stocked	1967
Secondary Drainage 2	McAllister Creek	Year last stocked	1967
Elevation	5,140 feet	Current stocking method	—
UTM_E	638314.9688	Outside range of Caudata	Yes
UTM_N	5382925.5000	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	—
Maximum Depth	—	Within range of AMGR (northwestern salamander)	—
Perimeter	3,093.83 feet	AMGR present	—
Lake or pond surface area	13.5 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	—	Shrub	0%
Fishing potential (based on Trailblazer data)	Fair	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.138	Talus	100%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Alpine
Number of outflow streams	—	Cross-country zone	Klawatti
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (EP-10-01, EP-02-01, EP-11-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	399 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	—
Species/strains historically present	OM, OC	Number of overnight visitors to cross-country zone annually	193
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Unnamed			
NPS lake code: MR-11-01			
Current management: Stocked; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	50
Secondary Drainage 1	North Stehekin River	Year initially stocked	1990
Secondary Drainage 2	Rainbow Creek	Year last stocked	2002
Elevation	6,111 feet	Current stocking method	Backpack
UTM_E	671232.4063	Outside range of Caudata	—
UTM_N	5364761.2500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	28.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,404.20 feet	AMGR present	No
Lake or pond surface area	2.9 acres	Number of times stocked since?	3
Median Epilimnetic (surface) water temperature	14.6°C	Forest	0%
TKN – median	0.06 mg/L	Shrub	70%
Fishing potential (based on Trailblazer data)	Fair	Meadow	0%
Shoreline development (ratio between perimeter and surface area)	1.124	Talus	30%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Trail/Rainbow Ridge
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	RRC01
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-18-01, MR-15-01, MR-15-02, MR-12-01, MR-16-01)	Camp type	Cross-country
Index of connectivity	0.4	Distance to closest lake	2,286 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.2 miles
Species/strains historically present	OC, OM, OM(MW)	Number of overnight visitors to cross-country zone annually	6
Stocking frequency (years of cycle)	5	Number of anglers annually (based on 10% assumption of total visitors)	0



Unnamed			
NPS lake code: MR-16-01			
Current management: Has limited population of reproducing fish; located in Lake Chelan NRA.			
Major Drainage	Stehekin	Stocking density (fish/acre)	—
Secondary Drainage 1	North Stehekin River	Year initially stocked	1983
Secondary Drainage 2	Rainbow Creek	Year last stocked	1983
Elevation	6,230 feet	Current stocking method	—
UTM_E	672989.9688	Outside range of Caudata	—
UTM_N	5362254.7500	Caudata survey done	Yes
Side of Pacific Crest	East	Within range of AMMA (long-toed salamander)	Yes
County	Chelan	AMMA present	Yes
Maximum Depth	6.6 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	1,167.98 feet	AMGR present	No
Lake or pond surface area	1.9 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	—	Forest	0%
TKN – median	0.055 mg/L	Shrub	57%
Fishing potential (based on Trailblazer data)	Good	Meadow	43%
Shoreline development (ratio between perimeter and surface area)	1.157	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Rennie
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (MR-11-01, MR-12-01, MR-18-01, MR-15-01, MR-15-02)	Camp type	—
Index of connectivity	0.2	Distance to closest lake	4,994 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	No
Reproducing species present	OC	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	1.2 miles
Species/strains historically present	OM(MW), OC	Number of overnight visitors to cross-country zone annually	7
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	1



Vulcan			
NPS lake code: ML-04-01			
Current management: Fishless; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Thunder Creek	Year initially stocked	1968
Secondary Drainage 2	Fisher Creek	Year last stocked	1968
Elevation	5,180 feet	Current stocking method	—
UTM_E	650636.4063	Outside range of Caudata	Yes
UTM_N	5380712.0000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	No
Maximum Depth	25.2 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,522.97 feet	AMGR present	No
Lake or pond surface area	8.2 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	10.7°C	Forest	21%
TKN – median	0.03 mg/L	Shrub	23%
Fishing potential (based on Trailblazer data)	Fair	Meadow	15%
Shoreline development (ratio between perimeter and surface area)	1.190	Talus	41%
Inlet or outlet	No	Bedrock	0%
Number of inflow streams	1	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Logan
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	No	Camp type	—
Index of connectivity	—	Distance to closest lake	—
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	No	Trailhead outside the park	Yes
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	0.6 mile
Species/strains historically present	OM(HG)	Number of overnight visitors to cross-country zone annually	129
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—

Wilcox/Lillie, Upper			
NPS lake code: EP-06-01			
Current management: Has reproducing fish; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Newhalem Creek	Year initially stocked	1967
Secondary Drainage 2	East Fork Newhalem Creek	Year last stocked	1991
Elevation	5,136 feet	Current stocking method	—
UTM_E	634874.9375	Outside range of Caudata	Yes
UTM_N	5384523.7500	Caudata survey done	—
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	—
Maximum Depth	65 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,683.73 feet	AMGR present	—
Lake or pond surface area	10.5 acres	Number of times stocked since?	1
Median Epilimnetic (surface) water temperature	14.5°C	Forest	7%
TKN – median	0.024 mg/L	Shrub	25%
Fishing potential (based on Trailblazer data)	Good	Meadow	49%
Shoreline development (ratio between perimeter and surface area)	1.118	Talus	19%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	5	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Stout Lake
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (EP-05-01, EP-03-01, EP-04-01, EP-01-01, DD-08-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	76 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	OC, OM, OMxOC	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	2.5 miles
Species/strains historically present	OC, OM, OM(MW)	Number of overnight visitors to cross-country zone annually	45
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	5

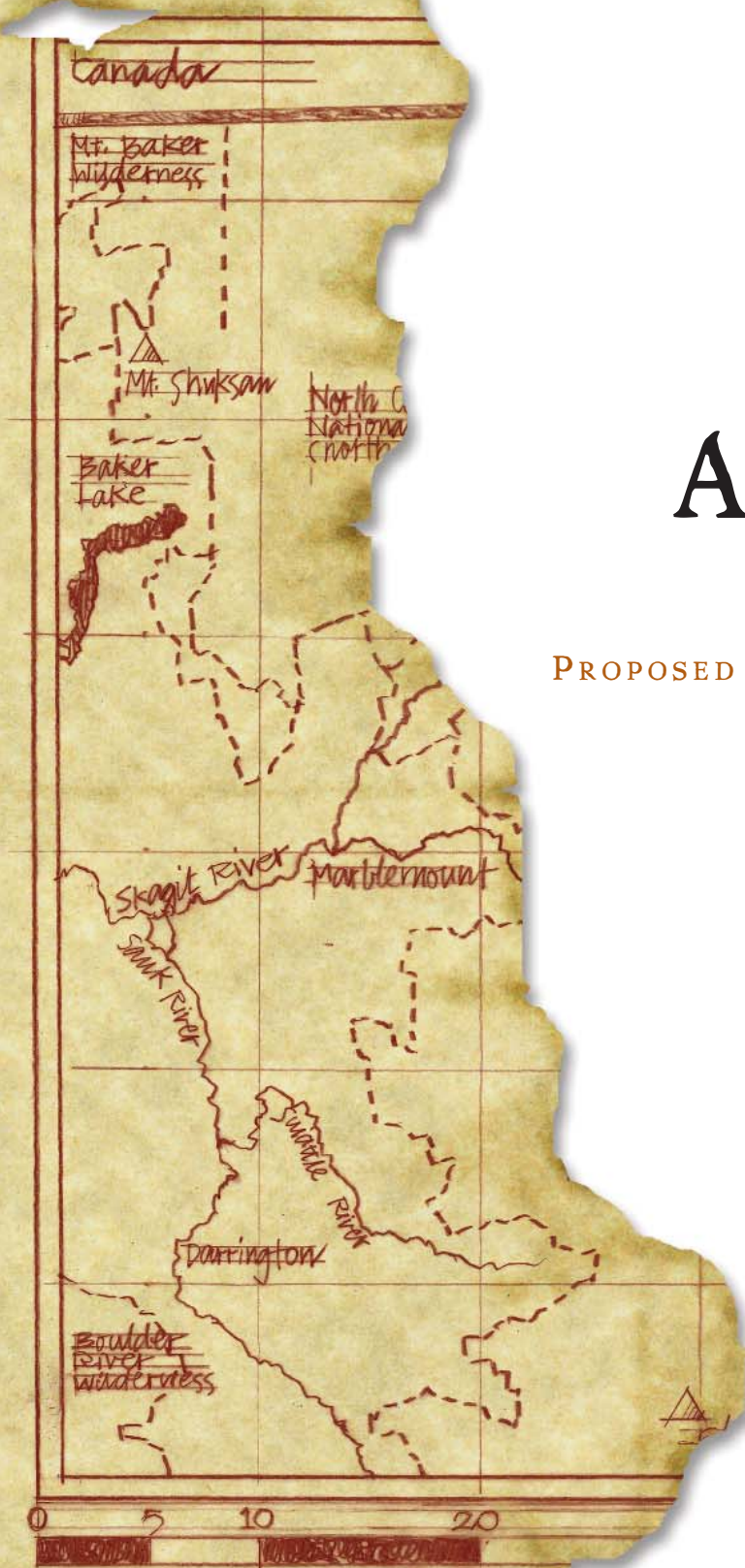


Wilcox/Sandie, Lower			
NPS lake code: EP-05-01			
Current management: Has reproducing fish and is stocked; located in the south unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	70
Secondary Drainage 1	Newhalem Creek	Year initially stocked	1967
Secondary Drainage 2	East Fork Newhalem Creek	Year last stocked	1993
Elevation	5,120 feet	Current stocking method	Backpack; fixed-wing aircraft
UTM_E	634611.8125	Outside range of Caudata	Yes
UTM_N	5384573.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Skagit	AMMA present	No
Maximum Depth	19.7 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	2,296.59 feet	AMGR present	No
Lake or pond surface area	5.4 acres	Number of times stocked since?	4
Median Epilimnetic (surface) water temperature	13.5°C	Forest	29%
TKN – median	0.03 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Good	Meadow	4%
Shoreline development (ratio between perimeter and surface area)	1.335	Talus	67%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	Mixed	Vegetation zone	Subalpine
Number of outflow streams	1	Cross-country zone	Stout Lake
Isolated from any other lake or pond within 2,000 feet	No	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (EP-06-01, EP-03-01, EP-04-01, EP-01-01, DD-08-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	76 feet
Observed fish reproduction	Yes	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	OC	Trail to lake	No
Stocked spp/strain present	OM(MW)	Line of sight distance to trail	1.9 miles
Species/strains historically present	OC, OM, OM(MW)	Number of overnight visitors to cross-country zone annually	45
Stocking frequency (years of cycle)	4	Number of anglers annually (based on 10% assumption of total visitors)	5

Wild			
NPS lake code: MC-27-01			
Current management: Fishless; located in the north unit of the national park.			
Major Drainage	Skagit	Stocking density (fish/acre)	—
Secondary Drainage 1	Goodell Creek	Year initially stocked	1967
Secondary Drainage 2	Upper Goodell Creek	Year last stocked	1967
Elevation	4,880 feet	Current stocking method	—
UTM_E	619985.9375	Outside range of Caudata	Yes
UTM_N	5405364.7500	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	28.9 feet	Within range of AMGR (northwestern salamander)	—
Perimeter	4,288.06 feet	AMGR present	No
Lake or pond surface area	12.7 acres	Number of times stocked since?	2
Median Epilimnetic (surface) water temperature	10.1°C	Forest	0%
TKN – median	0.0105 mg/L	Shrub	0%
Fishing potential (based on Trailblazer data)	Poor	Meadow	60%
Shoreline development (ratio between perimeter and surface area)	1.626	Talus	40%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	—	Cliff	0%
Inflow type	—	Vegetation zone	Subalpine
Number of outflow streams	—	Cross-country zone	Pioneer Ridge
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	None
Lake shares drainage with other lakes (other lakes denoted)	Yes (M-21-01, M-16-01, MC-13-01)	Camp type	—
Index of connectivity	—	Distance to closest lake	10,883 feet
Observed fish reproduction	—	Accessible by horseback	No
Observed spawning habitat present	—	Trailhead outside the park	—
Reproducing species present	—	Trail to lake	No
Stocked spp/strain present	—	Line of sight distance to trail	5.6 miles
Species/strains historically present	OM	Number of overnight visitors to cross-country zone annually	26
Stocking frequency (years of cycle)	—	Number of anglers annually (based on 10% assumption of total visitors)	—



Willow			
NPS lake code: HM-04-01			
Current management: Stocked; located in Ross Lake NRA.			
Major Drainage	Ross	Stocking density (fish/acre)	25
Secondary Drainage 1	Northeast Ross Lake	Year initially stocked	1960
Secondary Drainage 2	Upper Lightning Creek	Year last stocked	2002
Elevation	2,853 feet	Current stocking method	Backpack; fixed-wing aircraft; unknown
UTM_E	646033.6875	Outside range of Caudata	—
UTM_N	5422914.5000	Caudata survey done	Yes
Side of Pacific Crest	West	Within range of AMMA (long-toed salamander)	—
County	Whatcom	AMMA present	No
Maximum Depth	26.9 feet	Within range of AMGR (northwestern salamander)	Yes
Perimeter	5,436.35 feet	AMGR present	Yes
Lake or pond surface area	16.9 acres	Number of times stocked since?	14
Median Epilimnetic (surface) water temperature	19.5°C	Forest	71%
TKN – median	0.12 mg/L	Shrub	7%
Fishing potential (based on Trailblazer data)	Good	Meadow	22%
Shoreline development (ratio between perimeter and surface area)	1.790	Talus	0%
Inlet or outlet	Yes	Bedrock	0%
Number of inflow streams	2	Cliff	0%
Inflow type	Ephemeral	Vegetation zone	Low forest
Number of outflow streams	1	Cross-country zone	None
Isolated from any other lake or pond within 2,000 feet	Yes	Camp name	Willow Lake
Lake shares drainage with other lakes (other lakes denoted)	Yes (Ross Lake)	Camp type	Hiker
Index of connectivity	—	Distance to closest lake	5,000 feet
Observed fish reproduction	—	Accessible by horseback	Yes
Observed spawning habitat present	No	Trailhead outside the park	No
Reproducing species present	—	Trail to lake	Yes
Stocked spp/strain present	OCC	Line of sight distance to trail	0
Species/strains historically present	OM, OM(MW), OC, OCL(TL)	Number of overnight visitors to nearest camp annually	32
Stocking frequency (years of cycle)	1	Number of anglers annually (based on 10% assumption of total visitors)	3



Appendix F

PROPOSED MOUNTAIN LAKES FISHERY

MONITORING PLAN

APPENDIX F: PROPOSED MOUNTAIN LAKES FISHERY MONITORING PLAN

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INTRODUCTION

Adaptive management is a central theme of the three action alternatives analyzed in this *Draft Mountain Lakes Fishery Management Plan / Environmental Impact Statement* for the 91 naturally formed mountain lakes in the North Cascades National Park Service Complex (North Cascades Complex). Monitoring of the 91 lakes is a key component of adaptive management. Adaptive management is based on the continuing, iterative process of applying management actions, monitoring consequences, evaluating monitoring results against objectives, adjusting management actions, and using feedback to make future management decisions. The adaptive management process for the 91 lakes in the study area would include evaluating the effects of management actions (for example, management of low densities of nonreproducing fish) on biological resources at individual lakes and identifying whether and how these practices should be modified to meet the objectives of the selected management action for the lakes. Monitoring activities would be selected and designed to test the success and effectiveness of management actions at each lake. This proposed mountain lakes fishery monitoring plan (monitoring plan) for the North Cascades Complex would provide the basis for the monitoring activities.

The specific objectives of the monitoring plan are listed below.

Reduce uncertainty of current conditions by gathering additional information where data are lacking.

Develop, if needed, and implement standardized protocols for data collection that are cost effective, efficient, and explicitly linked to management actions. Also, develop thresholds/criteria for data evaluation that will facilitate the adaptive management process.

Perform adaptive management by evaluating the success or failure of management actions to conserve/improve biological integrity and provide quality fishing opportunities.

Sampling under the proposed monitoring plan is not intended to replace monitoring that has been or is currently being performed under other programs in the North Cascades Complex (such as long-term monitoring). Instead, monitoring would use data already collected and implement sampling protocols developed and applied within the North Cascades Complex lakes. One notable example of established sampling methods is the set of sampling protocols prepared by Hoffman et al. (2003). Other aquatic monitoring efforts include

Long-term research by the National Park Service (NPS) that was initiated following the 1988 Supplemental Agreement. The research was performed with the support of the U.S. Geological Survey (USGS)-Biological Resources Division and Oregon State University and completed in 2002. Results of this research are summarized in the “Purpose of and Need for Action” chapter in the section titled “Summary of Existing Research.”

Management by the Washington Department of Fish and Wildlife (WDFW) of fishery resources in 17 stocked lakes and 23 lakes with self-sustaining (reproducing) fish populations in North Cascades National Park and all lakes in the Ross Lake and Lake Chelan National Recreation Areas. Two private groups, the Washington State Hi-Lakers and the Trail Blazers Inc., assist the WDFW in collecting fishery data.

This proposed monitoring plan is organized as follows:

Past Monitoring: Existing Data, Reliability of Data, Protocols Used—provides a summary of the known physical, chemical, and biological data collected at the 91 lakes in the North Cascades Complex that are the subject of the *Draft Mountain Lakes Fishery Management Plan / Environmental Impact Statement* (plan/EIS).

Management Actions and Associated Monitoring Needs—for each management action, provides the needed monitoring efforts and objectives in table and flowchart formats.

Key Data Categories and Selection of Methods/Protocols for Monitoring—describes *key data* to be used during monitoring and recommends methods best suited for use in monitoring the results of the selected management actions.

Decision Support Framework—describes the basic elements in the process by which the Technical Advisory Committee (TAC) would make lake management decisions.

Adaptive Management Framework—discusses how the key data for each lake would be evaluated and interpreted to determine if a change in management direction would be needed.

Priorities for Monitoring—describes considerations that would be used when setting priorities as to which lakes would be monitored and which data are key to monitoring management activities.

References Cited

PAST MONITORING: EXISTING DATA, RELIABILITY OF DATA, PROTOCOLS USED

A variety of data have been collected from many of the 91 lakes in the North Cascades Complex. The most common physical characteristics, water temperature and depth, have been measured for approximately 75 of the 91 lakes. Outlet habitat type has only been estimated from Geographic Information System (GIS) data but not confirmed in the field. The 21 types of data (abiotic and biotic) collected from the 91 study area lakes are provided in [table F-1](#). For each data type, the method used to collect the data and the reliability of the data are listed in the table, with additional explanation provided in footnotes. In most cases, fishless lakes have less data available than do lakes that currently have fish.

MANAGEMENT ACTIONS AND ASSOCIATED MONITORING NEEDS

The 91 lakes in the North Cascades Complex have been placed into one of four categories according to the fishery population found in the lake. The four categories are

1. Lakes that are currently fishless
2. Lakes with high densities of reproducing fish
3. Lakes with low densities of reproducing fish
4. Lakes with nonreproducing fish.



TABLE F-1: NORTH CASCADES COMPLEX SURVEYS FOR 91 LAKES IN THE STUDY AREA—PROTOCOLS, DATA CATEGORIES, AND RELIABILITY OF DATA^a

Lake Information		Abiotic Data Categories						Biotic Data Categories															
								Fish					Amphibian			Benthic Macroinvertebrates		Zooplankton			Vegetation		
		Lake Name	NPS Lake Code	TKN (mg/l)	Surface Water Temperature	Lake Depth	Substrate	Available Spawning Habitat	Outlet Habitat Type	Fish Presence	Fish Reproductive Status	Fish Species Present	Density of Reproducing Fish	Status of Fish Population in Outlet	Snorkel Survey	Visual Survey	Trap Survey	OSU BMI Survey	NOCA BMI Survey	NOCA Presence Survey	OSU Presence Survey	OSU Density Survey	Riparian Vegetation
Azure	MP-09-01		1	X				Fishless														P	
Battalion	MLY-02-01	2	1	X				1	2	2	2	3	2	1	1		X			X		P	
Bear	MC-12-01	2	1	X				1	1	1	2	3					X			X		P	
Berdeen	M-08-01		2	X				1	1	2	2	2										P	
Berdeen (Lower)	M-07-01	2	2	X				1	1	2	2	3	2	3								P	
Berdeen (Upper)	M-09-01		2					2	2	2	3	2										P	
Blum (Largest/Middle, No. 3)	M-11-01		2		X			1	2	1	2	3						X				P	
Blum (Lower/West, No. 4)	LS-07-01	2	1	X	X			1	1	1	1	3	2					X				P	
Blum (Small/North, No. 2)	MC-01-01	2	2	X	X			Fishless					2					X				P	
Blum (Vista/Northwest, No. 1)	MC-02-01	2	1	X	X			Fishless					2				X	X				X	X
Bouck, Lower	DD-04-01	2	2	X				1	1	1	3	3					X			X		P	
Bouck, Upper	DD-05-01	1	1	X				1					2					X				X	X
Bowan	MR-12-01	1		X				1					2						X	X		P	
Coon	MM-10-01	1	1	X	X			1					2	2			X		X	X		P	
Copper	MC-06-01	1	1	X				1					2					X		X		X	X
Dagger	MR-04-01	1	1	X	X			1	1	2	1	3	2	2	2			X	X	X		P	
Dee Dee, Upper	MR-15-01	1	1	X				1	2	1	2		2					X		X		X	X
Dee Dee/Tamarack, Lower	MR-15-02	1	1	X				1					2	3	3			X		X	X	X	X
Despair, Lower	M-14-01							Fishless														P	
Despair, Upper	M-13-01							Fishless														P	
Diobsud No. 1	LS-01-01	1	1	X				1	1	1	2	2	1	3			X	X		X	X	X	X
Diobsud No. 2, Lower	LS-02-01	1	1	X				1	1	1	2	3	1	3			X			X	X	P	
Diobsud No. 3, Upper	LS-03-01	1	1	X				1					2	3			X			X		P	
Doubtful	CP-01-01	1	1	X	X			1	1	2	3	2	2				X	X	X	X		X	X
Doug's Tarn	M-21-01	2	2	X				1	1	1	2	3	2									P	
East, Lower	MC-14-02		2					Fishless						3				X				X	X
East, Upper	MC-14-01							Fishless										X				X	X
Firn	MP-02-01		2	X				1	1	2	3	3		3	3			X				X	X
Green	M-04-01		2	X				1	1	2	2	3										P	
Green Bench	LS-04-01		2	X				Fishless									X	X				X	X
Hanging	MC-08-01							1														P	
Hidden	SB-01-01		1	X	X			1	3	2	2	3					X		X			P	
Hidden Lake Tarn	EP-14-01		1	X				1										X				X	X
Hi-Yu	M-01-01	1	1	X				1					2	1				X				X	X
Hozomeen	HM-02-01	1	1	X	X			1	1	1	2	2	2				X	X	X	X		X	X
Ipsoot	LS-06-01		1	X			No outlet	1	1	2	2	No outlet		1								P	

TABLE F-1: NORTH CASCADES COMPLEX MOUNTAIN LAKES SURVEYS—PROTOCOLS, DATA CATEGORIES, AND RELIABILITY OF DATA (CONTINUED)

Lake Information		Abiotic Data Categories						Biotic Data Categories														
								Fish					Amphibian			Benthic Macroinvertebrates		Zooplankton			Vegetation	
Lake Name	NPS Lake Code	TKN (mg/l)	Surface Water Temperature	Lake Depth	Substrate	Available Spawning Habitat	Outlet Habitat Type	Fish Presence	Fish Reproductive Status	Fish Species Present	Density of Reproducing Fish	Status of Fish Population in Outlet	Snorkel Survey	Visual Survey	Trap Survey	OSU BMI Survey	NOCA BMI Survey	NOCA Presence Survey	OSU Presence Survey	OSU Density Survey	Riparian Vegetation	Aquatic Vegetation
Jeanita	DD-01-01	1	1	X	X		No outlet	1	2	1	2	No outlet	2	1		X		X			P	
Kettling	MR-05-01	2	2	X				1	1	2	1	3	2	1					X	X	P	
Kwahnesum	MC-07-01	2	1	X	X			1					2	1			X	X			X	X
McAlester	MR-10-01	2	1	X	X			1	1	1	1	1	1	1	1	X	X	X	X	X	X	X
Middle, Lower	MC-16-02		2	X				Fishless						3			X				X	X
Middle, Upper	MC-16-01		2	X				Fishless													P	
Monogram	M-23-01	1	1	X	X			1	1	1	2	3	2	1	3	X	X	X	X		X	X
Monogram Tarn	M-23-11							2						3	3						P	
Nert	M-05-01	1	1	X				2					2	1		X	X		X		X	X
Noisy Creek, Upper	LS-14-01							Fishless													P	
No Name	PM-01-01	2	1	X				1													P	
Panther Potholes, Lower	RD-05-02	1	1	X	X			2					1	1		X	X	X	X	X	X	X
Panther Potholes, Upper	RD-05-01	1	1	X	X			Fishless					1	1		X	X	X	X	X	X	X
Pegasus	EP-10-01							Fishless													P	
Pond SE of Kettling Lakes	MR-09-01	2		X				1					2				X		X	X	X	X
Quill, Lower	M-24-02						No outlet	1	3	2	3	No outlet									P	
Quill, Upper	M-24-01		2	X			No outlet	1	3	2	3	No outlet									P	
Rainbow	MR-14-01	2	1	X				1	1	1	1	3	1			X	X		X	X	X	X
Rainbow, Upper (North)	MR-13-01	1	1	X	X			Fishless					2	1		X		X	X	X	P	
Rainbow, Upper (South)	MR-13-02	1	1	X	X			1					1			X		X	X	X	P	
Rainbow, Upper (West)	MM-11-01	1	1	X				1					2						X		P	
Redoubt	MC-11-01	2	2	X				Fishless					2			X	X				X	X
Reveille, Lower	MC-21-02	2	2	X				Fishless								X	X		X		X	X
Reveille, Upper	MC-21-01	2	1	X				Fishless					2			X	X		X		X	X
Ridley	HM-03-01	1	1	X	X			1					2	1		X	X	X	X		X	X
Sky	EP-13-01							Fishless													P	
Skymo	PM-03-01	2	1	X				1	1	1	2	3	2	2	2	X	X		X		X	X
Sourdough	PM-12-01		2	X				1	1	1	2	3									P	
Sourpuss	ML-01-01	1	1	X				Fishless					2	3			X				X	X
Stiletto	MR-01-01	2	1	X				1									X				X	X
Stout	EP-09-02			X				1	1	1	2	2									P	
Stout, Lower	EP-09-01	2	2	X				1	1	1	2	3	2								P	
Sweet Pea	ML-02-01	1	1	X	X			1					2	3	3		X	X	X		X	X
Talus Tarn	M-06-01	1	1	X				Fishless					2	3		X					P	
Tapto, Lower	MC-17-03							Fishless													P	
Tapto, Middle	MC-17-02	1	1	X				Fishless								X			X	X	P	
Tapto, Upper	MC-17-01	2		X				Fishless								X	X		X	X	X	X
Tapto, West	MC-17-04	1	2	X				Fishless								X	X		X	X	X	X
Thornton, Lower	M-20-01	2	1	X				1	3	3	3	3	2	1			X		X		X	X

TABLE F-1: NORTH CASCADES COMPLEX MOUNTAIN LAKES SURVEYS—PROTOCOLS, DATA CATEGORIES, AND RELIABILITY OF DATA (CONTINUED)

Lake Information		Abiotic Data Categories						Biotic Data Categories														
								Fish					Amphibian			Benthic Macroinvertebrates		Zooplankton			Vegetation	
Lake Name	NPS Lake Code	TKN (mg/l)	Surface Water Temperature	Lake Depth	Substrate	Available Spawning Habitat	Outlet Habitat Type	Fish Presence	Fish Reproductive Status	Fish Species Present	Density of Reproducing Fish	Status of Fish Population in Outlet	Snorkel Survey	Visual Survey	Trap Survey	OSU BMI Survey	NOCA BMI Survey	NOCA Presence Survey	OSU Presence Survey	OSU Density Survey	Riparian Vegetation	Aquatic Vegetation
Thornton, Middle	M-19-01	2	1	X	X			1					2				X	X	X		X	X
Thunder	RD-02-01	1	1	X	X			Fishless					2	3	1	X	X	X	X		X	X
Tiny	MC-15-01		2	X				Fishless						3			X				X	X
Torment	ML-03-01	2	1	X	X			1					2	3				X			P	
Trapper	GM-01-01	1	1	X	X			1	1	2	2	2	2			X		X	X		P	
Triplet, Lower	SM-02-01	1	2	X				1	1	1	1	3	2	3		X	X		X	X	X	X
Triplet, Upper	SM-02-02	2	2	X				1	1	1	1	3	2	3		X	X		X	X	X	X
Triumph	M-17-01		2	X				1						1		X					P	
Unnamed	FP-01-01							Fishless													P	
Unnamed	MR-11-01	1	1	X	X			1					2	3	1	X	X	X	X	X	X	X
Unnamed	MR-16-01	2		X				2	3	2	1	3	2						X	X	P	
Vulcan	ML-04-01	1	1	X				Fishless					2	3	3	X	X		X		X	X
Wilcox/Lillie, Upper	EP-06-01	1	1	X				1	1	1	3	2				X			X		P	
Wilcox/Sandie, Lower	EP-05-01	2	1	X				1	1	1	3	3	2				X				X	X
Wild	MC-27-01	1	1	X				Fishless					2			X			X		P	
Willow	HM-04-01	1	1	X	X			1					2	2		X	X	X	X		X	X

Notes:
a. The presence/absence of data and its reliability are presented as a "snapshot" of the data available in April 2004. Additional lake surveys may have been performed, and conditions may change prior to baseline surveys conducted as part of the proposed monitoring plan.
Cells marked by an "X" indicate that a reliable survey has been conducted; blank cells indicate that no survey has been conducted.

Data Categories:

TKN (mg/l): Total Kjeldahl nitrogen determined using OSU protocols for collecting water samples in the field.
1 = High confidence in number because surveys on multiple dates were conducted, the mean has a low standard deviation, or few outliers were present.
2 = Low confidence in number because surveys were only conducted on one date, the mean had a high standard deviation, or two or more values were both higher and lower than 0.045 mg/l.

Surface Water Temperature: Surface water taken during thermal maxima (warmest period of day) over deepest portion of lake using OSU Protocols.
1 = High confidence in number because surveys were conducted on multiple dates, the mean has a low standard deviation, or few outliers were present.
2 = Low confidence in number because surveys were only conducted on one date, the mean had a high standard deviation, or the range of values was unusually high.

Lake Depth: Lake depth measured in feet at deepest portion of lake, depth is usually measured with a weighted line, but can be measured with electronic depth finders. Reliable measurements exist for most lakes.

Substrate (percentage by type: silt, sand, gravel, cobble, coarse woody debris, etc.): Percentage of substrate types is visually estimated for individual measured segments of shoreline during a survey of perimeter of lakeshore, and the percentages by type are totaled.

Available Spawning Habitat (spawning area and type of spawning habitat): No spawning habitat surveys have been conducted. The percentage of available (accessible) spawning gravel in inlet and outlet streams is visually estimated for measured stream areas. If available beach spawning habitat needs to be determined, gravel areas can be measured by snorkel surveys in areas where upwelling through gravel is measured or assumed.

Outlet Habitat Type (surface, subsurface, none): Outlet surveyed in field to determine if a surface connection exists part of the season so that fish can physically migrate out from a lake into downstream basin. Currently, the only available information is if a lake does or does not have an outlet.

Fish Presence: Fish presence is measured by setting funnel traps, visual observation of shallow areas of lake (by wading or snorkeling), observation of surface feeding activity, hook-and-line fishing, or gillnets. Since this information is to be gathered after a fish removal treatment, young of the year are the target of surveys. Visual observation and trapping are likely to be the most successful methods of surveying.
Fishless = Lake is currently fishless. This information has been determined by either survey or historic information (no reports of observed fish or lake with no recorded reproduction and has not been stocked in over 10 years).
1 = High confidence that fish are present in lake because (1) reproduction well documented, (2) lake has been recently stocked, or (3) recent reports exist of fish observed or caught.
2 = Low confidence in presence of fish because of lack of confidence in available records.

Fish Reproductive Status (by species/subspecies/hatchery stock): Fish have continued to persist in multiple year classes with no documented stocking occurring. Fish have been observed spawning, and fry have been documented during years when documented stocking is not known to have occurred.
1 = Lakes with known reproduction at adequate levels to sustain population.
2 = Lakes where limited levels of reproduction are known to occur.
3 = Lakes where limited levels of reproduction are thought to occur.

Fish Species Present (species/subspecies/hatchery stock): Fish species have been determined through historic records of stocking and examination of catch records. In one case (McAlester Lake), a genetic analysis of the fish population is available.
1 = Fish species/strain/hatchery stock is well documented.
2 = Fish species/subspecies/strain is not fully documented or level of introgression is suspected.
3 = Species of fish that is reproducing is not known.



TABLE F-1: NORTH CASCADES COMPLEX MOUNTAIN LAKES SURVEYS—PROTOCOLS, DATA CATEGORIES, AND RELIABILITY OF DATA (CONTINUED)

<p>Density of Reproducing Fish: The only reliable estimates are from mark-and-recapture studies conducted by OSU.</p> <ul style="list-style-type: none">1 = Density of reproducing fish population has been documented through mark-and-recapture study (OSU protocols).2 = Density of reproducing fish has not been quantified but estimated based on subjective data and best professional judgment.3 = Density of reproducing fish has not been documented, and no data other than presence and a general idea of species is available. <p>Status of Fish Population in Outlet: The outlet stream of McAlester Lake is the only stream where an assessment of downstream migration of trout introduced into mountain lakes has been documented. Outlet streams of lakes with reproducing populations of trout should be surveyed by visual means (assessment of availability of suitable habitat and visual signs of trout) to determine where fish occur. Backpack electrofishers should be used to confirm the upstream extent of native fish (usually at a barrier falls) and the presence of introduced fish above and below the upstream maximum extent of native fish.</p> <ul style="list-style-type: none">1 = Outlet has been surveyed for presence and type of fish downstream to native fish populations.2 = Outlet has not been surveyed, but some evidence of downstream migration and colonization is available.3 = Outlet has not been surveyed. <p>No outlet; No surface outlet is known to exist.</p> <p>Amphibian Snorkel Survey: OSU protocol was used to determine salamander nearshore population densities by conducting nearshore snorkel transects of randomly selected 100-meter segments of lake shorelines.</p> <ul style="list-style-type: none">1 = High confidence in data because more than 2 surveys were conducted.2 = Moderate confidence in data because 1–2 surveys were conducted. The probability of detection of populations was still good, but density data may reflect low recruitment years (weather and other causes). <p>Amphibian Visual Survey: Visual surveys of amphibians conducted utilizing methodologies outlined in Olson et al. 1997. Surveys are not quantitative (number/time, area, or distance). Amphibians usually identified without capture, but where identification is questionable, individuals are captured by hand or dipnet and voucher specimens collected if necessary.</p> <ul style="list-style-type: none">1 = High confidence in presence because amphibians were observed.2 = Moderate confidence in presence data because more than one survey was conducted.3 = Low confidence in presence data because only one survey was conducted. <p>Amphibian Trapping Survey: Trapping surveys conducted with funnel traps utilizing methodologies outlined in Olson et al. 1997. Some surveys were quantitative (number/time), but it is unlikely that enough traps were set to achieve the level of detection available from a snorkel survey. No mark-and-recapture surveys were conducted, so densities were not determined.</p> <ul style="list-style-type: none">1 = High confidence in presence because amphibians were observed.2 = Moderate confidence in presence data because more than one survey was conducted.3 = Low confidence in presence data because only one survey was conducted. <p>OSU Benthic Macroinvertebrate Survey: Survey used OSU sampling protocols. BMI were collected with kicknets. No habitat data (substrate, riparian vegetation, and aquatic vegetation) were collected.</p> <p>NOCA Benthic Macroinvertebrate Survey: Survey used NOCA sampling protocols. More intensive sampling of BMI occurred using kicknets for sampling. This protocol is more likely to detect presence of all species present than OSU protocols. In addition, habitat data (substrate, riparian vegetation, and aquatic vegetation) were collected.</p> <p>NOCA Zooplankton Presence Survey (to document the presence of large copepod species): Surveys used vertical net tows, but information has not been quantified and methodology or equipment documented.</p> <p>OSU Zooplankton Presence Survey (to document the presence of large copepod species): Surveys used OSU protocol for vertical (deeper lakes) or horizontal (shallow lakes) net tows. Samples were not quantified by volume of water sampled, but proportions of taxa were measured to determine dominant/subdominant taxa. Reliability of presence data is good, but sparse populations may not be documented.</p> <p>OSU Zooplankton Density Survey (to document the presence and density of large copepod species): Surveys used OSU protocol in vertical or horizontal net tows. Data were quantified by determining the volume of water sampled to approximate zooplankton densities by species.</p> <p>Riparian Vegetation: Percentage of riparian vegetation by type (shrub, forest, talus, forbes) was visually estimated for measured segments of shoreline during surveys of lake perimeters. The total breakdown by percentage for each vegetation type was calculated from this data. Cells marked with an "X" indicate that a survey was performed. Cells marked with a "P" indicate that this information has been approximated through aerial photo interpretation.</p> <p>Aquatic Vegetation: The percentage of shoreline with aquatic vegetation present has been visually estimated for measured segments of shoreline during a survey of lake perimeters. The total percentage of shoreline with aquatic vegetation was calculated from this data.</p>
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Management actions for each of the four categories of lakes are described in [table F-2](#). Management actions and their associated monitoring requirements would differ for many lakes according to the action alternative (B, C, or D) chosen. A list of all 91 lakes and their management actions under each alternative are shown in [table F-3](#). Under alternative B, up to 42 lakes may be available for fishing; under alternative C, up to 11 lakes may be available for fishing; and under alternative D, all 91 lakes would either remain fishless or be returned to a fishless condition. Under the no-action alternative (alternative A), current lake management practices would continue.

For each management action, the monitoring actions and objectives would remain the same, regardless of the alternative chosen, such as under management action 2A—remove all reproducing fish. Monitoring the recovery of native organisms and maintaining the lake in a fishless state would be the same under alternatives B and C. Under management action 2A, four monitoring actions are indicated:

Monitor effects of chemical fish removal on nontarget organisms (if applicable)

Monitor effectiveness of fish removal or die off (if applicable)

Monitor recovery of indicators after fish removal or die off (never restock)

Monitor riparian vegetation impacts/recovery (if present)

These monitoring actions are the same for all lakes that fall under management action 2A.

The various management actions and their monitoring requirements and objectives are listed in [table F-4](#). Monitoring actions are shown in the main body of the table, and the monitoring objectives are described in footnotes. The process for deciding what monitoring should be performed is illustrated in the monitoring flowchart ([figure F-1](#)).

KEY DATA CATEGORIES AND SELECTION OF METHODS/PROTOCOLS FOR MONITORING

Key data are needed in order to determine into what category to place each lake and to monitor the effects of the various management actions. These data include such parameters as presence/absence of fish, density of fish, fish reproductive status, zooplankton species and abundance, benthic (bottom dwelling) macroinvertebrate community composition, lake productivity, lake depth, and lake location relative to the Cascade Crest (west or east side). Data already collected or needed to be collected are separated into abiotic (physical and chemical) and biotic (fish, amphibians) categories. Within each of these categories, data are further identified as either *key data* or *additional data* that may be useful but are not critical to monitoring the management actions.

TABLE F-2: MANAGEMENT ACTIONS FOR THE 91 LAKES

<p>This table presents a standard set of fishery management actions for implementation under alternatives B and C. Note that management actions under alternative A would not change from current management, and management actions under alternative D only involve discontinuing stocking and removing all fish. The standard management actions in this table are broken down into classes 1-4, based on the Technical Advisory Committee's current understanding of the presence, reproductive status, and density of fish in the lakes. These standard management actions would require periodic monitoring and evaluation to facilitate adaptive management.</p>	
For a lake that is currently fishless:	
1	The lake would remain fishless.
For a lake with high densities of reproducing fish, apply one of the following management actions:	
2A	Remove all reproducing fish. Monitor the recovery of native organisms and keep the lake fishless.
2B	Remove all reproducing fish. Monitor lake conditions and use the results to determine whether or not to restock the lake with nonreproducing fish. If the lake is restocked and monitoring results indicate fish are causing major adverse impacts, then fish densities would be reduced by changing stocking densities, stocking cycles or the species of stocked fish. If these management changes do not work, then discontinue stocking.
2C	Remove all reproducing fish. Implement a resting period (that is, keep the lake fishless for a period of time) to foster recovery of native organisms. The duration of the resting period will be determined on a lake-by-lake basis based upon monitoring results. If monitoring results indicate favorable recovery of native organisms, then restock the lake with low densities of nonreproducing fish and monitor lake conditions. If monitoring results indicate fish are causing major adverse impacts, then reduce stocking densities, stocking cycles, or the species of stocked fish. If these management changes do not work, then discontinue stocking.
For a lake with low densities of reproducing fish, apply one of the following management actions:	
3A	Remove all reproducing fish. Monitor the recovery of native organisms, and keep the lake fishless.
3B	Evaluate the reproductive status of fish and the status of indicator taxa. If fish density is high enough that impacts on indicator taxa may be major, apply prescription 2A, 2B, or 2C. If fish densities and impacts to indicator taxa are low, maintain the low fish densities. If monitoring data indicate fish are causing major adverse impacts, then completely remove fish.
3C	For lakes with extremely low densities of fish, augment the population with supplemental stocking and monitor indicator taxa. If monitoring results indicate fish are causing major adverse impacts, then stop stocking and remove all fish.
For a lake that has been stocked and does not contain a reproducing population of fish, apply one of the following management actions:	
4A	Discontinue stocking. Monitor the recovery of native organisms.
4B	Lack of data for decision-making. Discontinue stocking and monitor lake conditions. If the lake is restocked and monitoring results indicate fish are causing major adverse impacts, then discontinue stocking.
4C	Continue stocking with low densities of fish expected not to reproduce in the lake. If monitoring results indicate fish are causing major adverse impacts, then reduce stocking densities, stocking cycles or the species of stocked fish. If these management changes do not work, then discontinue stocking.



TABLE F-3: MANAGEMENT ACTION FOR EACH OF THE 91 LAKES

Note: Shaded rows indicate lakes that are in Ross Lake and Lake Chelan National Recreation Areas; the other lakes are in the national park portion of the North Cascades Complex.

Lake Name	NPS Lake Code	Current Condition of Lake (as represented under alternative A)	Management Action		
			Alternative B	Alternative C	Alternative D
Azure	MP-09-01	Fishless	1	1	1
Battalion	MLY-02-01	High density reproducing fish	2B	2B	2A
Bear	MC-12-1	High density reproducing fish	2C	2A	2A
Berdeen	M-08-01	High density reproducing fish	2C	2A	2A
Berdeen, Lower	M-07-01	High density reproducing fish	2A	2A	2A
Berdeen, Upper	M-09-01	High density reproducing fish	2A	2A	2A
Blum (Largest/Middle, No. 3)	M-11-01	High density reproducing fish	2B	2A	2A
Blum (Lower/West, No. 4)	LS-07-01	High density reproducing fish	2C	2A	2A
Blum (Small/North, No. 2)	MC-01-01	Fishless	1	1	1
Blum (Vista/Northwest, No. 1)	MC-02-01	Fishless	1	1	1
Bouck, Lower	DD-04-01	High density reproducing fish	2C	2C	2A
Bouck, Upper	DD-05-01	Stocked with nonreproducing fish	4A	4A	4A
Bowan	MR-12-01	Stocked with nonreproducing fish	4A	4A	4A
Coon	MM-10-01	Stocked with nonreproducing fish	4C	4C	4A
Copper ^a	MC-06-01	Stocked with nonreproducing fish	4B	4A	4A
Dagger	MR-04-01	High density reproducing fish	2B	2A	2A
Dee Dee, Upper	MR-15-01	High density reproducing fish	2B	2A	2A
Dee Dee/Tamarack, Lower	MR-15-02	Stocked with nonreproducing fish	4A	4A	4A
Despair, Lower	M-14-01	Fishless	1	1	1
Despair, Upper	M-13-01	Fishless	1	1	1
Diobsud No. 1	LS-01-01	High density reproducing fish	2A	2A	2A
Diobsud No. 2, Lower	LS-02-01	High density reproducing fish	2B	2A	2A
Diobsud No. 3, Upper	LS-03-01	Stocked with nonreproducing fish	4A	4A	4A
Doubtful	CP-01-01	High density reproducing fish	2C	2A	2A
Doug's Tarn	M-21-01	High density reproducing fish	2C	2A	2A
East, Lower	MC-14-02	Fishless	1	1	1
East, Upper	MC-14-01	Fishless	1	1	1
Firn	MP-02-01	Low density reproducing fish	3B	3A	3A
Green	M-04-01	High density reproducing fish	2B	2A	2A
Green Bench	LS-04-01	Fishless	1	1	1
Hanging	MC-08-01	High density reproducing fish	2A ^b	2A ^b	2A ^b
Hidden	SB-01-01	Low density reproducing fish	3C	3A	3A
Hidden Lake Tarn	EP-14-01	Stocked with nonreproducing fish	4A	4A	4A
Hi-Yu	M-01-01	Stocked with nonreproducing fish	4B	4A	4A
Hozomeen	HM-02-01	High density reproducing fish	2A	2A	2A
Ipsoot	LS-06-01	Low density reproducing fish	3B	3A	3A
Jeanita	DD-01-01	Low density reproducing fish	3B	3A	3A
Kettling	MR-05-01	High density reproducing fish	2A	2A	2A
Kwahnesum	MC-07-01	Stocked with nonreproducing fish	4A	4A	4A
McAlester	MR-10-01	High density reproducing fish	2B	2B	2A
Middle, Lower	MC-16-02	Fishless	1	1	1
Middle, Upper	MC-16-01	Fishless	1	1	1
Monogram	M-23-01	High density reproducing fish	2C	2A	2A
Monogram Tarn	M-23-11	Stocked with nonreproducing fish	4A	4A	4A
Nert	M-05-01	Stocked with nonreproducing fish	4A	4A	4A
Noisy Creek, Upper	LS-14-01	Fishless	1	1	1
No Name	PM-01-01	Stocked with nonreproducing fish	4C	4A	4A

TABLE F-3: MANAGEMENT ACTION FOR EACH OF THE 91 LAKES (CONTINUED)

Lake Name	NPS Lake Code	Current Condition of Lake (as represented under Alternative A)	Management Action		
			Alternative B	Alternative C	Alternative D
Panther Potholes, Lower	RD-05-02	Stocked with nonreproducing fish	4A	4A	4A
Panther Potholes, Upper	RD-05-01	Fishless	1	1	1
Pegasus	EP-10-01	Fishless	1	1	1
Pond SE of Kettling Lakes	MR-09-01	Stocked with nonreproducing fish	4C	4C	4A
Quill, Lower	M-24-02	Stocked with nonreproducing fish	4B	4A	4A
Quill, Upper	M-24-01	Stocked with nonreproducing fish	4B	4A	4A
Rainbow	MR-14-01	High density reproducing fish	2C	2C	2A
Rainbow, Upper (North)	MR-13-01	Fishless	1	1	1
Rainbow, Upper (South)	MR-13-02	Stocked with nonreproducing fish	4A	4A	4A
Rainbow, Upper (West)	MM-11-01	Stocked with nonreproducing fish	4A	4A	4A
Redoubt	MC-11-01	Fishless	1	1	1
Reveille, Lower	MC-21-02	Fishless	1	1	1
Reveille, Upper	MC-21-01	Fishless	1	1	1
Ridley	HM-03-01	Stocked with nonreproducing fish	4C	4C	4A
Sky	EP-13-01	Fishless	1	1	1
Skymo	PM-03-01	High density reproducing fish	2C	2A	2A
Sourdough	PM-12-01	High density reproducing fish	2B	2A	2A
Sourpuss	ML-01-01	Fishless	1	1	1
Stiletto	MR-01-01	Stocked with nonreproducing fish	4B	4A	4A
Stout	EP-09-02	Low density reproducing fish	3B	3A	3A
Stout, Lower	EP-09-01	Low density reproducing fish	3B	3A	3A
Sweet Pea	ML-02-01	Stocked with nonreproducing fish	4C	4A	4A
Talus Tarn	M-06-01	Fishless	1	1	1
Tapto, Lower	MC-17-03	Fishless	1	1	1
Tapto, Middle	MC-17-02	Fishless	1	1	1
Tapto, Upper	MC-17-01	Fishless	1	1	1
Tapto, West	MC-17-04	Fishless	1	1	1
Thornton, Lower	M-20-01	Low density reproducing fish	3C	3A	3A
Thornton, Middle	M-19-01	Stocked with nonreproducing fish	4C	4A	4A
Thunder	RD-02-01	Fishless	1	1	1
Tiny	MC-15-01	Fishless	1	1	1
Torment	ML-03-01	Stocked with nonreproducing fish	4A	4A	4A
Trapper	GM-01-01	Low density reproducing fish	3B	3A	3A
Triplet, Lower	SM-02-01	High density reproducing fish	2C	2C	2A
Triplet, Upper	SM-02-02	High density reproducing fish	2A	2A	2A
Triumph	M-17-01	Stocked with nonreproducing fish	4C	4A	4A
Unnamed	FP-01-01	Fishless	1	1	1
Unnamed	MR-11-01	Stocked with nonreproducing fish	4C	4C	4A
Unnamed	MR-16-01	Low density reproducing fish	3B	3B	3A
Vulcan	ML-04-01	Fishless	1	1	1
Wilcox/Lillie, Upper	EP-06-01	High density reproducing fish	2A	2A	2A
Wilcox/Sandie, Lower	EP-05-01	High density reproducing fish	2C	2A	2A
Wild	MC-27-01	Fishless	1	1	1
Willow	HM-04-01	Stocked with nonreproducing fish	4C	4C	4A

Notes:

- a. In August 2004, a large fish kill was observed in Copper Lake, possibly due to disease. Further surveys are needed to confirm that the lake is fishless.
- b. Remove all reproducing fish pending agreement with British Columbia.



TABLE F-4: MANAGEMENT ACTIONS AND MONITORING OBJECTIVES

Monitoring Objectives: (see below for descriptions)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Monitoring Actions: Management Actions ^(a)	Perform Baseline Measurements	Monitor Effects of Chemical Fish Removal on Nontarget Organisms (if applicable)	Monitor Effectiveness of Fish Removal or Die Off (if applicable)	Monitor Recovery of Indicators After Fish Removal or Die Off (never restock) ^(b)	Monitor Indicators to Determine Restocking After Fish Removal or Die Off	Monitor Effects of (Re)Stocked Fish on Indicators ^(c)	Determine Characteristics of Fish Population	Improve Knowledge of Recreational Fishing Levels	Survey Riparian Vegetation Impacts/Recovery (if present) ⁽²⁾
Lakes that are Currently Fishless									
1 (Lakes to remain fishless) [29,29]	X ^d (for selected lakes)								
Lakes with High Densities of Reproducing Fish									
2A (Treat lakes to remove high-density reproducing fish) [8,22]	X (as needed)	X	X	X					X
2B (Remove reproducing fish, gather information, determine if lake should be restocked) [8,2]	X (as needed)	X	X		X	X	X	X	X
2C (Remove reproducing fish, allow lake to rest, restock with nonreproducing fish) [11,3]	X (as needed)	X	X			X	X	X	X
Lakes with Low Densities of Reproducing Fish									
3A (Treat lakes to remove low density reproducing fish) [0,8]	X (as needed)	X	X	X					X
3B (Evaluate reproductive status of fish, allow low densities of fish) [7,1]	X (as needed)	X (if needed)	X (if needed)			X	X	X	X
3C (Supplement low densities of reproducing fish with stocked nonreproducing fish) [2,0]	X (as needed)	X (if needed)	X (if needed)			X	X	X	X
Lakes with Nonreproducing Fish									
4A (Discontinue stocking of lake [nonreproducing fish]) [12,21]	X (as needed)		X	X					X
4B (Discontinue stocking of lake, gather information, determine if lake should be restocked) [5,0]	X (as needed)	X (if needed)	X (if needed)		X	X	X	X	X
4C (Continue to stock with nonreproducing fish) [9,5]	X (as needed)	X (if needed)	X (if needed)			X	X	X	X

Notes:

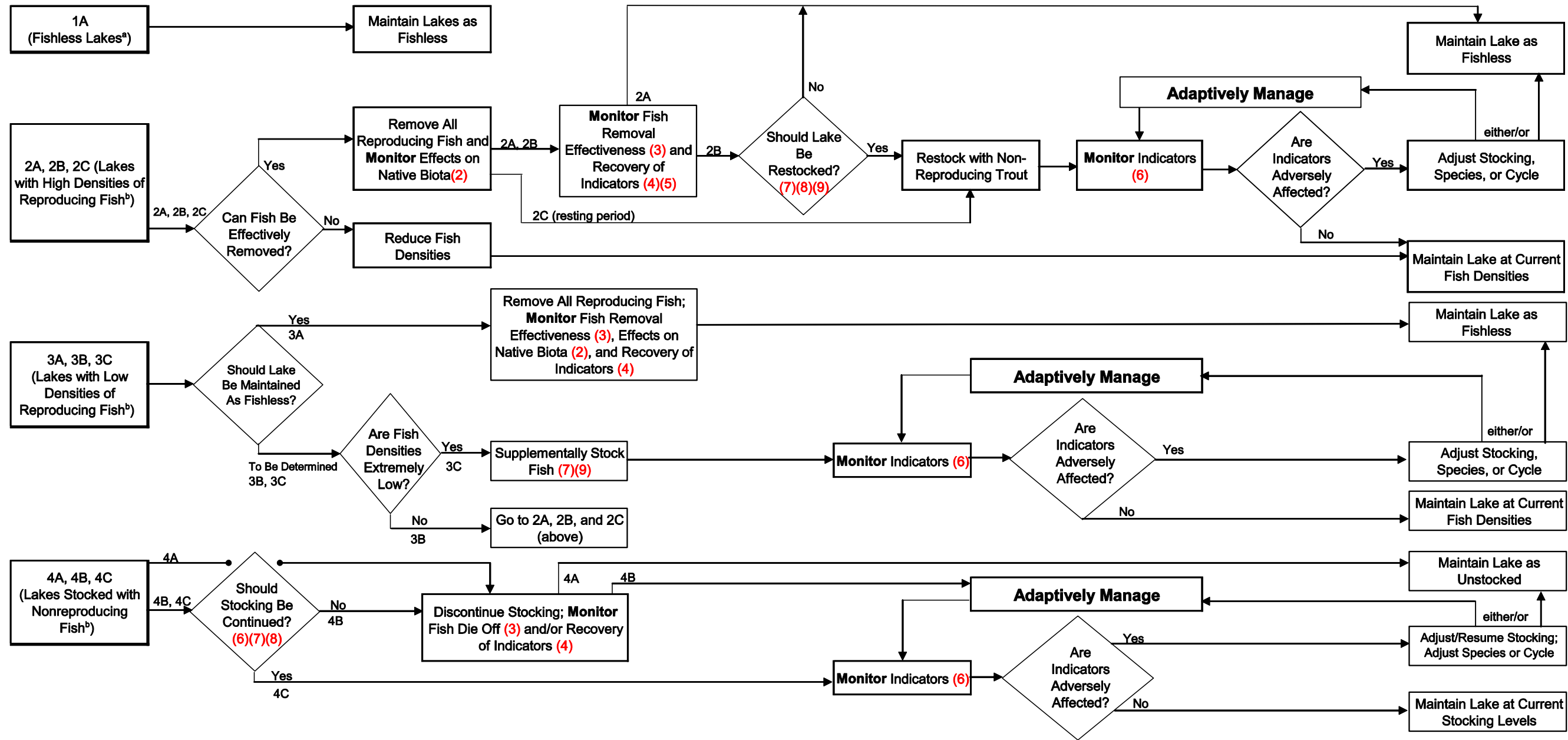
- a. See table F-2 for full descriptions of the management actions. Numbers in brackets [B,C] are estimated numbers of lakes within each management action under alternatives B and C (see table F-3).
- b. If needed as input to adaptive management decisions.
- c. If unacceptable effects occur, a different management action (e.g., fish removal) would be applied.
- d. X = possible monitoring could occur for each management action.

MONITORING OBJECTIVES:

1. To supplement existing data with key biological and physical/chemical data as needed for use as baseline in the monitoring program.
2. To evaluate the degree of adverse impact of antimycin on native biota in order to minimize impacts of future antimycin applications.
3. To determine the effectiveness of fish removal and to evaluate if all fish (reproducing or nonreproducing) have been eliminated or if population levels have been reduced, and if additional/different fish removal should be performed.
4. In lakes that would be maintained as fishless, to determine recovery of indicators after fish removal or die-off — never restock. Use the monitoring data as input for possible adjustments to thresholds or future adaptive management decisions.
5. Prior to any restocking, use the data to determine whether indicators are satisfactorily recovering to permit restocking at an appropriate level. Use the data as input to adaptive management decisions.
6. To determine the impacts of nonnative fish on the native biota. Use the data as input to future adaptive management decisions.
7. To improve knowledge of recreational fishing activity. To understand relative demand for fishing and focus mitigation measures where needed.
8. To determine fish population characteristics. Data would serve as one indicator of the biological condition of the lake and as an indicator of recreational fishing opportunities/experience and the need for stocking/restocking with nonreproducing fish.
9. If riparian-zone vegetation is present along shoreline, determine the impacts of trampling of vegetation by anglers. Data on degree of trampling and recovery would be used as input to management decisions.



FIGURE F-1: MOUNTAIN LAKES FISHERY MANAGEMENT MONITORING FLOW CHART



NOTES:

- Selected lakes may be surveyed for baseline measurements of key data (1).
- It is assumed that these lakes have adequate baseline aquatic data to support decision making. If data are found to be inadequate, the missing/inadequate key data sets would be supplemented with baseline sampling and analysis (1) as described in the monitoring plan and in "Table F-4: Management Actions and Monitoring Objectives."

Red numbers (1, 2, 3, 4, 5, 6, 7, 8, 9) indicate monitoring objectives (see "Table F-4: Management Actions and Monitoring Objectives").



ABIOTIC CATEGORIES — KEY DATA

Water temperature—required to accurately classify lakes for analysis of biotic data and is also used in determining fish removal methodology.

Water conductivity—required to determine effectiveness of electrofishing for use in removing fish.

Lake depth—required to accurately classify lakes for analysis of biotic data and to evaluate best methodology to effectively remove fish. Lake depth data is available for most lakes.

Total Kjeldahl nitrogen (TKN)—serves as a general indicator of lake nutrient levels and is needed to classify lakes for analysis of biotic data. TKN data is available for a moderate number of lakes, but the data is from many lakes and is questionable due to the extreme range of values recorded or the limited number of data points.

Substrate percentage by type (silt, sand, gravel, coarse woody debris, etc.)—needed to classify lakes by type when analyzing benthic macroinvertebrate (BMI) survey data and may be useful in evaluating the biotic integrity of assemblages of other groups of organisms.

Available spawning area (ASA or available spawning gravel) and spawning habitat (inlet, outlet, or beach) type—needed to evaluate the feasibility of fish removal and determine the best methodology for fish removal.

Outlet habitat type (surface, subsurface, none)—needed to determine if it is physically possible for fish in mountain lakes to migrate out of lakes into downstream basins.

Inlet and outlet water flows—needed to determine proper amount of the piscicide antimycin needed to eliminate fish, yet not impact other aquatic biota.

ABIOTIC CATEGORIES —
ADDITIONAL DATA POTENTIALLY USEFUL

In addition to TKN, other basic water chemistry/water quality data (pH, water hardness, turbidity, basic nutrients) may be available or could be gathered while collecting water samples for TKN measurements. This information probably should be collected if additional TKN measurements are needed from individual lakes, but may not be necessary for the purposes of monitoring under the plan/EIS. Also, water samples for analysis of anthropogenic pollutants (such as methyl-mercury and persistent organic pollutants) could be collected. Results of these analyses would be used to help understand any observed long-term trends in the monitored aquatic communities.

BIOTIC CATEGORIES — KEY DATA

Fish

Fish Presence—information has already been collected for the 91 lakes; however, after fish removal treatments, it would be necessary to survey lakes for fish presence to determine the success of removal treatments. If stocking were continued, fishing mortalities may have to be monitored to determine suitable stocking rates (densities) of nonreproducing fish.

Reproductive status of fish in lakes by species/subspecies/hatchery stock—needed in order to place each lake into one of the three categories used in the monitoring plan. It would also be



used to classify lake by type for the analysis of survey data; that is, fish reproductive status would be required for analysis of BMI survey data under the protocol for the North Cascades Complex.

Species of trout present in lakes—needed in conjunction with reproductive status. This also includes examining suspect populations for hybridization. In some cases, genotypes would probably have to be determined by USGS biological survey. Tissue samples should be collected where fish cannot be identified by physical appearance (phenotype).

Density of reproducing fish—required in order to place each lake into one of the three categories used in the monitoring plan. Also, in lakes where gillnets would be used to reduce fish density, the success of treatment would need to be monitored.

Status of fish population in outlet—needed to assess the potential for escape or extent of escape of stocked populations of trout in mountain lakes to downstream water bodies.

Fishery health—needed as an indication of the quality of sport fishing in lakes that are currently stocked or would be stocked. Elements used to determine overall fishery health would include growth rates, condition factors, and parasite loads.

Amphibians

Three amphibian protocols (snorkel, visual, and trapping) have been utilized during amphibian surveys. Since larvae population densities are required for lake management, it is recommended that snorkel surveys be used for both presence and density information. All three methodologies could be used to determine salamander presence, with snorkeling providing the most reliable presence information. Although trapping may be used for mark-and-recapture estimates of population densities, snorkeling would be the most practical method of determining population densities of amphibian larvae. Amphibian surveys would focus on salamanders, but the presence/abundance of Columbia spotted frogs (*Rana luteiventris*) should also be noted.

Presence of salamander larvae by species—needed to document the presence of either of the two salamander species found in the North Cascades Complex: long-toed salamander (*Ambystoma macrodactylum*) or Northwestern salamander (*A. gracile*). Although the extended rearing period of salamander larvae in lakes (more than one year) increases the probability of detection, how appealing larvae are to fish can vary with weather and climate conditions.

Density of salamander larvae by species—needed to evaluate potential impacts of fish to salamander populations; same problems as described above.

Benthic Macroinvertebrates

Two protocols were used for benthic (bottom dwelling) macroinvertebrate (BMI) surveys. An OSU protocol was used for a provisional inventory of species composition at each lake; however, the methodology developed by staff at the North Cascades Complex has a greater probability of detecting less common or difficult to detect species, and when combined with substrate and vegetation surveys, enables a more detailed analysis and better predictions of species assemblages in the study area lakes.



Although there is some overlap in the lakes surveyed by the two different protocols, coverage is not complete. If the protocol at the North Cascades Complex were used for BMI surveys, additional surveys may be required in lakes that have only been surveyed under the OSU protocol.

Presence and frequency of occurrence of benthic macroinvertebrates by species—needed to determine the biodiversity index for BMI, which can be used to evaluate direct fish impacts to macroinvertebrates. The season of the year when lakes are surveyed, and the fragmented distribution of some species populations, may create issues with the BMI data, which may need compensation.

Zooplankton

Data describing the presence and density of large copepods are needed to evaluate direct fish impacts on zooplankton. Because the presence and densities of individual zooplankton species vary dramatically during the ice-free season, the timing of surveys can create an issue with the comparability of these data between lakes and from year to year.

Three protocols have been used for zooplankton surveys.

Earlier surveys were conducted by the NPS at the North Cascades Complex. Information about the survey methodology is not available, but it does not appear to have been quantitative and appears to have been used only for identification of a few species (large copepods and a few other important taxa).

Zooplankton surveys were also conducted by OSU using more intensive searches. Most of the surveys were not quantitative but only intended to determine presence of each species that were the dominant and subdominant species.

Additional surveys were conducted by OSU using essentially the same protocols used for their initial surveys but with the sampled water volume quantified. It was recommended that this latter OSU protocol be used to quantitatively measure the presence and density of large copepods during lake monitoring.

BIOTIC CATEGORIES — ADDITIONAL DATA POTENTIALLY USEFUL

Surveys of riparian and aquatic vegetation may be required in conjunction with the BMI surveys at the North Cascades Complex to determine the biodiversity index for individual lakes. Other vegetation data would be useful in assessing habitat quality for salamanders or the presence of sensitive plant species:

Riparian vegetation (percent by type: talus, shrub, forbes, forest)—information may be needed to classify lakes by type when analyzing BMI survey data and may be useful in evaluating the biological integrity of assemblages of other groups of organisms.

Presence and status of state-listed plant species or other vegetation that is unique or particularly sensitive to trampling—information would be useful in deciding whether to mitigate for angler use or whether a lake should be closed to restocking.

Aquatic Vegetation (percent of shoreline with aquatic vegetation)—information also may be needed to classify lakes by type when analyzing BMI survey data and may be useful in evaluating the biotic integrity of assemblages of other groups of organisms.

Width of emergent vegetation—useful in determining the survivability of adult salamanders during the breeding season. This could be collected during assessments of the percentage of aquatic vegetation.

Distance to closed-canopy forest—helpful in assessing the availability of adult salamander habitat for pond-breeding salamanders. This information has been evaluated through interpretation of ortho-photographs, actual field measurements of interpretation of better-quality aerial photographs would provide a better assessment.

Descriptions of monitoring protocols for each data category are provided in [appendix F-1](#). The descriptions include a brief explanation of the protocol itself, the number of lakes where it has been performed, and the reason for collecting the data.

ADAPTIVE MANAGEMENT FRAMEWORK

Once the monitoring program has been initiated and *key data* collected, as needed, for each lake in the program, the data would be evaluated and interpreted to determine if a change in management direction would be needed, based on the management objectives. This could be done in a variety of ways, including the development and use of a formal decision support model, such as what is used in the *Northwest Forest Aquatic and Riparian Effectiveness Monitoring Plan* (Reeves et al. 2004) or by the establishment of a decision support framework that would use a designated Technical Advisory Committee to evaluate the data, based on a set of criteria or thresholds that would be developed to guide the decision. The committee would be charged with

- establishing priorities as to which lakes to monitor and which physical/chemical/biological parameters to monitor

- developing and refining evaluation thresholds/criteria

- assessing whether the data indicate that some thresholds have been exceeded or that biological integrity of the system is being compromised

- deciding if a change in management actions may be necessary

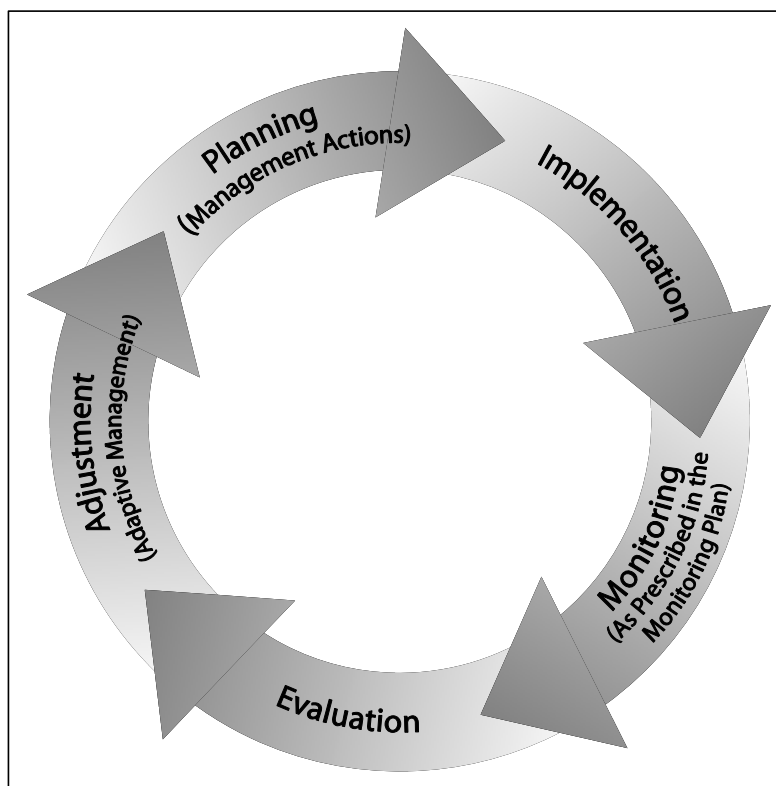
- making other lake management decisions, as needed

At this point in time, a formal decision support model has not been developed for use in this proposed monitoring plan; rather, the following outlines a decision support framework, or decision protocol, that has been developed to provide for a consistent, integrated interpretation of the data, using the best science available. The interpretation would drive future adaptive management decisions, as indicated in [figure F-2](#).

Integral to the adaptive management component of the framework, is continued monitoring and evaluation, as needed, to ensure the management objectives for the lake(s) are being met.



FIGURE F-2: FUTURE ADAPTIVE MANAGEMENT DECISIONS



TECHNICAL ADVISORY COMMITTEE COMPOSITION

A necessary component of this decision protocol is the establishment of a technical advisory committee (TAC) that would review the *key data* categories and validate reference sites and values; define the evaluation factors and criteria; adjust the decision support protocol, as needed, to take into account different indicator weights and relations; apply the criteria; and verify the results. This committee must include regional and provincial experts who represent interagency and interdisciplinary skills and who can draw upon the expertise and knowledge of local research and field staffs, as necessary. The TAC for the monitoring plan would consist of key researchers in the NPS, WDFW, and USGS who have been involved in past monitoring in the North Cascades Complex. In addition, other TAC members who would be familiar with the North Cascades Complex and the ecology of high mountain lakes may include informed citizens or the scientific community associated with local universities, the U.S. Environmental Protection Agency, and U.S. Forest Service.

Initially, TAC members could include the following: Roy Zipp (Natural Resource Specialist—North Cascades Complex), Reed Glesne (Aquatic Ecologist—North Cascades Complex), Bob Pfeifer (Inland Fisheries Management Biologist, Habitat Biologist—WDFW), Mark Downen (Inland Fisheries Biologist—WDFW), and John Wullschleger (Fisheries Biologist—NPS, Fort Collins, CO). Roy Zipp would serve as chairman of the TAC. Bob Hoffman (OSU Research Professor/USGS) would serve as technical advisor to the committee. The specific individuals on the TAC would likely change as the monitoring program evolves.

FRAMEWORK FOR DECISIONS

The basic framework would initially involve the TAC examining a suite of physical and biological indicators (the *key data* categories discussed above) to evaluate the condition of the subject lake (the “observed”), relative to a selected baseline (the “expected”). For each lake, the TAC would examine all the key data or indicator values that would be monitored under that lake’s designated management action (see [table F-3](#)). Then, the TAC would use a multiple-lines-of-evidence approach to determine what level of change in the data would indicate a need for a change in management. Biological assemblages would be assessed in combination with physical and chemical attributes. The TAC would then interpret the suite of data as a whole, examining the indicator values, the amount of difference between “observed” and “expected” values, and the interdependence among various factors to evaluate a lake’s condition and condition of shoreline vegetation.

In general, the “expected” baseline would consist of similar data from a reference lake or lakes—generally historically fishless lakes of the same or similar class. General lake classes would be assigned based on work performed by Lomnický et al. (1989). The first level of classification would separate the lakes into two major geographic regions with large-scale differences in climate, aspect, and vegetation, based on location east or west of the hydrological divide (Cascade Crest) of the Cascade Mountains. The second level of classification, representing smaller variations in ecological habitat, would also be considered.

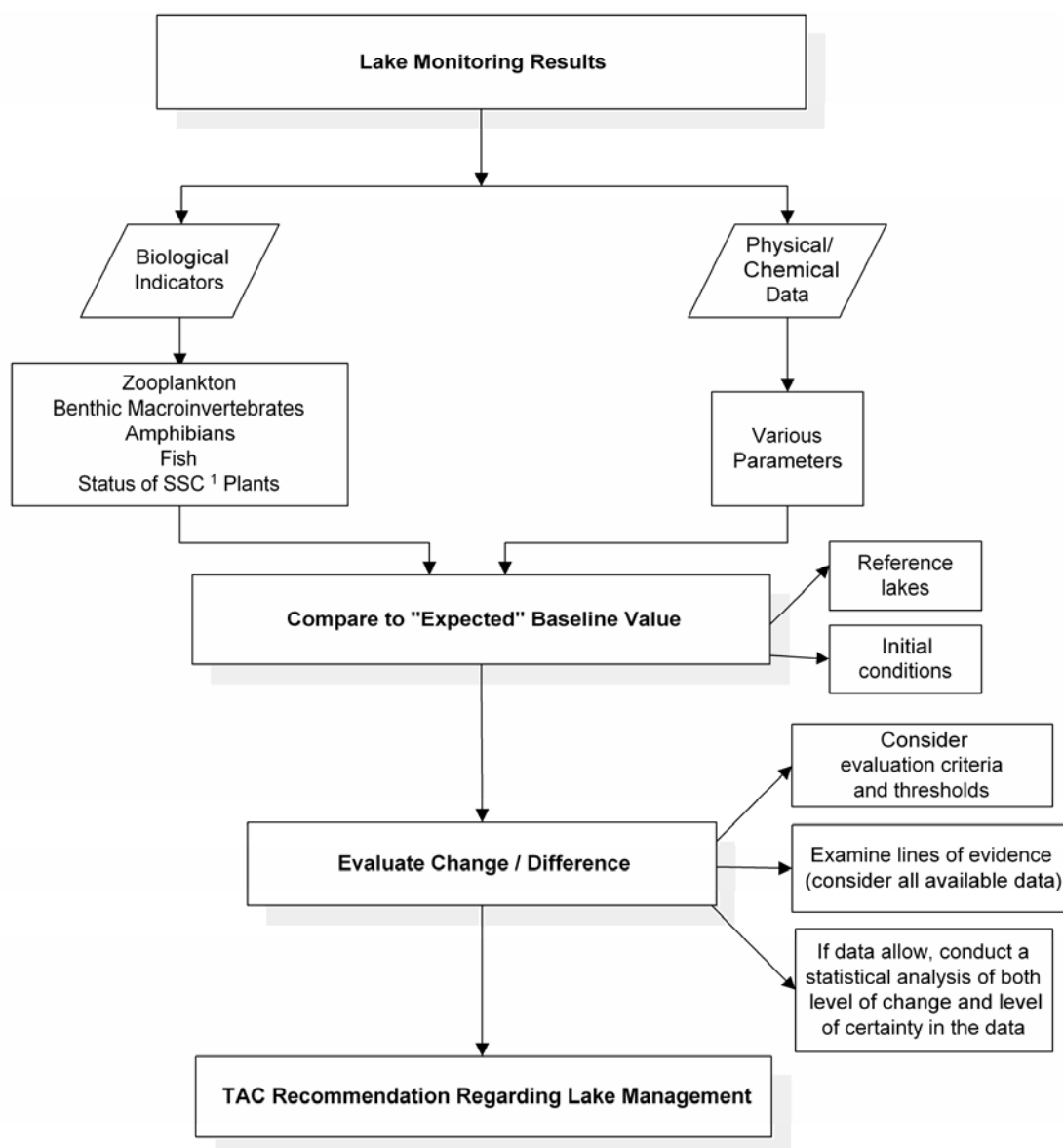
Where distribution, habitat requirements, or species assemblages of indicator species or species assemblages are better known, reference lakes could be grouped by data specific to the indicator taxa. A predictive model for BMI species assemblages has been developed where mountain lakes in the North Cascades Complex are classified into six biologically similar groups based on location west (four groups) or east (two groups) of the hydrological divide and similarity of their BMI species composition (species assemblages), using ordination or clustering methods. Lake classes for predicting presence, species, and relative abundance of salamander larvae could be grouped by side of hydrologic divide, range of salamander distribution, lake fertility (measured by TKN value), and distance from other known or potential breeding lakes. The dominant large copepod (*Diaptomus kenai*) are strongly associated with lakes that have temperatures greater than 50°F, while small copepods (*D. tyrrelli*) are strongly associated with shallow (less than 33 feet in depth) lakes with higher TKN values (Liss et al. 2002). Lake depth and TKN values are not correlated with the presence of large copepods, but their relative abundance in lakes with high densities of reproducing trout tends to be much higher in lakes greater than 33 feet in depth.

Data from the subject lake could also be compared with the initial conditions of the lake, or previously obtained monitoring results, to see what changes have occurred in the lake over time. Using this as a baseline would not imply that this would serve as the desired condition for the lake. It would, however, provide a baseline from which it would be possible to determine if application of the management actions are resulting in the desired change and the conditions in the lake are moving in the desired direction (in other words, is the observed change meeting the management objectives).

If the TAC agrees (by a consensus decision) that the observed change (such as reduction in fish density and reestablishment of indicator taxa) is meeting management objectives, management actions for the lake would not be changed. If, however, there has been no change or a significant change from the expected/desired value, and this cannot be explained by variables other than fish density or fish condition, a change in the management action would be indicated. [Figure F-3](#) provides an illustration of the basic decision framework.



FIGURE F-3: BASIC DECISION FRAMEWORK



Note: 1. Species of Special Concern

EVALUATION THRESHOLDS

Absent a formal model, the TAC would be charged with evaluating the levels of change and their implication for lake management. The actual thresholds/criteria for each biotic and abiotic parameter cannot be defined at this time but would be defined initially by the TAC based on previously collected data. Thresholds for each data type would include the actual measurements/observations plus the associated data variability. The thresholds would be refined by the TAC as the monitoring program progresses. Park- or region-wide trends, as monitored in reference lakes, would be factored into all management decisions. Any changes in fishery management would require consideration of all appropriate data in a line-of-evidence approach and would require consensus of the TAC. The types of thresholds/criteria to be considered by the TAC would include, at a minimum, the following:

If the data for a parameter are statistically adequate, a change based on one or two standard deviations from expected would be applied.

If the data for a parameter are quantitative, but could not support a statistical evaluation, thresholds based on a percent change from baseline would be applied.

If the data for a parameter are qualitative, the observed changes would be classified as minor, moderate, or major and considered in conjunction with the quantifiable data.

PRIORITIES FOR MONITORING

Monitoring priorities must be set to determine which lakes should be monitored and which monitoring data types should be collected for each lake monitored. As described earlier, one of the initial activities for the TAC would be to establish priorities as to which lakes to monitor and the *key data* required for monitoring. Both prioritization activities would have to consider budget and schedule constraints. The following are the factors that would be considered when prioritizing lakes for monitoring:

Highest Priority—lakes requiring evaluation before a management action could be selected and implemented. These lakes would require further inventories of baseline conditions; the inventories would provide the basis for longer-term monitoring.

High Priority—lakes with management actions identified based upon sufficient baseline information. These lakes would be monitored to evaluate the success of management actions.

Low Priority—lakes with management actions identified but no current plans for implementation. These lakes would include the larger, deeper lakes in the North Cascades Complex that are targeted for fish removal. Also, fishless lakes selected to act as reference lakes would be categorized as either low- or high-priority lakes, depending on data needs and budget/schedule constraints. Data needs on trends in the North Cascades Complex may be satisfied using information compiled from higher-priority lakes or from other monitoring programs.

The factors to consider when prioritizing data types would include

Highest Priority—data that are considered *key data*. These data must be collected during baseline studies and monitoring in order to make management decisions.

High Priority—data that would help interpret the *key data*. These data, while not considered *key*, would help to interpret the consequences of management actions if the *key data* could not be conclusively interpreted. Should be considered for collection if funding and schedule permit.

Low Priority—data that would be nice to gather while a lake is being sampled but would not be used directly or indirectly by the NPS to make lake management decisions. Because these data may be useful to other researchers or fishery managers, the data may be collected if incremental costs and effort would not be excessive and if other sources of funding could be identified.



REFERENCES CITED IN APPENDIX F

- Hoffman, R.L., T.J. Tyler, and G.L. Larson
2003 Sampling protocols for monitoring abiotic and biotic characteristics of mountain ponds and lakes, Draft Version 1.00. Prepared for the U.S. Department of the Interior, National Park Service by the U.S. Geological Survey, Corvallis, OR.
- Liss, W.J., G.L. Larson, L. Ganio, T.J. Tyler, and R.L. Hoffman
2002 Distributions and Abundances of Larval Salamanders (*Ambystoma macrodactylum*) and Large Copepods (*Diaptomus* sp.) in Relation to Introduced Trout and Abiotic Factors in Mountain Lakes in North Cascades National Park Service Complex. *In*: Liss et al. (2002).
- Lomnický, G.A., W.J. Liss, and G.L. Larson
1989 *Towards a Classification of the Watersheds and Lakes of North Cascades National Park Service Complex*. Final Report to the National Park Service. Dept. of Fisheries and Wildlife, Oregon State University. 107 pp.
- Olson, D.H., W.P. Leonard, and R.B. Bury (editors)
1997 Sampling amphibians in lentic habitats. Northwest Fauna Number 4, Society for Northwestern Vertebrate Biology, Olympia, WA.
- Reeves, G.H., D.B. Hohler, D.P. Larsen, D.E. Busch, K. Kratz, K. Reynolds, K.F. Stein, T. Atzet, P. Hayes, and M. Tehan
2004 *Aquatic and Riparian Effectiveness Monitoring Plan for the Northwest Forest Plan*. Available at: <http://www.reo.gov/monitoring/watershed/aremp-compile.htm> Accessed on April 18.

APPENDIX F-1

SUGGESTED SURVEY PROTOCOLS



APPENDIX F-1: SURVEY PROTOCOLS

The categories listed below cover data categories that must be collected in the field, rather than by analysis of Geographic Information System (GIS) data and interpretation of aerial photographs. Where data (zooplankton presence and relative densities, amphibian presence and densities, water temperature, total Kjeldahl nitrogen [TKN]) would be expected to vary significantly over the ice-free season or from year to year, multiple samples (three or more) may be required to increase confidence in the collected data.

ABIOTIC CATEGORIES

PROTOCOLS FOR OBTAINING KEY DATA

Surface (epilimnetic) water temperature—from Hoffman et al. (2003). Temperature is measured in centigrade over the deepest spot in lakes at 1 meter (3.28 feet) from the surface and again half way to the bottom using a hand-held thermometer and a remote thermistor (thermocouple). Temperatures are recorded on warm summer days during the warmest period of the day (thermal maxima)—around 2:00 P.M.

Surface water temperature has been determined for 74 lakes. Mid-depth temperatures have not been taken but are useful in determining if thermal stratification occurs in a lake. Water temperatures are needed in the monitoring program to assess lake productivity and characterize lake habitat and expected biotic community.

Lake depth—from Hoffman et al. (2003). A handheld sonar device or calibrated line is used to determine a lake's deepest point. At a minimum, two perpendicular depth transects intersecting at the deepest point of the lake are conducted. When determined, the maximum depth and the UTM (Universal Transverse Mercator) coordinates of its location are recorded.

Maximum depths have been determined for 77 lakes. Maximum depths are needed in the monitoring program to help determine the most appropriate methods to use to remove fish and to characterize the basic lake habitat and expected biotic community. Transect depth profile data are needed to calculate the lake volume for use in estimating the volume of antimycin needed to remove fish.

Total Kjeldahl nitrogen (TKN)—from Hoffman et al. (2003). Water samples are collected for measuring TKN and a suite of water chemistry variables. A minimum of 1 liter sample of filtered lake water and 250 milliliters (ml) sample of unfiltered lake water should be collected at the deepest point of each lake and processed in the field by methods described in Hoffman et al. (2003). Samples will be transported out of the field and stored in a refrigerator for laboratory analysis. Additional samples (field duplicates) may be collected to ensure confidence in the repeatability of the data.

TKN values have been determined for 62 lakes. TKN values are needed in the monitoring program to help determine lake productivity and characterize lake habitat and expected biotic community. Additional water chemistry variables, including pH, alkalinity, conductivity, total dissolved solids, ammonia, nitrate-N, total phosphorus (and cations [positive ions] and anions [negative ions] if desired) may also be determined during laboratory analysis of the water samples. Samples for anthropogenic pollutants (e.g.,



persistent organic pollutants [POPs] or methyl-mercury) may also be collected at the same time as other water quality sampling.

Chlorophyll-a concentration—from Hoffman et al. 2003. Water samples may be collected for measuring Chlorophyll-a. A minimum 500 milliliter (ml) sample of filtered lake water should be collected at the deepest point of each lake and processed in the field by methods described in Hoffman et al. (2003). Samples will be transported out of the field and stored in a freezer until the sample is processed in the laboratory. Additional samples may be collected to ensure confidence in the repeatability of the data.

Chlorophyll-a values have not been determined for any of the lakes. Chlorophyll-a values are needed in the monitoring program as an indication (in addition to TKN) of lake productivity.

Dominant littoral substrate. The dominant littoral (near shore) zone substrate is estimated within 10% categories (silt, sand, gravel, cobble, coarse woody debris, etc.) during a visual examination of the perimeter of the lake.

Dominant littoral zone substrates have been determined for 25 lakes. Dominant littoral substrates measured in 10% increments is needed to characterize lake habitat and expected biotic community.

Available spawning area (ASA or available spawning gravel) and spawning habitat (inlet, outlet, or beach) type. Stream spawning gravels are assessed by walking all tributary and outlet streams until a barrier to upstream migration is reached. The percent of available spawning gravel in each segment is estimated and recorded. This data is used to calculate the amount of available stream spawning habitat. Available lake spawning gravel can be located by snorkel surveys of the littoral zones of mountain lakes during salmonid spawning periods. Generally, this area can be mapped accurately by recording redds (spawning areas) or surveying extent of upwelling area with flow metering devices. The recruitment new-year classes of trout fry in most lakes is limited by the available area of spawning gravel, rather than the number of available spawning females.

Field surveys indicate that limited spawning habitat is available at Wilcox/Lillie, Upper Lake (EP-06-01). Available spawning area has not been determined for any of the other study area lakes. Data describing available spawning habitat are needed as input for determination of the most effective fish removal technique and as an indication of the sustainability of trout populations in lakes with low levels of trout reproduction.

Outlet habitat type (surface, subsurface, none). Lake outlets where reproducing trout are present should be surveyed to determine if an accessible surface outlet exists that trout can utilize to migrate downstream from lakes into downstream basins. Although some lakes have been determined to have no outlets based on available mapping data, this should be confirmed in the field. In many cases, mapped outlets do not actually flow on the surface or do not receive water from mountain lakes. In other cases, an outlet stream may cease to have a surface channel and will flow subsurface for a considerable distance. For these reasons, it is recommended that, where there is concern that nonnative fish may enter stream basins through mountain lake outlet streams, the outlet stream be surveyed to determine if there is a complete surface connection to downstream basins. Surveys should extend to known perennial streams and preferably to the upstream limit of native fish distribution. Document any falls considered to be barriers to upstream fish migration for the native species in the downstream lake/pond.

Outlet habitat type has been estimated for all lakes from GIS data, but not confirmed in the field. An accurate assessment of outlet habitat type is needed in the monitoring program to assess the potential of nonnative trout in mountain lakes colonizing downstream basins.



Inlet and outlet flows. Inlet and outlet flows would be measured using a propeller flow meter in a measured flow channel (width and depth). By counting the number of revolutions over one minute, the flow in cubic feet per second can be calculated.

Inlet and outlet flows have not been measured at any lakes. These data are needed as input to the estimate of the volume of antimycin needed to remove fish.

BIOTIC CATEGORIES

PROTOCOLS FOR OBTAINING KEY DATA

Fish Surveys

Fish presence. Rod-and-reel angling, gillnet fishing, visual-encounter surveys, snorkel surveys, seining, electrofishing, or trapping can be used to determine fish presence or absence and species present, and with the exception of visual-encounter surveys and snorkel surveys, to collect meristic data (e.g., total and fork lengths, weight, sex, and age) and tissue samples for genetic analysis or analysis for methyl-mercury or persistent organic pollutants. Fish presence has been evaluated for all study area lakes, but data from several lakes are not considered reliable. A combination of gillnet and rod-and-reel angling gives the best combination of presence by species, meristic data, and tissue samples. Where it is necessary to determine the presence of fry (when determining if reproduction is occurring or if fish have been successfully removed from a lake), a combination of seining, trapping, snorkel surveys, and visual-encounter surveys may be required.

Where it is necessary to confirm the removal of reproducing populations of fish, a lake should be surveyed annually for the presence of fish. A period of at least 3 years with no detection of fish should pass before fish removal is considered a success. In lakes where reproduction has not been documented, and fish are to be removed through the cessation of stocking, the lake should be surveyed for fish approximately 10 years after the last stocking. If fish are observed, but numbers appear to be few, and fish are from the age class of the last stocking, the lake should be surveyed for fish presence periodically until no fish can be detected. If young fish are observed, the lake should be evaluated for the presence of natural reproduction.

Fish-presence surveys are necessary to confirm the presence or absence of fish, determine species of fish present, and to collect meristic data and tissue samples. Confirming the absence of fish requires a more intensive effort over a greater period of time than confirming presence and visual means of surveying. (Note: visual-encounter surveys and snorkel surveys do not allow the collection of any data other than confirmation of the presence of fish, although population densities can be estimated from quantified snorkel surveys.)

Species of trout present in lakes. Fish should be collected by one of the methods listed above under fish presence. Bias in sampling should be avoided by using multiple methods of collection to obtain as complete a collection of age classes and species present as possible. Fish should be field identified by specimen, but photographs and tissue samples (in 95% ethanol) should also be collected for verification of the species of fish that are present in the lake.

The trout species present in lakes have been determined to various degrees of accuracy for all lakes, but several lakes need additional data to confirm the identity of species/subspecies/hatchery stock. This information is needed to determine if reproducing fish in lakes are not native to the stream basin into which the lakes drain.

Indices of condition of fish. Fish should be collected by one of the methods listed above (except for snorkel surveys and visual-encounter surveys) under “Fish Presence.” Meristic data can be collected and recorded from the sampled fish. Indices of condition (such as Fulton Condition Factors), relative condition factor, or relative weight can be calculated from measurements of length and weight. The sex, species, and time of year that data is collected should be recorded along with meristic data. These factors can have a strong bearing on how the data is evaluated (condition can vary by sex, species, age, spawning period, and time of year).

Condition factors have not been collected for the *Draft Mountain Lakes Fishery Management Plan / Environmental Impact Statement* (plan/EIS), but data may be available for some of the 91 study area lakes. Indices of fish condition are needed to manage the fishery in lakes where the effects of fish stocking are evaluated. Condition factors also may be used as an indication if fish densities have exceeded the carrying capacity of a lake, providing a rough approximation of effects on native biota.

Growth rate of fish. Fish should be collected by one of the methods listed above (except for snorkel surveys and visual-encounter surveys) under “Fish Presence.” Meristic data can be collected and recorded from the sampled fish. Samples of fish scales and otoliths (particles of calcium carbonate found in the inner ear of vertebrates) should also be collected to age fish so that growth rates by length and weight can be calculated. The sex, species, and time of year should be recorded along with meristic data. These factors can have a strong bearing on how the data is evaluated (condition can vary by sex, species, age, spawning period, and time of year).

Growth rates of fish have not been collected for this plan/EIS, but data may be available for some of the lakes. Growth rates are needed to manage the fishery in lakes where fish stocking would continue. Growth rates also may be used as an indication if fish densities are having effects on native biota. Growth rates can also provide a good approximation of lake productivity.

Parasite load of fish. Fish should be collected by one of the methods listed above (except for snorkel surveys and visual-encounter surveys) under “Fish Presence.” Sampled fish can be dressed in the field and the gills, skin, viscera, and muscle tissue examined for the presence of parasites. Sampling of live fish is mandatory for parasite examination because many external parasites leave fish within minutes after the host’s death. As a result, when using gillnets to sample fish, nets should be sampled frequently. An external examination and necropsy (autopsy) conducted in the field may provide useful general information, but a complete parasite examination requires at least a good dissection microscope and a person with fish health training for a definitive inventory of parasites. This would require transport of living fish from the field. As a result, parasite examinations in the field would be limited to judgments of the severity of infections by an experienced biologist or technician. Methods described in Murphy and Willis (1996) should be used for the examination of fish parasite loads.

Parasite load data have not been collected for this plan/EIS, but this data may be available for some of the lakes. Estimates of fish parasite loads are needed to manage the fishery in lakes where fish stocking would continue. Fish parasite loads may be used as an indication if fish densities have exceeded the carrying capacity of a lake, providing a rough approximation of effects on native biota. High loads of parasites can be a sign of environmental stress, such as low levels of available forage organisms and organic and inorganic pollutants.

Reproductive status of fish in lakes by species/subspecies/hatchery stock. Fish should be collected by one of the methods listed above (except for snorkel surveys and visual-encounter surveys) under “Fish Presence.” The age of the specimens should be verified through the collection of scales and otoliths as described below under the section on density of reproducing fish. Length frequency distributions should not be used to distinguish different stocking efforts or year classes (Nelson 1988). Bias in sampling



should be avoided by using multiple methods of collection to obtain a complete a collection of age classes and species present. At least 20–30 individuals should be collected, if possible. After the ages of collected fish are determined by examination in a laboratory, this information should be compared to documented fish stocking. The presence of many age classes of fish that were not documented in stocking records can be considered documentation of reproduction, with confidence increasing with the number of reproducing fish of various age classes present. A single age class, not the product of a documented stocking, may represent an undocumented stock and should be regarded as suspect (although many lakes may have reproduction only in years with favorable climate and water level conditions). Photographs and tissue samples (in 95% ethanol) should also be collected for verification of the species of fish that is reproducing in the lake.

The reproductive status of fish in lakes has been determined to various degrees of accuracy for all lakes, but several lakes need additional data to confirm determinations as to reproductive status and the identity of species/subspecies/hatchery stock that are reproducing. This information is needed to determine if a reproducing population exists in a lake and if the reproducing fish are not native to the stream basin into which the lake drains.

Density of reproducing fish. Mark-recapture methods (Gresswell et al. 1997) and gillnet sampling (Nelson 1964, 1972, 1984, 1988) can be used to determine the density of reproducing fish in lakes. Snorkel surveys similar to those for salamander larvae (Hoffman et al. 2003) can be used.

The density of reproducing fish has been determined through mark-and-recapture for 8 lakes and population densities based on average densities in the literature for the reproducing species have been estimated for an additional 18 lakes. This information is needed to assess the level of effect trout populations have on native biota, such as zooplankton (relative abundance of larger copepods), and salamander larvae (density and presence).

Status of fish population in outlet streams. Fish populations in outlet streams may be assessed to determine if nonnative fish stocked in mountain lakes are migrating downstream from lakes and either hybridizing or replacing native fish populations in downstream basins. In addition, nonnative fish may be colonizing reaches of streams above the range of native fish with possible effects on native biota.

The historic distribution of native fish in streams should be determined as accurately as possible from the available literature and fish inventory reports. Fish distribution is usually limited to the first major barrier falls on tributary streams, but sometimes there is a gradual loss of fish species diversity as successive barrier falls are encountered, while moving upstream. Where there is concern about the escape of reproducing trout from mountain lakes into downstream basins, or a need to prioritize lakes for fish removal by their effects to native fish populations in downstream basins, the upper limit of fish distribution should be approached by the most direct (or easiest route) available. At least two crewmen should participate in field surveys. The presence of fish should be determined by a combination of habitat evaluation (gradient and pool structure), visual encounter (using Polaroid glasses to more easily observe movements of fish in stream pools), and a backpack electrofisher and dip net. If fish cannot be found, survey downstream until the upstream limit of native fish distribution is found. Document any falls considered barriers to upstream fish migration. (Note: different fish species have different abilities to navigate barrier falls.) Sample 20–40 fish (if available) to determine species composition. If nonnative fish do not appear to be present, stop downstream survey; however, collect meristic information and tissue samples from sampled fish for later analysis of possible hybridization. Take photographs of sampled fish.

Survey either upstream to barrier for native fish or downstream from lake outlet, noting physical barriers to upstream movement. If no fish habitat (lower gradient reaches with pools) exists between the lake

outlet and upper limit of fish distribution, it is only necessary to survey downstream from the lake until a reach of 100 meters (328 feet) of stream is surveyed with no fish encountered. When surveying upstream from the limit of native fish distribution, the survey can stop when nonnative fish are first encountered.

The colonization of a lake's outlet stream by nonnative trout stocked in the lake has only been documented for McAlester Lake. There is some evidence of downstream migration and colonization with reproducing populations of trout for 8 lakes. Densities of reproducing fish have been determined through mark-and-recapture for 8 lakes, and population densities based on average densities in the literature for the reproducing species have been estimated for an additional 18 lakes. This information is needed in the monitoring program to assess the extent of colonization of outlet streams and downstream basins by nonnative trout stocked in mountain lakes and its effect on native fish and other taxa.

Amphibian Surveys

Three amphibian protocols (snorkel, visual, and trapping) have been utilized during amphibian surveys. All three methodologies can be used to determine salamander presence, with snorkeling (Hoffman et al. 2003) providing the most reliable presence information. Trapping (Adams et al. 1997) can also provide highly reliable presence information, but the number of traps necessary to approximate detection abilities of snorkel surveys may be prohibitive at most mountain lakes.

Since larvae population densities are required for lake management, it is recommended that snorkel surveys be used for both presence and density information when surveying for salamander larvae. In addition to snorkel surveys for the determination of salamander larvae presence and densities, a visual-encounter survey should be conducted for frogs and toads using protocols outlined in Olson et al. (1997), Tyler et al. (1998), Brookes (2000), Hoffman et al. 2003, Thoms et al. (1997), Bury and Major (1997), and Crisafulli (1997). If frogs or toads (adults) are documented during visual-encounter survey, dipnets should be used to capture specimens, which can either be used for field identification (with photographs), as voucher specimens, or as sources of tissue samples for genetic analysis and identification.

Snorkel surveys for salamander larvae (along with visual-encounter surveys for other amphibians) have been conducted in 53 lakes. An additional 7 lakes have had visual-encounter surveys for amphibians. This information (presence and abundance of salamander larvae and presence of any other amphibians) will provide an estimate of effects of fish on native biota.

Benthic Macroinvertebrate Surveys

Two protocols have been used for benthic (bottom dwelling) macroinvertebrate (BMI) surveys. An Oregon State University (OSU) protocol was used for a provisional inventory of species composition at each lake; however, the methodology developed by personnel at the North Cascades Complex has a greater probability of detecting less common or difficult-to-detect species and was combined with substrate and vegetations surveys that enable a more detailed analysis and better predictions of species assemblages in the study area lakes. BMI survey data from the North Cascades Complex was used to develop a BMI index of water quality and biological integrity. Samples are collected using kick-and-sweep techniques for approximately 6 minutes at each of five randomly located sites at each lake, within the 1 meter (3.28 feet) depth contour.

BMI data using the North Cascades Complex protocol has been collected at 43 lakes (OSU BMI data is available for 23 of these lakes), with BMI data using the OSU protocol collected at an additional 16 lakes. The information is needed for the monitoring program to assess the biotic integrity of the BMI data in lakes by determining if the BMI assemblages of lakes fall within their expected range of biodiversity or if the assemblages are being affected by high densities of fish.



Zooplankton Surveys

Three protocols were used for zooplankton surveys. Earlier surveys were conducted by personnel at the North Cascades Complex using protocols similar to those used by OSU during later surveys (Hoffman et al. 2003). These surveys primarily documented the taxa present in lakes and grouped them as dominant or subdominant in the zooplankton species assemblages. Zooplankton surveys also were conducted by OSU using essentially the same protocols but with the volume of sampled lake water quantified, so relative densities of large copepods and *D. tyrrelli*/volume of water surveyed could be determined for each lake. It is recommended that the quantitative OSU protocols be used to measure for the presence and density of large copepods and other zooplankton species. Both vertical and horizontal tows should be used in deeper lakes, with only horizontal tows 25 meters (82 feet) in length used in lakes less than 2 meters (6.5 feet) in maximum depth. In lakes that are greater than or equal to (\geq) 2 meters maximum depth, at least three replicate vertical tows and one horizontal tow of approximately 25 meters in length should be performed.

Zooplankton presence data has been collected at 53 lakes, with relative abundance data collected at 20 of the 53 lakes. Zooplankton presence and relative abundance (at least for large copepods) is needed for the monitoring program to assess the effects of trout populations on zooplankton communities.

Vegetation Surveys

Surveys of riparian and aquatic vegetation may be useful (but not required) in conjunction with the BMI surveys and surveys for other taxa to characterize lake habitat and expected biotic communities.

Riparian vegetation (percent by type: talus, shrub, meadow, forest). The riparian vegetation is estimated within 10% cover categories (shrub, forest, meadow, talus) during a visual examination of the perimeter of the lake. Meadow species include both forbs (broad-leaf plants) and graminoids (grasses and sedges).

Riparian vegetation percent by type has been determined through field observation for 43 lakes. Riparian vegetation for the remaining lakes has been assessed through interpretation of aerial photographs, but the estimates have not been checked through ground observations. Riparian vegetation measured in 10% increments may be used to characterize lake habitat and expected biotic community. Both data types provide rough cover estimates, but they cannot be used to identify the specific types of vegetation that may be present in the riparian communities. The status (trampled or healthy) of the riparian vegetation can also be used to estimate usage by recreational anglers.

Aquatic vegetation (percent of shoreline with aquatic vegetation). The percentage of shoreline with aquatic vegetation present in the littoral zone is estimated within 10% categories during a visual examination of the perimeter of the lake.

Aquatic vegetation percentage has been determined for 43 lakes. The percent of shoreline littoral zone with aquatic vegetation may be used to characterize lake habitat and expected biotic community.

Additional vegetation data potentially available, but not necessarily needed, include

Width of emergent vegetation—This information, which is useful in determining the survivability of adult salamanders during the breeding season, could be collected during assessments of the percentage of aquatic vegetation. Up to 30% of the breeding adult Northwestern salamanders leaving lakes in the Mt. St. Helens Volcanic Monument without emergent shoreline vegetation have been observed to be visibly maimed by feeding trout (Dr. Crisafulli, pers. comm., 2003).

Distance to closed canopy forest—This information has been evaluated through interpretation of ortho-photographs; however, actual field measurements of interpretation of better-quality aerial photographs would provide a better assessment of the availability of adult habitat for pond-breeding salamanders.

Additional vegetation data not currently available that should be collected include

Specific types of vegetation present in the riparian zone—The cover categories used to characterize the riparian and aquatic vegetation types are very general and do not indicate the specific types of vegetation present in those communities. Low, woody shrubs (such as *Phyllodoce* spp.), seedlings, and forbs are more sensitive to trampling and take longer to recover than do tall, woody shrubs (such as *Salix* spp.) and graminoids (Cole and Trull 1992). Assessments of the status of riparian vegetation should take into account the types of vegetation impacted. Recreational users should be informed to avoid heavily impacted areas, especially those communities sensitive to the effects of trampling.

Presence of state special status species—None of the lakes have been surveyed for the presence of riparian or aquatic state special status plant species. Because state special status species are rare and often occur in small populations, any trampling of those populations has the potential to have a major impact on the species. As resources and funds allow, surveys for special status species should be conducted by a qualified plant biologist in conjunction with surveys for other biota.



REFERENCES

CITED IN APPENDIX F-1

- Adams, M.J., K.O. Richter, and W.P. Leonard
 1997 "Surveying and monitoring amphibians using aquatic funnel traps." *In*: D.H. Olson, W.P. Leonard, and R.B. Bury (editors), Sampling amphibians in lentic habitats. Northwest Fauna Number 4, Society for Northwestern Vertebrate Biology, Olympia, WA.
- Brokes, B.J.
 2000 Habitat segregation of two ambystomatids in mountain ponds, Mount Rainier National Park. M.S. Thesis. Oregon State University, Corvallis, OR.
- Bury, R.B. and D.J. Major
 1997 "Sampling pond amphibian communities in montane habitats." *In*: D.H. Olson, W.P. Leonard, and R.B. Bury (editors), Sampling amphibians in lentic habitats. Northwest Fauna Number 4, Society for Northwestern Vertebrate Biology, Olympia, WA.
- Cole, D.N. and S.J. Trull
 1992 Quantifying vegetation response to recreational disturbance in the North Cascades, Washington. Northwest Science 66:229-236.
- Crisafulli, C.M.
 1997 "A habitat-based method for monitoring pond-breeding amphibians." *In*: D.H. Olson, W.P. Leonard, and R.B. Bury (editors), Sampling amphibians in lentic habitats. Northwest Fauna Number 4, Society for Northwestern Vertebrate Biology, Olympia, WA.
- Gresswell, R.E., W.J. Liss, G.A. Lomnický, E.K. Deimling, R.L. Hoffman, and T.J. Tyler
 1997 "Using mark-recapture methods to estimate fish abundance in small mountain lakes." Northwest Science 71(1):39-44.
- Hoffman, R.L., T.J. Tyler, and G.L. Larson
 2003 Sampling protocols for monitoring abiotic and biotic characteristics of mountain ponds and lakes, Draft Version 1.00. Prepared for the U.S. Department of the Interior, National Park Service by the U.S. Geological Service, Corvallis, OR.
- Murphy, B.R. and D.W. Willis (editors)
 1996 Fisheries Techniques, Second Edition. American Fisheries Society, Bethesda, Maryland.
- Nelson, W.C.
 1964 "Rawah- McIntyre high lakes project." *In*: Research in Colorado. Colorado Department of Game, Fish and Parks, Denver, CO.
- 1972 "Colorado trout lake studies." *In*: Colorado Fisheries Research Review 1972. Colorado Department of Game, Fish and Parks, Denver, CO.
- 1984 Some preliminary results of Parvin Lake studies 1977-83. Colorado Division of Wildlife, Denver, CO.
- 1988 High lake research and management in Colorado. Special Report Number 64. Colorado Division of Wildlife Aquatic Research, Colorado Division of Wildlife, Denver, CO.
- Olson, D.H., W.P. Leonard, and R.B. Bury (editors)
 1997 Sampling amphibians in lentic habitats. Northwest Fauna Number 4, Society for Northwestern Vertebrate Biology, Olympia, WA.



APPENDICES

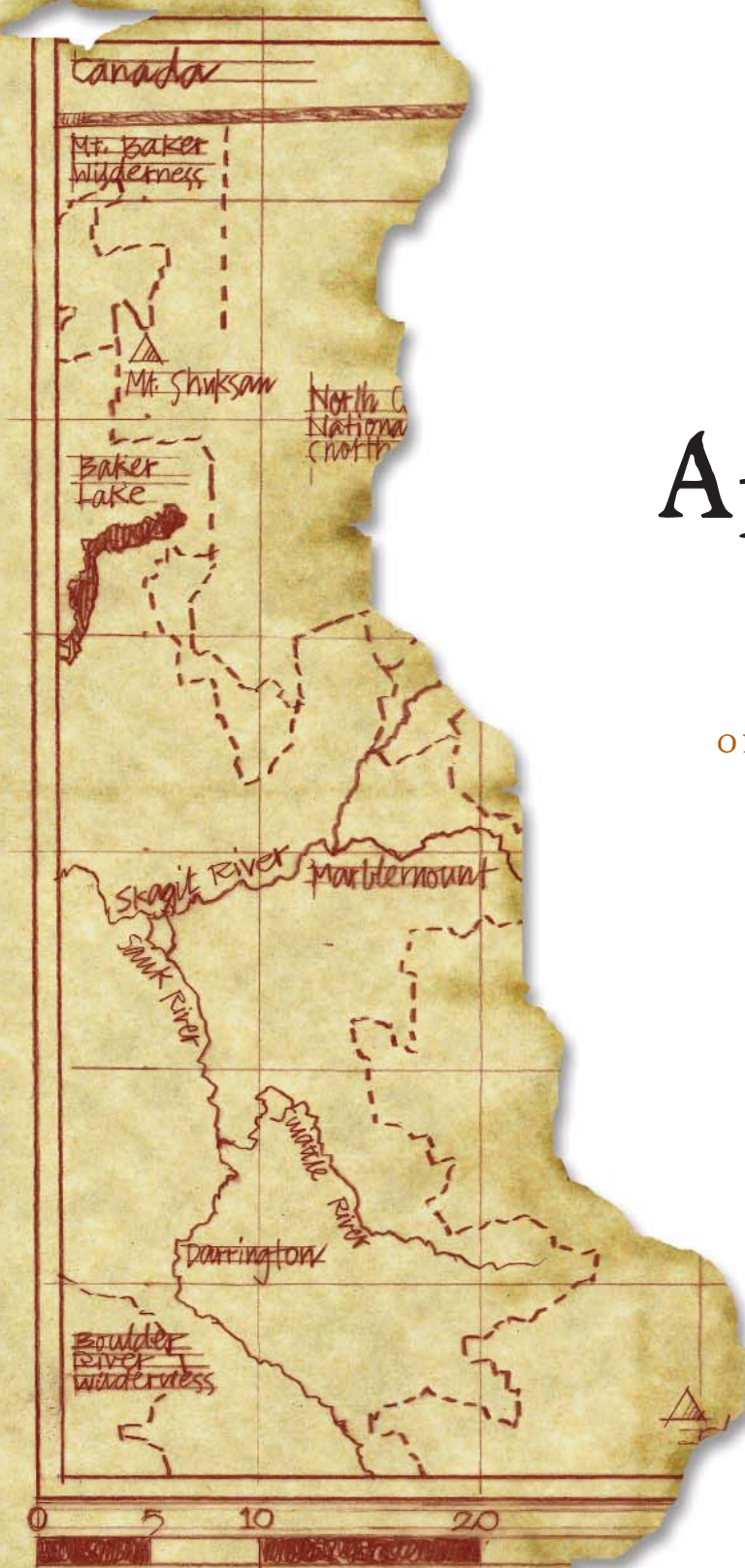
Thoms, C., C.C. Corkran, and D.H. Olson

- 1997 "Basic amphibian survey for inventory and monitoring in lentic habitats." *In*: D.H. Olson, W.P. Leonard, and R.B. Bury (editors), Sampling amphibians in lentic habitats. Northwest Fauna Number 4, Society for Northwestern Vertebrate Biology, Olympia, WA.

Tyler, T.J., W.J. Liss, L.M. Ganio, G.L. Larson, R. Hoffman, E. Deimling and G.A. Lomnický

- 1998 Interaction between introduced trout and larval salamanders (*Ambystoma macrodactylum*) in high-elevation lakes. *Conservation Biology* 12:94-115.





Appendix G

DETAILED DISCUSSION
OF IMPACT THRESHOLDS FOR
AQUATIC ORGANISMS

APPENDIX G: DETAILED DISCUSSION OF IMPACT THRESHOLDS FOR AQUATIC ORGANISMS

IMPACT CRITERIA AND METHODOLOGY

Four separate sets of impact thresholds, ranging from negligible to major intensity, were defined to address potential impacts on the plankton, macroinvertebrates, and amphibians in the 91 study area lakes and native fish in downstream drainages. Because there is incomplete knowledge of the actual impacts that are occurring or could occur in the 91 lakes under all four alternatives, impact thresholds were developed using predictive factors that have been shown to affect the distribution and viability of these organisms. These factors were identified from a review of scientific literature and past research. In addition to predictive factors, data and professional knowledge supplied by National Park Service (NPS) and Washington Department of Fish and Wildlife (WDFW) staff involved in the preparation of the *Draft Mountain Lakes Fishery Management Plan / Environmental Impact Statement* (plan/EIS) were used to arrive at impact intensities, whenever possible. The assessments were done on a lake-by-lake basis, using impact thresholds based on both the predictive factors and actual knowledge of site conditions, to arrive at a final impact level for each lake and associated downstream drainage.

The discussions below present more detail about the predictive factors that were used in the impact thresholds for four groups of aquatic organisms.

PLANKTON

The plankton community in lakes in the North Cascades National Park Service Complex (North Cascades Complex) is divided into two components: phytoplankton and zooplankton. Phytoplankton mainly include microscopic photosynthetic algae (such as diatoms and dinoflagellates), while zooplankton are non-insect invertebrate animals ranging in size from microscopic to as large as 0.25 inch in length that drift with the current.

The direct and indirect effects of fish stocking on each of these community components differ. Stocked trout generally do not prey directly on phytoplankton but can indirectly cause significant changes in the abundance of individual species and overall community structure in mountain lakes because their presence indirectly results in altered nutrient cycling and food web dynamics (Brett et al. 1994; Drake and Naiman 2000; Elser et al. 1995; Leavitt et al. 1994). While changes in abundance and community structure can be substantial, total loss of phytoplankton species has generally not been observed. Shifts in community composition (referred to as “state changes”) tend to remain stable following fish removal, not returning to conditions that were present prior to fish stocking (Drake and Naiman 2000). Changes in the phytoplankton community caused by fish stocking resemble those that occur due to other natural events (e.g., catastrophic forest fires or volcanism).

Because changes to the phytoplankton community due to fish stocking are similar to those that occur under natural conditions, and food web dynamics generally remain resilient, effects on the phytoplankton community from fish stocking were considered minimal for the purpose of evaluating impacts. Therefore, the focus was placed on impacts to zooplankton species, especially larger copepods, which can be demonstrably affected by predation and changes in food web dynamics resulting from fish introduction.

Research has shown that, in some cases, fish introductions have been observed to result in the complete elimination of some zooplankton species, with large copepods and large cladoceran species appearing to be most vulnerable. For example, large copepods in high-altitude lakes in Alberta, Canada, were no

longer present as a result of very high densities of reproducing trout in some mountain lakes and, in some cases, did not recover following fish removal (Parker et al. 1996, 2001). This level of effects was observed to occur only in smaller shallow lakes (Donald et al. 1994). Another recent study found that the average recovery time for zooplankton assemblages from the influence of stocked salmonids in Canadian lakes was 19 years (Donald et al. 2001).

Failure of copepods to recover has been attributed to the presence of scuds, or large amphipods (*Gammarus lacustris*), that prey on dormant copepod eggs, thus eliminating the potential for population recovery (Parker et al. 1996). Cladoceran species in shallow lakes were also no longer present in some cases, but they are likely to recover (Parker et al. 2001). Large amphipod species may also be vulnerable to extirpation (complete disappearance of a species) resulting from intense predation. It should be noted that zooplankton species were not extirpated in deeper lakes, even lakes with extremely high stocking densities (exceeding 800 fish/acre), because the profundal (deep) zone provides a refuge area against predation. Lakes greater than 50 feet in depth appear to provide sufficient refuge habitat for the large copepod and cladoceran species that are most vulnerable to extirpation (Donald et al. 1994). Similarly, larger lakes with more overall refuge habitat can provide areas for escape from fish predation. A size of 40 acres was selected for use in the impact thresholds (based on professional judgment and experience working in similar lakes) to help distinguish between impact levels.

Based on the information described above and the professional knowledge and judgment of the NPS and WDFW staff involved in this plan/EIS, the following impact thresholds were defined for plankton (to be applied on a lake-by-lake basis):

Major: Significant changes in community structure would potentially occur, and large copepod abundance would be reduced significantly such that they are undetectable. If fish were removed or died off, the community structure may not become comparable to currently fishless lakes. For this assessment, potentially major impacts to large zooplankton would be expected in a lake where the following predictive factors are found:

- Lake depth less than (<) 50 feet , and
- Lake area <40 acres, and
- Fish density is very high (reproducing trout or multiple age classes at greater than [>] 400 fish/acre)

Moderate: Noticeable changes in community structure would potentially occur, and large copepod abundance would be greatly reduced. If fish were removed or died off, the relative abundance of large copepods would increase. For this assessment, potentially moderate impacts to large zooplankton would be expected in a lake where the following predictive factors are found:

- Lake depth <50 feet, and
- Lake area <40 acres, and
- Fish density is high (reproducing trout at >50 fish/acre).

Minor: Minor changes in community structure would potentially occur. If fish were removed or died off, the community structure would become comparable to currently fishless lakes. For this assessment, minor impacts to the zooplankton community would be expected in a lake where the following predictive factors are found:



- Lake depth >50 feet, or
- Lake area >40 acres, or
- Fish density is low (stocked trout at <100 fish/acre or reproducing trout at <50 trout/acre).

Negligible: Long-term adverse impacts would potentially be negligible even though these lakes have historically been stocked. Abundance and community structure would be expected to be influenced primarily by biogeographical and evolutionary processes. For this assessment, negligible impacts to the zooplankton community would be expected in a lake that was previously stocked but is currently fishless.

Table G-1 (located at the back of this appendix) provides the analysis matrix used for the assessment of impacts on plankton, by alternative, for each of the 91 lakes in the study area.

MACROINVERTEBRATES

Impacts on the macroinvertebrate community were evaluated by considering the effects of fish stocking on the primary prey species of fish: aquatic insect species with terrestrial adult forms. These include mayflies (*Ephemeroptera*), stoneflies (*Plecoptera*), caddisflies (*Trichoptera*), and midges (*Diptera*). These species are considered to be primary prey because they are large, mobile, and most exposed to predation. Other macroinvertebrate species, such as snails and fingernail clams (mollusca), flatworms (*Platyhelminthes*), and nematodes frequent less exposed habitats and are less likely to be targeted by fish as prey. Populations of primary macroinvertebrate prey (*Diptera*, *Ephemeroptera*, *Trichoptera*, *Plecoptera*) are considered to exist at the drainage basin scale, due to the dispersal potential from individual lakes and streams (Bilton et al. 2001). Other species of macroinvertebrates, including terrestrial insects, snails, and nematodes, are generally minor prey species and not sensitive to predation at the population level but can be influenced by indirect effects on food web dynamics. The primary prey species are relatively resilient to fish predation at the population level in lake environments, with the exception of specific sensitive species such as phantom midges (*Chaoborus* spp.), which are highly sensitive to fish predation and can be extirpated by even low stocking densities. This is not an issue of concern, however, because the temperature regime in high-mountain lakes in the North Cascades Complex is too cold to support these sensitive species (Verschuren and Marnell 1997).

Fish predation may result in significant changes in abundance and biomass of some macroinvertebrates, as well as behavioral and phenotypical changes (Chess et al. 1993; Knapp 1996; Luecke 1990; Walters and Vincent 1973). Because population boundaries usually extend beyond individual lakes, these effects are limited to the segments of the population exposed to fish predation. While some population segments may be depressed or even temporarily extirpated from a given lake environment, the affected species are usually capable of recolonizing these habitats quickly because they have high dispersal rates (Bilton et al. 2001; Bohonak and Jenkins 2003).

Recent studies by NPS staff of the biological integrity of benthic macroinvertebrate (BMI) communities in 32 lakes have substantially improved the identification of factors contributing to changes in the community. Primary predictive factors identified include, among others, fish density, reproductive status of the fish, quality of the bottom habitat, and area of the lake. Major changes to the benthic macroinvertebrate communities in the 32 lakes studied were associated with a loss of over 40% of the expected taxa in a lake. Other lakes containing high densities of reproducing fish also showed major changes in macroinvertebrate communities (density and/or diversity), although those lakes that contained substantial refuge habitat showed a lessened effect (NPS, R. Glesne, pers. comm., 2004).

Based on the factors identified in the NPS BMI monitoring results, and actual monitoring data from several of the study area lakes, the following impact thresholds were defined for macroinvertebrates (to be applied on a lake-by-lake basis):

Major: Major impacts include the absence of more than 40% of taxa expected to commonly occur in fishless lakes of similar environmental characteristics. Additionally, significant changes in dominant taxa and functional feeding group composition would also occur. Recolonization might not occur for an extended period of time without active intervention. Of the 91 lakes where the benthic community has not been studied, major impacts would be expected where the following predictive factors are present:

- Fish density is high (stocked trout at >100 fish/acre or reproducing trout at >50 fish/acre), and
- Lake area is <10 acres, often with limited habitat complexity.

Moderate: Moderate changes in community structure and functional group composition in a lake would potentially occur, relative to currently fishless but otherwise similar lakes. Populations eventually would recover from impacts if fish were removed. For lakes where the benthic community has not been studied, moderate impacts would be expected when the following predictive factors are present:

- Fish density is high (stocked trout at >100 fish/acre or reproducing trout at >50 fish/acre), and
- Lake area is more than 10 acres or lake area is less than or equal to (\leq) 10 acres with high habitat complexity.

Minor: Minor changes in community structure in a lake would potentially occur, although populations would recover if fish were removed. For lakes where the benthic community has not been investigated, minor impacts would be expected where the following predictive factor is present:

- Fish density is low (stocked trout at <100 fish/acre).

Negligible: Community structure would be comparable to fishless lakes with similar physical/chemical characteristics. Abundance and community structure would be predominantly influenced by biogeographical and evolutionary processes. Negligible impacts to the macroinvertebrate community would be expected in a lake that was previously stocked but is currently fishless.

Table G-2 (located at the back of this appendix) provides the analysis matrix used for the assessment of impacts, by alternative, on macroinvertebrates for each of the 91 lakes in the study area.

AMPHIBIANS

The amphibian community in mountain lakes is represented by a range of species that includes salamanders, newts, frogs, and toads. The aquatic amphibian community found in the study area consists of two subspecies of long-toed salamander (*Ambystoma macrodactylum macrodactylum* and *A. m. columbianum*), Northwestern salamander (*A. gracile*), rough-skinned newt (*Taricha granulosa*), Columbia spotted frog (*Rana luteiventris*), western toad (*Bufo boreas*), tailed frog (*Ascaphus truei*), and northern red-legged frog (*Rana aurora*). The latter four are listed species and are addressed in the “Affected Environment” chapter under the “Special Status Species” section of this plan/EIS. Due to their sensitivity to stocked trout, the long-toed salamander and Northwestern salamander were selected as the focus of the analysis of impacts on amphibians.



Amphibians are both directly and indirectly impacted by the presence of stocked fish populations in mountain lakes. Direct impacts include predation and competition for prey. Indirect impacts include changes in prey availability resulting from changes in food web dynamics and nutrient cycling attributable to fish introductions in historically fishless lakes. Direct and indirect impacts of the proposed alternatives on amphibians are evaluated at the population level for each amphibian species.

The potential for adverse impacts on the salamander species varies with a number of factors, including the habitat requirements of each species, physical and chemical lake characteristics, the type (that is, stocked or reproducing), and density of stocked fish populations. The two species are generally not found in the same spawning and rearing habitats, but adult habitats are similar. In the adult stage, both species use animal burrows for migration and overwintering habitat, which in turn restricts their range to areas with sufficient soil depth for burrowing mammals (Semlitsch 1983). The differences in habitat preference and tendency for competition between the two species influence the extent of impacts from stocked trout on each species.

Northwestern salamanders are restricted to the west side of the Cascade Crest and require dense, closed-canopy forest during their terrestrial adult phase and downed woody debris in the nearshore areas of ponds and lakes for spawning substrate (Hoffman et al. 2003; Dvornich et al. 1997; Aubry and Hall 1991; Petranks 1998). Dense old-growth forest habitat is particularly important to hibernating adults in the Cascade Mountains from Mount Hood, north (Aubry and Hall 1991). Because this species requires a long juvenile rearing stage of at least two years, and often reaches maturity in aquatic form, spawning and juvenile rearing habitat must be perennial. Because of this range of habitat preferences, suitable lakes and ponds for Northwestern salamanders are usually large and deep and typically found below the treeline. The available evidence indicates that when in their preferred habitat, Northwestern salamanders usually dominate and out-compete long-toed salamanders to the point of exclusion (Hoffman et al. 2003; Hoffman 2003; Hoffman and Larson 1999). Trout populations have been documented to reduce the numbers of larvae and neotenic adults (adults that retain some juvenile characteristics) of Northwestern salamanders in individual lakes. However, populations of Northwestern salamanders are likely to coexist with stocked trout and remain viable, albeit at reduced densities. This is likely due to the large size of older larvae and neotenic adults in this species (relative to long-toed salamanders), and a stronger propensity for behavioral adaptations for avoiding predation.

Because long-toed salamanders do not compete well with Northwestern salamanders in perennial bodies of water on the west side of the North Cascades, this species is usually found in lakes in open terrain above the treeline where its competitor is not present. However, these lake habitats will be within a relatively short distance of forested terrestrial habitat for adult salamanders. Lakes above the treeline lack the woody structure and debris required by Northwestern salamanders as spawning substrate. Long-toed salamander breeding sites on the east side of the Cascade Crest are still usually located in areas of open vegetation within a relatively short distance of forested terrestrial habitat, but they are more likely to occur in forested regions below treeline because Northwestern salamanders do not occur in this region. Long-toed salamanders are generally more sensitive to competition and predation by stocked trout and, therefore, are more likely to suffer adverse impacts.

Three predictive factors appear to influence the extent of impacts: the productivity of the rearing lakes (as measured by total Kjeldahl nitrogen, or TKN), the density of stocked trout populations, and the Index of Connectivity (IOC). Based on available evidence, long-toed salamanders are at highest risk of extirpation in low-productivity lakes (TKN values <0.045 mg/l) with high-density populations of reproducing fish (>50 fish/acre), or high-density populations of stocked fish (>100 fish/acre) (Liss et al. 1995, 1999, 2002). A lower potential for extirpation exists in high-productivity lakes (TKN values greater than or equal to ≥ 0.045 mg/l) with low-density fish populations. Lakes with low-density fish populations of stocked trout

(≤ 100 fish/acre) do not appear to be at risk of extirpation, but the density of rearing salamander larvae may be reduced.

A final factor to explain the variability of impacts from stocked trout on long-toed salamander larvae in lakes with otherwise suitable habitats is the IOC. The IOC was based on the density or number of potential long-toed salamander breeding ponds or lakes (lakes with suitable aquatic and terrestrial habitat) within a target lake's basin (lakes/mile), number of known long-toed salamander populations within a radius of 3.75 miles (maximum likely colonization distance) of the target lake or pond, and the number of potential long-toed salamander breeding ponds or lakes within a 0.4-mile radius (maximum likely dispersal distance) of the target lake. These values were used to calculate the IOC, which represents the level of gene flow likely to occur between lake populations, likelihood of colonization events, and degree of isolation of a lake from the long-toed salamander metapopulation. IOC cannot exceed a value of 1.0, but it can be below a value of 0. Lakes with an IOC below 0 are considered to have very low potential for colonization or recolonization events in the short term and low levels of genetic interchange. The higher the IOC, the higher the connectivity, and the more likely it is that genetic exchange would occur.

Based on the above information and the knowledge of the plan/EIS team experts about the presence of amphibians in study area lakes, the following thresholds were defined (to be applied on a lake-by-lake basis):

Major: Populations of long-toed salamanders would be permanently altered from normal levels and possibly eliminated from a lake, with recolonization unlikely. For the impact assessment, potentially major impacts to long-toed salamanders would be expected where the following predictive factors are present:

- Lake with suitable habitat (open terrain at the lake with forest nearby) is within the range of the long-toed salamander, and
- TKN is ≥ 0.045 mg/L, fish density is high, and IOC is less than 0;

OR

- Lake with suitable habitat is within their range, and
- TKN is < 0.045 mg/L, fish density is high, and IOC is ≤ 0.3 .

Major impacts to Northwestern salamanders are unlikely in any lake due to larger larvae than long-toed salamanders and behavioral adaptations for avoiding predation.

Moderate: Populations of long-toed salamanders would be present within their historic range, but density of larvae in a lake would potentially be smaller than in comparable fishless lakes, and populations may be eliminated on a temporary or local basis. Populations would deviate from normal levels. Potentially moderate impacts to long-toed salamanders would be expected where the following predictive factors are present:

- Lake with suitable habitat is within their range, and
- TKN is ≥ 0.045 mg/L, fish density is high, and IOC is ≥ 0 ;

OR

- Lake with suitable habitat is within their range, and
- TKN is < 0.045 mg/L, fish density is high, and IOC is between 0.4 and 0.6.



Moderate impacts to Northwestern salamanders may occur where a lake with dense, closed-canopy forest habitat is within their range, and fish density is high.

Minor: Populations of long-toed salamanders likely would be present within their historic range, but density of larvae in a lake would potentially be slightly smaller than comparable fishless lakes. Minor impacts to long-toed salamanders would be expected where the following predictive factors are present:

- Lake with suitable habitat is within their range, and
- TKN is ≥ 0.045 mg/L, fish density is low, and IOC is ≤ 0.3 .

Minor impacts to Northwestern salamanders may occur where a lake with suitable forested habitat is within their range and fish density is low.

Negligible: Populations likely would be present in any lake within their historic range, with larval density close to that of fishless lakes. For the impact assessment, negligible impacts to long-toed salamanders would be expected where the following predictive factors are present:

- Lake with suitable habitat is within their range, and
- TKN is ≥ 0.045 mg/L, fish density is low, and IOC is ≥ 0.4 ;

OR

- Lake with suitable habitat is within their range, and
- TKN is < 0.045 mg/L and fish density is low;

OR

- Lake with suitable habitat is within their range, and
- TKN is < 0.045 mg/L, fish density is high, and IOC is ≥ 0.7 .

Table G-3 summarizes the outcome of various combinations of the principal predictive factors for impacts on the long-toed salamander larvae.

**TABLE G-3: PRINCIPAL PREDICTIVE FACTORS
FOR IMPACTS ON LONG-TOED SALAMANDER LARVAE**

TKN ≥ 0.045 mg/L	Fish Density	Index of Connectivity	Impact Level
Yes	High	< 0.0	Major
No	High	$< 0.0 - 0.3$	Major
Yes	High	$0.0 - 1.0$	Moderate
No	High	$0.4 - 0.6$	Moderate
Yes	Low	$< 0.0 - 0.3$	Minor
No	High	$0.7 - 1.0$	Negligible
Yes	Low	$0.4 - 1.0$	Negligible
No	Low	$< 0.0 - 1.0$	Negligible

[Table G-4](#) (located at the back of this appendix) provides the analysis matrix used for the assessment of impacts, by alternative, on amphibians for each of the 91 lakes in the study area.

NATIVE FISH

Impacts on native salmonids from downstream colonization by nonnative species can occur through competition for resources (such as prey species and spawning gravels), introgression (hybridization between nonnative trout and closely related native trout), and predation on juvenile native trout.

Native fish communities in watersheds below mountain lakes can be affected if salmonids stocked in mountain lakes establish populations in outlet streams. The extent of potential adverse impacts on native fish depends upon the species and strain stocked in a given mountain lake and the native species in the downstream areas of the watershed exposed to colonization. There is incomplete information regarding actual impacts currently occurring, or that could occur, for all 91 lakes under all alternatives; therefore, impact thresholds were developed using predictive factors based on the types of species stocked and the watershed locations (since certain species are native only to either the east or west side of the Cascades). Relevant literature and the professional experience of biologists on the plan/EIS team were used to relate the presence of certain nonnative fish to a likely level of impact. In addition to this predictive approach, actual knowledge of impacts (colonization and/or hybridization) occurring in certain drainages (as provided by WDFW staff involved in the preparation of this plan/EIS) was used to characterize impact levels whenever possible (see [“Table G-5: Assessment of Impacts on Native Fish”](#)). After the record of decision on this plan/EIS is made and a monitoring program is implemented, more specific biologically based factors would be developed and used in making future adaptive management decisions that would affect lake stocking.

The predictive factors used in this analysis focus on the potential for colonization and/or hybridization of downstream drainages. Colonization of downstream habitats by stocked mountain lake trout has been widely documented, but colonization success varies by species. For example, brook trout stocked in mountain lakes have successfully transited 80% gradient stream reaches and, in one case, a 60-foot waterfall to colonize tributaries with a gradient as high as a 23%. Downstream colonization over distances up to 68 miles has been documented (Adams et al. 2001). In contrast, Mt. Whitney rainbows and California golden trout have been widely stocked in high-elevation lakes in Washington, but successful colonization of downstream habitats by these species has never been documented in Washington State (WDFW, B. Pfeifer, pers. comm., 2002; WDFW, M. Downen, pers. comm., 2002). Various strains of cutthroat and rainbow trout have also been broadly stocked to high-elevation lakes and have had variable success with colonization of downstream habitats.

Because of the low potential of establishing populations in watersheds below mountain lakes, Ross Lake rainbows, Mt. Whitney rainbows, or California golden trout stocked in mountain lakes are unlikely to adversely affect native salmonids on the west side of the Cascade Crest. Also, the stocking of coastal cutthroat trout in a west-side lake would not create adverse effects, since these species are native to west-side watersheds.

Westslope cutthroat trout, however, are not native to stream basins on the west side of the Cascades and have the potential to compete with native trout, char, and salmon for resources and to hybridize with coastal rainbows and coastal cutthroat trout (WDFW, M. Downen, pers. comm., 2002, 2003). The Twin Lakes strain of westslope cutthroat trout has been widely stocked on the west side of the Cascades, with many reproducing populations established in both mountain lakes and streams. The zone of hybridization is likely to be restricted to reaches of streams where both westslope cutthroat and native trout can reproduce. Westslope cutthroat trout generally reproduce later in the year and in colder water



temperatures than coastal cutthroat and rainbow trout, which restricts the potential for introgression. Brook trout cannot hybridize with native rainbow or cutthroat trout, but can compete with native trout for available resources in headwater streams and tributaries (Adams et al. 2001). Brook trout are capable of hybridizing with bull trout, which are currently listed as threatened under the *Endangered Species Act*. A high percentage of the hybrids produced are thought to be sterile, giving the smaller but numerically superior brook trout a competitive advantage. A few lakes in the study area west of the Cascade Crest contain reproducing populations of rainbow trout strains, which are more closely related to native strains of rainbow trout and less likely to impact native trout than westslope cutthroat trout.

In the Lake Chelan / Stehekin River basin, Twin Lakes westslope cutthroat trout are stocked in many of the mountain lakes. Although this strain of westslope cutthroat may not be genetically identical to westslope cutthroats that are native to east-side streams, it is closely related and unlikely to have substantial impacts to native trout. Rainbow trout that were adapted to headwater stream and mountain lake environments (perhaps from Packwood Lake, Washington) were stocked into Rainbow Lake in the 1930s before the establishment of the Washington Game Department (currently the Washington Department of Fish and Wildlife). These stocked trout established a reproducing population of rainbow trout on the east side of the Cascade Crest. Reproducing populations of rainbow trout or populations of cutthroat/rainbow hybrids also exist in approximately three other lakes in the study area east of the Cascade Crest. Stocked rainbow trout have been documented to replace, through competition or hybridization, native populations of westslope cutthroat trout throughout its native range (Behnke 1992).

In general, the greatest threat to native fish in downstream drainages would occur from the presence of reproducing brook trout in a west-side lake with outlets to streams containing native char, or from rainbow or rainbow/cutthroat hybrids in an east-side lake, where native westslope cutthroat trout could occur in downstream reaches. These impacts would be considered major if both colonization and hybridization occur as a result of downstream dispersal.

Based on the above information, including the knowledge of WDFW biologists familiar with streams in the study area, the following impact thresholds were defined for native fish populations (to be applied on a lake-by-lake basis):

Major: There would be measurable evidence of colonization, and where interbreeding is possible, hybridization with native fish. Native species deviate from normal population levels or abundance, and/or genotypes are permanently altered. On a local basis, native species may be eliminated or become hybrid swarms. For this assessment, potentially major impacts would be expected when a surface outlet connects to a downstream basin AND the following additional predictive factors are found:

- Inventories demonstrate colonization and hybridization of the outlet stream from downstream dispersal of nonnative stocked fish has occurred,

AND

- Reproducing brook trout are present in a west-side lake, or
- Reproducing rainbow trout or rainbow/cutthroat hybrids are present in an east-side lake.

Moderate: Although individuals of nonnative species stocked into a lake could occasionally disperse downstream and rear in streams, there would be no measurable evidence of colonization or hybridization with native fish. All native species would be indefinitely viable. For this assessment, potentially moderate impacts would be expected when a surface outlet connects to a downstream basin AND the following additional predictive factors are found:

- Inventories demonstrate that colonization and/or hybridization of the outlet stream has not occurred from populations of nonnative stocked fish that have a long history of high levels of reproduction,

AND

- Reproducing brook trout are present in a west-side lake, or
- Reproducing rainbow trout or rainbow/cutthroat hybrids are present in an east-side lake.

Minor: Relatively small numbers of individuals could potentially be affected through intraspecies hybridization. Outbreeding depression may occur in vicinity of outlet stream, but effects would be localized. All native species would be indefinitely viable. For this assessment, potentially minor impacts would be expected when a surface outlet connects to a downstream basin AND one of the following additional predictive factors is found:

- Reproducing strains or subspecies of rainbow or cutthroat trout not native to the basin are present in a west-side lake,

OR

- Mt. Whitney rainbow trout are stocked in an east-side lake.

Negligible: If present in a lake with an outlet, fish are either native to the basin or are unlikely to colonize downstream areas if one or more of the following predictive factors applies:

- Ross Lake or Mt. Whitney rainbow trout, coastal cutthroat trout, or California golden trout are present in a west-side lake,

OR

- Westslope cutthroat trout are present in an east-side lake,

OR

- The lake is fishless.



TABLE G-1: ASSESSMENT OF IMPACTS ON PLANKTON

Lake Name	NPS Lake Code	Zone	Elevation (ft)	Surface Area (acres)	Maximum Depth (ft)	Water Temp (°C)	Fish Status	Fish Density	Reproducing Trout	Management Action Fish Densities				Level of Impact			
										Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Azure	MP-09-01	W	4,055	91.6	344.5	8.5	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Battalion	MLY-02-01	E	5,340	6.3	15.6	12.2	M	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Bear ^a	MC-12-01	W	5,795	25.7	151.9	11.4	R	H	Y	Fish-high density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Berdeen ^a	M-08-01	W	5,000	126.7	215.0	9.3	M	H	Y	Fish-high density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Berdeen, Lower	M-07-01	W	4,460	7.5	36.1	9.7	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Berdeen, Upper	M-09-01	W	5,050	9.5	—	—	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Blum (Largest/Middle, No. 3)	M-11-01	W	5,030	12.9	—	11.0	M	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Blum (Lower/West, No. 4)	LS-07-01	W	4,940	6.4	25.9	12.9	R	VH	Y	Fish-high density	Fish-low density	Fishless	Fishless	Major	Minor	Negligible	Negligible
Blum (Small/North, No. 2)	MC-01-01	W	5,620	0.9	10.0	19.5	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Blum (Vista/Northwest, No. 1)	MC-02-01	W	5,900	2.7	35.0	11.0	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Bouck, Lower	DD-04-01	W	3,850	10.8	63.2	11.2	R	H	Y	Fish-high density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Bouck, Upper	DD-05-01	W	5,030	5.5	29.0	10.5	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Bowen	MR-12-01	E	6,495	1.5	13.1	—	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Coon	MM-10-01	E	2,172	11.3	19.0	16.6	S	L	N	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Copper ^b	MC-06-01	W	5,263	12.9	67.2	10.3	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Dagger	MR-04-01	E	5,508	8.2	15.9	12.3	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Dee Dee, Upper	MR-15-01	E	6,303	12.2	89.2	7.4	M	H	Y	Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Dee Dee/Tamarack, Lower	MR-15-02	E	6,260	0.8	9.8	7.1	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Despair, Lower	M-14-01	W	4,820	1.7	—	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Despair, Upper	M-13-01	W	5,100	2.1	—	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Diobsud No. 1	LS-01-01	W	4,220	1.0	11.2	14.1	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Diobsud No. 2, Lower	LS-02-01	W	4,220	3.1	17.2	13.7	M	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Diobsud No. 3, Upper	LS-03-01	W	4,420	3.9	17.1	14.8	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Doubtful	CP-01-01	E	5,385	30.2	68.2	10.9	R	H	Y	Fish-high density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Doug's Tarn	M-21-01	W	3,951	5.0	10.2	11.2	R	H	Y	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
East, Lower	MC-14-02	W	5,460	8.0	—	15.6	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
East, Upper	MC-14-01	W	5,595	6.2	—	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Firn	MP-02-01	W	5,472	5.7	37.7	12.6	M	L	N	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Green ^a	M-04-01	W	4,261	80.0	153.2	8.7	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Green Bench	LS-04-01	W	4,870	3.9	21.5	10.5	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Hanging ^{a,c}	MC-08-01	W	4,522	88.8	—	—	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Hidden ^a	SB-01-01	W	5,733	61.7	258.2	7.2	M	L	N	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Hidden Lake Tarn	EP-14-01	W	5,830	4.9	42.7	12.8	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Hi-Yu	M-01-01	W	3,830	3.6	18.0	16.4	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Hozomeen ^a	HM-02-01	W	2,823	97.4	66.7	17.4	R	VH	Y	Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Ipsoot	LS-06-01	W	4,460	8.9	50.8	19.7	R	L	Y	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Jeanita	DD-01-01	W	4,904	1.4	8.0	12.7	R	L	N	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Kettling	MR-05-01	E	5,375	9.9	23.0	11.4	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Kwahnesum	MC-07-01	W	5,102	16.4	104.3	12.3	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
McAlester	MR-10-01	E	5,507	13.2	23.0	13.0	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Middle, Lower	MC-16-02	W	5,595	2.9	8.0	7.9	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Middle, Upper	MC-16-01	W	5,700	4.5	25.9	3.4	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Monogram ^a	M-23-01	W	4,873	29.1	122.0	12.3	M	H	Y	Fish-high density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Monogram Tarn	M-23-11	W	4,860	—	—	—	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Nert	M-05-01	W	4,556	3.6	29.5	15.8	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible



TABLE G-1: ASSESSMENT OF IMPACTS ON PLANKTON (CONTINUED)

Lake Name	NPS Lake Code	Zone	Elevation (ft)	Surface Area (acres)	Maximum Depth (ft)	Water Temp (°C)	Fish Status	Fish Density	Reproducing Trout	Management Action Fish Densities				Level of Impact			
										Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Noisy Creek, Upper	LS-14-01	W	3,660	0.3	—	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
No Name	PM-01-01	W	3,843	7.5	31.2	7.6	S	L	N	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Panther Potholes, Lower	RD-05-02	W	3,375	0.5	17.2	17.4	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Panther Potholes, Upper	RD-05-01	W	3,380	0.2	9.4	17.8	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Pegasus	EP-10-01	W	5,620	10.9	—	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Pond SE of Kettling Lakes	MR-09-01	E	5,945	4.7	16.1	—	S	L	N	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Quill, Lower	M-24-02	W	4,510	1.0	18.0		S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Quill, Upper	M-24-01	W	4,510	1.2	10.0	20.0	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Rainbow	MR-14-01	E	5,630	15.5	107.6	13.1	R	H	Y	Fish-high density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Rainbow, Upper (North)	MR-13-01	E	5,900	0.6	7.2	15.7	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Rainbow, Upper (South)	MR-13-02	E	5,865	3.6	24.1	10.6	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Rainbow, Upper (West)	MM-11-01	E	6,473	3.5	27.6	13.4	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Redoubt	MC-11-01	W	5,300	18.4	45.9	9.3	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Reveille, Lower	MC-21-02	W	4,995	4.4	9.8	13.8	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Reveille, Upper	MC-21-01	W	4,995	3.4	16.4	8.0	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Ridley	HM-03-01	W	3,140	10.9	35.1	18.2	S	L	N	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Sky	EP-13-01	W	5,380	1.9	—	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Skymo	PM-03-01	W	5,277	10.8	20.0	11.1	M	H	Y	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
Sourdough	PM-12-01	W	4,623	27.6	107.0	14.7	M	VH	Y	Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Sourpuss	ML-01-01	W	4,835	2.0	3.9	7.8	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Stiletto	MR-01-01	E	6,795	9.9	85.3	6.1	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Stout ^a	EP-09-02	W	5,215	25.2	175.5	5.4	M	L	Y	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Stout, Lower	EP-09-01	W	5,190	1.0	8.2	13.2	R	L	Y	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Sweet Pea	ML-02-01	W	5,540	10.3	92.0	6.5	S	L	N	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Talus Tarn	M-06-01	W	5,355	1.5	11.8	11.7	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Lower	MC-17-03	W	5,700	0.4	—	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Middle	MC-17-02	W	5,730	1.2	18.0	12.9	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Upper	MC-17-01	W	5,750	10.2	43.0	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, West	MC-17-04	W	5,660	2.3	14.1	11.7	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Thornton, Lower	M-20-01	W	4,486	55.1	108.3	12.2	M	L	N	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Thornton, Middle	M-19-01	W	4,700	11.9	78.7	8.2	S	L	N	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Thunder	RD-02-01	W	1,350	6.8	24.6	15.3	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tiny	MC-15-01	W	6,100	0.3	6.0	17.0	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Torment	ML-03-01	W	6,560	3.6	49.9	8.0	S	L	N	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Trapper ^a	GM-01-01	E	4,165	147.2	160.8	14.1	R	H	Y	Fish-high density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Triplet, Lower	SM-02-01	E	6,331	2.2	7.2	17.5	R	H	Y	Fish-high density	Fish-low density	Fish-low density	Fishless	Moderate	Minor	Minor	Negligible
Triplet, Upper	SM-02-02	E	6,551	2.3	12.5	19.7	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Triumph	M-17-01	W	3,685	4.3	20.5	17.1	S	L	N	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Unnamed	FP-01-01	W	5,140	13.5	—	—	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Unnamed	MR-11-01	E	6,111	2.9	28.9	14.6	S	L	N	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Unnamed	MR-16-01	E	6,230	1.9	6.6	—	R	L	N	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Vulcan	ML-04-01	W	5,180	8.2	25.2	10.7	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Wilcox/Lillie, Upper	EP-06-01	W	5,136	10.5	65.0	14.5	R	H	Y	Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Wilcox/Sandie, Lower	EP-05-01	W	5,120	5.4	19.7	13.5	R	H	Y	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
Wild	MC-27-01	W	4,880	12.7	28.9	10.1	FL	N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Willow	HM-04-01	W	2,853	16.9	26.9	19.5	S	L	N	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible

TABLE G-1: ASSESSMENT OF IMPACTS ON PLANKTON (CONTINUED)

Notes:

Zone:

E = East side of Cascade Crest
W = West side of Cascade Crest

Fish Status:

S = Stocked
S* = Stocked with reproducing fish. Limited reproduction in the past – needs verification.
R = Reproducing
M = Mixed reproducing and stocked
NF = No fish (historically stocked)
FL = No fish (historically fishless)

Fish Density:

H = High fish density (> 100 trout/acre for stocked fish or > 50 trout/acre for reproducing fish)
L = Low fish density (< 100 trout/acre for stocked fish or < 50 trout/acre for reproducing fish)
N = No fish present
VH = Very High fish density (> 400 trout/acre of reproducing fish or stocked fish with multiple year-classes approximating age structure of reproducing fish)

Reproducing Trout:

N = No
Y = Yes

Management Action Fish Densities:

Level of Impact:

- For impact thresholds, refer to “Table 31: Summary of Impact Thresholds—Aquatic Organisms” in the “Environmental Consequences” chapter.
- a. The feasibility of complete removal of fish in these lakes would need to be evaluated.
 - b In August 2004, a large fish kill was observed in Copper Lake, possibly due to disease. Further surveys are needed to confirm that the lake is fishless.
 - c. Remove all reproducing fish from Hanging Lake pending agreement with British Columbia.



TABLE G-2: ASSESSMENT OF IMPACTS ON MACROINVERTEBRATES

Lake Name	NPS Lake Code	Zone	Elevation (ft)	Surface Area (acres)	Max. Depth (ft)	Water Temp (°C)	Fish Status	Fish Density	Management Action Fish Densities				Level of Impact			
									Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Azure	MP-09-01	W	4,055	91.6	344.5	8.5	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Battalion	MLY-02-01	E	5,340	6.3	15.6	12.2	M	H	Fish-high density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Bear ^a	MC-12-01	W	5,795	25.7	151.9	11.4	R	H	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
Berdeen ^a	M-08-01	W	5,000	126.7	215.0	9.3	M	H	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
Berdeen, Lower	M-07-01	W	4,460	7.5	36.1	9.7	R	H	Fish-high density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Berdeen, Upper	M-09-01	W	5,050	9.5	—	—	R	H	Fish-high density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Blum (Largest/Middle, No. 3)	M-11-01	W	5,030	12.9	—	11.0	M	H	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Blum (Lower/West, No. 4)	LS-07-01	W	4,940	6.4	25.9	12.9	R	VH	Fish-high density	Fish-low density	Fishless	Fishless	Major	Minor	Negligible	Negligible
Blum (Small/North, No. 2)	MC-01-01	W	5,620	0.9	10.0	19.5	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Blum (Vista/Northwest, No. 1)	MC-02-01	W	5,900	2.7	35.0	11.0	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Bouck, Lower	DD-04-01	W	3,850	10.8	63.2	11.2	R	H	Fish-high density	Fish-low density	Fish-low density	Fishless	Moderate	Minor	Minor	Negligible
Bouck, Upper	DD-05-01	W	5,030	5.5	29.0	10.5	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Bowan	MR-12-01	E	6,495	1.5	13.1	—	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Coon	MM-10-01	E	2,172	11.3	19.0	16.6	S	L	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Copper ^b	MC-06-01	W	5,263	12.9	67.2	10.3	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Dagger	MR-04-01	E	5,508	8.2	15.9	12.3	R	H	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Dee Dee, Upper	MR-15-01	E	6,303	12.2	89.2	7.4	M	H	Fish-high density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Dee Dee/Tamarack, Lower	MR-15-02	E	6,260	0.8	9.8	7.1	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Despair, Lower	M-14-01	W	4,820	1.7	—	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Despair, Upper	M-13-01	W	5,100	2.1	—	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Diobsud No. 1	LS-01-01	W	4,220	1.0	11.2	14.1	R	H	Fish-high density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Diobsud No. 2, Lower	LS-02-01	W	4,220	3.1	17.2	13.7	M	H	Fish-high density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Diobsud No. 3, Upper	LS-03-01	W	4,420	3.9	17.1	14.8	S	L	Fish-low density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Doubtful	CP-01-01	E	5,385	30.2	68.2	10.9	R	H	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
Doug's Tarn	M-21-01	W	3,951	5.0	10.2	11.2	R	H	Fish-high density	Fish-low density	Fishless	Fishless	Major	Minor	Negligible	Negligible
East, Lower	MC-14-02	W	5,460	8.0	—	15.6	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
East, Upper	MC-14-01	W	5,595	6.2	—	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Firn	MP-02-01	W	5,472	5.7	37.7	12.6	M	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Green ^a	M-04-01	W	4,261	80.0	153.2	8.7	R	H	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Green Bench	LS-04-01	W	4,870	3.9	21.5	10.5	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Hanging ^{a,c}	MC-08-01	W	4,522	88.8	—	—	R	H	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Hidden ^a	SB-01-01	W	5,733	61.7	258.2	7.2	M	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Hidden Lake Tarn	EP-14-01	W	5,830	4.9	42.7	12.8	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Hi-Yu	M-01-01	W	3,830	3.6	18.0	16.4	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Hozomeen ^a	HM-02-01	W	2,823	97.4	66.7	17.4	R	VH	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Ipsoot	LS-06-01	W	4,460	8.9	50.8	19.7	R	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Jeanita	DD-01-01	W	4,904	1.4	8.0	12.7	R	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Ketling	MR-05-01	E	5,375	9.9	23.0	11.4	R	H	Fish-high density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Kwahnesum	MC-07-01	W	5,102	16.4	104.3	12.3	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
McAlester	MR-10-01	E	5,507	13.2	23.0	13.0	R	H	Fish-high density	Fishless	Fishless=	Fishless	Moderate	Negligible	Negligible	Negligible
Middle, Lower	MC-16-02	W	5,595	2.9	8.0	7.9	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Middle, Upper	MC-16-01	W	5,700	4.5	25.9	3.4	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible



TABLE G-2: ASSESSMENT OF IMPACTS ON MACROINVERTEBRATES (CONTINUED)

Lake Name	NPS Lake Code	Zone	Elevation (ft)	Surface Area (acres)	Max. Depth (ft)	Water Temp (°C)	Fish Status	Fish Density	Management Action Fish Densities				Level of Impact			
									Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Monogram ^a	M-23-01	W	4,873	29.1	122.0	12.3	M	H	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
Monogram Tarn	M-23-11	W	4,860	—	—	—	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Nert	M-05-01	W	4,556	3.6	29.5	15.8	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Noisy Creek, Upper	LS-14-01	W	3,660	0.3	—	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
No Name	PM-01-01	W	3,843	7.5	31.2	7.6	S	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Panther Potholes, Lower	RD-05-02	W	3,375	0.5	17.2	17.4	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Panther Potholes, Upper	RD-05-01	W	3,380	0.2	9.4	17.8	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Pegasus	EP-10-01	W	5,620	10.9	—	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Pond SE of Kettling Lakes	MR-09-01	E	5,945	4.7	16.1	—	S	L	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Quill, Lower	M-24-02	W	4,510	1.0	18.0		S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Quill, Upper	M-24-01	W	4,510	1.2	10.0	20.0	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Rainbow	MR-14-01	E	5,630	15.5	107.6	13.1	R	H	Fish-high density	Fish-low density	Fish-low density	Fishless	Moderate	Minor	Minor	Negligible
Rainbow, Upper (North)	MR-13-01	E	5,900	0.6	7.2	15.7	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Rainbow, Upper (South)	MR-13-02	E	5,865	3.6	24.1	10.6	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Rainbow, Upper (West)	MM-11-01	E	6,473	3.5	27.6	13.4	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Redoubt	MC-11-01	W	5,300	18.4	45.9	9.3	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Reveille, Lower	MC-21-02	W	4,995	4.4	9.8	13.8	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Reveille, Upper	MC-21-01	W	4,995	3.4	16.4	8.0	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Ridley	HM-03-01	W	3,140	10.9	35.1	18.2	S	L	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Sky	EP-13-01	W	5,380	1.9	—	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Skymo	PM-03-01	W	5,277	10.8	20.0	11.1	M	H	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
Sourdough	PM-12-01	W	4,623	27.6	107.0	14.7	M	VH	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Sourpuss	ML-01-01	W	4,835	2.0	3.9	7.8	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Stiletto	MR-01-01	E	6,795	9.9	85.3	6.1	S	L	Fish-low density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Stout ^a	EP-09-02	W	5,215	25.2	175.5	5.4	M	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Stout, Lower	EP-09-01	W	5,190	1.0	8.2	13.2	R	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Sweet Pea	ML-02-01	W	5,540	10.3	92.0	6.5	S	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Talus Tarn	M-06-01	W	5,355	1.5	11.8	11.7	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Lower	MC-17-03	W	5,700	0.4	—	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Middle	MC-17-02	W	5,730	1.2	18.0	12.9	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Upper	MC-17-01	W	5,750	10.2	43.0	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, West	MC-17-04	W	5,660	2.3	14.1	11.7	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Thornton, Lower	M-20-01	W	4,486	55.1	108.3	12.2	M	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Thornton, Middle	M-19-01	W	4,700	11.9	78.7	8.2	S	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Thunder	RD-02-01	W	1,350	6.8	24.6	15.3	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tiny	MC-15-01	W	6,100	0.3	6.0	17.0	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Torment	ML-03-01	W	6,560	3.6	49.9	8.0	S	L	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Trapper ^a	GM-01-01	E	4,165	147.2	160.8	14.1	R	H	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Minor	Negligible	Negligible
Triplet, Lower	SM-02-01	E	6,331	2.2	7.2	17.5	R	H	Fish-high density	Fish-low density	Fish-low density	Fishless	Major	Minor	Minor	Negligible
Triplet, Upper	SM-02-02	E	6,551	2.3	12.5	19.7	R	H	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Triumph	M-17-01	W	3,685	4.3	20.5	17.1	S	L	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Unnamed	FP-01-01	W	5,140	13.5	—	—	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Unnamed	MR-11-01	E	6,111	2.9	28.9	14.6	S	L	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible



TABLE G-2: ASSESSMENT OF IMPACTS ON MACROINVERTEBRATES E (CONTINUED)

Lake Name	NPS Lake Code	Zone	Elevation (ft)	Surface Area (acres)	Max. Depth (ft)	Water Temp (°C)	Fish Status	Fish Density	Management Action Fish Densities				Level of Impact			
									Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Unnamed	MR-16-01	E	6,230	1.9	6.6	—	R	L	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Vulcan	ML-04-01	W	5,180	8.2	25.2	10.7	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Wilcox/Lillie, Upper	EP-06-01	W	5,136	10.5	65.0	14.5	R	H	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Wilcox/Sandie, Lower	EP-05-01	W	5,120	5.4	19.7	13.5	R	H	Fish-high density	Fish-low density	Fishless	Fishless	Major	Minor	Negligible	Negligible
Wild	MC-27-01	W	4,880	12.7	28.9	10.1	FL	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Willow	HM-04-01	W	2,853	16.9	26.9	19.5	S	L	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible

Notes:

Zone: E = East side of Cascade Crest
W = West side of Cascade Crest

Fish Status: S = Stocked
S* = Stocked with reproducing fish. Limited reproduction in the past – needs verification.
R = Reproducing
M = Mixed reproducing and stocked
NF = No fish (historically stocked)
FL = No fish (historically fishless)

Fish Density: VH = Very high density of reproducing trout (> 220 fish/acre), typically brook trout.
H = Reproducing trout at >100 fish/acre, or reported high density trout population with poor condition index or high reproductive rate.
M = Reproducing population with documented density of 50 to 100 fish/acre or reported reproducing population with good numbers, size, growth, and condition factor.
L = Stocked population < 100 fish/acre or reproducing population < 50 fish.
N = No fish present.

Impacts: See [table 31](#) for impact thresholds.

a. The feasibility of complete removal of fish in these lakes would need to be evaluated.

b. In August 2004, a large fish kill was observed in Copper Lake, possibly due to disease. Further surveys are needed to confirm that the lake is fishless.

c. Remove all reproducing fish from Hanging Lake pending agreement with British Columbia.



TABLE G-4: ASSESSMENT OF IMPACTS ON AMPHIBIANS

Lake Name	NPS Lake Code	Zone	Index of Connectivity	Within Range of Distribution LTS	NWS	Fish Density	TKN ≥ 0.045 mg/L	Management Action Fish Densities				Level of Impact			
								Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Azure	MP-09-01	W	—	—		N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Battalion	MLY-02-01	E	0.0	X		H	N	Fish-high density	Fishless	Fishless	Fishless	Major (1)	Negligible (1)	Negligible (1)	Negligible
Bear ^a	MC-12-01	W	—	—		H	N	Fish-high density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Berdeen ^a	M-08-01	W	—	—		H	—	Fish-high density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Berdeen, Lower	M-07-01	W	0.4	X		H	N	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Berdeen, Upper	M-09-01	W	—	—		H	—	Fish-high density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Blum (Largest/Middle, No. 3)	M-11-01	W	0.3	X		H	U	Fish-high density	Fishless	Fishless	Fishless	Major (1)	Negligible	Negligible	Negligible
Blum (Lower/West, No. 4)	LS-07-01	W	0.2	X		VH	N	Fish-high density	Fish-low density	Fishless	Fishless	Major	Negligible	Negligible	Negligible
Blum (Small/North, No. 2)	MC-01-01	W	0.3	X		N	Y	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Blum (Vista/Northwest, No. 1)	MC-02-01	W	0.3	X		N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Bouck, Lower	DD-04-01	W	—	—	X	H	—	Fish-high density	Fish-low density	Fish-low density	Fishless	Moderate	Minor	Minor	Negligible
Bouck, Upper	DD-05-01	W	0.2	X		L	Y	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Bowan	MR-12-01	E	0.4	X		L	Y	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Coon	MM-10-01	E	-0.2	X		L	Y	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible
Copper ^b	MC-06-01	W	-1.4	X		L	N	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Dagger	MR-04-01	E	0.5	X		H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Dee Dee, Upper	MR-15-01	E	0.2	X		H	N	Fish-high density	Fishless	Fishless	Fishless	Major (1)	Negligible	Negligible	Negligible
Dee Dee/Tamarack, Lower	MR-15-02	E	0.2	X		L	N	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Despair, Lower	M-14-01	W	—	—		N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Despair, Upper	M-13-01	W	—	—		N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Diobsud No. 1	LS-01-01	W	0.4	—	X	H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Diobsud No. 2, Lower	LS-02-01	W	0.5	X		H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Diobsud No. 3, Upper	LS-03-01	W	0.5	X		L	Y	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Doubtful	CP-01-01	E	—	—		H	N	Fish-high density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Doug's Tarn	M-21-01	W	—	—		H	N	Fish-high density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
East, Lower	MC-14-02	W	—	—		N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
East, Upper	MC-14-01	W	—	—		N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Firn	MP-02-01	W	—	—		L	—	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Green ^a	M-04-01	W	0.4	X		H	U	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Green Bench	LS-04-01	W	—	—		N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Hanging ^{a,c}	MC-08-01	W	NA	X		H	U	Fish-high density	Fishless	Fishless	Fishless	Major (1)	Negligible	Negligible	Negligible
Hidden ^a	SB-01-01	W	—	—		L	—	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Hidden Lake Tarn	EP-14-01	W	—	—		L	—	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Hi-Yu	M-01-01	W	0.2	X		L	Y	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible (1)	Negligible	Negligible
Hozomeen ^a	HM-02-01	W	—	—	X	VH	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Ipsoot	LS-06-01	W	0.3	X		L	U	Fish-low density	Fish-low density	Fishless	Fishless	Minor (1)	Minor (1)	Negligible	Negligible
Jeanita	DD-01-01	W	-0.5	X		L	Y	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible
Kettling	MR-05-01	E	0.5	X		H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Kwahnesum	MC-07-01	W	-0.9	X		L	Y	Fish-low density	Fishless	Fishless	Fishless	Minor	Minor	Negligible	Negligible
McAlester	MR-10-01	E	0.7	X		H	Y	Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Middle, Lower	MC-16-02	W	—	—		N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible



TABLE G-4: ASSESSMENT OF IMPACTS ON AMPHIBIANS (CONTINUED)

Lake Name	NPS Lake Code	Zone	Index of Connectivity	Within Range of Distribution LTS	NWS	Fish Density	TKN ≥ 0.045 mg/L	Management Action Fish Densities				Level of Impact			
								Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Middle, Upper	MC-16-01	W	—			N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Monogram ^a	M-23-01	W	0.9	X		H	N	Fish-high density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Monogram Tarn	M-23-11	W	0.8	X		L	U	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Nert	M-05-01	W	0.2	X		L	Y	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Noisy Creek, Upper	LS-14-01	W	—		X	N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
No Name	PM-01-01	W	—			L	N	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Panther Potholes, Lower	RD-05-02	W	—		X	L	Y	Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Panther Potholes, Upper	RD-05-01	W	—		X	N	Y	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Pegasus	EP-10-01	W	—			N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Pond SE of Kettling Lakes	MR-09-01	E	0.7	X		L	N	Fish-low density	Fish-low density	Fish-low density	Fishless	Negligible	Negligible	Negligible	Negligible
Quill, Lower	M-24-02	W	0.0	X		L	U	Fish-low density	Fishless	Fishless	Fishless	Minor (1)	Minor (1)	Negligible	Negligible
Quill, Upper	M-24-01	W	0.0	X		L	U	Fish-low density	Fishless	Fishless	Fishless	Minor (1)	Negligible	Negligible	Negligible
Rainbow	MR-14-01	E	0.5	X		H	Y	Fish-high density	Fish-low density	Fish-low density	Fishless	Moderate	Negligible	Negligible	Negligible
Rainbow, Upper (North)	MR-13-01	E	0.4	X		N	Y	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Rainbow, Upper (South)	MR-13-02	E	0.4	X		L	N	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Rainbow, Upper (West)	MM-11-01	E	—			L	N	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Redoubt	MC-11-01	W	—			N	Y	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Reveille, Lower	MC-21-02	W	—			N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Reveille, Upper	MC-21-01	W	—			N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Ridley	HM-03-01	W	—		X	L	Y	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor (1)	Minor (1)	Minor (1)	Negligible
Sky	EP-13-01	W	—			N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Skymo	PM-03-01	W	0.5	X		H	N	Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible
Sourdough	PM-12-01	W	-0.5	X		VH	U	Fish-high density	Fishless	Fishless	Fishless	Major (1)	Negligible (1)	Negligible	Negligible
Sourpuss	ML-01-01	W	—			N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Stiletto	MR-01-01	E	—			L	Y	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible (1)	Negligible	Negligible
Stout ^a	EP-09-02	W	—			L	—	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Stout, Lower	EP-09-01	W	—			L	N	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Sweet Pea	ML-02-01	W	—			L	N	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Talus Tarn	M-06-01	W	0.2	X		N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Lower	MC-17-03	W	—			N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Middle	MC-17-02	W	—			N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, Upper	MC-17-01	W	—			N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tapto, West	MC-17-04	W	—			N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Thornton, Lower	M-20-01	W	-0.3	X		L	Y	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Negligible	Negligible	Negligible
Thornton, Middle	M-19-01	W	—			L	N	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Thunder	RD-02-01	W	—		X	N	Y	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Tiny	MC-15-01	W	—			N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Torment	ML-03-01	W	—			L	N	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Trapper ^a	GM-01-01	E	—			H	N	Fish-high density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Triplet, Lower	SM-02-01	E	-0.2	X		H	Y	Fish-high density	Fish-low density	Fish-low density	Fishless	Major (1)	Minor	Minor	Negligible
Triplet, Upper	SM-02-02	E	—			H	N	Fish-high density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Triumph	M-17-01	W	0.0	X		L	U	Fish-low density	Fish-low density	Fishless	Fishless	Minor (1)	Minor (1)	Negligible	Negligible
Unnamed	FP-01-01	W	—			N	—	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible



TABLE G-4: ASSESSMENT OF IMPACTS ON AMPHIBIANS (CONTINUED)

Lake Name	NPS Lake Code	Zone	Index of Connectivity	Within Range of Distribution LTS	NWS	Fish Density	TKN ≥ 0.045 mg/L	Management Action Fish Densities				Level of Impact			
								Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D
Unnamed	MR-11-01	E	0.4	X		L	Y	Fish-low density	Fish-low density	Fish-low density	Fishless	Negligible	Negligible	Negligible	Negligible
Unnamed	MR-16-01	E	0.2	X		L	Y	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Negligible	Negligible	Negligible
Vulcan	ML-04-01	W	—			N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Wilcox/Lillie, Upper	EP-06-01	W	—			H	N	Fish-high density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Wilcox/Sandie, Lower	EP-05-01	W	—			H	N	Fish-high density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Wild	MC-27-01	W	—			N	N	Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible
Willow	HM-04-01	W	—		X	L	Y	Fish-low density	Fish-low density	Fish-low density	Fishless	Minor (1)	Minor (1)	Minor (1)	Negligible

Notes:

Zone: E = East side of Cascade Crest
W = West side of Cascade Crest

Index of Connectivity: An Index of Connectivity (IOC) based on weighted calculations of potential salamander breeding lake (lakes within range of salamander distribution and having appropriate habitat) density (lakes/acre) within a target lake's basin (major tributary basin). Documented salamander breeding Lakes within 6 km (maximum colonization distance) of target lake, and number of potential salamander lakes with 0.6 km (maximum dispersal distance) of target lake. Lakes with an IOC = 0.7–0.9 have high connectivity, lakes with a IOC of 0.4–0.6 have moderate connectivity, lakes with an IOC of 0–0.3 have poor connectivity, and lakes with an IOC of < 0.0 can be considered isolated. Dash (-) indicates outside the range of long-toed salamanders (LTS) and TKN not determined.

Fish Density: H or High = > 50 trout/acre of reproducing trout or > 100 trout/acre of stocked trout; L or Low = < 50 trout/acre of reproducing trout or ≤ 100 trout/acre of stocked trout, with a total fish density of no more than 100 trout/acre; N or No Fish = No fish present in lake.

Within Range of Distribution: X - lake is within distribution range of long-toed salamander (LTS) or Northwestern salamander (NWS) and has suitable aquatic and terrestrial habitat for all life stages.

TKN ≥ 0.045 mg/l: (Total Kjeldahl Nitrogen) Y =Yes, TKN ≥0.045 mg/L; N = No, TKN <0.045 mg/L. U = unknown concentration. Dash = outside range of salamanders.

Fishless: Initial management action would result in a fishless lake. Depending upon the results of further evaluation, the lake may be stocked with a low density of trout.

Level of Impact: See [table 31](#) for impact thresholds. Where a (1) follows a Negligible impact determination, additional evaluation or management actions may result in a Minor impact. Where a (1) follows a Minor, Moderate, or Major impact determination, a conservative assessment was performed in view of an absence of data for one or more factors (e.g., IOC is unknown), and additional evaluation or management actions may result in a reduction of the impact by one level (e.g., reduce Major to Moderate).

- a. The feasibility of complete fish removal in these lakes would need to be evaluated.
- b. In August 2004, a large fish kill was observed in Copper Lake, possibly due to disease. Further surveys are needed to confirm that the lake is fishless.
- c. Remove all reproducing fish from Hanging Lake pending agreement with British Columbia.



TABLE G-5: ASSESSMENT OF IMPACTS ON NATIVE FISH

Drainage Basin	NPS Lake Code	Lake Name	Side of Cascade Crest	Surface Inlet or Outlet	Trout Present, Historically Present, or Scheduled for Stocking in Lake									Management Action Fish Densities					Level of Impact			
					Brook Trout	Westslope Cutthroat	Coastal Cutthroat	Yellowstone Cutthroat	Rainbow/Cutthroat Hybrids	Rainbow Trout	Mt. Whitney Rainbow	Ross Lake Rainbow	Rainbow Subspecies	Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D	
Skagit	MP-09-01	Azure	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MLY-02-01	Battalion	E	Yes						X	X			Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible	
Chilliwack	MC-12-01	Bear ^a	W	Yes		X					*			Fish-high density	fish-low density	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	M-08-01	Berdeen ^a	W	Yes		X					X			Fish-high density	Fish –low density	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	M-07-01	Berdeen, Lower	W	Yes		X								Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	M-09-01	Berdeen, Upper	W	Yes		X								Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Baker	M-11-01	Blum (Largest/Middle, No. 3)	W	Yes						X	*			Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible	
Baker	LS-07-01	Blum (Lower/West, No. 4)	W	Yes	X						X			Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible	
Baker	MC-01-01	Blum (Small/North, No. 2)	W	No										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Baker	MC-02-01	Blum (Vista/Northwest, No. 1)	W	No										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	DD-04-01	Bouck, Lower	W	Yes		X					X			Fish-high density	Fish-low density	Fish-low density	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	DD-05-01	Bouck, Upper	W	Yes									X	Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-12-01	Bowan	E	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Stehekin	MM-10-01	Coon	E	Yes		X								Fish-low density	Fish-low density	Fish-low density	Fishless	Negligible	Negligible	Negligible	Negligible	
Chilliwack	MC-06-01	Copper ^b	W	Yes			X				*			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-04-01	Dagger	E	Yes		X								Fish-high density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-15-01	Dee Dee, Upper	E	Yes						X	*			Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible	
Stehekin	MR-15-02	Dee Dee/Tamarack, Lower	E	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	M-14-01	Despair, Lower	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	M-13-01	Despair, Upper	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	LS-01-01	Diobsud No. 1	W	Yes		X								Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	LS-02-01	Diobsud No. 2, Lower	W	Yes		X					*			Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	LS-03-01	Diobsud No. 3, Upper	W	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	CP-01-01	Doubtful	E	Yes		X			X	X				Fish-high density	Fish-low density	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible	
Skagit	M-21-01	Doug's Tarn	W	Yes		X								Fish-high density	Fish-low density	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Ross	MC-14-02	East, Lower	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	MC-14-01	East, Upper	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	MP-02-01	Firn	W	Yes		X					*			Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible	
Skagit	M-04-01	Green ^a	W	Yes		X			X	X	*			Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	LS-04-01	Green Bench	W	No										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Chilliwack	MC-08-01	Hanging ^{a,c}	W	Yes						X				Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	SB-01-01	Hidden ^a	W	Yes						X	X		X	Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible	
Skagit	EP-14-01	Hidden Lake Tarn	W	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	M-01-01	Hi-Yu	W	No							X			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	HM-02-01	Hozomeen ^a	W	Yes	X									Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible	
Baker	LS-06-01	Ipsoot	W	No				X						Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	DD-01-01	Jeanita	W	Yes									X	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	



TABLE G-5: ASSESSMENT OF IMPACTS ON NATIVE FISH (CONTINUED)

Drainage Basin	NPS Lake Code	Lake Name	Side of Cascade Crest	Surface Inlet or Outlet	Trout Present, Historically Present, or Scheduled for Stocking in Lake									Management Action Fish Densities					Level of Impact			
					Brook Trout	Westlope Cutthroat	Coastal Cutthroat	Yellowstone Cutthroat	Rainbow/Cutthroat Hybrids	Rainbow Trout	Mt. Whitney Rainbow	Ross Lake Rainbow	Rainbow Subspecies	Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D	
Stehekin	MR-05-01	Kettling	E	Yes		X	X		X	X				Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible	
Chilliwack	MC-07-01	Kwahnesum	W	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-10-01	McAlester	E	Yes										Fish-high density	Fishless	Fishless	Fishless	Major	Negligible	Negligible	Negligible	
Ross	MC-16-02	Middle, Lower	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	MC-16-01	Middle, Upper	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	M-23-01	Monogram ^a	W	Yes		X					X			Fish-high density	Fish-low density	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	M-23-11	Monogram Tarn	W	No		X								Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Baker	M-05-01	Nert	W	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Baker	LS-14-01	Noisy Creek, Upper	W	No										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	PM-01-01	No Name	W	Yes							X			Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	RD-05-02	Panther Potholes, Lower	W	No			X							Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	RD-05-01	Panther Potholes, Upper	W	No										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	EP-10-01	Pegasus	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-09-01	Pond SE of Kettling Lakes	E	No							X			Fish-low density	Fish-low density	Fish-low density	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	M-24-02	Quill, Lower	W	No						X	X			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	M-24-01	Quill, Upper	W	No						X	X			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-14-01	Rainbow	E	Yes						X	X			Fish-high density	Fish-low density	Fish-low density	Fishless	Moderate	Negligible	Negligible	Negligible	
Stehekin	MR-13-01	Rainbow, Upper (North)	E	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-13-02	Rainbow, Upper (South)	E	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Stehekin	MM-11-01	Rainbow, Upper (West)	E	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Chilliwack	MC-11-01	Redoubt	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Chilliwack	MC-21-02	Reveille, Lower	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Chilliwack	MC-21-01	Reveille, Upper	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	HM-03-01	Ridley	W	Yes							X	X		Fish-low density	Fish-low density	Fish-low density	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	EP-13-01	Sky	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	PM-03-01	Skymo	W	Yes		X					X			Fish-high density	Fish-low density	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Ross	PM-12-01	Sourdough	W	Yes	X						X			Fish-high density	Fishless	Fishless	Fishless	Moderate	Negligible	Negligible	Negligible	
Ross	ML-01-01	Sourpuss	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-01-01	Stiletto	E	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	EP-09-02	Stout ^a	W	Yes		X	X							Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible	
Skagit	EP-09-01	Stout, Lower	W	Yes		X					*			Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible	
Ross	ML-02-01	Sweet Pea	W	Yes							X			Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	M-06-01	Talus Tarn	W	Yes							X			Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Chilliwack	MC-17-03	Tapto, Lower	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Chilliwack	MC-17-02	Tapto, Middle	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Chilliwack	MC-17-01	Tapto, Upper	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Chilliwack	MC-17-04	Tapto, West	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	M-20-01	Thornton, Lower	W	Yes		X					X			Fish-low density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible	
Skagit	M-19-01	Thornton, Middle	W	Yes							X		X	Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	RD-02-01	Thunder	W	No										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	



TABLE G-5: ASSESSMENT OF IMPACTS ON NATIVE FISH (CONTINUED)

Drainage Basin	NPS Lake Code	Lake Name	Side of Cascade Crest	Surface Inlet or Outlet	Trout Present, Historically Present, or Scheduled for Stocking in Lake									Management Action Fish Densities					Level of Impact			
					Brook Trout	Westslope Cutthroat	Coastal Cutthroat	Yellowstone Cutthroat	Rainbow/Cutthroat Hybrids	Rainbow Trout	Mt. Whitney Rainbow	Ross Lake Rainbow	Rainbow Subspecies	Alternative A	Alternative B	Alternative C	Alternative D	Alternative A	Alternative B	Alternative C	Alternative D	
Ross	MC-15-01	Tiny	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	ML-03-01	Torment	W	Yes							X			Fish-low density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	GM-01-01	Trapper ^a	E	Yes		X					*			Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	SM-02-01	Triplet, Lower	E	Yes		X					X			Fish-high density	Fish-low density	Fish-low density	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	SM-02-02	Triplet, Upper	E	Yes		X								Fish-high density	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	M-17-01	Triumph	W	Yes							X			Fish-low density	Fish-low density	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	FP-01-01	Unnamed	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Stehekin	MR-11-01	Unnamed	E	Yes							X			Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Negligible	Negligible	Negligible	
Stehekin	MR-16-01	Unnamed	E	Yes		X					*			Fish-low density	Fish-low density	Fish-low density	Fishless	Minor	Minor	Minor	Negligible	
Skagit	ML-04-01	Vulcan	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Skagit	EP-06-01	Wilcox/Lillie, Upper	W	Yes		X			X	X				Fish-high density	Fishless	Fishless	Fishless	Minor	Negligible	Negligible	Negligible	
Skagit	EP-05-01	Wilcox/Sandie, Lower	W	Yes		X				X	X			Fish-high density	Fish-low density	Fishless	Fishless	Minor	Minor	Negligible	Negligible	
Skagit	MC-27-01	Wild	W	Yes										Fishless	Fishless	Fishless	Fishless	Negligible	Negligible	Negligible	Negligible	
Ross	HM-04-01	Willow	W	Yes			X							Fish-low density	Fish-low density	Fish-low density	Fishless	Negligible	Negligible	Negligible	Negligible	

Notes:

Trout Present or Scheduled for Stocking in Lake: There are 9 columns for the 9 species, subspecies, or strains of trout reproducing, stocked, or currently scheduled to be stocked in mountain lakes. Management actions for some lakes in alternatives B and C include, or may include after a period of evaluation, stocking nonreproductive trout at low densities to replace or supplement current populations of trout. These lakes are indicated with an asterisk (*) under the column for Mt. Whitney Rainbow, which would be the preferred stock of currently available hatchery trout for stocking.

Level of Impact: Refer to [table 31](#) in the “**Environmental Consequences**” chapter.

a. The feasibility of complete removal of fish in these lakes would need to be evaluated.

b. In August 2004, a large fish kill was observed in Copper Lake, possibly due to disease. Further surveys are needed to confirm that the lake is fishless.

c. Remove all reproducing fish from Hanging Lake pending agreement with British Columbia.



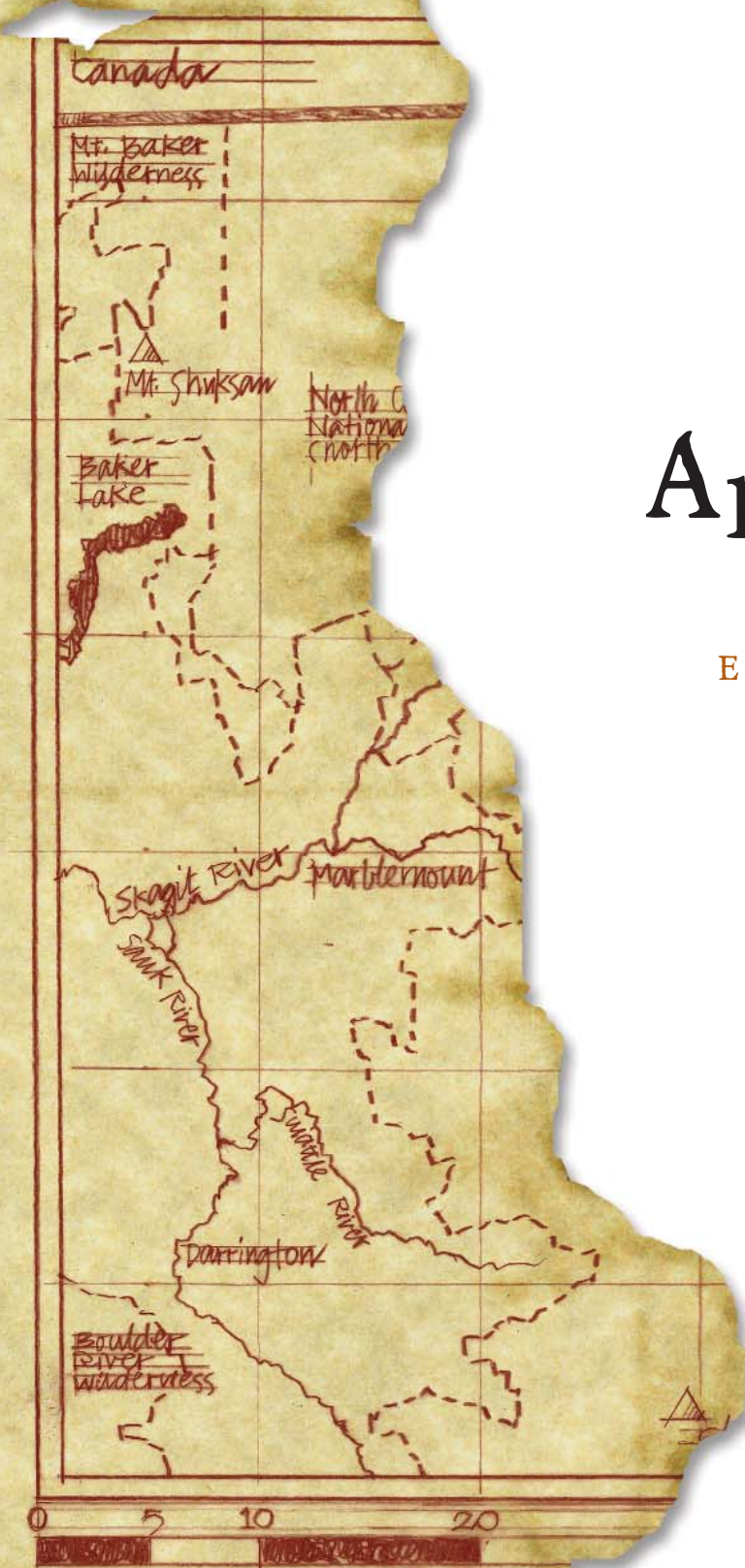
REFERENCES CITED IN APPENDIX G

- Adams, S.B., C.F. Frissell, and B.E. Reiman
2001 "Geography of invasion in mountain streams: Consequences of headwater lake fish introductions." *Ecosystems* 4(4):296-307.
- Aubry, K.B. and P.A. Hall
1991 "Terrestrial amphibian communities in the southern Washington Cascade Range." *Wildlife and vegetation of unmanaged Douglas-fir forests*. L.F. Ruggiero, K.B. Aubry, A.B. Carey, M.H. Huff eds. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-285, Portland, OR.
- Behnke, R.J.
1992 Native trout of western North America. Monograph 6. American Fisheries Society, Bethesda, MD.
- Bilton, D.T., J.R. Freeland, and B. Okamura
2001 "Dispersal in freshwater invertebrates." *Annual review of Ecology and Systematics* 32:159-181.
- Bohonak, A.J., and D.G. Jenkins
2003 Ecological and evolutionary significance of dispersal by freshwater invertebrates. *Ecol. Letters* 6: 783-796.
- Brett, M.T., K. Wiackowski, F.S. Lubnow, A. Mueller-Solger, J.J. Elser, and C.R. Goldman
1994 "Species-dependent effects of zooplankton on planktonic ecosystem processes in Castle Lake, California." *Ecology* 76:2243-2254.
- Chess, D.W., F. Gibson, A.T. Scholz, and R.J. White
1993 "The introduction of lahontan cutthroat trout into a previously fishless lake: feeding habits and effects upon the zooplankton and benthic community." *Journal of Freshwater Ecology* 8:215-225.
- Donald, D.B., R.D. Vinebrooke, R.S. Anderson, J. Syrgiannis, and M.D. Graham
2001 "Recovery of zooplankton assemblages in mountain lakes from the effects of introduced sport fish." *Canadian Journal of Fisheries and Aquatic Sciences* 58:1822-1830.
- Donald, D.B., R.S. Anderson, and D.W. Mayhood
1994 "Coexistence of fish and large *Hesperodiptomus* species (Crustacea: Calanoida) in subalpine and alpine lakes." *Canadian Journal of Zoology* 72:259-261.
- Drake, D.C. and R.J. Naiman
2000 "An evaluation of restoration efforts in fishless lakes stocked with exotic trout." *Conservation Biology* 14(6):1807-1820.
- Dvornich, K.M., K.R. McAllister, and K.B. Aubry
1997 Amphibians and reptiles of Washington State: Location data and predicted distributions, Volume 2 in Washington State Gap Analysis - Final Report, (K.M. Cassidy, C.E. Grue, M.R. Smith and K.M. Dvornich, eds.), Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle. 146 pp.
- Elser, J.J., C. Luecke, M.T. Brett, and C.R. Goldman
1995 "Effects of food web compensation after manipulation of rainbow trout in an oligotrophic lake." *Ecology* 76:52-69.

- Hoffman, R.L. and G.L. Larson
1999 "Ambystoma gracile (northwestern salamander). Predation and Cannibalism." Natural History notes in *Herpetological Review* 30(3):159.
- Hoffman, R.L., G.L. Larson, and B.J. Brokes
2003 "Habitat segregation of *Ambystoma gracile* and *Ambystoma macrodactylum* in mountain ponds and lakes, Mount Rainier National Park, Washington, USA." *Journal of Herpetology* 37(1):24-34.
- Knapp R.A.
1996 "Non-Native Trout in Natural Lakes of the Sierra Nevada: An Analysis of Their Distribution and Impacts on Native Aquatic Biota". Chapter 8 in, *Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. II, Assessments and scientific basis for management options*. University of California, Davis, Centers for Water and Wildland Resources.
- Leavitt, P.R., D.E. Schindler, A.J. Paul, A.K. Hardie, and D.W. Schindler
1994 "Fossil pigment records of phytoplankton in trout-stocked alpine lakes." *Canadian Journal of Fisheries and Aquatic Sciences* 51:2411-2423.
- Liss, W.J., G.L. Larson, E.K. Deimling, R. Gresswell, R. Hoffman, M. Kiss, G. Lomnický, C.D. McIntire, R. Truitt, and T. Tyler
1995 Ecological Effects of Stocked Trout in Naturally Fishless High Mountain Lakes: North Cascades National Park Service Complex, WA, USA. Technical Report NPS/PNROSU/NRTR-95-03. USDI National Park Service, Pacific Northwest Region, Science and Technology. Seattle, WA. 285 pp.
- Liss, W.J., G.L. Larson, and R.L. Hoffman, eds.
2002 *Ecological Impact of Introduced Trout on Native Aquatic Communities in Mountain Lakes: Phase III Final Report*. Prepared for the USDI National Park Service, Pacific Northwest Region, North Cascades National Park Service Complex by USGS Forest and Rangeland Ecosystem Science Center. Corvallis, OR. 102 pp.
- Liss, W.J., G.L. Larson, T.J. Tyler, L. Ganio, R. Hoffman, E.A. Deimling, G. Lomnický, C.D. McIntire, and R. Truitt
1999 Ecological Effects of Stocked Trout in Naturally Fishless High Mountain Lakes: North Cascades National Park Service Complex, WA, USA: Phase II. Technical Report NPS/CCSSOOSU/NRTR-98/01. USDI National Park Service, Pacific Northwest Region, Science and Technology. Seattle, WA. 133 pp.
- Luecke, C.
1990 "Changes in abundance and distribution of benthic macroinvertebrates after introduction of cutthroat trout into a previously fishless lake." *Transactions of the American Fisheries Society* 119:1010-1021.
- Marnell, L.F.
1997 "Herpetofauna of Glacier National Park." *Northwestern Naturalist* 78:17-33.
- Parker, B.R., D.W. Schindler, D.B. Donald, and R.S. Anderson
2001 "The effects of stocking and removal of a nonnative salmonid on the plankton of an alpine lake." *Ecosystems* 2001(4):334-345.
- Parker, B.R., F.M. Wilhelm, and D.W. Schindler
1996 "Recovery of *Hesperodiaptomus arcticus* populations from diapausing eggs following elimination by stocked salmonids." *Canadian Journal of Zoology* 74:1292-1297.
- Petranka, J.W.
1998 *Salamanders of the United States and Canada*. Smithsonian Institution Press, Washington, DC.



- Semlitsch, R.D.
 1983 "Burrowing ability and behavior of salamanders of the genus *Ambystoma*." *Canadian Journal of Zoology* 61: 616-620.
- Verschuren, D., and L.F. Marnell
 1997 Fossil zooplankton and the historical status of Westslope cutthroat trout in a headwater lake of Glacier National Park. *Trans. Amer. Fish. Soc.* 126(1): 21-34.
- Walters, C.J. and R.E. Vincent
 1973 "Potential productivity of an alpine lake as indicated by removal and reintroduction of fish." *Transactions of the American Fisheries Society* 102:675-697.



Appendix H

ESTIMATING FISH DENSITIES

APPENDIX H: ESTIMATING FISH DENSITIES

ESTIMATING REPRODUCING DENSITIES OF FISH

Fish density was determined by using best available data from existing reports and observations. The Liss et al. 1999 Phase II report contains a table (table 4.3) of mark-and-recapture densities for 10 lakes with reproducing (self-sustaining) fish populations. In that table, the average reported density for each of the 10 lakes was applied to each year between 1989 and 2003. For these 10 lakes, the data collected by Oregon State University and the U.S. Geological Survey are listed in [table H-1](#).

For some of the lakes, fish densities were estimated from mark-and-recapture data for sampled reproducing populations (Liss et al. 1998), stocking records, and calculated annual mortality rates of stocked fish. Others were estimated from a variety of other information reported in Liss et al. 1998, including apparent impacts to long-toed salamanders and the condition of fish in a particular lake. A density of 222 fish/acre was considered to be the average density for reproducing fish populations in lakes with high densities of fish. Unless a lake was reported to have a lower density of reproducing fish or a population of brook trout, a density of 222 fish/acre was used for each year for lakes with reproducing fish.

Reproducing brook trout populations are seldom maintained at low densities and have been reported to reach densities as high as 700 fish/acre. For lakes in the North Cascades Complex with reproducing brook trout populations, the following numbers were used: an average of 222 fish/acre for lakes with high densities and a maximum of 700 fish/acre (average of 461 fish/acre).

There were few lakes with low densities of reproducing fish; the densities in these lakes ranged from 11 to 53 fish/acre, for an average of 33 fish/acre. Other lakes contained low densities of reproducing fish, where reproduction was inadequate to sustain fish populations. If these low-density reproducing populations are not supplemented with hatchery fish, they would likely be eliminated over a period of a few decades due to variations in reproductive success. The average value of 33 fish/acre was applied to these lakes for each year between 1989 to 2003.

ESTIMATING DENSITIES FOR LAKES WITH NONREPRODUCING FISH AND MIXED-MANAGEMENT LAKES

Maximum literature values for yearly survival rates of fish stocked in mountain lakes (including both natural and angling mortalities) are about 90% survival for the first two years (before fish are large enough to be caught by anglers) and 60% each year after they enter the sport fishery. For the first two years after stocking, the stocking density was multiplied by a 90% survival rate. After the first two years, a 60% survival rate was used. Year-by-year after stocking, fish numbers for a stocked year class generally declined in an exponential fashion until about the 10th year after stocking, when no fish are likely to remain.

Some lakes have a combination of nonreproducing and reproducing fish. In these mixed-management lakes, both approaches were used for estimating density. For each lake, the total density per year was calculated. This number represents the total number of stocked fish from each stocked year class and fish from natural reproduction that were present in a lake for each calendar year. The total yearly densities for each year from 1989 to 2003 are presented in [table H-1](#) for each of the 91 lakes in the North Cascades Complex that has a history of fish stocking.



TABLE H-1: FISH SURVIVAL CALCULATIONS

Lake Name	NPS Lake Code	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Azure	MP-09-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Battalion	MLY-02-01	237	289	280	272	252	237	230	267	261	256	242	232	227	225	223
Bear	MC-12-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Berdeen	M-08-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Berdeen, Lower	M-07-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Berdeen, Upper	M-09-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Blum (Largest / Middle No. 3)	M-11-01	222	222	222	222	382	420	400	344	287	255	238	230	226	224	223
Blum (Lower / West, No. 4)	LS-07-01	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461
Blum (Small / North, No. 2)	MC-01-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blum (Vista / Northwest, No. 1)	MC-02-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bouck, Lower	DD-04-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Bouck, Upper	DD-05-01	27	69	56	48	28	14	62	53	46	28	69	56	48	28	14
Bowan	MR-12-01	77	65	57	34	17	8	111	98	88	53	26	13	7	111	99
Coon	MM-10-01	159	213	154	210	152	111	64	32	16	8	4	104	93	83	50
Copper	MC-06-01	105	90	78	47	77	60	50	29	15	76	66	58	34	17	9
Dagger	MR-04-01	259	259	259	259	259	259	259	259	259	259	259	259	259	259	259
Dee Dee, Upper	MR-15-01	53	52	52	51	51	51	51	51	51	51	92	88	84	71	61
Dee Dee (Tamarack, Lower)	MR-15-02	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Despair, Lower	M-14-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Despair, Upper	M-13-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diobsud No. 1	LS-01-01	11	61	56	52	35	23	17	14	13	12	11	0	0	0	11
Diobsud No. 2, Lower	LS-02-01	74	274	254	236	171	123	98	86	80	77	76	75	74	74	74
Diobsud No. 3, Upper	LS-03-01	35	30	27	16	98	85	75	45	99	80	68	40	20	10	5



TABLE H-1: FISH SURVIVAL CALCULATIONS (CONTINUED)

Lake Name	NPS Lake Code	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Doubtful	CP-01-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Doug's Tarn	M-21-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
East, Lower	MC-14-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East, Upper	MC-14-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Firm	MP-02-01	82	73	44	22	11	5	3	1	1	0	0	26	23	21	13
Green	M-04-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Green Bench	LS-04-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hanging	MC-08-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Hidden	SB-01-01	127	115	82	58	93	82	75	58	93	82	75	58	94	83	76
Hidden Lake Tarn	EP-14-01	10	5	53	47	42	25	13	6	54	47	42	25	13	62	54
Hi-Yu	M-01-01	20	10	5	3	1	112	100	90	138	103	82	48	108	87	74
Hozomeen	HM-02-01	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461
Ipsoot	LS-06-01	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Jeanita	DD-01-01	78	56	44	39	36	34	34	33	33	33	33	33	33	33	33
Kettling	MR-05-01	103	103	103	103	103	103	103	103	103	103	103	103	103	103	103
Kwahnesum	MC-07-01	199	173	128	72	188	155	132	78	39	182	156	136	81	41	20
McAlester	MR-10-01	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204
Middle, Lower	MC-16-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Middle, Upper	MC-16-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monogram	M-23-01	264	243	232	227	225	223	275	269	264	247	235	228	225	224	223
Monogram Tarn	M-23-11	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Nert	M-05-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noisy Creek, Upper	LS-14-01	0	0	0	0	0	0	0	0	0	0	0				0
No Name	PM-01-01	83	69	58	35	84	69	59	35	17	9	4	2	1	1	0
Panther Potholes, Lower	RD-05-02	77	141	106	80	46	98	79	67	39	20	10	5	2	1	1
Panther Potholes, Upper	RD-05-01	288	234	137	69	34	17	9	4	2	1	0	0	0	0	0
Pegasus	EP-10-01	0	0	0	0	0	0	0	0	0	0	0				0

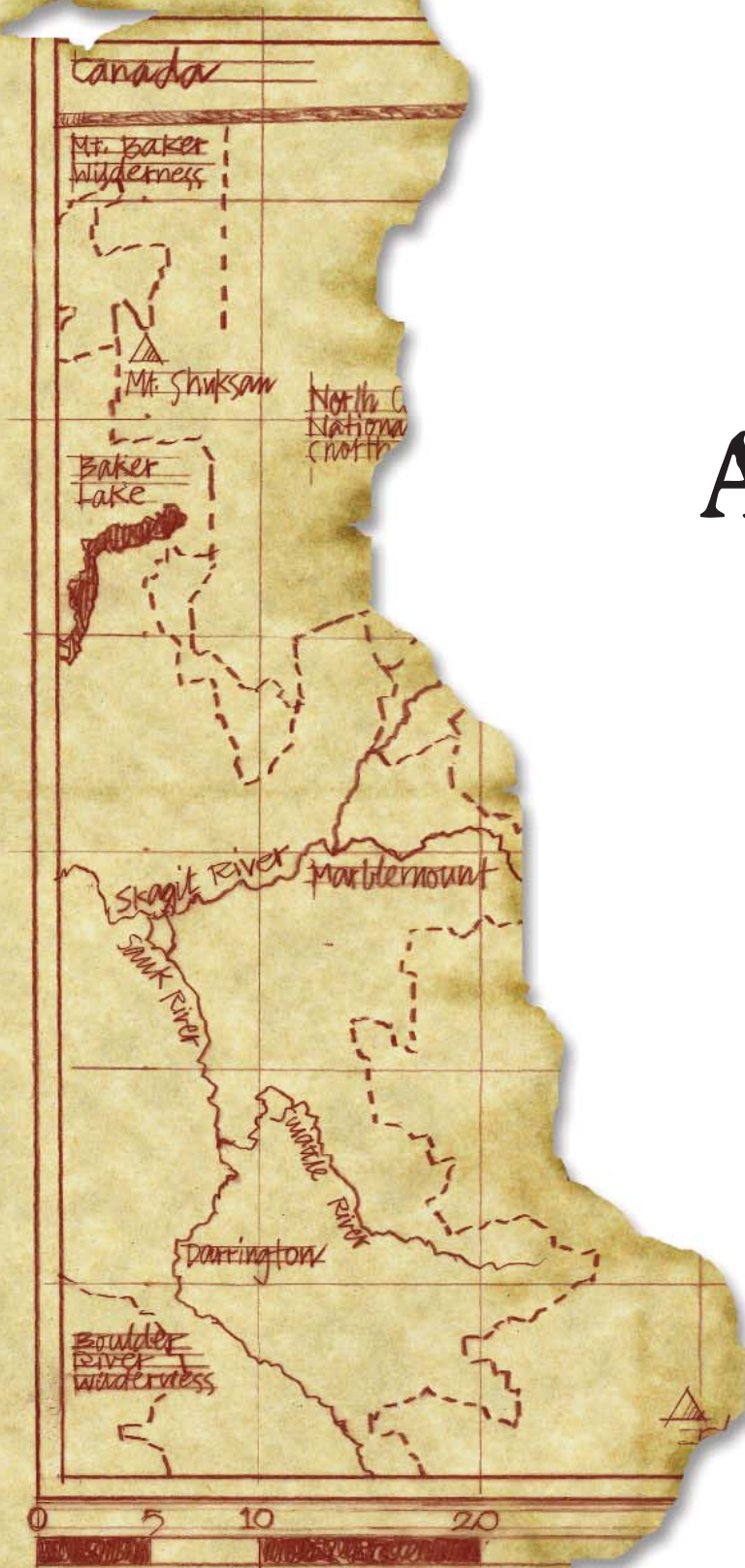
TABLE H-1: FISH SURVIVAL CALCULATIONS (CONTINUED)

Lake Name	NPS Lake Code	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Pond SE of Kettling Lakes	MR-09-01	29	26	16	8	44	38	33	20	10	45	38	34	20	10	5
Quill, Lower	M-24-02	58	56	53	45	39	36	35	34	33	33	33	33	33	68	65
Quill, Upper	M-24-01	54	52	50	43	38	36	34	34	33	33	33	33	33	62	59
Rainbow	MR-14-01	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233
Rainbow, Upper (North)	MR-13-01	646	578	346	173	87	43	22	11	5	3	1	1	0	0	0
Rainbow, Upper (South)	MR-13-02	114	150	105	71	39	20	10	34	29	25	15	7	4	2	1
Rainbow, Upper (West)	MM-11-01	112	100	60	30	15	8	4	2	1	40	36	33	19	10	5
Redoubt	MC-11-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reveille, Lower	MC-21-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reveille, Upper	MC-21-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ridley	HM-03-01	108	87	51	57	42	32	65	51	42	71	54	89	67	50	29
Sky	EP-13-01	0	0	0	0	0	0	0	0	0	0	0				0
Skymo	PM-03-01	222	222	222	222	222	222	222	222	222	222	222	222	222	222	222
Sourdough	PM-12-01	461	461	461	461	612	748	719	657	571	652	611	585	534	497	479
Sourpuss	ML-01-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stiletto	MR-01-01	47	40	36	21	11	5	41	36	31	19	9	5	2	1	1
Stout	EP-09-02	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Stout, Lower	EP-09-01	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Sweet Pea	ML-02-01	36	30	25	15	36	30	25	15	8	4	41	36	32	19	10
Talus Tarn	M-06-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tapto, Lower	MC-17-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tapto, Middle	MC-17-02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tapto, Upper	MC-17-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tapto, West	MC-17-04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thornton, Lower	M-20-01	95	85	51	26	13	6	3	2	1	112	101	91	54	27	14
Thornton, Middle	M-19-01	98	72	57	33	162	139	122	73	165	134	114	67	34	51	39
Thunder	RD-02-01	628	413	269	190	124	90	64	48	40	37	35	34	33	33	33



TABLE H-1: FISH SURVIVAL CALCULATIONS (CONTINUED)

Lake Name	NPS Lake Code	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Tiny	MC-15-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Torment	ML-03-01	7	40	35	31	18	9	47	40	35	21	10	5	3	1	1
Trapper	GM-01-01	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Triplet, Lower	SM-02-01	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193
Triplet, Upper	SM-02-02	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186
Triumph	M-17-01	75	61	51	30	108	91	79	47	94	75	63	37	18	43	35
Unnamed	FP-01-01	0	0	0	0	0	0	0	0	0	0	0				0
Unnamed	MR-11-01	29	81	65	52	71	51	92	70	54	71	52	40	23	66	54
Unnamed	MR-16-01	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
Vulcan	ML-04-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wilcox/Lillie, Upper	EP-06-01	257	240	301	289	281	257	240	231	226	224	223	223	222	222	222
Wilcox/Sandie, Lower	EP-05-01	256	239	230	226	298	290	282	258	240	231	227	224	223	223	222
Wild	MC-27-01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Willow	HM-04-01	210	166	97	80	80	74	106	86	71	96	90	129	98	90	57



Appendix I

MOUNTAIN LAKES FISHERY
CURRENT AND PROPOSED
MITIGATION PRACTICES

APPENDIX I: MOUNTAIN LAKES FISHERY CURRENT AND PROPOSED MITIGATION PRACTICES

Alternative A: No Action—Existing Management Framework of 91 Lakes (62 Lakes Have Fish)

Alternative B: Proposed Adaptive Management of 91 Lakes under a New Framework (42 Lakes May Have Fish) (Preferred Alternative)

Alternative C: Proposed Adaptive Management of 91 Lakes under a New Framework (11 National Recreation Area Lakes May Have Fish)

Alternative D: 91 Lakes Would Be Fishless (Environmentally Preferred Alternative)

Action	Alternative A	Alternative B	Alternative C	Alternative D	Responsible Agency
Lake Stocking	<p>To make sure stocked fish do not reproduce and affect downstream fish, sterile fish are stocked in many lakes. For lakes where monitoring shows that fish densities in a lake are having adverse effects on fish health, the density and cycle of fish stocking are adjusted to allow periods of low density.</p> <p>The Park Headquarters and Offices department would continue to issue brochures about park areas, in general, and about minimum impact practices. Information about fishing refers to the Washington State fishing regulations. Literature about the stocking program is available from the Washington Department of Fish and Wildlife. The National Park Service maintains the North Cascades Complex website that provides an abundance of information on the national park and national recreational areas: http://www.nps.gov/NOCA/.</p> <p>Informational signs about fish stocking are posted in the park.</p>	<p>Same as under alternative A with the following additions:</p> <p>For lakes where removal of reproducing fish may not be feasible because of the complexity of the associated stream where reproduction occurs, it may be possible to reduce the access to the area in order to minimize impacts to vegetation.</p> <p>Additional signs could be posted in the riparian areas that are most heavily used to allow for recovery of vegetation.</p> <p>For lakes where monitoring shows that fish densities are having more adverse effects on other biota than would be acceptable, the density of stocked fish would be reduced, or the stocking of the lake could become cyclical to allow periods of very low density or no fish, which would allow populations of other affected organisms to rebound. If monitoring indicates that unacceptable adverse effects continue despite reduced densities, stocking would be discontinued to allow for a fishless condition in the lake. For more information about monitoring and adaptive management, see appendix F and, also, the "Adaptive Management" section in the "Alternatives" chapter of this document.</p> <ul style="list-style-type: none"> • If possible, camp at least 200 feet from the nearest lake or stream. • Use camp stoves instead of building a fire. Where campfires are legal and safe, use an established fire ring and only small pieces of dead and downed wood. 	Same as alternative B.	N/A	





Action	Alternative A	Alternative B	Alternative C	Alternative D	Responsible Agency
Lake Stocking (continued)		<ul style="list-style-type: none"> Pack out the offal (carcass) from any fish kept, or dispose of it in a manner that will not attract wildlife or harm the aesthetics of the area. Be mindful of damaging fragile vegetation, both along the shoreline and in campsites. Always camp in established campsites and walk on established trails to avoid trampling fragile vegetation and compacting soil. Do not alter campsites or build structures such as tables or lean-tos. <p>Stocking would have to occur after lakes thaw (which varies according to elevation and aspect) and before fall in order for fry to acclimatize to the lakes. Visitors would be informed of airplane stocking schedules. Rangers issuing backcountry permits would advise visitors of any impending aircraft stocking and suggest alternate destinations. Aircraft stocking would only be used if it were determined that fish would not survive a long-distance backpack trip.</p> <p>As part of a monitoring component of this plan, the park would gather more data about the effects of shoreline trampling and would establish a threshold and actions to implement, such as restoring soils.</p>			
Mechanical Fish Removal	N/A	<p>For gillnets:</p> <p>Where needed to reduce or avoid certain impacts, timing of the activity would be controlled to avoid conflicts with other specific species' activities or important use periods.</p> <p>No gillnets would be left unsupervised. Crews would free any wildlife observed in the nets. If necessary, nets would be cut to free an animal. If wildlife were injured during entrapment, they would be taken to an approved wildlife rehabilitation center for treatment.</p> <p>In order to mitigate trampling of shoreline vegetation, crews would be kept small and would walk in the lake, rather than along the shoreline when setting nets. In addition, crews would camp far enough from the lake to minimize impacts to the shoreline.</p>	Same as alternative B.	Same as alternative B.	

Action	Alternative A	Alternative B	Alternative C	Alternative D	Responsible Agency
Mechanical Fish Removal (continued)		<p>The park would post information about gillnetting schedules and locations on bulletin boards, the website for the North Cascades Complex, and visitor centers. Because most of the lakes in the study area cannot be reached and fished in one day, rangers who issue backcountry permits (which are required for overnight camping) would inform hikers and anglers of any gillnetting activity scheduled at their destination, and could recommend alternative lakes to visit. In addition, the park could take a less intensive, more long-term approach to netting in high-use areas in order to help ensure a positive visitor experience for anglers.</p> <p>To reduce impacts on vegetation, rafts or float tubes would be preferred over boats for setting and checking nets. In addition, crews would camp far enough from the lake to minimize impacts to the shoreline.</p> <p>For electrofishing: Where needed to reduce or avoid certain impacts, timing of the activity would be controlled to avoid conflicts with other specific species' activities or important use periods.</p>	Same as alternative B	Same as alternative B	
		<p>Crews would wear neoprene waders and would walk in the water rather than along the shoreline to reduce shoreline trampling. This method would require a one-time application; repeat visits would not be necessary, which would minimize the amount of trampling.</p> <p>In addition to fish, any other organism in the water where the current is applied would be shocked or possibly killed. However, the larger the organism, the greater the shock, making fish the most susceptible. Because the waters in the North Cascades Complex have a low ionic content, they do not carry a charge very well, reducing potential effects to nonfish wildlife.</p> <p>Visitors receiving backcountry permits for overnight camping would also be informed of any treatment scheduled at their destination.</p> <p>To reduce impacts on vegetation, rafts or float tubes would be preferred over boats for setting and checking nets. In addition, crews would camp far enough from the lake to minimize impacts to the shoreline.</p>			

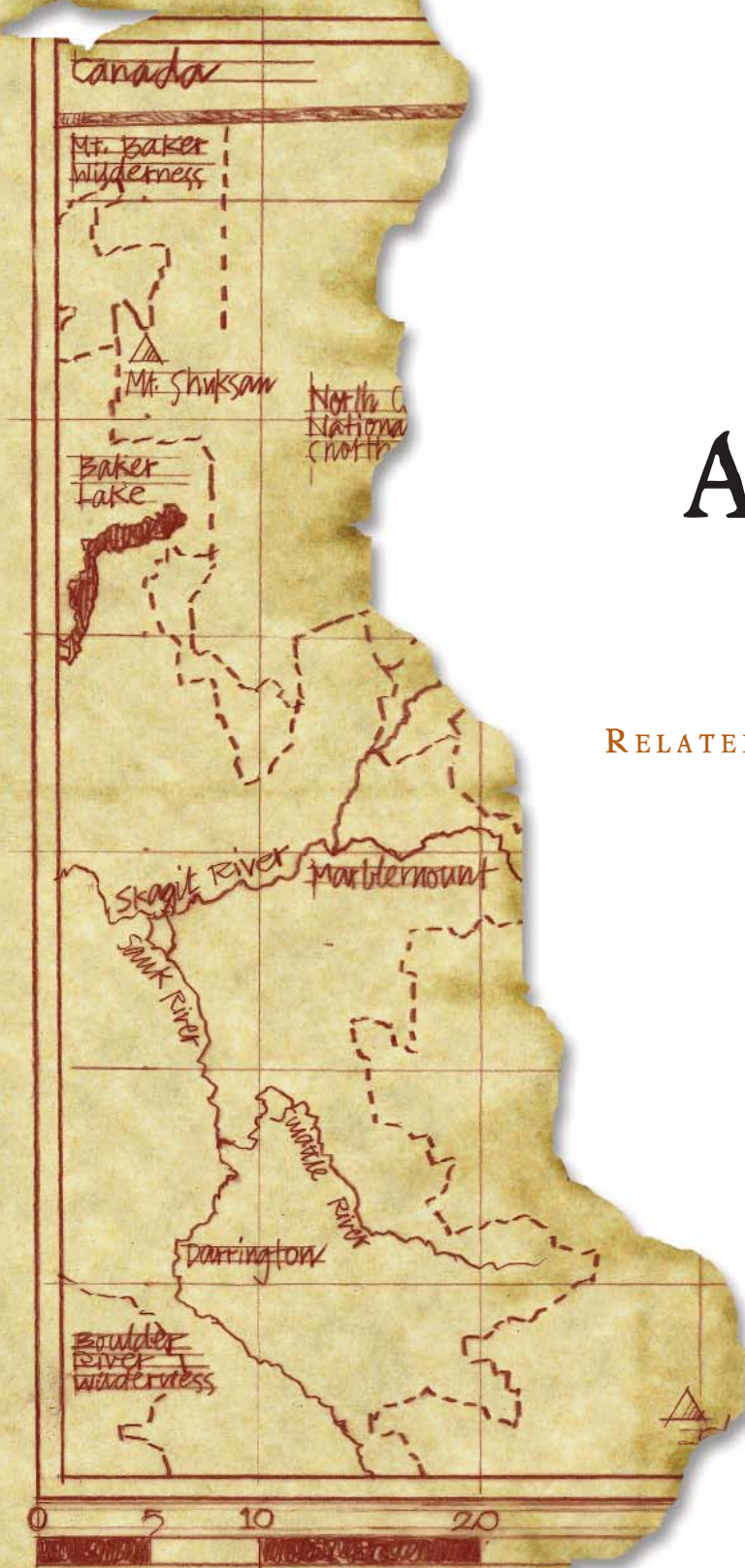


Action	Alternative A	Alternative B	Alternative C	Alternative D	Responsible Agency
Mechanical Fish Removal (continued)	<p>N/A</p> <p>N/A</p>	<p>If used, generators would produce a small amount of noise (roughly equivalent to a loud conversation between two people), which would affect solitude and visitor experience. Visitors would be advised of dates and locations where electrofishing would occur. Where needed to reduce or avoid certain impacts, timing of the activity would be controlled to avoid conflicts with other specific species' activities or important use periods.</p> <p>For trapping:</p> <p>Amphibian adults, which may not survive prolonged submersion, can be captured in minnow traps or entangled in the mesh of fyke nets. Minnow traps and the mesh of fyke nets should be inspected daily to reduce or eliminate amphibian mortalities. Because aquatic mammals and birds may be captured in fyke nets long enough to die from prolonged submersion, it is recommended that the upper portion of the net be above water to avoid mortalities.</p> <p>For spawning habitat removal:</p> <p>In order to mitigate trampling shoreline vegetation and dispersing rocks, crews would walk in the water as much as possible, rather than along the shoreline. As described under gillnetting, any camping would occur far from the lake in order to reduce impacts to shoreline vegetation.</p> <p>Visitors would be advised of dates and locations where spawning habitat removal would occur. Rangers issuing backcountry permits to overnight campers would also inform those visitors of any treatment scheduled at their destination.</p>	<p>Same as alternative B.</p> <p>Same as alternative B.</p>	<p>Same as alternative B.</p> <p>Same as alternative B.</p>	
Chemical Fish Removal		Where needed to reduce or avoid certain impacts, timing of the activity would be controlled to avoid conflicts with other specific species' activities or important use periods.			

Action	Alternative A	Alternative B	Alternative C	Alternative D	Responsible Agency
Chemical Fish Removal (continued)	N/A	<p>Piscicides being dripped into streams flowing out of a lake could carry that toxicant to downstream waters. Because antimycin is very sensitive to oxidation, exposing it to oxygen rapidly breaks it down (Rosenlund 1992). Potassium permanganate, an oxidizer, would be placed at outlet streams to remove residual antimycin and prevent it from traveling downstream. In addition, agitation and loss of elevation would result in loss of toxicity due to oxidation (Rosenlund 1992). Many streams leaving high mountain lakes in the study area quickly become waterfalls, and the oxidation that occurs as the water drops and becomes agitated also helps to further break down the chemical (NPS, R. Zipp, pers. comm. with P. Steinholtz, 2003).</p> <p>Antimycin dose rates would be double verified and monitored to prevent inadvertent overdoses, and neutralization (potassium permanganate) would be on hand as a contingency measure.</p> <p>Antimycin can affect other aquatic organisms besides fish. However, as mentioned above, the concentration of antimycin necessary to remove fish has little or no effect on other aquatic animals. Some mortality to other species may occur, but numbers are likely to be minimal (NPS, R. Zipp, pers. comm. with P. Steinholtz, 2003).</p> <p>Crews treating lakes with antimycin would be required to wear eye protection and gloves. No one wearing contact lenses would be allowed to participate in antimycin treatment because fumes can penetrate soft contact lenses. A safety and organizational briefing would be conducted for personnel involved in the project, which would include the goal of the project, safety, operation of treatment equipment, and delegation of duties.</p> <p>Everyone working with antimycin would be given a copy of the product label.</p> <p>As described under the mechanical methods, crews delivering treatment from the shoreline could trample vegetation (chemical treatment would require shoreline applications) (Rosenlund 1992). All of the mitigation methods described under gillnetting would also be adhered to (for example, crews would walk in the lake water rather than along the shoreline and camp away from the lake).</p>	Same as alternative B.	Same as alternative B.	



Action	Alternative A	Alternative B	Alternative C	Alternative D	Responsible Agency
Chemical Fish Removal (continued)		<p>Also, as described under gillnetting, anglers would experience diminished visitor experience during chemical application. Educational materials about treatment dates and locations would be posted at bulletin boards, on the website for the North Cascades Complex, and at visitor centers. Park rangers would alert visitors to such activities when backcountry permits are issued. If necessary, lakes would be closed to fishing immediately after treatment until it is determined that the chemical has dissipated to ensure treated fish are not caught and consumed.</p> <p>Visitors would be given educational materials explaining the closures and describing how to recognize fish treated with antimycin (the fish become discolored and lethargic). In addition, antimycin breaks down very quickly in a fish's body, reducing the likelihood of contamination if fish are caught and consumed (NPS, R. Zipp, pers. comm. with P. Steinholtz, 2003; Rosenlund 1992).</p> <p>NPS staff would use boats to release chemical piscicides (to the extent they are able to avoid trampling vegetation) and for logistical reasons.</p> <p>Staff would avoid walking on vegetation around the lake, and in particular, on meadow or riparian vegetation where state listed plant species are more likely to occur.</p>			
Natural Fish Removal	N/A	<p>Increased trampling of shoreline vegetation could occur as a result of incentives that encourage anglers to increase the amount of fishing to help reduce fish populations. The NPS would provide additional educational information about shoreline sensitivity by posting information on bulletin boards, the website for the North Cascades Complex, and at visitor centers. Rangers who issue backcountry permits would also provide such educational material to anglers who are camping.</p>	Same as alternative B.	Same as alternative B.	



Appendix J

DOCUMENTS AND PLANS
RELATED TO CULTURAL RESOURCES

APPENDIX J: DOCUMENTS AND PLANS RELATED TO CULTURAL RESOURCES

This appendix lists documents and plans related to cultural resources within North Cascades National Park, Ross Lake National Recreation Area, and Lake Chelan National Recreation Area. In addition to these planning documents, there are a variety of technical project reports authored by archeological staff at the North Cascades Complex and outside contractors that document specific archeological studies conducted within North Cascades Complex boundaries. A comprehensive list of all such documents has been prepared in the North Cascades National Park Service Complex Archeological Resources Bibliography.

ARCHEOLOGY

Aubrey, Michele C., Dana C. Linck, Mark J. Lynott, Robert R. Mierendorf, and Kenneth M. Schoenberg
1992 Systemwide Archeological Inventory Program, Anthropology Division, National Park Service. U.S. Department of the Interior. Washington, DC.

Mierendorf, Robert R.
1986 People of the North Cascades (Archeological Overview and Research Design). U.S. Department of the Interior: National Park Service, Pacific Northwest Region, Seattle, WA.

Mierendorf, Robert R., David J. Harry, and Gregg M. Sullivan
1998 "An Archeological Site Survey and Evaluation in the Upper Skagit River Valley, Whatcom County, Washington." Technical Report NPS/CCNOCA/CRTR-98/01. North Cascades National Park Service Complex, National Park Service, U.S. Department of Interior. Sedro-Woolley, WA.

HISTORIC RESOURCES

- *General Management Plan*, 1988
- Interpretive Prospectus, 1990
- *Lake Chelan General Management Plan*, 1995
- *Buckner Homestead Historic District Final Management Plan*, 1998
- Contested Terrain: North Cascades National Park Service Complex. An Administrative History, 1998

ETHNOGRAPHIC RESOURCES

Boxberger, Daniel L.
An Ethnographic Overview and Assessment of North Cascades National Park Service Complex. National Park Service, Cultural Resources, Seattle, WA.

Mierendorf, Robert R.

1986 People of the North Cascades. U.S. Department of the Interior: National Park Service, Pacific Northwest Region.

Smith, Allan H.

1988 Ethnography of the North Cascades. Center for Northwest Anthropology, Washington State University: Project Report Number 7. U.S. Department of the Interior: National Park Service.

MUSEUM OBJECTS

- *Resource Management Plan* (1994)
- *Collection Management Plan* (1994)
- *Buckner Homestead Historic District Final Management Plan* (1998)
- North Cascades National Park Service Complex Collection Condition and Preservation Assessment (1998)
- *Cultural Resource Housekeeping Plan* (unpublished draft)

HISTORIC STRUCTURES

Florence, Henry

1987 "Historic Structures Preservation Guide." U.S. Department of the Interior: National Park Service, Pacific Northwest Region.

Florence, Henry

1987 "Preliminary Historic Structure Report: Golden West Feasibility Study." U.S. Department of the Interior: National Park Service, Pacific Northwest Region.

Hovland, Donald E.

"Historic Structure Report: Buckner Cabin and Homestead, Courtney Cabin, and Gilbert's Cabin." U.S. Department of the Interior: National Park Service, Denver Service Center.

Luxenberg, Gretchen

1986 "Historic Resource Study." U.S. Department of the Interior: National Park Service, Pacific Northwest Region.

Luxenberg, Gretchen

1984 "Historic Structures Inventory." U.S. Department of the Interior: National Park Service, Pacific Northwest Region.

Luxenberg, Gretchen

1989 Multiple Property National Register Nomination: Historic Resources of the North Cascades National Park Service Complex. U.S. Department of the Interior: National Park Service, Pacific Northwest Region.



CULTURAL LANDSCAPES

Gilbert, Cathy and Gretchen Luxenberg

1985 Cultural Landscape Inventory: Buckner Homestead. Draft Cultural Landscape Inventory: 1985.

Gilbert, Cathy and Gretchen Luxenberg

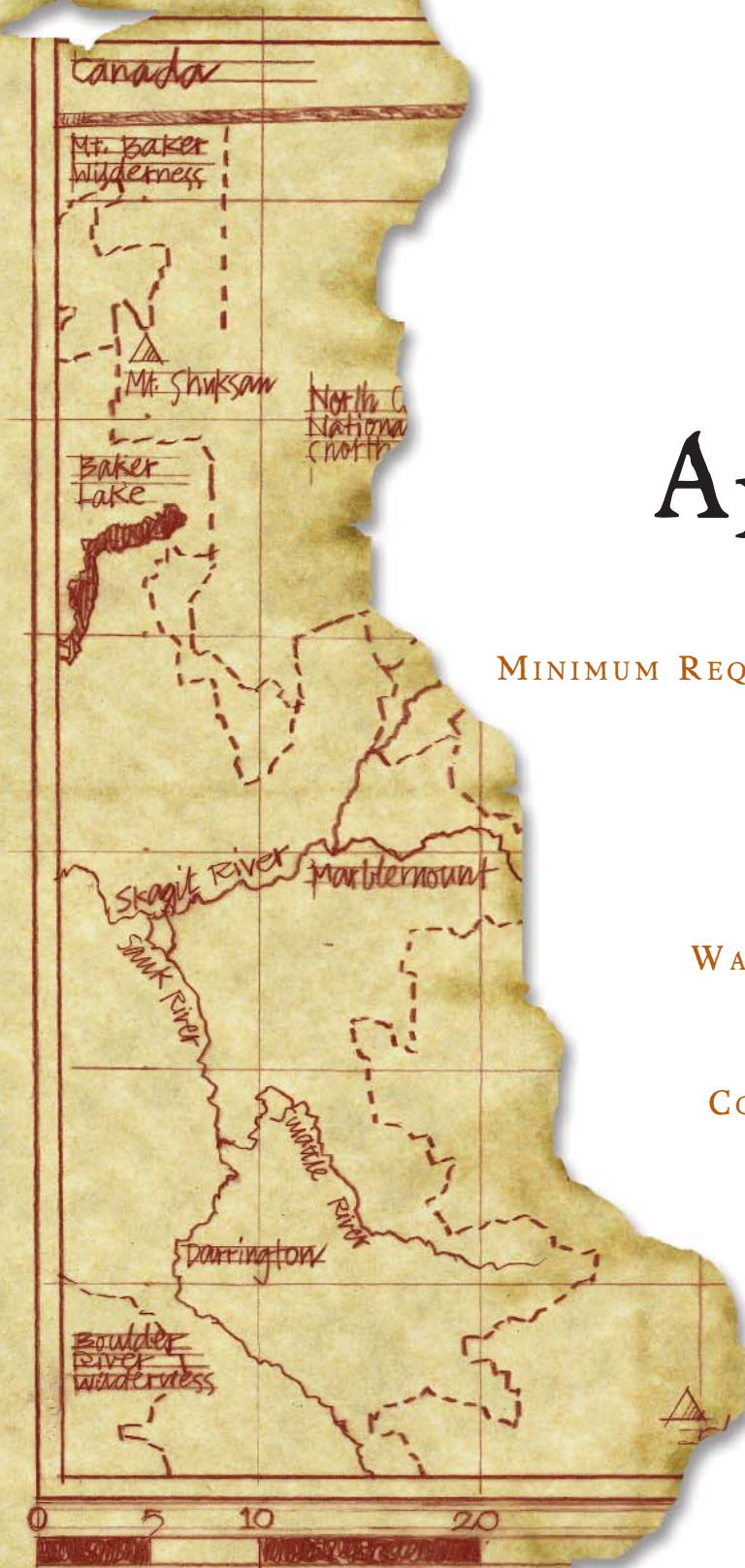
1985 Draft Cultural Landscape Inventory: Golden West Lodge.

Gilbert, Cathy

1986 Preliminary Landscape Documentation: Rainbow Lodge. Draft Cultural Landscape Inventory.

Gilbert, Cathy

1987 Landscape Analysis of Stehekin Landing. Draft: 1987.



Appendix K

MINIMUM REQUIREMENTS DECISION GUIDE
OVERVIEW, INSTRUCTIONS,
AND WORKSHEETS

WASHINGTON DEPARTMENT OF
FISH AND WILDLIFE
COMMENTS ON THE MINIMUM
REQUIREMENTS ANALYSIS

APPENDIX K:

MINIMUM REQUIREMENTS DECISION GUIDE
OVERVIEW, INSTRUCTIONS, AND WORKSHEETS

WASHINGTON DEPARTMENT OF
FISH AND WILDLIFE

COMMENTS ON THE MINIMUM REQUIREMENTS ANALYSIS



ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE

OVERVIEW

... except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...

– The Wilderness Act, 1964

Introduction

The Minimum Requirement Decision Guide (MRDG) is designed to assist wilderness managers in making appropriate decisions in wilderness. Use of the MRDG requires familiarity with the difference between wilderness and other public lands as defined by the Wilderness Act

This Overview document provides general information about the MRDG process, its origination, and how it relates to other processes such as NEPA. Please refer to the accompanying *MRDG Instructions* and *MRDG Worksheets* for specific information about completing the MRDG.

Wilderness Act Guidance

The concept of Minimum Requirement comes from Section 4(c) of the Wilderness Act of 1964:

“Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.” (emphasis added)

Applicable actions include, but are not limited to, scientific monitoring, research, recreational developments (trails, bridges, signs, etc.), and activities related to special provisions mandated by the Wilderness Act or subsequent legislation (such as grazing, exercising mineral rights, access to inholdings, maintenance of water developments, and commercial services).

2004

Overview – p.1



The following three boxes contain excerpts from the Wilderness Act of 1964 that may be useful reminders of key provisions of the law applicable to the use of this Minimum Requirements Decision Guide.

What is the purpose of wilderness?

"In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States..., leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." Section 2(a)

What is wilderness?

"... lands designated for preservation and protection in their natural condition..." Section 2(a)

"... an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation..." Section 2(c)

"... generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable..." Section 2(c)

"... has outstanding opportunities for solitude or a primitive and unconfined type of recreation... and may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." Section 2(c)

How is wilderness administered?

"... shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness..." Section 2(a)

"A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man is a visitor who does not remain." Section 2(c)

"An area of wilderness is... protected and managed so as to preserve its natural conditions and... its preservation and use in an unimpaired condition..." Section 2(c)

"... each agency administering wilderness... shall be responsible for preserving the wilderness character of the area..." Section 4(b)

"... wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use." Section 4(b)

In addition to the Wilderness Act, subsequent legislation and agency policy may influence determination of the minimum required for action. In some instances, Agencies have included more guidance and definitions in their respective policies. Please See *Agency Guidelines* for more specific information.

2004

Overview – p.2



Use of this Guide

The MRDG is a process to identify, analyze, and select management actions that are the minimum necessary for wilderness administration. It applies this direction from the Act and incorporates a two-step process. Step 1 determines whether it is **necessary** to take action. If action is found to be necessary, then Step 2 provides guidance for determining the **minimum** action.

The MRDG can be used as:

- a process for evaluation and documentation;
- a guide to help discuss proposals with interested parties; or
- a review of on-going management practices to determine if they are necessary or if a less intrusive practice can be implemented.

The level of detail and effort necessary to utilize the MRDG process depends on the scope and complexity of the issue or problem being considered. One person might adequately analyze simple actions; complex actions may require the coordination of several specialists. The MRDG Worksheets provide a series of questions about the necessity of taking any action to resolve a situation and the most appropriate methods or tools to use. The decision to approve an action is a critical aspect of wilderness management. At times, the decision is not straightforward and requires a delicate balancing act.

Emergencies

Do not use the MRDG for emergency situations; follow procedures already outlined in approved emergency plans. The minimum requirements concept should be incorporated into such plans when they are being prepared, so that minimum necessary methods and tools are being utilized to meet the needs of the emergency.

Safety

The safety of wilderness visitors, employees, volunteers, and contractors is a priority in all decisions and actions. Complying with Section 4(c) of The Wilderness Act and conducting a minimum requirements analysis using the MRDG does not alter or diminish this need.

The MRDG is intended to help identify, analyze and select management actions that are the minimum necessary for wilderness without compromising safety. A fair and honest evaluation of all available options, within agency safety requirements, is needed to make an appropriate decision for wilderness. Wilderness managers are encouraged to learn, cultivate, and share traditional and primitive skills and develop alternative minimum impact methods and tools that allow activities to be accomplished safely with a minimal amount of degradation to the wilderness character.



The Minimum Requirements Analysis and NEPA Analysis

The Minimum Requirements Decision Guide is designed to flow into a NEPA format, if needed. Portions of the MRDG may be transferable to a subsequent NEPA analysis.

Agency NEPA guidelines do not necessarily require a process to determine if administrative action in wilderness is necessary or to select the tool and method that causes the least adverse effect to wilderness character. The minimum requirements analysis provides a method to determine the necessity of an action and how to minimize impacts; NEPA analysis compares and discloses the environmental effects of alternatives, documents a decision, and requires public involvement.

Process Comparison

Minimum Requirements Analysis	NEPA Analysis
STEP 1: Determine if Action is necessary.	
Description	Purpose and need for action Existing environment or condition
Valid existing rights, special provisions, other legislation, or other guidance from policy or plans (Step 1 A-C)	Management direction
Wilderness character (Step 1 E) Public purposes of wilderness (Step 1 F)	Issues
STEP 2: Determine the minimum tool.	
Alternative descriptions	Proposed Action and Alternatives
Alternative comparison criteria	Alternative comparison by Issues
Effects to wilderness character	Environmental consequences
Selected alternative	Decision
Rationale	Reasons for the decision
Monitoring/reporting requirements	Decision conditions

The Minimum Requirements Analysis and the Planning Process

The degree to which a Minimum Requirements analysis can be useful in the planning process will vary depending on the scope of the process and the objectives for the plan. Listed below are the three typical planning levels in use by the agencies and a suggested use of the Minimum Requirements Analysis.

Planning Level	Use of Minimum Requirements Analysis
<u>Comprehensive Land Use Planning</u> (i.e. forest plans, park plans, refuge plans, resource management plans, and wilderness management plans) – Establish or modify general unit standards and guidelines and/or make land use allocations	Use the minimum requirements to help screen alternatives in anticipation authorizing needed actions in the future while insuring the preservation of wilderness character.
<u>Programmatic Planning</u> (i.e. Trail Plans, Weeds Treatment Plans, Monitoring Plans, Restoration Plans, Step Down Plans, etc.) - Analysis of multiple, similar, or routine project proposals or activities (trail maintenance, monitoring, dam maintenance, etc.) in one assessment	Use the Minimum Requirements Decision Guide to prepare a single analysis for similar, current, and potential actions. Create a 'decision tree' or 'GO/NO GO checklist' to be able to assess the necessity for action involving the Section 4(c) uses as similar needs come along in the future.
<u>Project or Site Specific Planning</u> (i.e. wildlife survey, stream crossing, trail repair, weed treatment, etc.) - Analysis of site-specific or non-recurring actions.	Use the Minimum Requirements Decision Guide to determine if action is necessary and, if so, determine the minimum tool.





ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE

INSTRUCTIONS

"... except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– The Wilderness Act, 1964

Introduction

The Minimum Requirements Decision Guide (MRDG) is designed to assist wilderness managers in making appropriate decisions for wilderness. These instructions refer to completing the MRDG *Worksheets*. More information about the background of the MRDG, and its appropriate uses can be found in the *Overview*. Please also refer to your agency policies and other guidance in *Agency Guidelines* for more direction on how and when to use the MRDG.

Use of this document assumes familiarity with the Wilderness Act, other relevant legislation, and agency policy.

The MRDG is derived from Section 4(c) of the Wilderness Act and involves two steps. Step 1 determines whether action is **necessary**. If action is necessary, then Step 2 provides guidance for determining the **minimum** necessary action.

2004

Instructions – p.1



Worksheet Instructions

Step 1: Determine if it is necessary to take action.

Description: Briefly describe the situation that may prompt action. This is not a description of a possible method or tool, but rather the situation that prompts the possible need for action. This step should **not** be used to justify use of motorized equipment or mechanical transport, or to approve placement of a structure, facility, or temporary road.

Correct Examples of description	Incorrect examples of description
An administrative cabin is deteriorating	Need to restore the administrative cabin
A request is received for access into a valid, existing mining claim	Need to build a temporary road for mining claim access.
Blown down trees are blocking trails	Need to use chainsaws to clear the blown down trees
Lack of information on a wildlife species	Need to land a helicopter to survey population
Fire alters wildlife habitat	Need to re-seed area to maintain wildlife habitat
User conflict complaints between stock users and hikers	Need to survey visitors about user conflicts or close trail to one type of use
A trail bridge has washed out	Need to replace the washed out bridge, using mules for supplies
Riverbank erosion is destabilizing a pioneer cabin listed on the National Historic Register	Need to sling-load rock gabions to stop erosion
Lack of information on air quality in Class I wilderness airshed	Need to set up air quality monitoring station in wilderness
Invasive species present	Need to use motorized sprayer to treat invasives

A. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Are there valid existing rights or is there a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of action involving Section 4(c) uses? Cite law and section.

If there is special provision language (e.g., maintenance of dams and water storage facilities with motorized equipment and mechanical transport, control of fire, insects and disease, access to private lands, etc), whether in the Wilderness Act of 1964 or subsequent designation legislation, some actions may be required that would otherwise be prohibited. The exact reference to the legislation is needed in this box. Examples include:

Existence of public use cabins and subsistence use and access in Wilderness (Alaska National Interest Lands Conservation Act of 1980, P.L. 96-487, Sec. 1315(c)).

Use of motorboats of ten horsepower or less in the Okefenokee Wilderness (Wilderness Act of 1964, P.L. 88-577, Sec. 4(d)(1); Okefenokee Wilderness Act of 1974, P.L. 93-430, Sec. 2)

Some Valid Existing Rights or the provisions of special legislation may be satisfied by an option outside wilderness. Such possibilities should be explored.



B. Describe Requirements of Other Legislation

Do other laws require action?

Laws not directly concerned with wilderness (such as the Endangered Species Act or National Historic Preservation Act) may influence the need for actions in Wilderness. In some instances, the administrator is asked to satisfy the requirements of at least two laws. For example:

- Recovery of an endangered species dependent on wilderness ecosystems (Endangered Species Act).
- Treatment of site listed on the National Register of Historic Places (National Historic Preservation Act).

Apparent conflicts between the Wilderness Act and other legislation may require innovative approaches. Not all apparent conflicts are genuine.

C. Describe Other Guidance

Does taking action conform to and implement relevant standards and guidelines and direction contained in agency policy, unit and wilderness management plans, species recovery plans, tribal government agreements, or state, local government, or interagency agreements?

Review guidance for conformance and carefully consider the context of the guidance, plan or agreement. Plans developed using a NEPA analysis are decisions that provide stronger guidance than plans developed with less public or interdisciplinary involvement. Examples include:

- A programmatic decision to treat invasive weeds has already been addressed in a unit level plan that included wilderness. No decision was made regarding the method of treatment.
- The need for bridges, fords, or in-stream structures has been addressed in a fish species recovery plan. The plan does not dictate the type of structure, method of construction, or tools required.

Even if relevant programmatic decisions have already been made that satisfy Step 1 of a Minimum Requirements analysis, both Step 1 and Step 2 should be completed to determine the minimum tool or method.

D. Describe Options Outside of Wilderness

Can this situation be resolved by action outside of wilderness?

Examples that might be explored include:

- Putting up nest boxes outside wilderness boundaries.
- Surveying visitors about user conflicts at the trailhead or visitor center, rather than on the trail or at their wilderness campsite
- Locating trail destination and distance signs can be located at trailheads outside wilderness (unless already determined by agency policy).
- Locating monitoring or other administrative structures outside wilderness.

E. Wilderness Character

How would action contribute to the preservation of wilderness character, as described by the components listed below?

Section 2(a) of the Wilderness Act directs us to manage wilderness areas for the preservation of their wilderness character. Similar direction is repeated in Section 4(b). It is recommended that particular attention is paid to the general guidance in the Wilderness Act, as outlined in the boxes on Page 2 of the

Overview, and to agency policy. In addition, at least four major components of wilderness character are mentioned in Section 2(c) of the Wilderness Act. These are:

- "**Untrammeled**" – Wilderness is ideally unhindered and free from modern human control or manipulation.
- "**Undeveloped**" – Wilderness has minimal evidence of modern human occupation or modification.
- "**Natural**" – Wilderness ecological and evolutionary systems are substantially free from the effects of modern civilization.
- "**Outstanding opportunities for solitude or a primitive and unconfined type of recreation**" – Wilderness provides opportunities for people to experience natural sights and sounds, solitude, freedom, risk, and the physical and emotional challenges of self-discovery and self-reliance.

This list of wilderness character components is not comprehensive. Other components can be defined that are of particular importance and reflect the character of your wilderness. An example of an action altering wilderness character is:

Taking management action to control invasive weeds might increase naturalness, while at the same time, greater manipulation of the wilderness decreases the untrammeled character of the area; the presence of employees and use of equipment to control invasive weeds may decrease visitor's opportunities for solitude in certain sections of this wilderness.

F. Describe Effects to the Public Purposes of Wilderness

How would action support the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Identify which of these public purposes would be degraded or enhanced by administrative action. For example:

If a main trail bridge is not replaced, it may affect recreation since the stream is otherwise impassable most of the year.
A secondary trail bridge makes travel easier for only a short time of year, and therefore not replacing it may not significantly impact recreation.
Scientific activities may be accomplished by limited visits to the area by researchers instead of a research installation.

Step 1 Decision: Is it necessary to take action? Evaluate the responses made to all questions in Step 1 and determine whether there is a need to proceed to Step 2. If the responses indicate potential adverse impacts from taking action, document whether there is sufficient reason to proceed to Step 2.



Step 2: Determine the minimum tool.

Description of Alternative Actions

For each alternative, describe what methods and techniques will be used, when the action will take place, where the action will take place, what mitigation measures are necessary, and the general effects to wilderness character.

The description of alternatives and effects varies by the complexity of the action. Identify and describe a full range of feasible alternatives, including necessary mitigation measures that represent the various actions, and the methods and tools that could be used. Include a "No Action" alternative to allow for a comprehensive comparison of effects. Complete a form for each alternative action being considered.

Compare the potential effects of each alternative on wilderness character by describing the effects of implementation using the criteria below. This list is not all-inclusive, and other criteria which address the special features or unique character of each wilderness should be developed as needed. Use the criteria for comparing the effects of each applicable phase of the action including design, construction, management, removal, or restoration.

Alternative Comparison Criteria

Biological and Physical Resource

- Describe the potential for protection, impairment, or restoration of natural conditions (air, water, soil, wildlife, fish, plants, etc.) including endangered, threatened, or rare species, natural biological diversity, and self-regulating ecosystems.
- Discuss effects related to protecting natural conditions within the regional landscape (i.e. insects, disease, or non-native species).

Social and Experiential Resource

- Identify how opportunities for visitors to experience solitude or a primitive and unconfined type of recreation will be protected or impaired.
- Describe the effects on wilderness character that will be noticeable to the visitor.

Heritage and Cultural Resource

- Describe any effects on protection or management of historic, pre-historic, listed or eligible items, sites, structures, or landscapes.

Maintaining Contrast and Unimpaired Character

- Identify any trend in wilderness management decisions that could be cumulative and cause impairment of wilderness character over time.
- Explain how the alternative helps provide a contrast between wilderness and other areas where humans and their work dominate the landscape.
- Determine if there will be effects that will prevent the wilderness from remaining unimpaired for the future use and enjoyment as wilderness.

Special Provisions

- Explain how the special provisions and rights (grazing, mining, water developments, access to non-federal land, etc.) identified in the Wilderness Act (Sections 4 and 5) or subsequent legislation, are managed to minimize degradation of wilderness character.

Safety of Visitors, Personnel, and Contractors and Work Methods

- Describe any safety concerns associated with implementing the alternative on agency personnel, volunteers, and/or contractors.
- Identify any potential public safety hazards resulting from implementation of the alternatives.
- Discuss use of primitive and traditional skills and tools.

Economic and Time Constraints

Describe the costs and the amount of time it will take for implementation of the alternative.
Explain how each alternative satisfies any significant timing requirements or identified need for urgency.

Additional Wilderness-specific Comparison Criteria

Identify any other decision factors that are relevant to the unique characteristics and special features of this wilderness.

Step 2 Decision: What is the Minimum Tool?

Select the alternative that represents the minimum requirements necessary to administer the areas as wilderness.

Describe the rationale for selecting it.

Describe management requirements for minimizing effects including location, timing, frequency of action, design standards, etc. List any maintenance, monitoring, or reporting requirements. To aid in tracking and reporting the number and type of authorizations, check the box for each Section 4(c) use that is included in the selected alternative.



MINIMUM REQUIREMENTS DECISION GUIDE WORKSHEETS

Arthur Carhart National Wilderness Training Center

“... except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”

– The Wilderness Act, 1964

Step 1: Determine if it is necessary to take action.

Briefly describe the situation that may prompt action:

The situation that may prompt action in the Stephen T. Mather Wilderness is the implementation of a Mountain Lakes Fishery Management Plan/Environmental Impact Statement (plan/EIS). The draft plan/EIS considers a range of management alternatives, which include fish stocking and removal of reproducing populations of fish in select mountain lakes. The following section describes the purpose and need for the draft plan/EIS, and the existing conditions that may prompt administrative action in the Stephen T. Mather Wilderness.

The purpose of the draft plan/EIS is to guide management actions by the NPS and WDFW in mountain lakes that would:

- Conserve native biological integrity;
- Provide a spectrum of recreational opportunities and visitor experiences, including sport fishing;
- Resolve the long-standing debate and conflicts over fish stocking in the naturally fishless mountain lakes in North Cascades National Park, Ross Lake National Recreation Area, and Lake Chelan National Recreation Area (which together make up the “North Cascades National Park Service Complex”)

Need:

NPS fishery management actions are governed by various relevant laws, regulations, and policies. In most NPS units, natural resources (including lakes and fish) are managed in accordance with the *Organic Act of 1916* and in concert with *NPS Management Policies* (NPS 2001a) and *Director’s Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making and Handbook*, which allow sport fishing unless it is specifically prohibited, and prohibit stocking in most NPS waters (NPS 2001a, 4.4.3 and 8.2.2.5).

In the North Cascades Complex, fish have historically been managed by a combination of agencies and user groups. This is partly because the enabling legislation for the North Cascades Complex does not define the angling activities that were to be allowed within its boundaries, and partly because the area has a history of fish management by the state of Washington and sport fishing groups. This history of fish management predates the 1968 establishment of the North Cascades Complex by many years (see “History of Fish Management in North Cascades Mountain Lakes” in the “Background” section of the “Purpose of and Need for Action” chapter of the draft plan/EIS for more information on the North Cascades Complex enabling legislation).



The lakes that are the focus of the draft plan/EIS are the 91 mountain lakes in the North Cascades Complex that were naturally fishless, but have had some history of fish stocking since the late 1800s. The Stephen T. Mather Wilderness portion of the North Cascades Complex encompasses all of the lakes (except Thunder Lake) under consideration in the draft plan/EIS.

Existing Conditions:

Approximately 1000 anglers per year fish in the mountain lakes in the Stephen T. Mather Wilderness. The lakes are naturally fishless. In order to maintain a viable mountain lakes fishery for these anglers, some of the mountain lakes are stocked periodically by the Washington Department of Fish and Wildlife and their approved representatives. The Washington Department of Fish and Wildlife and various user groups advocate allowing fish stocking to continue in order to maintain the mountain lakes sport fishery.

Past stocking efforts have created reproducing, self-sustaining populations of nonnative fish in 37 lakes in the Stephen T. Mather Wilderness. Research demonstrates that these self-sustaining populations of fish can overpopulate the lakes and cause a variety of ecological effects. These effects include predation and competition with native organisms, and the potential for downstream dispersal and hybridization with native fish populations.

Administrative Actions analyzed in this Minimum Requirements Analysis:

The administrative actions of fish stocking and fish removal in the Stephen T. Mather Wilderness are considered in this analysis. Fish stocking would involve placing hatchery produced, nonreproducing trout in select mountain lakes. Methods for transporting stocked fish would include hand stocking via backpack access, and stocking by air with fixed wing aircraft. Fish removal would include various means of removing reproducing fish populations from select lakes. Fish removal would involve mechanical methods such as gillnetting combined with electrofishing and blocking access to spawning grounds in lakes with very limited spawning habitat. Fish removal would also involve application of the piscicide antimycin. The draft plan/EIS also considers a passive or “natural” method of fish removal that simply involves stopping the ongoing practice of stocking certain lakes that do not contain reproducing populations of fish. Since ceasing to stock as a means of removing fish does not involve administrative action in the Stephen T. Mather Wilderness, it is not considered in this analysis. Fish stocking and fish removal are considered separately in the following sections of this Minimum Requirement Analysis because they have different consequences for wilderness resources and the wilderness experience.

A. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Are there valid existing rights or is there a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of action involving Section 4(c) uses? Cite law and section.

Yes: ☒

No: ☒

Not Applicable: ☐

Explain:

Valid Existing Rights: There is disagreement between the Washington Department of Fish and Wildlife and the National Park Service over the degree of jurisdictional authority to stock waters in the national park portion of North Cascades Complex. For the purpose of this analysis, it is asserted that this issue is



not subject to existing rights. The basis for this assertion is the NPS interpretation of the enabling legislation and legislative history for the North Cascades Complex.

Special provision in legislation (the 1964 Wilderness Act or subsequent laws), that allows this project or activity:

Fish Stocking: There is no provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that explicitly allows for fish stocking.

Fish Removal: There is no provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that explicitly allows for fish removal. However, as an administrative unit of the National Park System, the North Cascades Complex is governed by the National Park Service Organic Act (39 Stat. 535, codified at 16 U.S.C. sections 1 through 4), which prohibits the NPS from allowing impairment of park resources or values. Thus, the NPS would have the authority to remove fish from wilderness lakes if their presence has the potential to impair park resources or values.

B. Describe Requirements of Other Legislation

Do other laws require action?

Yes: ☒

No: ☐

Not Applicable: ☐

Explain:

Provisions of the NPS Organic Act (39 Stat. 535, codified at 16 U.S.C. sections 1 through 4), and the Redwood National Park Expansion Act, as amended (92 Stat. 166, codified at 16 U.S.C. 1a-1), prohibit NPS from taking any action that may potentially impair park resources and values. For a complete description of other related laws, see appendix D of the draft plan/EIS.

C. Describe Other Guidance

Does taking action conform to and implement relevant standards and guidelines and direction contained in agency policy, unit and wilderness management plans, species recovery plans, tribal government agreements, state and local government and interagency agreements?

Yes: ☒

No: ☒

Not Applicable: ☐

Fish Stocking: Stocking of naturally fishless lakes in the National Park portion of the Stephen T. Mather Wilderness violates current NPS management policies regarding stocking of nonnative fish into national park waters. However, NPS policies do allow for stocking of nonnative fish into national recreation areas under certain circumstances (see section below entitled “**NPS Management Policies 2001**” and **appendix D**).

Fish Removal: The removal of nonnative populations of fish from lakes in both the park and national recreation areas would conform to NPS management policies. Fish removal would also conform to the terms of the 1985 MOU between the NPS and WDFW regarding fish and wildlife management provided that the NPS consults with the WDFW before taking any action (see section below entitled “**MOU Between the NPS and WDFW**” and **appendix A**).

Explain:**NPS Management Policies (2001)**

NPS Management Policies instruct park units to:

Maintain as part of the natural ecosystems of parks all native plants and animals by minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them (NPS 2001a, 4.4.1).

Reestablish natural functions and processes in human-disturbed components of natural systems in parks (unless otherwise directed by Congress) (NPS 2001a, 4.1.5). (Human disturbances include the introduction of exotic species and the disruption of natural processes. Using the best available technology and within its staff, funding and other resource constraints, park units are to restore the biological and physical components of these systems.)

Seek to return human-disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated” (NPS 2001a, 4.1.5).

Allow recreational uses in wilderness that enable the areas to retain their primeval character and influence; protect and preserve natural conditions; leave the imprint of man’s work substantially unnoticeable; provide outstanding opportunities for solitude or primitive and unconfined types of recreation; and preserve wilderness in an unimpaired condition (NPS 2001a, 6.4.3).

Evaluate recreational uses --particularly new and emerging uses-- that compromise the stated purposes and definitions of wilderness or unduly impact the wilderness resource or the visitor experience within wilderness, to determine if these uses are appropriate, or should be limited or disallowed (NPS 2001a, 6.4.3.1).

Sport fishing is generally allowed in NPS units unless specifically prohibited, providing it “does not jeopardize natural aquatic ecosystems or riparian zones” (NPS 2001a, 8.2.2.5). At least one-third of the areas administered by the NPS have substantial fish resources and fishery activities. Sport fishing has been permitted in national parks since the establishment of Yellowstone National Park in 1872. Sport fishing is managed under 36 CFR 2.3, which states in part, “fishing shall be in accordance with the laws and regulation of the State . . . Nonconflicting State laws are adopted as part of these regulations.” The NPS is allowed to restrict fishing activities wherever needed to achieve its own management objectives.

In contrast to sport fishing, the practice of stocking fish is generally prohibited in park units. Stocking cannot “impair park natural resources or processes,” and it must take place only in national recreation areas or preserves that have historically been stocked (only the same species that has historically been stocked may continue to be stocked) (NPS 2001a, 4.4.3). Exotic species cannot displace native species (if displacement can be prevented), and parks are to manage “up to and including eradication” if control is feasible and the exotic species interferes with native species, natural habitats, or disrupts the integrity of the native species (NPS2001a, 4.4.4.2). If an exotic species is introduced or maintained to meet specific NPS management needs, all “feasible and prudent measures to minimize the risk of harm” to native biota or invasion of habitat by the exotic species must be taken, and the exotic species must “be known to be historically significant, to have existed in the park during the park’s period of historical significance, or to have been commonly used in the local area at that time (NPS 2001a, 4.4.4.1).”

For more information regarding NPS Management Policies, refer to appendix D of the draft plan/EIS.



Memorandum of Understanding between the NPS and WDFW

To resolve differences in policy and to foster a spirit of cooperation, the NPS and WDFW negotiated a series of agreements beginning in 1979 that allowed stocking to continue in selected lakes in the North Cascades Complex. Currently, the management of mountain lakes is performed under a temporary extension of the 1985 Memorandum of Understanding and 1988 Supplemental Agreement between the two agencies. The Memorandum of Understanding and Supplemental Agreement (see [appendix A](#) for copies of both documents) were written “to continue cooperative efforts in management of protection and enhancement of the fisheries and wildlife resources of mutual concern.” The Memorandum of Understanding provided “Statements of Work” (or directives) for both the NPS and the WDFW. The three main management directives from the Memorandum of Understanding that, in part, pertain to fish management are:

1. To consult with the Department [WDFW] prior to initiating research projects or implementing plans, programs, or regulations affecting fish and wildlife species distribution, numbers, or public use of fish and wildlife found within areas administered by the Service [NPS].
2. To practice those forms of management which will benefit fish and wildlife, and their habitats, and to maintain or restore their natural and historic distribution and abundance, consistent with the respective Service [NPS] policies and park objectives.
3. To permit the harvest of fish and wildlife in accordance with applicable state laws and regulations of the Department [WDFW] in those areas under the jurisdiction of the Service [NPS], which are open to hunting and/or fishing. It is recognized that some park regulations may vary for management purposes.

D. Describe Options Outside of Wilderness

Can this situation be resolved by action outside of wilderness?

Yes: ☐

No: ☐

Not Applicable: ☒

Explain:

Only one lake in the study area is outside of wilderness boundaries within the North Cascades Complex (Thunder Lake). There are hundreds of fishable lakes outside of the North Cascades Complex boundaries located within surrounding National Forests, but most of these lakes are also within wilderness boundaries. The NPS would not have authority to take actions outside its boundaries. In addition, some anglers who desire continued sport fishing believe that sport fishing in North Cascade lakes is a recreational opportunity that cannot be duplicated elsewhere.

E. Wilderness Character

How would action contribute to the preservation of wilderness character, as described by the components listed below?

Yes: ☒ No: ☒ Not Applicable: ☐

- **“Untrammeled”** – Wilderness is ideally unhindered and free from modern human control or manipulation.
- **“Undeveloped”** – Wilderness has minimal evidence of modern human occupation or modification.
- **“Natural”** – Wilderness ecological and evolutionary systems are substantially free from the effects of modern civilization.
- **“Outstanding opportunities for solitude or a primitive and unconfined type of recreation”** – Wilderness provides opportunities for people to experience natural sights and sounds, solitude, freedom, risk, and the physical and emotional challenges of self-discovery and self-reliance.

Untrammeled:

Stocking naturally fishless lakes, even with nonreproducing trout, would not leave the wilderness “ideally unhindered and free from modern human control or manipulation.” Stocking of fish would manipulate the native ecology of a lake and introduce a nonnative species for the purpose of enhancing recreation.

Fish removal would also entail short-term human control or manipulation, with the objective of reestablishing sustainable native ecological conditions. Over the long term, removal of self-sustaining populations of trout would reestablish the untrammeled nature of the wilderness character by reducing evidence of human manipulation (e.g., nonnative fish) in lakes.

Undeveloped:

Development of the wilderness would not occur under any of the alternatives.

Natural:

Stocking with nonreproducing trout would temporarily affect the natural character of naturally fishless lakes in wilderness by introducing a nonnative species, thus manipulating the ecological structure of the lakes.

Removal of self-sustaining populations of nonnative fish would help to reestablish and conserve the biological integrity in naturally fishless lakes.

Following removal of reproducing populations, two of the alternatives propose to restock some of the lakes with nonreproducing fish as a means of continuing to provide sport fishing opportunities while minimizing impacts to biological integrity associated with reproducing populations of fish. Restocking,



however would have minor to moderate adverse impacts to native biota over the long-term, and would provide no substantive benefits to the natural character of naturally fishless lakes within the wilderness.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation:

Fish stocking would provide approximately 500 to 1,000 anglers per year with the opportunity to fish and have a wilderness experience while doing so. Fish stocking, the presence of anglers, fishing tackle left inadvertently behind, and other evidence of this human activity may impact the opportunities for solitude for some visitors who seek a wilderness experience within the North Cascades Complex.

Removal of reproducing populations of fish would take many years. During this time, some anglers and nonanglers would experience removal activities such as helicopters flights, motorized equipment use and the routine presence of field crews in limited areas of the wilderness. These activities would adversely affect opportunities for solitude and other elements of the wilderness experience for some wilderness users.

Other unique components that reflect the character of this wilderness:

Some anglers have reported through the EIS public scoping process that fishing the mountain lakes in the Stephen T. Mather Wilderness is a unique wilderness experience cannot be duplicated elsewhere. They cite the ruggedness of the terrain and the remoteness of the mountain lakes as providing outstanding opportunities for a wilderness experience while fishing within the North Cascades Complex.

F. Describe Effects to the Public Purposes of Wilderness

How would action support the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Explain:

Fish stocking would continue to enhance recreational opportunities (sport fishing) in natural mountain lakes for approximately 1,000 anglers per year who use the wilderness area. Stocking and sport fishing have been a historic use of the area for several generations prior to the wilderness area's establishment. Stocking of nonreproducing trout in a scientifically informed manner using adaptive management principles would minimize impacts to the scientific and conservation purposes of wilderness. However, various elements of the scientific and conservation purposes of wilderness would remain compromised to some degree because the lakes were naturally barren of fish. For example, some of the mountain lakes would no longer provide scientists with the opportunity to study the ecology of naturally fishless mountain lakes because the lakes would contain nonnative fish.

Removal of self-sustaining populations of trout would best protect the scientific and conservation purposes of wilderness because removal would help to conserve biological integrity by reestablishing fishless conditions. Following removal, it is assumed that ecological structure of the lakes would revert to naturally fishless conditions although this could take many years. However, removal of reproducing populations of fish would reduce the recreational opportunities for a wilderness experience for some anglers because there would be fewer lakes available for fishing.

Following removal of reproducing, self-sustaining populations of trout, restocking of some lakes with nonreproducing populations of trout, as proposed in two alternatives, would support the recreational and historical use purposes of the wilderness area while minimizing impacts to biological integrity.

Step 1 Decision: Is it necessary to take action?

Yes: ☒ No: ☒ Not Applicable: ☐

Explain:

Fish Removal: Yes. Given the well-documented impacts of nonnative, reproducing populations of fish on native organisms, the NPS believes it is imperative to remove, wherever feasible, populations of reproducing trout from naturally fishless lakes. The draft plan/EIS concludes that if reproducing populations remained in the lakes, over time there would be major adverse impacts to native biota. Therefore, removal of reproducing, self sustaining populations of fish is required for administration of the area as wilderness in spite of the short term impacts to the wilderness experience that will occur during fish removal.

Fish Stocking: No. Stocking non reproducing trout into the high mountain lakes would continue to benefit the recreational wilderness experience for certain wilderness anglers. Stocking, however, would adversely impact the wilderness experience for other wilderness users. Fish stocking would also adversely impact, to varying degrees, the scientific, conservation and natural purposes of wilderness. If stocking were discontinued, opportunities for fishing in the high mountain lakes would be severely limited. However, various opportunities for sport fishing would remain in the rivers and streams, and other types of primitive and unconfined forms of recreation would still exist in the Steven T. Mather Wilderness. Therefore, the NPS believes that fish stocking is not required for administration of the area as wilderness.

If action is necessary, proceed to Step 2 to determine the minimum tool for action.



Step 2: Determine the minimum tool.

Description of Alternative Actions

For each alternative, describe what methods and techniques will be used, when the action will take place, where the action will take place, what mitigation measures are necessary, and the general effects to wilderness character.

Alternative # B, C, and D

Description:

Fish removal methods under alternatives B, C, and D would include mechanical, natural and chemical methods.

Mechanical methods would include gillnetting in combination with electrofishing and cobbling over of spawning grounds to break the cycle of reproduction.

Natural methods would be a passive means of eliminating fish by stopping stocking.

Chemical methods would be limited to application of the piscicide Antimycin to lakes larger than 5 acres in size where removal of fish using mechanical methods would probably not be feasible.

For a complete description of methods and mitigation, see the “Alternatives” chapter of the draft plan/EIS.

Effects:

Natural methods would have a beneficial effect on wilderness character for some wilderness users because stocking would cease and there would be less evidence of human manipulation of wilderness. For those who enjoy fishing in mountain lakes, there would be a loss of fishing opportunity and this would have an adverse impact on their wilderness experience.

Mechanical methods would have long-term beneficial impacts on mountain lakes by reestablishing historically fishless conditions. However, intensive use of gillnets and electrofishing equipment would also impose a variety of adverse, short-term impacts to wilderness character in limited areas of the wilderness. These impacts would include:

- Periodic use of helicopters to transport heavy equipment to lakes undergoing fish removal. Reduced opportunities for solitude in limited areas of the wilderness due to the short-term, seasonal presence of crews and mechanized equipment at select lakes undergoing fish removal.
- Some nontarget taxa would be inadvertently harmed or killed by gillnets. Although individual members of the population would be harmed, these adverse impacts would not be expected to affect the populations of nontarget taxa.
- Mechanical methods would only be feasible for removing reproducing populations of fish from small, shallow lakes. They would not be effective on larger deeper lakes.

Chemical methods would be limited to application of the piscicide antimycin in larger, deeper lakes with reproducing and self-sustaining populations of fish that could not be removed using mechanical methods.

The impacts of chemical methods would be similar to that of mechanical methods in many respects. For example, helicopters would be periodically needed to ferry heavy equipment to select lakes each season. In addition, field crews would be present at lakes undergoing treatment for several weeks at a time. Overall, field crews would not need to spend as much time at lakes undergoing antimycin treatment compared to lakes undergoing mechanical treatment, because antimycin treatment would remove fish more rapidly than mechanical treatment.

Application of antimycin would require use of motorized inflatable boats and other mechanized forms of equipment that would not be necessary for mechanical treatment.

Antimycin application would impact different forms of nontarget taxa compared to gillnetting. Impacts to nontarget taxa would be limited to those taxa most sensitive to antimycin, such as certain aquatic invertebrates. Nontarget taxa such as mammals and birds would not be affected by antimycin, whereas some individuals could be harmed or killed by gillnet entrapment.

Application of the piscicide antimycin in wilderness waters would offend some wilderness enthusiasts who would not support the use of pesticides in wilderness, the objective of fish removal, or both.

A comprehensive description of the impacts of fish removal on wilderness resources and values is provided in the “Environmental Consequences” chapter of the draft plan/EIS.



Step 2 Decision: What is the Minimum Tool?

The selected alternative is: (To be implemented prior to management action)

Describe the rationale for selecting this alternative:

Describe any monitoring and reporting requirements:

Please check any Wilderness Act Section 4(c) uses approved in this alternative:

- | | |
|---|--|
| <input type="checkbox"/> mechanical transport | <input type="checkbox"/> landing of aircraft |
| <input type="checkbox"/> motorized equipment | <input type="checkbox"/> temporary road |
| <input type="checkbox"/> motor vehicles | <input type="checkbox"/> structure or installation |
| <input type="checkbox"/> motorboats | |

Be sure to record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

APPENDICES

Approvals	Signature	Name	Position	Date
Prepared by:				
Recommended:				
Recommended:				
Approved by:				



WASHINGTON DEPARTMENT OF FISH AND WILDLIFE COMMENTS ON THE MINIMUM REQUIREMENTS ANALYSIS

The Washington Department of Fish and Wildlife (WDFW) appreciates the opportunity to work closely with National Park Service (NPS) staff in the development of the *Draft Mountain Lakes Fishery Management Plan / Environmental Impact Statement* (plan/EIS) for the North Cascades National Park Service Complex, and overall, we are generally satisfied with its technical content, and the responses to our technical comments and resultant revisions. The WDFW has carefully reviewed this appendix K. We were unable to find any mention of fish stocking in the *Wilderness Act*, including 4(c), where prohibited activities are defined. Our interpretation of the minimum requirements under the Act was that it would be applied to proposed prohibited activities. We now understand that it is NPS policy that requires any management action in wilderness administered by the NPS to undergo a Minimum Requirements Analysis (MRA). The WDFW expects that NPS will include additional text in their EIS to clarify this with citations.

With regard to the MRA on fish stocking itself, WDFW contends that the perspective brought forth in the following argument leads us to conclude that some limited, biologically based stocking of nonreproducing trout is necessary for the administration of the Stephen T. Mather Wilderness, and the NPS conclusion reached in Step 1 of the MRA regarding fish stocking should be reversed.

A fishery management program that is biologically based on limited stocking of nonreproducing trout would continue to provide high lakes recreational angling in park waters where fish stocking and wilderness angling are longstanding historical practices, while excessively reproducing fish populations in park high lakes are removed. Such a program would facilitate opportunities for angler education on conservation issues and reduce the risks of unsanctioned introductions of fish. Such a fishery management program has already been determined by the analyses documented in the EIS to conserve biological integrity of park lakes and their biota, leaving no permanent evidence of human presence and allowing natural processes to prevail.

Detailed comments on sections of the Worksheets for the MRA follow:

Section A. While there is no provision in the park's enabling legislation or the *Wilderness Act* that explicitly allows for fish stocking, there are also no provisions prohibiting it. Fish stocking itself does not fall under the 10 prohibitions defined in 4(c) of the *Wilderness Act*. Therefore, we believe very strongly that all analysis of *Fish Stocking* per se is unnecessary and inappropriate in sections A through F of the Worksheets. However, we fully agree with the need for an MRA for the *Fish Removal* aspect of the fishery management plan since the use of aircraft would likely be required. Aircraft use in wilderness is one of the prohibited uses noted in section 4c. WDFW believes the correct response for Section A is "Not Applicable" for fish stocking, although we reiterate that WDFW believes the correct approach is to not consider fish stocking as part of the MRA. The overall effects of fish stocking are more than adequately treated in the body of the EIS. Further, WDFW asserts that backpack stocking methods are the minimum tool for administering the stocking element of the fishery management plan, and backpack stocking of low numbers of trout fry has a minimal to undetectable impact.

Section D. As noted earlier, WDFW believes the MRA should not be applied to fish stocking per se. However, WDFW would answer "No" to this question. Too many, if not most, users of the remote, off-trail fish-bearing lakes in the wilderness fishery within the North Cascades Complex are unique, and suggesting "action" (stocking) in other wilderness areas is not applicable, and diminishes the value and importance of the North Cascades high-lake fishery. Within the Park, there are no lakes outside the Stephen T. Mather Wilderness that could be stocked to recreate the current opportunity, either in quality or quantity. WDFW, working cooperatively with NPS staff, has already greatly reduced the historic



extent of the stocked trout fishery in the wilderness lakes, as fully described in the body of the EIS. (For fish removal, the answer to this question is obviously ‘No,’ and WDFW supports the removal of the problem fish populations.)

Section E. WDFW recognizes that naturally barren lakes are not completely free from human manipulation if they harbor introduced fish, even low numbers of nonreproducing fish. However, WDFW has worked diligently over the past several decades and more recently with NPS technical staff to develop a responsible, biologically based fish stocking program that conserves biological integrity. A great deal of research now supports the premise that low numbers of nonreproducing fish can occupy certain lakes without causing significant deviations, or in some cases, even detectable changes in the structure or function of native high-lake ecosystems. These lakes show little evidence of human modification and are substantially free from the effects of modern civilization. Moreover, they still provide outstanding opportunities for solitude and primitive and an unconfined type of recreation, particularly a North Cascades wilderness fishing experience that cannot be met outside of the Park. Stocking effects are minor and temporary, and the periodic and dispersed nature of this fishery is unlikely to have major impacts on wilderness experience. Again, WDFW believes fish stocking should not be part of the MRA but is in agreement with the NPS analysis of the effects of fish removal on wilderness character.

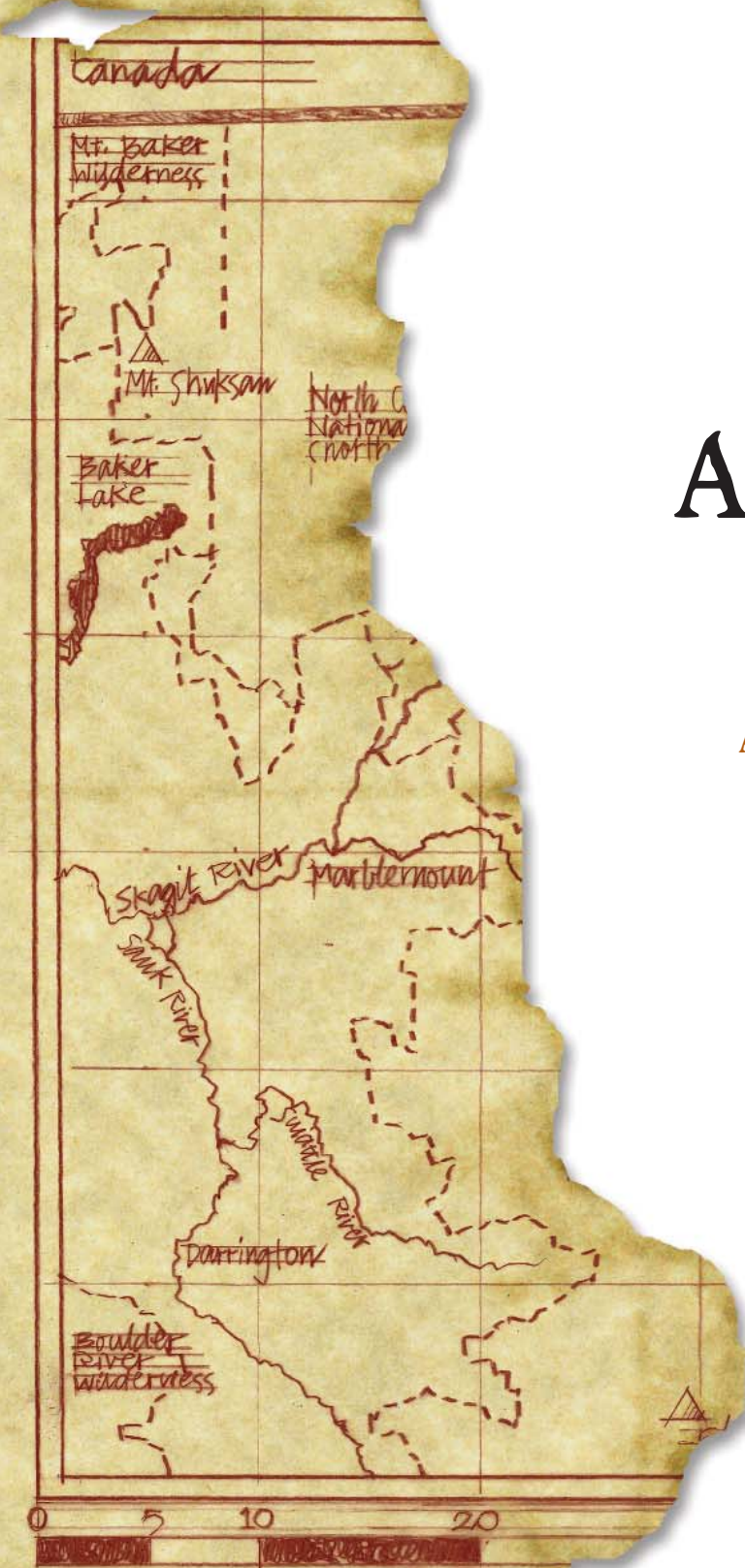
Section F. With regard to the effects of fish stocking to the public purpose of wilderness, WDFW not only views fish stocking as an enhancement of the North Cascades Complex high-lake fishery, but as the fundamental support of this long-standing historic fishery, given the fact that WDFW agrees that most of the excessively reproducing fish populations in park high lakes should be removed. In providing this fishery, WDFW also places great value on the close relationship it has developed with the backcountry angling community. This relationship fosters ongoing efforts to educate anglers on conservation issues such as bull trout, amphibians, and the importance of biological integrity to high-lakes ecology. WDFW believes these efforts promote conservation throughout wilderness areas and reduce the likelihood of unsanctioned spread of nonnative fish species in wilderness areas. While scientific opportunity to study fishless ecosystems may be diminished in some individual lakes, there are still many such lakes where these opportunities exist. Opportunities to study recovery will also emerge as a collaborative and successful fish removal program moves forward. Moreover, the presence of low densities of nonreproducing fish does provide research opportunity for the study of how this important management approach affects native lake biota.

These points lead WDFW to the conclusion that fish stocking is the primary means by which this long-standing historical fishery is supported without significantly impacting other uses and, therefore, meets the minimum requirements for administering the Stephen T. Mather Wilderness.

Conclusion. WDFW does not believe fish stocking is a needed, or an appropriate, part of the Minimum Requirements Analysis because it is not prohibited under the *Wilderness Act*, and the paragraph on *Fish Stocking* should be removed from the MRA. However, we clearly agree that fish removal that uses any of the prohibited uses or actions within wilderness (such as aircraft use) requires the MRA, and that fish removal should occur in the agreed-upon lakes. Since park policy requires an MRA on all proposed activities, then the conclusion regarding fish stocking should be that limited, biologically based stocking of nonreproducing trout is necessary for the administration of the Stephen T. Mather Wilderness.

Minimum Tool. WDFW supports the use of helicopters as described in the body of the EIS to enable those fish removal projects requiring aircraft support. We are not aware of any other need to use any of the “10 Prohibited Uses” listed in section 4c of the *Wilderness Act*.





Appendix L

FINTROL LABEL AND
APPLICATION INSTRUCTIONS

APPENDIX L: FINTROL LABEL
AND APPLICATION INSTRUCTIONS

<p style="text-align: center;">FINTROL CONCENTRATE PRECAUTIONARY STATEMENTS Hazards to Humans and Domestic Animals</p> <p>DANGER: Fatal if swallowed. May be fatal if absorbed through skin. Causes substantial but temporary eye injury. Causes skin irritation. Do not breath spray mist. Do not get in eyes, on skin or on clothing. Wear protective goggles. Wear chemical gloves. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove contaminated clothing and wash before reuse.</p> <p style="text-align: center;">Environmental Hazards This product is very highly toxic to fish Physical or Chemical Hazards</p> <p>Extremely Flammable: Keep away from fire, sparks and heated surfaces.</p> <p>FIRST AID: IF SWALLOWED: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. If person is unconscious, do not give anything by mouth and do not induce vomiting.</p> <p>IF INHALED: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.</p> <p>IF ON SKIN: Wash with plenty of soap and water. Get medical attention.</p> <p>IF IN EYES: Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">STORAGE AND DISPOSAL</p> <p>Do not contaminate water, food or feed by storage or disposal.</p> <p>Storage: Store only in original containers, in a dry place inaccessible to children and pets. Fintrol Concentrate will thicken if stored at temperatures below 65 F. Before use store overnight above 70 F. Fintrol Concentrate is stable for a minimum of 3 years when stored in unopened original glass bottles.</p> <p>Pesticide Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your state pesticide or environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.</p> <p>Container Disposal: Triple rinse (or equivalent). Then dispose of in a sanitary landfill or by other approved state and local procedures.</p> </div>	<p style="text-align: center;">RESTRICTED USE PESTICIDE <small>Due to Aquatic Toxicity & Need for Highly Specialized Applicator training. For retail sale to, and use only by, Certified Applicators, or persons under their direct supervision, and only for those uses covered by the Certified Applicators' Certification.</small></p> <div style="text-align: center; margin-top: 20px;"> <p>FINTROL® CONCENTRATE (ANTIMYCIN A) FISH TOXICANT KIT (contains Fintrol Concentrate and Fintrol Diluent)</p> </div> <p>This can contains 1 bottle of FINTROL-Concentrate and 1 bottle of Fintrol-Diluent.</p> <table style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <th style="text-align: left;">FINTROL CONCENTRATE (8 fl. Oz.)</th> <th style="text-align: left;">FINTROL DILUENT (8 fl. Oz.)</th> </tr> <tr> <td>Active Ingredients</td> <td>Inert Ingredients</td> </tr> <tr> <td>Antimycin A 23% w/w</td> <td>Diethyl Phthalate (surfactant) 30.5% w/w</td> </tr> <tr> <td>Inert Ingredients 15%</td> <td>Nonoxyl-9 (detergent) 16.7% w/w</td> </tr> <tr> <td>Soy lipids 62%</td> <td>Acetone 52.8% w/w</td> </tr> <tr> <td>Acetone 100% w/w</td> <td>Acetone 100.0% w/w</td> </tr> </table> <p style="text-align: center; margin-top: 10px;">AQUABIOTICS CORP. P.O. BOX 10576 Bainbridge Island, WA 98110 E.P.A. Reg. No 39096-2 E.P.A. Est. No 39096-WA-01</p> <div style="text-align: center; margin-top: 10px;"> <p>DANGER POISON</p> <p>Keep out of reach of children <small>See side panel for other Precautionary Statements.</small></p> <p style="font-size: x-small;">DIRECTIONS FOR USE It is a violation of federal law to use this product in a manner inconsistent with its labeling. See USE DIRECTIONS LEAFLET for "Fintrol (Antimycin A) Fish Toxicant Kit"</p> </div>	FINTROL CONCENTRATE (8 fl. Oz.)	FINTROL DILUENT (8 fl. Oz.)	Active Ingredients	Inert Ingredients	Antimycin A 23% w/w	Diethyl Phthalate (surfactant) 30.5% w/w	Inert Ingredients 15%	Nonoxyl-9 (detergent) 16.7% w/w	Soy lipids 62%	Acetone 52.8% w/w	Acetone 100% w/w	Acetone 100.0% w/w
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**FINTROL DILUENT
PRECAUTIONARY STATEMENTS
Hazards to Humans and Domestic Animals**

CAUTION: Harmful if swallowed. Harmful if inhaled. Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin and clothing. Do not breath spray mist. Do not get in eyes, on skin or on clothing. Wear protective goggles. Wear chemical gloves. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove contaminated clothing and wash before reuse.

Physical or Chemical Hazards

EXTREMELY FLAMMABLE: KEEP AWAY FROM FIRE, SPARKS AND HEATED SURFACES.

FIRST AID

IF SWALLOWED: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. If person is unconscious, do not give anything by mouth and do not induce vomiting.

IF INHALED: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

IF ON SKIN: Wash with plenty of soap and water. Get medical attention.

IF IN EYES: Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.


Storage: Store only in original containers, in a dry place inaccessible to children and pets. Fintrol Concentrate will thicken if stored at temperatures below 65 F. Before use store overnight above 70 F. Fintrol Concentrate is stable for a minimum of 3 years when stored in unopened original glass bottles.

Pesticide Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your state pesticide or environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal: Triple rinse (or equivalent). Then dispose of in a sanitary landfill or by other approved state and local procedures.



TAKE TIME



OBSERVE LABEL DIRECTIONS

FINTROL-®

CONCENTRATE

(antimycin A) (solution 20%)

PRECAUTIONARY STATEMENTS
Hazards to Humans and Domestic Animals

DANGER: Fatal if swallowed. May be fatal if absorbed through skin. Causes substantial but temporary eye injury. Causes skin irritation. Do not breathe spray mist. Do not get in eyes, on skin or on clothing. Wear protective goggles. Wear chemical gloves. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove contaminated clothing and wash before reuse.

Environmental Hazards
This product is very highly toxic to fish.


STORAGE AND DISPOSAL
Do not contaminate water, food or feed by storage or disposal. SEE OUTER CAN LABEL FOR PROPER STORAGE, PESTICIDE DISPOSAL AND CONTAINER DISPOSAL

EPA Reg. No. 39096-2
EPA Est. No. 39096-WA-01

Fintrol Concentrate for use with Fintrol (Antimycin) Fish Toxicant Kit

Ingredients	(w/w%)
Active Ingredients	
Antimycin A	23%
Inert Ingredients	
Soy lipids	15%
Acetone	62%
	100%

DANGER



POISON

KEEP OUT OF REACH OF CHILDREN

Aquabiotics Corp.
PO Box 10576
Bainbridge Island, WA

Physical or Chemical Hazards:
Extremely Flammable: Keep away from fire, sparks and heated surfaces.

FIRST AID IF SWALLOWED: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. If person is unconscious, do not give anything by mouth and do not induce vomiting.

IF INHALED: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

IF ON SKIN: Wash with plenty of soap and water. Get medical attention.

IF IN EYES: Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention.

DIRECTIONS FOR USE
It is a violation of federal law to use this product in a manner inconsistent with its labeling. See "USE DIRECTIONS LEAFLET" for "FINTROL (Antimycin A) Fish Toxicant Kit".



FINTROL®

Fish Toxicant Kit

Use Direction Leaflet

Directions For Use

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

FINTROL-CONCENTRATE is designed for use in running water, streams and shallow waters. This liquid form of FINTROL may be applied to lakes and ponds by boat bailer method or spray equipment. Spray methods are useful at depths to 1 foot. Boat bailer and drip tubes, applied at the propeller wash, are used at other depths. Application from an airplane is NOT recommended.

Each can of Fintrol-Concentrate (Antimycin A) Fish Toxicant Kit [containing 240 cc. Fintrol-Concentrate (solution 20%) and 240 cc. Diluent] will, after mixing, make 480 cc., which treats approximately 38 acre-feet of water at 1 p.p.b. (1 part per billion).

AQUABIOTICS CORP.
P.O. Box 10576
10750 Arrow Point Dr. NE
Bainbridge Island, WA 98110

EPA Reg. No. 39096-2
EPA Est. No. 39096-WA-01

Licensed by: Wisconsin Alumni Research
 Foundation

Trademark licensed by: Ayerst Laboratories, Inc.

Before applying FINTROL to either public or private waters, contact the Director of the State Fish and Game Department or Conservation Department for State and Federal regulations governing the use of fish toxicants in your area.



DESCRIPTION

The active ingredient of FINTROL is antimycin A. When absorbed through the gills of fish, antimycin A kills by interfering with the respiration of body cells. Antimycin A does not repel fish. This is an important advantage, particularly when running waters, bog lakes, and the epilimnion, or upper layer, of large lakes are treated. Fish make no attempt to escape contact with the toxicant by seeking to move into waters that are clear of it. FINTROL'S action is rapid and irreversible.

Sensitivity to FINTROL varies widely among fish species. Hence it may be employed to selectively destroy certain species, without affecting other species concurrently inhabiting the same body of water.

Sensitive:

Gizzard shad, trouts, pikes, carp, minnows, suckers, brook stickleback, white bass, sunfishes, perches, freshwater drum, sculpins.

Least Sensitive:

Shortnose gar, bowfin, goldfish, catfish.

FINTROL also may be used to selectively destroy certain age groups of species; younger fish are more sensitive to FINTROL.

Providing the concentration is correctly estimated, FINTROL can be used effectively at any time of year in either cold, warm, soft, hard, acid, alkaline, clear or turbid (muddy) waters. (See TABLE 1 and instruction for bioassay.)

FINTROL does not impart detectable taste or odor to treated waters. In the usual, recommended concentrations it causes no apparent harm to aquatic plants, insects, or bottom fauna. Since FINTROL'S active ingredient degrades rapidly, the reclaimed waters may be restocked soon after treatment. (See HOW TO DETERMINE WHEN TREATED WATER MAY BE RESTOCKED.) There is very little interruption in availability of the waters for recreational, agricultural, industrial, or other purpose.

USES

FINTROL is used to cull undesirable species of fish from freshwater lakes, ponds, and streams. It can be used to eliminate all fish from a body of water (complete kill). Or, it can be used to remove only certain fish species or size groups from mixed populations (selective kill).

A complete kill may be achieved with a concentration of anywhere from 5 to 25 p.p.b. of active ingredient. (See HOW TO DETERMINE THE MOST EFFECTIVE CONCENTRATION.) FINTROL is particularly advantageous for complete kills because it detoxifies so rapidly the pond can usually be restocked in about a week, or as soon as caged fish survive 48 hours' exposure to the treated waters.

Under optimal circumstances, in ponds managed for sports fishing, selective kills may be achieved at concentrations as low as 0.5 to 1.0 p.p.b. However, because these concentrations are extremely low, there is no rule of thumb that can be relied upon to determine them accurately. A BIOASSAY IS ALWAYS REQUIRED TO PINPOINT THE OPTIMAL CONCENTRATION FOR SELECTIVE KILLS. (Literature describing this procedure is available upon request.)

A selective kill has these advantages: It can be made without interrupting sport fishing for more than a week or so, and fishing may be gradually improved without restocking. In the past, when bluegill, minnows, or green sunfish dominated a pond managed for bass, the usual solution to the problem was the total removal of all the fish with a fish toxicant. This meant restocking and little or no fishing for one or two years. Now — with FINTROL — this is no longer necessary. Low concentrations of FINTROL will affect small bluegill, green sunfish, and minnows primarily. Only a few of the very small bass will succumb. The bulk of the adult bluegill and green sunfish will not be affected. Thus FINTROL helps to bring about a balanced relationship between the bass and bluegill populations. This improves fishing without interrupting it for any appreciable length of time.

In catfish farming FINTROL can be used to selectively eliminate the trash fish (scale fish) that commonly reduce the yields and increase the costs of the commercial catfish farmer. It is possible to do this with FINTROL because concentrations that will eliminate scale fish generally will not harm adult catfish. The scale fish most often encountered by the catfish farmer will succumb to anywhere from 5 to 10 p.p.b. of active ingredient (See TABLE 1) whereas, under ordinary circumstances, it takes in excess of 20 p.p.b. to kill catfish. (Caution should be exercised during stress conditions of unusually high water temperature and reduced oxygen content when the sensitivity of fishes to chemicals may increase.)

HOW TO SELECT THE APPROPRIATE FORMULATION

The nature of the water to be treated (its depth and rate of flow) and the character of the surrounding land are factors to be taken into consideration when determining the formulation of FINTROL to employ in a given situation.

HOW TO DETERMINE THE MOST EFFECTIVE CONCENTRATION

For complete kills and also, for removal of scale fish from catfish ponds.

The concentration of antimycin A required to kill one or more species of fish in any given body of water depends upon: 1) the sensitivity of the species to be eradicated, and 2) the chemical and physical properties of the water at the time of application of the toxicant; the pH and the temperature of the water are the most important of these chemical and physical factors under ordinary circumstances. Therefore, to determine what concentration of antimycin A will be required to kill the undesirable fish in your pond or lake:

- 1) identify the species to be eradicated,
- 2) determine the pH and average water temperature by measuring at various sites and depths,
- 3) refer to TABLE 1 for approximate concentrations.
- 4) conduct a bioassay to pinpoint the optimal concentration.

TABLE 1 provides a rough estimate of the concentrations required for a complete kill under various environmental conditions. However, since water chemistry is subject to sudden alteration by many variables and often unpredictable factors (pollution, heavy algae bloom, weather, drawdown, etc.) it should be realized that such changes may affect the performance of the toxicant. For this reason, measurements of pH and water temperature should always be taken as close to the time of treatment as is feasible.



**TABLE 1—FOR ROUGH ESTIMATION OF CONCENTRATIONS* OF FINTROL (ANTIMYCIN A) NEEDED FOR COMPLETE†
ERADICATION OF DIFFERENT FISH SPECIES, UNDER VARIOUS COMBINATION OF WATER TEMPERATURE AND WATER pH**

TARGET SPECIES	SENSITIVITY OF TARGET SPECIES TO FINTROL (in p.p.b. of active ingredient)	EFFECTIVE CONCENTRATION OF FINTROL* (in p.p.b. of active ingredient)			
		When pH is 8.5 or less		When pH is 8.5 or more	
		water temperature above 60°F.	water temperature below 60°F.	water temperature above 60°F.	water temperature below 60°F.
gizzard shad trouts pikes carp minnows suckers brook stickleback white bass sunfishes perches freshwater drum sculpins	5-10	5	7.5	7.5	10
short nose gar bowfin goldfish catfish	15-25	15	20	20	25
*The concentration level suggested by this table should be confirmed by an on-site bioassay. † This table is applicable only when a complete kill is desired. Do not use it for a selective kill. (See the following section.)					

* Fish nomenclature according to American Fisheries Society

Note (columns 1 and 2) that the sensitivity of the target species determines the concentration range. To eradicate sensitive species, it is recommended that the appropriate formulation of FINTROL be applied so that the body of water will have a concentration of from 5 to 10 p.p.b. of antimycin A, depending upon variation in pH and water temperature. For more tolerant species, higher concentrations are recommended. Laboratory studies indicate that less sensitive fish will succumb at concentrations of from 15 to 25 p.p.b. of antimycin A, depending upon variations in pH and water temperature. Columns 3 to 6 show how to adjust for pH and water temperature. Note that, in general, the lower the pH, the less FINTROL required. The higher the water temperature, the less FINTROL required. The ideal situation for a complete kill would combine a highly sensitive species, low pH and high water temperature.

For selective kills in ponds managed for sports fishing

The only way to determine the concentration of FINTROL needed for a selective kill is to perform a bioassay. This involves subjecting both the target and nontarget fish to several concentrations of FINTROL to determine the minimum lethal dose. (A description of the bioassay procedure is available upon request.)

HOW TO CALCULATE THE AMOUNT OF FINTROL TO BE ADDED TO A BODY OF WATER TO OBTAIN A GIVEN CONCENTRATION

To calculate the amount of FINTROL to be added to a body of water for eradication of undesired species, the following steps should be taken:

- Determine the volume of water to be treated in acre-feet. This can be arrived at by multiplying the surface area in acres by the average depth in feet.
- Determine the concentration to be used from Table 1.
- Multiply the number of acre-feet by the value given in Table 2, opposite the desired concentration.
- Divide this number by the total kit volume (480 cc. or 16 oz.) to get number of Fish Toxicant Kits needed.

**TABLE 2—RAPID ESTIMATION OF
FINTROL-CONCENTRATE REQUIREMENTS**

Desired Concentration (p.p.b. active ingredient)	Amount of FINTROL-CONCENTRATE per acre-foot	
	cc*	oz. (approx.)
1 p.p.b.	12.3	½
2 p.p.b.	24.6	¾
3 p.p.b.	36.9	1¼
4 p.p.b.	49.2	1½
5 p.p.b.	61.5	2
6 p.p.b.	73.8	2½
7 p.p.b.	86.1	2¾
8 p.p.b.	98.4	3¼
9 p.p.b.	110.7	3¾
10 p.p.b.	123.0	4

*Obtained by multiplying 12.3 cc. by the p.p.b.

Note: 1 measuring teaspoon = 5 cc.; 1 measuring tablespoon = 15 cc.; ¼ standard measuring cup = 60 cc.; ½ standard measuring cup = 120 cc.; 1 standard meas. cup = 240 cc.

Sample calculation:

To treat 75 acre-feet at 3 p.p.b., use:

75 x 36.9 cc = 2,767 cc. of FINTROL-CONCENTRATE / 480 cc. = 5.8 Kits, or

75 x 1¼ fl. oz. = 93¾ fl. oz. of FINTROL-CONCENTRATE / 16 oz = 5.8 kits).



METHODS OF APPLICATION

IMPORTANT: DURING APPLICATION OF FINTROL, ALL PERSONS IN THE IMMEDIATE VICINITY SHOULD WEAR PROTECTIVE GOGGLES AND PROTECTIVE GLOVES

Liquid formulation: Directions for mixing: Add the Diluent [blue label] to the FINTROL CONCENTRATE (solution 20%) [Green label] in the oversize mixing container. Cap tightly and invert 2 to 3 times to mix thoroughly. Further dilute with AT LEAST five (5) gallons of water to insure that the acetone contained in FINTROL-CONCENTRATE will not affect rubber parts on any equipment that might be used to apply it. After water has been added, apply within eight (8) hours. [Note: The solution obtained by mixing the Diluent with FINTROL-CONCENTRATE (solution 20%) retains potency for up to seven (7) days. But once water has been added to this solution, it must be used within eight (8) hours to ensure potency.]

After appropriate dilution with water, the liquid formulation of FINTROL can be applied to lakes and ponds by the boat bailer method or spray equipment. Spray methods are useful at depths to one foot. Boat bailer and drip tubes when applied at the propeller wash are useful at greater depths. Pinpoint applications to shoal areas and small, isolated ponds can readily be made with backpack sprayers. (See CAUTION on use of PROTECTIVE GOGGLES AND PROTECTIVE GLOVES.)

In streams, FINTROL-CONCENTRATE is most often applied through drip stations established to meter the toxicant at a precalculated rate. Information on the use of such equipment may be obtained from state and/or federal agencies, experienced in stream treatment.

It is recommended that all applications of FINTROL be made at daybreak or as soon as there is enough light to work by.

PRECAUTIONS

Fish killed with antimycin A should not be consumed by man or animals. Treated waters must not be used for drinking by man or animals, or for crop irrigation, until fingerling rainbow trout or fingerling bluegills survive 48 hours' exposure in livecars in the treated waters.

Leftover portions of mixed liquid formulation retain potency for up to seven (7) days. But once water has been added to FINTROL-CONCENTRATE, it must be used within eight (8) hours to ensure potency.

Due to its acetone component, FINTROL-CONCENTRATE is flammable: keep away from heat and flame.

HOW TO DETERMINE WHEN TREATED WATER MAY BE RESTOCKED

Since antimycin A degrades rapidly following application, waters can usually be restocked about one week following treatment with FINTROL. Place livecars containing a sensitive species of fish in the treated water. It is recommended that these fish be fingerling rainbow trout or fingerling bluegills if the water temperature is between 35° and 68° F. When the water temperature exceeds 68° F, only fingerling bluegills should be used. If the fish survive for 48 hours, the water may be restocked.

HOW TO DETOXYIFY FINTROL WITH POTASSIUM PERMANGANATE (KMnO₄)

If it should be necessary to detoxify FINTROL in the outflow of a pond to prevent killing fish downstream, apply potassium permanganate at 1 part per million (1 p.p.m.) to the outflow. (More potassium permanganate may be needed if the stream has a high permanganate demand). Drip systems of hose-and-clamp or carburetor types can be employed to continuously dispense a solution of potassium permanganate into the water at the discharge outlet.

To evaluate the effectiveness of the detoxification process, place livecars containing fingerling rainbow trout or fingerling bluegills approximately 100 yards downstream from the site of KMnO₄ introduction. The water is considered detoxified if the fish survive for at least 48 hours in the livecar.

To detoxify FINTROL-treated streams, apply KMnO₄ at 1 p.p.m. at detoxification stations. (More KMnO₄ may be needed if the stream has a high permanganate demand). Continue the application of KMnO₄ until all FINTROL-treated water has passed the station. The water may be considered detoxified when fingerling rainbow trout or fingerling bluegills survive for at least 48 hours in livecars placed 100 yards downstream from the site of potassium permanganate (KMnO₄) introduction.

RE-ENTRY STATEMENT

Do not allow swimming in, drinking, or irrigation with FINTROL (Antimycin) treated water until a livecar of sensitive species of fish (fingerling rainbow trout or bluegill) survive for 48 hours in the treated waters. (See statement of How To Determine When Treated Water May Be Restocked).

SPECIAL INSTRUCTIONS

Prior to the use of a fish toxicant in either public or private waters, the Director of the State Fish and Game Department or Conservation Department must be contacted to determine whether a permit is required. Such products must be used by or under the technical supervision of personnel of state and federal fish and game agencies, trained in fisheries management, who will provide any special instructions applicable to the particular geographical area.





Appendix M

SHORELINE COVER TYPES
AROUND THE 91 LAKES
IN THE STUDY AREA

APPENDIX M: SHORELINE COVER TYPES AROUND THE 91 LAKES IN THE STUDY AREA

The statistics for shoreline cover types shown in table M-1 were calculated by on-screen digitizing shoreline distance of cover types using 1:12000 black and white Digital Orthophoto Quads. 1:12000 color photos were analyzed in stereo (3-D) for additional interpretation. Cover types include forest, shrub, meadow, talus, bedrock, and cliff. If “cliff” was identified as the type, no other cover was specified; for example, if there was a bedrock cliff, it was just labeled cliff and not bedrock. Cover type values are percentages of the total perimeter for each lake.

The analyses presented in the “Special Status Plant Species” and “Vegetation” sections in the “**Environmental Consequences**” chapter used the information in **table M-2** as a guide in determining the level of impacts on the two impact topics (resource categories).

TABLE M-1: SHORELINE COVER TYPES AROUND THE 91 LAKES IN THE STUDY AREA

Lake Name ^a	NPS Lake Code	Vegetation Zone	Percent of Shoreline Cover					
			Forest	Shrub	Meadow	Talus	Bedrock	Cliff
Azure Lake	MP-09-01	Alpine	0	12	2	31	0	55
Battalion	MLY-02-01	High Forest	9	39	20	32	0	0
Bear	MC-12-01	Subalpine	0	30	6	63	0	0
Berdeen	M-08-01	Subalpine	0	20	0	54	26	0
Berdeen, Lower	M-07-01	Subalpine	0	53	21	26	0	0
Berdeen, Upper	MR-09-01	Subalpine	0	63	7	30	0	0
Blum (Largest/Middle, No. 3)	M-11-01	Subalpine	0	47	0	53	0	0
Blum (Lower/West, No. 4)	LS-07-01	Subalpine	0	30	70	0	0	0
Blum (Small/North, No. 2)	MC-01-01	Subalpine	0	0	44	56	0	0
Blum No. 1 (Vista/Northwest, No. 1)	MC-02-01	Subalpine	0	37	14	49	0	0
Bouck, Lower	DD-04-01	High Forest	60	18	22	0	0	0
Bouck, Upper	DD-05-01	Subalpine	23	17	20	41	0	0
Bowan	MR-12-01	Subalpine	0	24	76	0	0	0
Coon	MM-10-01	Low Forest	29	13	58	0	0	0
Copper	MC-06-01	Subalpine	0	37	5	59	0	0
Dagger	MR-04-01	High Forest	3	36	60	0	0	0
Dee Dee, Upper	MR-15-01	Subalpine	0	14	6	80	0	0
Dee Dee/Tamarack, Lower	MR-15-02	Subalpine	16	29	39	16	0	0
Despair, Lower	M-14-01	Subalpine	0	43	0	57	0	0
Despair, Upper	M-13-01	Alpine	0	0	0	100	0	0
Diobsud No. 1	LS-01-01	High Forest	0	0	76	24	0	0
Diobsud No. 2, Lower	LS-02-01	High Forest	0	47	53	0	0	0
Diobsud No. 3, Upper	LS-03-01	Subalpine	0	24	76	0	0	0
Doubtful	CP-01-01	Subalpine	0	0	55	34	0	11
Doug's Tarn	M-21-01	Subalpine	10	53	29	7	0	0
East, Lower	MC-14-02	Subalpine	0	57	25	18	0	0
East, Upper	MC-14-01	Subalpine	0	0	12	88	0	0
Firn	MP-02-01	Subalpine	0	8	7	85	0	0
Green	M-04-01	Subalpine	0	71	10	19	0	0
Green Bench	LS-04-01	Alpine	0	0	9	13	78	0

TABLE M-1: SHORELINE COVER TYPES AROUND THE 91 LAKES IN THE STUDY AREA (CONTINUED)

Lake Name ^a	NPS Lake Code	Vegetation Zone	Percent of Shoreline Cover					
			Forest	Shrub	Meadow	Talus	Bedrock	Cliff
Hanging	MC-08-01	High Forest	20	14	8	58	0	0
Hidden	SB-01-01	Subalpine	0	30	2	69	0	0
Hidden Tarn	EP-14-01	Alpine	0	0	0	100	0	0
Hi-Yu	M-01-01	Subalpine	0	44	56	0	0	0
Hozomeen	HM-02-01	Low Forest	95	0	3	2	0	0
Ipsoot	LS-06-01	Subalpine	0	73	27	0	0	0
Jeanita	DD-01-01	High Forest	0	25	62	13	0	0
Kettling	MR-05-01	High Forest	60	35	0	5	0	0
Kwahnesum	MC-07-01	Subalpine	18	13	23	46	0	0
McAlester	MR-10-01	High Forest	57	9	29	5	0	0
Middle, Lower	MC-16-02	Subalpine	0	0	69	31	0	0
Middle, Upper	MC-16-01	Subalpine	0	0	14	86	0	0
Monogram	M-23-01	Subalpine	0	66	34	0	0	0
Monogram Tarn	M-23-11	Subalpine	NA ^b	NA	NA	NA	NA	NA
Nert	M-05-01	High Forest	0	35	53	0	0	12
Noisy Creek, Upper	LS-14-01	High Forest	0	39	61	0	0	0
No Name	PM-01-01	High Forest	5	58	37	0	0	0
Panther Potholes, Lower	RD-05-02	Low Forest	52	21	18	8	0	0
Panther Potholes, Upper	RD-05-01	Low Forest	0	37	34	30	0	0
Pegasus	EP-10-01	Alpine	0	37	0	63	0	0
Pond SE of Kettling Lakes	ML-09-01	Subalpine	0	69	8	23	0	0
Quill, Lower	M-24-02	Subalpine	0	38	30	33	0	0
Quill, Upper	M-24-01	Subalpine	0	0	50	50	0	0
Rainbow	MR-14-01	High Forest	24	33	42	0	0	0
Rainbow, Upper (North)	MR-13-01	Subalpine	0	38	33	29	0	0
Rainbow, Upper (South)	MR-13-02	Subalpine	0	8	18	74	0	0
Rainbow, Upper (West)	MM-11-01	Subalpine	0	13	16	60	11	0
Redoubt	MC-11-01	Subalpine	0	4	3	94	0	0
Reveille, Lower	MC-21-02	Subalpine	15	0	43	41	0	0
Reveille, Upper	MC-21-01	Subalpine	0	0	4	96	0	0
Ridley	HM-03-01	Low Forest	100	0	0	0	0	0
Sky	EP-13-01	Subalpine	0	37	0	63	0	0
Skymo	PM-03-01	Subalpine	0	28	14	58	0	0
Sourdough	PM-12-01	Subalpine	6	51	12	31	0	0
Sourpuss	ML-01-01	Subalpine	0	0	70	30	0	0
Stiletto	MR-01-01	Subalpine	0	42	0	58	0	0
Stout	EP-09-02	Subalpine	5	45	0	50	0	0
Stout, Lower	EP-09-01	Subalpine	0	35	55	10	0	0
Sweet Pea	ML-02-01	High Forest	0	23	10	35	0	31
Talus Tarn	M-06-01	Subalpine	0	0	10	90	0	0
Tapto, Lower	MC-17-03	Subalpine	0	16	22	63	0	0
Tapto, Middle	MC-17-02	Subalpine	0	58	42	0	0	0
Tapto, Upper	MC-17-01	Subalpine	0	28	10	62	0	0
Tapto, West	MC-17-04	Subalpine	0	15	85	0	0	0



TABLE M-1: SHORELINE COVER TYPES AROUND THE 91 LAKES IN THE STUDY AREA (CONTINUED)

Lake Name ^a	NPS Lake Code	Vegetation Zone	Percent of Shoreline Cover					
			Forest	Shrub	Meadow	Talus	Bedrock	Cliff
Thornton, Lower	M-20-01	High Forest	0	77	6	13	0	4
Thornton, Middle	M-19-01	Subalpine	0	5	0	82	0	13
Thunder	RD-02-01	Low Forest	42	42	15	0	0	0
Tiny	MC-15-01	Subalpine	0	0	50	50	0	0
Torment	ML-03-01	Subalpine	0	0	5	95	0	0
Trapper	GM-01-01	Subalpine	21	43	12	24	0	0
Triplet, Lower	SM-02-01	Subalpine	0	48	46	6	0	0
Triplet, Upper	SM-02-02	Subalpine	0	35	33	31	0	0
Triumph	M-17-01	Subalpine	0	7	21	72	0	0
Unnamed	FP-01-01	Alpine	0	0	0	100	0	0
Unnamed	MR-11-01	Subalpine	0	70	0	30	0	0
Unnamed	MR-16-01	Subalpine	0	57	43	0	0	0
Vulcan	ML-04-01	Subalpine	21	23	15	41	0	0
Wilcox/Lillie, Upper	EP-06-01	Subalpine	7	25	49	19	0	0
Wilcox/Sandie, Lower	EP-05-01	Subalpine	29	0	4	67	0	0
Wild	MC-27-01	Subalpine	0	0	60	40	0	0
Willow	HM-04-01	Low Forest	71	7	22	0	0	0

Notes:

a. Shaded rows indicate the 22 lakes that are in Ross Lake and Lake Chelan National Recreation Areas; the other 69 lakes are in the national park portion of the North Cascades Complex.

b. "NA" means that information on the shoreline cover type for the lake is not available.

**TABLE M-2: SHORELINE COVER TYPES AND LEVEL OF VISITATION**

This table corresponds with the backcountry overnight use visitation numbers in “[Map 2 Table](#),” the shoreline cover types in [table M-1](#), and the management action codes for each lake from [table 5](#) in the “Alternatives” chapter. The lakes in the same-colored rows mean those lakes occur in the same backcountry zone or camp (see “[Map Table 2](#)”). The “X” means the lake would or may have fish (depending on the applied management action).

Total estimated annual backcountry overnight use = 4,035

Level of Visitation: H = High (3,210), M = Medium (594), L = Low (231)

Lake Name	NPS Lake Code	Level of Visitation in 2003	Number of Visitors	Lakes That Have or May Have Fish				Percent of Shoreline Cover					
				Alt A	Alt B	Alt C	Alt D	Forest	Shrub	Meadow	Talus	Bedrock	Cliff
Doubtful	CP-01-01	H	441	X	X-2C	2A	2A	0	0	55	34	0	11
NRA-McAlester	MR-10-01	H	372	X	X-2B	X-2B	2A	57	9	29	5	0	0
NRA-Panther Potholes, Lower	RD-05-02	H	342	X	4A	4A	4A	52	21	18	8	0	0
NRA-Panther Potholes, Upper	RD-05-01	H		1	1	1	1	0	37	34	30	0	0
NRA-Coon	MM-10-01	H	306	X	X-4C	X-4C	4A	29	13	58	0	0	0
NRA-Hozomeen	HM-02-01	H	280	X	2A	2A	2A	95	0	3	2	0	0
NRA-Ridley	HM-03-01	H		X	X-4C	X-4C	4A	100	0	0	0	0	0
Copper	MC-06-01	H	268	X	X-4B	4A	4A	0	37	5	59	0	0
Dagger	MR-04-01	H	221	X	X-2B	2A	2A	3	36	60	0	0	0
Stiletto	MR-01-01	H		X	X-4B	4A	4A	0	42	0	58	0	0
Tapto, Lower	MC-17-03	H	211	1	1	1	1	0	16	22	63	0	0
Tapto, West	MC-17-04	H		1	1	1	1	0	15	85	0	0	0
Thornton, Lower	M-20-01	H	203	X	X-3C	3A	3A	0	77	6	13	0	4
Thornton, Middle	M-19-01	H		X	X-4C	4A	4A	0	5	0	82	0	13
Unnamed	FP-01-01	H	193	1	1	1	1	0	0	0	100	0	0
Pegasus	EP-10-01	H		1	1	1	1	0	37	0	63	0	0
NRA-Rainbow	MR-14-01	H	132	X	X-2C	X-2C	2A	24	33	42	0	0	0
NRA-Rainbow, Upper (North)	MR-13-01	H		1	1	1	1	0	38	33	29	0	0
NRA-Rainbow, Upper (South)	MR-13-02	H		X	4A	4A	4A	0	8	18	74	0	0
NRA-Rainbow, Upper (West)	MM-11-01	H		X	4A	4A	4A	0	13	16	60	11	0
NRA-Bowan	MR-12-01	H		X	4A	4A	4A	0	24	76	0	0	0
Vulcan	ML-04-01	H	129	1	1	1	1	21	23	15	41	0	0
Hidden	SB-01-01	H	112	X	X-3C	3A	3A	0	30	2	69	0	0
Hidden Lake Tarn	EP-14-01	H		X	4A	4A	4A	0	0	0	100	0	0

TABLE M-2: SHORELINE COVER TYPES AND LEVEL OF VISITATION (CONTINUED)

Lake Name	NPS Lake Code	Level of Visitation in 2003	Number of Visitors	Lakes That Have or May Have Fish				Percent of Shoreline Cover					
				Alt A	Alt B	Alt C	Alt D	Forest	Shrub	Meadow	Talus	Bedrock	Cliff
Monogram	M-23-01	M	94	X	X-2C	2A	2A	0	66	34	0	0	0
Monogram Tarn	M-23-11	M		X		4A	4A	4A	NA	NA	NA	NA	NA
Jeanita	DD-01-01	M	92	X	X-3B	3A	3A	0	25	62	13	0	0
Sourdough	PM-12-01	M		X	X-2B	2A	2A	6	51	12	31	0	0
Trapper	GM-01-01	M	90	X	X-3B	3A	3A	21	43	12	24	0	0
Tapto, Middle	MC-17-02	M	64	1	1	1	1	0	58	42	0	0	0
Tapto, Upper	MC-17-01	M		1	1	1	1	0	28	10	62	0	0
Doug's Tarn	M-21-01	M	49	X	X-2C	2A	2A	10	53	29	7	0	0
Quill, Lower	M-24-02	M		X	X-4B	4A	4A	0	38	30	33	0	0
Quill, Upper	M-24-01	M		X	X-4B	4A	4A	0	0	50	50	0	0
Triumph	M-17-01	M		X	X-4C	4A	4A	0	7	21	72	0	0
Despair, Lower	M-14-01	M		1	1	1	1	0	43	0	57	0	0
Despair, Upper	M-13-01	M		1	1	1	1	0	0	0	100	0	0
Berdeen	M-08-01	M	48	X	X-2C	2A	2A	0	20	0	54	26	0
Green	M-04-01	M		X	X-2B	2A	2A	0	71	10	19	0	0
Ipsoot	LS-06-01	M		X	X-3B	3A	3A	0	73	27	0	0	0
Berdeen, Lower	M-07-01	M		X	2A	2A	2A	0	53	21	26	0	0
Berdeen, Upper	MR-09-01	M		X	2A	2A	2A	0	63	7	30	0	0
Green Bench	LS-04-01	M		1	1	1	1	0	0	9	13	78	0
Nert	M-05-01	M		X	4A	4A	4A	0	35	53	0	0	12
Talus Tarn	M-06-01	M		1	1	1	1	0	0	10	90	0	0
Stout	EP-09-02	M	45	X	X-3B	3A	3A	5	45	0	50	0	0
Sky	EP-13-01	M		1	1	1	1	0	37	0	63	0	0
Stout, Lower	EP-09-01	M		X	X-3B	3A	3A	0	35	55	10	0	0
Wilcox/Lillie, Upper	EP-06-01	M		X	2A	2A	2A	7	25	49	19	0	0
Wilcox/Sandie, Lower	EP-05-01	M		X	X-2C	2A	2A	29	0	4	67	0	0
NRA-Dee Dee, Upper	MR-15-01	M	38	X	X-2B	2A	2A	0	14	6	80	0	0
NRA-Dee Dee/Tamarack, Lower	MR-15-02	M		X	4A	4A	4A	16	29	39	16	0	0

TABLE M-2: SHORELINE COVER TYPES AND LEVEL OF VISITATION (CONTINUED)

Lake Name	NPS Lake Code	Level of Visitation in 2003	Number of Visitors	Lakes That Have or May Have Fish				Percent of Shoreline Cover					
				Alt A	Alt B	Alt C	Alt D	Forest	Shrub	Meadow	Talus	Bedrock	Cliff
Blum (Largest/Middle, No. 3)	M-11-01	M		X	X-2B	2A	2A	0	47	0	53	0	0
Blum (Lower/West, No. 4)	LS-07-01	M		X	X-2C	2A	2A	0	30	70	0	0	0
Blum (Small/North, No. 2)	MC-01-01	M		1	1	1	1	0	0	44	56	0	0
Blum #1 (Vista/Northwest, No. 1)	MC-02-01	M		1	1	1	1	0	37	14	49	0	0
Azure Lake	MP-09-01	M	37	1	1	1	1	0	12	2	31	0	55
Diobsud, No. 1	LS-01-01	L	34	X	2A	2A	2A	0	0	76	24	0	0
Diobsud, No. 2, Lower	LS-02-01	L		X	X-2B	2A	2A	0	47	53	0	0	0
Diobsud, No. 3, Upper	LS-03-01	L		X	4A	4A	4A	0	24	76	0	0	0
Hi-Yu	M-01-01	L		X	X-4B	4A	4A	0	44	56	0	0	0
Noisy Creek, Upper	LS-14-01	L		1	1	1	1	0	39	61	0	0	0
NRA-Willow	HM-04-01	L	32	X	X-4C	X-4C	4A	71	7	22	0	0	0
Bear	MC-12-01	L	30	X	X-2C	2A	2A	0	30	6	63	0	0
East, Lower	MC-14-02	L		1	1	1	1	0	57	25	18	0	0
East, Upper	MC-14-01	L		1	1	1	1	0	0	12	88	0	0
Reveille, Lower	MC-21-02	L		1	1	1	1	15	0	43	41	0	0
Reveille, Upper	MC-21-01	L		1	1	1	1	0	0	4	96	0	0
Sweet Pea	ML-02-01	L	28	X	X-4C	4A	4A	0	23	10	35	0	31
Sourpuss	ML-01-01	L		1	1	1	1	0	0	70	30	0	0
Torment	ML-03-01	L		X	4A	4A	4A	0	0	5	95	0	0
Wild	MC-27-01	L	26	1	1	1	1	0	0	60	40	0	0
Redoubt	MC-11-01	L	20	1	1	1	1	0	4	3	94	0	0
Middle, Lower	MC-16-02	L	13	1	1	1	1	0	0	69	31	0	0
Middle, Upper	MC-16-01	L		1	1	1	1	0	0	14	86	0	0
Tiny	MC-15-01	L		1	1	1	1	0	0	50	50	0	0
NRA-Bouck, Lower	DD-04-01	L	11	X	X-2C	X-2C	2A	60	18	22	0	0	0
Bouck, Upper	DD-05-01	L		X	4A	4A	4A	23	17	20	41	0	0
NRA-Thunder	RD-02-01	L		1	1	1	1	42	42	15	0	0	0
NRA-Triplet, Lower	SM-02-01	L	9	X	X-2C	X-2C	2A	0	48	46	6	0	0
NRA-Triplet, Upper	SM-02-02	L		X	2A	2A	2A	0	35	33	31	0	0

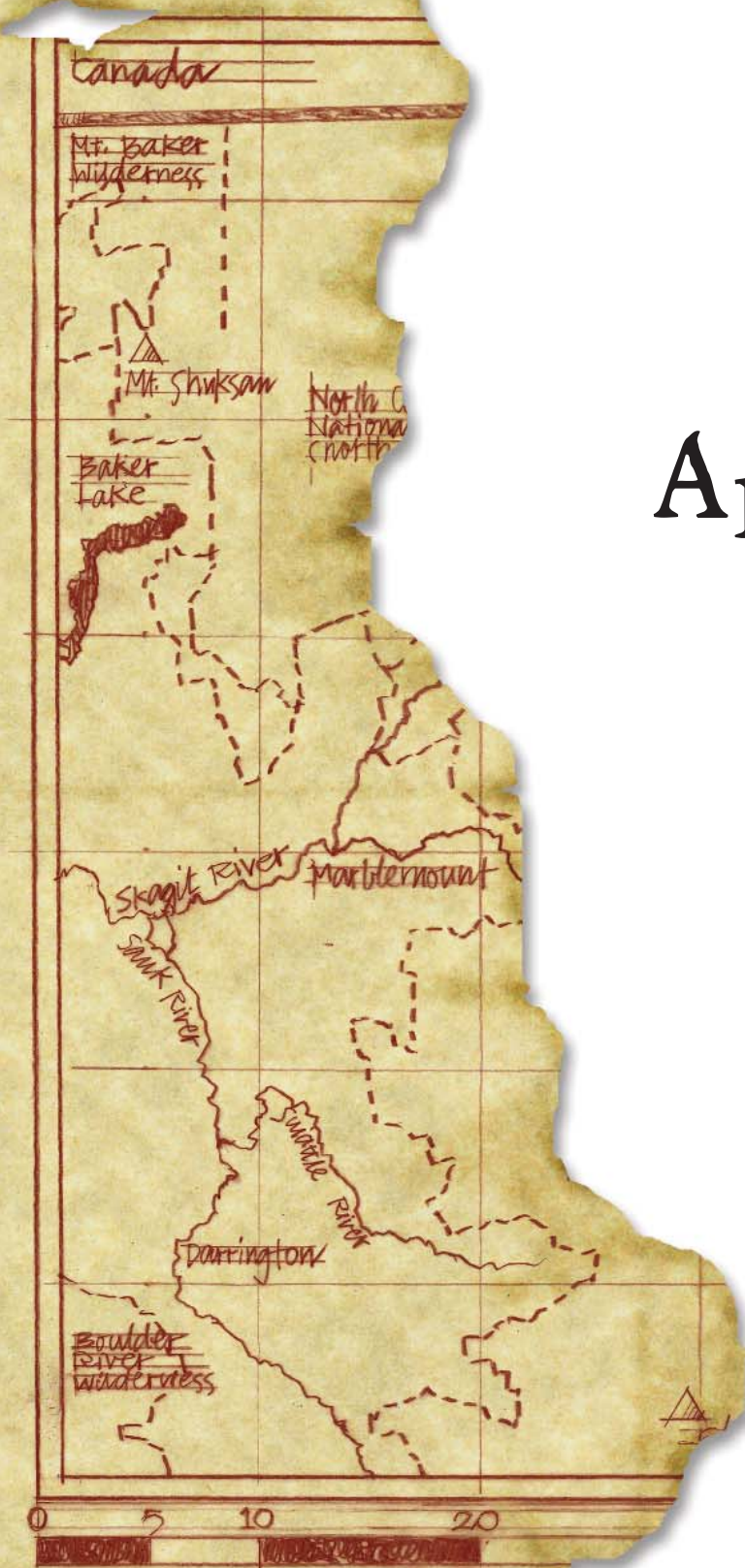
TABLE M-2: SHORELINE COVER TYPES AND LEVEL OF VISITATION (CONTINUED)

Lake Name	NPS Lake Code	Level of Visitation in 2003	Number of Visitors	Lakes That Have or May Have Fish				Percent of Shoreline Cover					
				Alt A	Alt B	Alt C	Alt D	Forest	Shrub	Meadow	Talus	Bedrock	Cliff
Kettling	MR-05-01	L	7	X	2A	2A	2A	60	35	0	5	0	0
NRA-Pond SE of Kettling Lake	ML-09-01	L		X	X-4C	X-4C	4A	0	69	8	23	0	0
NRA-Unnamed	MR-16-01	L	7	X	X-3B	X-3B	3A	0	57	43	0	0	0
NRA-Unnamed	MR-11-01	L	6	X	X-4C	X-4C	4A	0	70	0	30	0	0
Hanging	MC-08-01	L	5	X	2A	2A	2A	20	14	8	58	0	0
Kwahnesum	MC-07-01	L		X	4A	4A	4A	18	13	23	46	0	0
Firn	MP-02-01	L	3	X	X-3B	3A	3A	0	8	7	85	0	0
No Name	PM-01-01	L		X	X-4C	4A	4A	5	58	37	0	0	0
Skymo	PM-03-01	L		X	X-2C	2A	2A	0	28	14	58	0	0
NRA-Battalion	MLY-02-01	L	0	X	X-2B	X-2B	2A	9	39	20	32	0	0

Management action codes at a glance

- 1 Fishless
- 2A / 3A Remove fish
- 2B Remove fish, evaluate, potentially restock
- 2C Remove/restock
- 3B Evaluate fish/allow low density
- 3C Supplement by stocking
- 4A Discontinue stocking
- 4B Discontinue stocking, evaluate, potentially restock
- 4C Continue to stock





Appendix N

FISH REMOVAL
IMPLEMENTATION PLAN

NATURAL RESOURCE
PRESERVATION PROGRAM

APPENDIX N: FISH REMOVAL IMPLEMENTATION PLAN – NATURAL RESOURCE PRESERVATION PROGRAM

Funding source: Natural Resource Preservation Program-Resource Management
Funding request: Fiscal Year (FY)08–\$125,541; FY09–\$150,899; FY10–\$106,694
Total: \$383,134
Contact: Roy Zipp, Natural Resource Specialist,
North Cascades National Park Service Complex

GOALS AND OBJECTIVES

The goal of this project is to protect native species from the ecological impacts of nonnative trout.

OBJECTIVES

- Eradicate self-sustaining populations of trout from seven mountain lakes in North Cascades National Park Service Complex (North Cascade Complex).
- Reduce the within-lake impacts to native species from nonnative trout predation and competition.
- Prevent downstream dispersal of nonnative trout from lakes and protect native, threatened fish stocks from competition and hybridization with nonnative trout.
- Develop staff expertise in fish removal using various methods.
- Improve fisheries management cooperation and partnerships between the National Park Service (NPS), the Washington Department of Fish and Wildlife (WDFW), and various stakeholders.

METHODS

We propose to remove self-sustaining populations of nonnative trout from select lakes using an integrated pest management approach including gillnetting/electrofishing, antimycin treatment and spawning habitat exclusion. A brief discussion of the background and context for these methods is provided in the following section.

BACKGROUND

Various fisheries management experts have recommended that a simple and effective method for reducing or eliminating trout reproduction (and eventually eliminating fish) involves blocking access to spawning grounds by “cobbling over” gravel beds in lakes. This population control method has been successfully used on an experimental basis in the Sierra Nevada. (Danny Boiano, SEKI Fisheries Management Biologist, pers. comm.). This method is appealing given its low cost, but it will likely only prove useful in lakes with very limited spawning habitat.

Gillnetting combined with electrofishing in confined, shallow areas (e.g., shorelines, outlet streams) has proven to be effective in lakes generally less than 5 acres in size (Parker et al. 2001). Fishery managers at

Sequoia-Kings Canyon National Park have developed a highly successful method of intensive gillnetting to remove of nonnative trout from lakes in as few as one or two years (Danny Boiano, SEKI Fisheries Biologist, pers. comm.). However, case studies in gillnet eradication of fish from Mount Rainier National Park demonstrate that gillnetting often requires five or more years to completely eradicate fish (Bob Hoffman, Oregon State University, pers. comm.). Gillnetting efficiency is highly dependent upon habitat complexity. Large amounts of talus and woody debris can make gillnet eradication much more time consuming, even in small lakes.

The mean size of the 38 lakes in the North Cascades Complex with self-sustaining populations of nonnative trout is 27 acres. There are only 10 lakes less than 5 acres in size that are probably suitable for gillnetting. For the larger lakes, we propose to remove fish using the piscicide antimycin A.

Antimycin A is a potent yet ephemeral piscicide derived from the mold *Streptomyces*. Antimycin kills trout by irreversibly blocking cellular respiration (Lennon and Berger 1970). Antimycin can be neutralized with potassium permanganate to avoid harming nontarget organisms. It also rapidly degrades in turbulent outlet streams over relatively short distances (Bruce Rosenlund, U.S. Fish and Wildlife Service [USFWS], pers. comm.).

At the minute (2–8 parts per billion) concentrations required to kill nonnative trout, antimycin is considered to be relatively harmless to waterfowl and mammals (Schnick 1974). However, field trials have demonstrated that gill breathing, aquatic organisms such as macroinvertebrates and larval amphibians may be harmed by antimycin at piscicidal concentrations. Most invertebrate populations typically rebound within 1–3 years (Kennedy 2002). Recovery of amphibians is not as well documented, though research suggests that amphibians should be capable of recolonizing lakes, even where source populations may not be nearby (Funk and Dunlap 1989).

Success with antimycin requires careful calculations, detailed planning and experience (Steve Moore, GRSM). In spite of these challenges, antimycin has been used successfully in Great Smokey Mountain National Park and Crater Lakes National Park to remove nonnative trout from streams and restore native species (Steve Moore, GRSM and Scott Girdner, CRLA, pers. comm.). Antimycin has also been used successfully in Rocky Mountain National Park to remove nonnative trout from lakes up to 10 acres in size to restore populations of greenback and cutthroat trout (Bruce Rosenlund, USFWS, pers. comm.). Most recently, Great Basin National Park successfully used antimycin to remove nonnative trout from a small mountain lake (Johnson Lake) to restore the endangered Bonneville cutthroat trout (Gretchen Baker, GRBA, pers. comm.).

These case studies demonstrate the successful NPS track record of using antimycin as an important fisheries management tool. Although antimycin is not a “silver bullet,” NPS and WDFW staffs believe that it offers the only feasible alternative for removing fish from large, deep lakes in North Cascades.

Intensive Gillnetting and Electrofishing

Two pairs of lakes (4 total) are proposed for fish removal using gillnets. The lakes were selected in part because they are in close proximity and this reduces the cost of access and treatment. The lakes are also relatively small. Diobsud Lake No. 2 was chosen in particular because it has a reproducing population of westslope cutthroat trout that are dispersing into habitat for native coastal cutthroat (*Oncorhynchus clarki clarki*). Removal of westslope cutthroat trout from this lake will reduce the potential for downstream dispersal and hybridization in the Noisy Creek watershed.

Immediately after ice out, approximately 15 gillnets will be placed like the spokes of a wheel around the perimeter of each lake. The nets will be cleaned daily, and periodically moved around to different



locations because fish learn to avoid nets placed in one location for long time periods. The lakes will be treated throughout the ice-free season (Mid-June through October). A two-person crew will work at each site. One crew member will remove fish from the nets using a float tube, flippers and waders or a raft, depending upon conditions. The other crew member will remain on shore, recording data and ensuring safety. Dead fish will be measured then disposed of in the deep portion of the lake.

Antimycin (piscicide) Treatment

We propose to develop our skill and experience with antimycin by removing self-sustaining populations of nonnative brook trout from Lower and Middle Blum Lakes. These lakes were selected for treatment because they contain brook trout that are dispersing downstream into known bull trout habitat. The Blum Lakes were also chosen because they are too large to be treated with non-chemical means yet still relatively small to gain staff expertise. Furthermore, the lakes are immediately adjacent to each other and less than a day's cross-country journey from the trailhead. These logistical considerations will greatly reduce costs of access, monitoring and treatment.

We propose to remove brook trout from Middle and Lower Blum Lakes using a three-phased approach, including assessment (year 1), treatment (year 2) and follow-up (year 3). The assessment phase will entail collection of physical, chemical, and biological data to improve our understanding of the abundance, diversity and potential sensitivity of native aquatic species in the lake. Antimycin is toxic to trout at extremely low concentrations, so precise estimates of lake volume are needed to prevent overdosing the lake. Therefore, in the first year we will gather basic water chemistry data and additional lake bathymetry data and inflow/outflow rates to optimize calculations for antimycin application. We will also gather extensive data on the abundance and diversity of native aquatic taxa to evaluate the potential impacts of antimycin on these non-target taxa.

The second year, treatment phase will involve a “window” of antimycin application in early August, during low flows and prior to brook trout spawning. Should the first treatment fail, this proposal includes a contingency measure for re-treatment. Middle Blum Lake will be treated first because it is upstream of Lower Blum Lake. The piscicide will be applied with a motorized zodiac (or similar lightweight motorized boat) transported to the site via helicopter. Antimycin will be dripped into inlet streams and into the prop wash of the outboard motor to maximize mixing. Bilge pumps and hoses will be used to treat deeper waters. Crews will work in parallel along the lakeshores, hand spraying shallow areas not effectively reached by boat. Application will take place.

The third year of the project will involve post-treatment monitoring to determine fish removal success and to monitor the recovery of native organisms. Longer-term monitoring will be folded into the North Cascade day-to-day resource management activities.

Spawning Habitat Exclusion

We propose to use this method on Upper Wilcox Lake because field surveys indicate that spawning habitat is limited to a 10 meter section of the inlet streambed. A massive supply of cobble is readily available from an adjacent talus slope, so volunteer crews will simply need to carry small rocks a short distance to the inlet stream. This method will lend itself to a partnership with various fishing groups who have expressed a strong willingness to assist with fisheries management. If successful, this approach will provide us with a useful, minimally invasive tool for removing nonnative trout from other large lakes with very limited spawning habitat.

Long-term Monitoring and Research

Long-term ecological monitoring protocols will be used to document the recovery of native species in the lakes, with an emphasis on measuring the abundance and diversity of various taxa (amphibians, large crustacean zooplankton, and macroinvertebrates) known to be sensitive to fish predation. The North Cascades Complex is the Lakes and Streams Prototype Park for the NPS Inventory and Monitoring program, and the protocols for the long-term monitoring program are expected to be completed by FY06. We will thus have in place (and funded) a distinct monitoring program to evaluate the recovery of these lakes following fish removal.

Case studies in nonnative fish removal remain limited for mountain lakes. Scientists and resource managers need a better understanding of the consequences of reversing introduced species effects. In keeping with the notion of parks as “living laboratories,” we will use these applied experiments to foster research and monitoring among the broader scientific community.

The Lake Rehabilitation Team

These proposed methods will require a four-person field crew comprised of three GS-5 seasonal Biological Technicians and a GS-7/9 Crew Leader (term appointment, subject to furlough). This team will split into two crews for gillnetting, then work together applying antimycin at Blum Lakes. Hiring a Crew Leader under a term appointment will provide an important degree of continuity from year to year. Various North Cascades Complex resource personnel will assist with fieldwork, logistics, and overall project management.

PARTNERSHIPS

Nonnative fish removal requires detailed planning and experience to ensure success. We have recruited an experienced team of personnel from several national parks, the USFWS and the WDFW. Please refer to In-kind Contributions for further details.

The WDFW will be a primary partner. They will provide equipment, field and logistical support, and serve as an interface with several sport fishing organizations that routinely assist WDFW with mountain lakes fishery management. These organizations have expressed a strong desire to assist with fishery management actions in the park, provided they have a stake in the outcome. Involving these groups in fish removal will be a tremendous step forward toward ending the conflict over mountain lakes fishery management. The importance of their involvement cannot be overstated:

success depends in large measure on broad public acceptance, because just one intentional fish introduction can undermine years of costly removal efforts.

EDUCATION AND PUBLIC OUTREACH

To minimize the risk of “vigilante” stocking, the NPS must convey a basic understanding of the ecological issues at stake and the management resolution to both the general public and the angling community. In year one, we will (1) develop a portable exhibit for the park’s two visitor centers and for taking to relevant, heavily-attended fairs and festivals in the region; (2) submit guest editorials to area newspapers and publications; (3) design a web page presenting a clear, concise, and illustrated explanation of the issue and its resolution; (4) prepare a companion brochure for distribution at the visitor



centers and fairs and festivals where the park is represented; and (5) encourage media coverage of the fish removal program by contacting local newspapers, radio stations, and television stations.

In years two and three, we will update the exhibit and web page to reflect the field experience of the first year, and submit follow-up articles to newspapers and publications. We will measure success by tracking visitor comments in reaction to the exhibit and web pages and noting letters-to-the-editor or correspondence to the park following media coverage.

ENVIRONMENTAL COMPLIANCE

This proposal is derived from fish removal actions outlined in “Actions Common to All Alternatives” section of the *Draft Mountain Lakes Fishery Management Plan/EIS*. Removal of self-sustaining populations is an essential element of the plan. The draft plan/EIS recently completed public review, and a Record of Decision is expected spring 2006. The WDFW is a cooperating agency.

PRODUCTS AND DELIVERABLES

- Self-sustaining fish populations will be eliminated from 7 lakes, including 2 out of 4 lakes in the park with self-sustaining populations of brook trout that threaten to hybridize/compete with federally threatened bull trout.
- North Cascades Complex staffs will gain invaluable experience with various fish removal methods. The knowledge and skills gained from this project will enhance fish removal efforts in other high-priority lakes in the North Cascades Complex and other parks and protected areas in need of assistance with fish removal.
- Resources management staffs will submit publications to various forums, including Park Science, so that knowledge is shared among the broader scientific community.
- Interpretive staffs will produce various brochures and exhibits to enhance public understanding and acceptance.

BUDGET

FY08—\$125,541	FY09—\$150,899	FY10—\$106,694	Total: \$383,134
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Attachment I provides full breakdown of project costs. The budget reflects the need for skilled personnel and specialized equipment for a comprehensive fish removal/lake rehabilitation program. Hiring a GS-7 term Crew Leader will provide continuity from year to year and ensure sufficient time in the shoulder seasons to manage data and project logistics. Antimycin costs include a contingency to retreat both lakes should the first treatments fail. Any extra chemical will be used to treat other lakes in the future. North Cascades is one of the most rugged, remote areas in the United States; all the lakes are located in steep, untrailed wilderness. A helicopter will be required as the minimum tool to shuttle supplies and equipment at the beginning and end of the field season. Helicopter access is not needed for pre- and post-treatment monitoring and evaluation. A modest amount of funding is requested to pay travel costs for NPS and USFWS personnel to provide essential technical assistance with gillnetting (year one) and antimycin treatment (year two). A small amount of funding is requested for pesticide training to ensure environmental/personnel safety.

IN-KIND CONTRIBUTIONS

In-park Funding: Salary estimates are based on current wages as of October 2005. Aquatic Ecologist (GS-12/10): \$14,304 per year (4 pay periods devoted to overall program management). Natural Resource Specialist (GS-11/5) and Aquatic Ecologist, GS-11/3 (term): \$16,782 per year (3 pay periods each year devoted to training, fieldwork, data management). Interpretive staffs assistance with education and outreach: \$10,000 for development of brochures, interpretive displays, slide program and website. Total North Cascades' In-kind Contributions: \$103,258.

TECHNICAL ASSISTANCE

- *Danny Boiano, Fishery Biologist, Sequoia-Kings Canyon National Park.* Mr. Boiano will provide two pay periods worth of training and field assistance with gillnetting: \$7000.
- *Gretchen Baker, Ecologist, Great Basin National Park.* Ms. Baker recently used antimycin to successfully remove nonnative trout from a small mountain lake. She has pledged 3 pay periods of assistance (\$9,900) plus \$500 in equipment: \$10,400
- *Steve Moore, Supervisory Fishery Biologist, Great Smokey Mountain National Park.* Mr. Moore has extensive experience with antimycin application in running waters. He will provide one pay period of technical assistance with antimycin application in the field: \$4000.
- *USFWS – Bruce Rosenlund, Project Leader, Colorado Fish and Wildlife Management Assistance Office, Region 6.* Mr. Rosenlund is considered the authority on antimycin application. Mr. Rosenlund has pledged technical assistance with pre-treatment planning in year one and field treatment in year two: \$5000.
- *WDFW – Mark Downen, Inland Fisheries Biologist.* Mr. Downen will provide field assistance for the duration of the project. He will also provide equipment (motorized zodiac, nets, etc.), assistance with public outreach, and interface with various fishing groups: WDFW contribution: \$30,000.

Total In-Kind Funding: \$160,000 (42%)

REFERENCES

- Behnke, R. and J. Tomelleri
2002 Trout and Salmon of North America. New York: The Free Press. 359 pp.
- Brönmark, Christer and Lars-Anders Hansson
1998 The Biology of Lakes and Ponds: the Biology of Habitats. New York: Oxford University Press. 216 pp.
- Bury, R.B. and M.J. Adams, eds.
2000 Inventory and Monitoring of Amphibians in North Cascades and Olympic National Parks, 1995–1998, Final Report. Prepared for the USDI National Park Service, Natural Resources Protection Program by USGS Forest and Rangeland Ecosystem Science Center, Corvallis, OR. 135 pp.
- Funk, W. and W. Dunlap
1999 Colonization of high-elevation lakes by long-toed salamanders (*Ambystoma macrodactylum*) after the extinction of introduced trout populations. Canadian Journal of Zoology 77:1759-1767.



- Gilderhus, P.A., B.L. Berger, R.E. Lennon
 1969 Investigations in fish control: Field trials of Antimycin A as a Fish Toxicant. U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, Washington, DC. 21 pp.
- Knapp, R.A. and K.R. Matthews
 2000 Non-native fish introductions and the decline of the mountain yellow-legged frog from within protected areas. *Conservation Biology* 14:428–438.
- Larson, G. and B. Hoffman
 2003 Native salamanders and introduced fish: changing the nature of mountain lakes and ponds. USGS Fact Sheet No. FS-025-03. 2pp.
- Lennon, R.E. and B.L. Berger
 1970 A Resume on Field Application of Antimycin A to Control Fish. U.S. Department of the Interior, Bureau of Sport Fisheries, Fish and Wildlife Investigations in Fish Control, 40: 1-19.
- Leonard, W.P., H.A. Brown, L.L.C. Jones, K.R. McAllister, and R.M. Storm
 1993 Amphibians of Oregon and Washington. Seattle Audubon Society, Seattle, WA. 168 pp.
- Liss, W., G. Larson and R. Hoffman
 2002 Ecological Impact of Introduced Trout on Native Aquatic Communities in Mountain Lakes. Phase III Final Report. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Corvallis, OR
- Liss, W.J., G.L. Larson, E.K. Deimling, L. Ganio, R. Gresswell, R. Hoffman, M. Kiss, G. Lomnický, C.D. McIntire, and R. Truitt, T. Tyler
 1995 Ecological effects of stocked trout in naturally fishless high mountain lakes, North Cascades National Park Service Complex, WA, USA. Technical Report NPS/PNROSU/NRTR-95-03. 285 pp.
- Louter
 2003 NPS Historian. Whitepaper. The Fish-Stocking Controversy: North Cascades National Park Service Complex, 1968-2003. (<http://www.nps.gov/noca/whitepaper.htm>).
- Nussbaum, R.A., E.D. Brodie, and R.M. Storm
 1983 Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow.
- Parker, B.R., D.W. Schindler, D.B. Donald and R.S. Anderson
 2001 The Effects of Stocking and Removal of a Nonnative Salmonid on the Plankton of an Alpine Lake. *Ecosystems*, Volume 4: pp.334-344.
- Tyler, T.J., W.J. Liss, L.M. Ganio, G.L. Larson, R. Hoffman, E. Deimling and G. Lomnický
 1998 Interaction between introduced trout and larval salamanders (*Ambystoma macrodactylum*) in high-elevation lakes. *Conservation Biology* 12:94-105.
- Vredenberg, V.
 2004 Reversing introduced species effects: Experimental removal of introduced fish leads to rapid recovery of a declining frog. *Proceedings of the National Academy of Sciences* 101(20): 7646-7650.

PERSONAL COMMUNICATIONS

Bob Hoffman, Research Scientist (Fishery Biologist) at Oregon State University

Mr. Hoffman provided cost estimates and logistical recommendations for gillnetting. He has worked extensively at North Cascades and Mount Rainier documenting the ecological effects of nonnative trout and removing fish from lakes with gillnets.

Bruce Rosenlund, Fishery Biologist USFWS

Mr. Rosenlund is the authority on fish removal using antimycin. He recommended methods of application, and assisted with estimating treatment costs.

Carl Ostberg, USGS-BRD, Western Fisheries Research Center

Mr. Ostberg provided information on the status and threats to Westslope cutthroat trout in the Stehekin River watershed based on recent research into hybridization between westslope cutthroat trout and nonnative rainbow trout.

Danny Boiano, Fisheries Biologist, SEKI

Mr. Boiano recommended gillnetting methods and provided cost estimates for fish removal using gillnets.

David Morgan, U.S. Fish and Wildlife Service, Washington State

Mr. Morgan recently provided critical comments on the Draft Plan/EIS, including valuable information on the current status of westslope cutthroat trout.

Mark Downen, Inland Fishery Biologist, WDFW

Mr. Downen is representing the WDFW as a Cooperating Agency in preparation of the Mountain Lakes Fishery Management Plan/EIS. He has extensive first-hand knowledge of the status of native and nonnative fish in North Cascades.

Nick Romeo, President, Aquabiotics Corporation. Aquabiotics Corporation

Currently the only supplier of Antimycin, Mr. Romeo provided background information on antimycin toxicity, treatment methods and cost estimates.

Steve Moore, Supervisory Fisheries Biologist at Great Smokey Mountain National Park

Mr. Moore provided advice on antimycin application.

Scott Girdner, Fishery Biologist, Crater Lake National Park

Mr. Girdner shared lessons learned from antimycin application in running waters.

Marie Denn, Aquatic Ecologist, National Park Service, Pacific West Region

Ms. Denn provided a thorough review of the fiscal year 2005 version of this proposal.

RANKING CRITERIA

1. **Significance of the Resource or Issue to the Park:** How important is the resource or issue to the park involved, relative to its other resources and issues?

Almost all of the 240 natural mountain lakes were historically fishless. Far from barren, the lakes contain a diverse assemblage of native aquatic organisms, including several rare, endemic and listed species that are threatened by nonnative fish in the mountain lakes. Since its inception in 1968, fisheries management in the North Cascades Complex has been a very contentious issue—one that has received national scrutiny and more than a decade of intensive research. The Mountain Lakes Fishery Management Plan/EIS was developed in cooperation with the WDFW. Many of the past differences between the NPS and WDFW are being eclipsed by an unprecedented spirit of cooperation. Nonetheless, mountain lake fisheries management remains a long-standing and highly



contentious biopolitical issue with service wide implications. After 40 years of intransigence, removal of self-sustaining populations of fish as proposed here will mark the first tangible improvement to the North Cascades Complex superlative water resources.

2. **Severity of Resource Threat, Problem, or Need(s):** What is the potential of the threat, how current or imminent is it, and its extent?

Native species of trout and various pond-breeding amphibians, including several listed species, are chronically threatened by self-sustaining populations of nonnative trout. Nonnative trout are known to be dispersing downstream from lakes into known bull trout (Threatened) and westslope cutthroat trout (petitioned for listing; population in park disjunct). The recent finding of a new species of blind amphipod suggests that other unknown, endemic species could be at risk. The current condition borders on impairment; continued inaction could lead to irreversible loss of native biological diversity.

3. **Problem definition and information base:** How well is the problem defined?

More than a decade of research and nearly \$1.6 million has been spent studying the ecological effects of nonnative trout in the mountain lakes of North Cascades. This research effort has unequivocally demonstrated that self-sustaining populations of nonnative trout pose the greatest threat to native aquatic organisms. Other research and monitoring efforts have found that nonnative trout are dispersing downstream from the mountain lakes and competing/hybridizing with various native trout including several rare and listed species. As nonnative fish have been present for so long in the mountain lakes, we may never fully know the extent to which native species have been affected. Nonetheless, the scientific basis for understanding and solving the problem of nonnative fish in North Cascades rests on solid ground.

4. **Feasibility:** The objectives are clearly stated, achievable and shared among all parties involved. All the methods proposed in this proposal have been tried and proven elsewhere. The intensive gillnetting/electrofishing methods are based upon work at Sequoia Kings Canyon National Park and Mount Rainier National Park. The methods for antimycin application are based upon similar fish removal projects at Rocky Mountain National Park, Great Basin National Park, Crater Lake National Park, and Great Smokey National Park. Technical input has been solicited from various experts, including the leading authority on antimycin application to remove fish from lakes. Very careful consideration of logistics and the feasibility of success has been given to the lakes selected for treatment. The 3-year timeframe is ambitious but reasonable for the seven lakes under consideration given results from other fish removal projects and the quantity equipment, personnel and in-kind resources available for project implementation. All National Environmental Policy Act and Endangered Species Act (ESA) compliance associated with the project is being completed through an Environmental Impact Statement that recently completed public review. The Record of Decision is expected in spring 2006.
5. **Problem Resolution:** Will the project contribute directly to decisions or actions that, when implemented, will meaningfully resolve the stated problem?

Twelve years and \$1.6 million in research funding have been spent on characterizing impacts of introduced trout in North Cascades Complex lakes. A comprehensive EIS is currently being completed (with funding/technical assistance provided by the NPS' Environmental Quality Division) as the basis for a comprehensive *Mountain Lakes Fishery Management Plan*. Upon completion, the NPS will have invested more than \$2 million dollars on the problem—without implementing a single solution. One element common to all alternatives in the plan/EIS (and therefore assured of implementation even though the plan/EIS process is not final) is removal of self-sustaining populations.



This project will be the first significant step toward removing self-sustaining, nonnative fish populations in the Complex. It will specifically reduce the potential for hybridization between bull trout (Threatened) and nonnative brook trout. The project will also help us to build on the momentum of the plan/EIS planning process by demonstrating tangible results after years of research and planning. In addition, it will foster a cooperative relationship between the NPS, WDFW and various stakeholders following years of disagreement. Finally, the lessons learned from this project could also help other parks and protected areas to restore lakes that currently contain self-sustaining, nonnative fish.

6. **Transferability:** How widely will the project protocols or results be useful?

More than 95% of the more than 16,000 natural lakes in the western United States have been stocked with nonnative fish. Many of these lakes now contain self-sustaining populations of fish. The growing body of scientific evidence regarding the ecological effects of nonnative fish is raising a greater awareness of impacts and fostering a willingness among state and federal agencies to put aside jurisdictional disputes to protect native fish, amphibians, and other less charismatic species. The various methods for fish removal in this proposal have been developed in other NPS areas including Rocky Mountain, Great Basin, Mount Rainier and Sequoia-Kings Canyon. These methods continue to evolve as they are applied elsewhere and as a growing number of resource professionals gain and share their knowledge and expertise. This project will help to foster further development of fish removal methods for the benefit of other NPS units and other protected areas. The protocols for antimycin application should prove especially useful because we will be “pushing the envelope” in terms of the size and depth of lakes suitable for treatment. Also, reliance upon antimycin for the purpose of restoring lake ecosystems may have the indirect effect of dispelling some of the public phobias surrounding use of piscicides.

7. **Cost effectiveness:** Given problem statement and proposed methodology, are cost estimates realistic and commensurate with the results to be produced?

The methods and associated costs have been carefully researched as part of the ongoing plan/EIS planning process. They are based upon successful fish removal efforts that have recently performed in other NPS units. Assumptions are clearly stated. Costs reflect current market prices and are spelled out in detail in the Budget section.

8. **Project Support:** What resources (including in-kind contributions) are the park, region or other partner(s) willing to commit to this project?

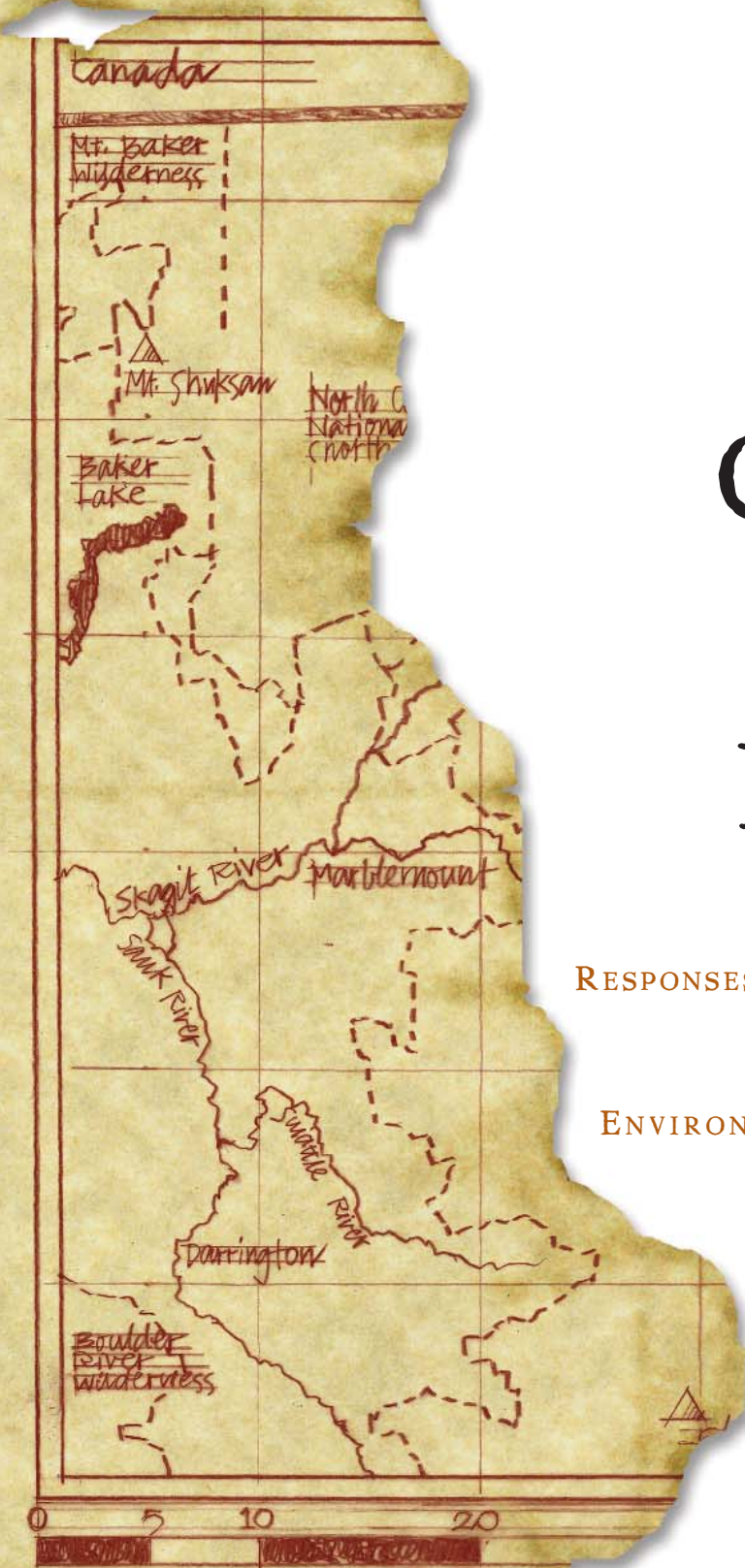
North Cascades Complex resources management staffs will provide project management and field assistance as part of their basic duties. An experienced team of personnel from the NPS and the U.S. Fish and Wildlife Service pledged to provide significant in-kind technical assistance. The WDFW has pledged assistance in the field, logistical support, public relations assistance and various sources of expensive and specialized equipment. The North Cascades Complex is a prototype park under the Long Term Ecological Monitoring Initiative for aquatics. Lake monitoring methods that have been developed for the North Cascades Complex will be used for follow-up monitoring, and some cost savings will be gained by coordinating logistics of lake treatment and long-term monitoring. Finally, partnerships will be pursued with various stakeholder groups who have expressed a willingness to assist with fisheries management.

Total project support = \$160,000, or 42% of total project costs.



ATTACHMENT I. BUDGET

Item	Description	Year 1	Year 2	Year 3
Personnel Services Costs	1. GS-7 Crew Leader, three year term appointment, subject to furlough, 8 month season, promotion to GS-9 after one year in grade. 2. 3-GS-5 Biological Technicians (4 month seasonal appointment). Estimates based upon current salaries plus 3% COLA increase each year through 2010. Total Personnel Cost = \$207,439	\$63,324	\$69,051	\$75,064
Travel and Transportation	1. Helicopter: \$700/hour; min. 2 hour flights per lake to ferry equipment and personnel for gillnetting and antimycin. Two extra flights needed in year 2 to treat Blum Lakes. Cost = \$35,714 2. Backcountry Per Diem (4 people, 48 days each per season). Cost=\$11869 3. Travel for Technical Assistance (\$1,000 for year one; \$2,000 for antimycin treatment year two). Cost = \$3,000 Total Travel/Transportation Cost = \$50,583	\$16,040	\$18,933	\$15,610
Supplies	104 units of Antimycin A (Piscicide). \$450/unit; one unit treats 38 acre-feet at 1 p.p.b. 1. Upper Blum Lake: approx. 180 Acre-Feet in volume; 40 units to treat lake and outlet stream at up to 8 ppb plus another 40 units should first treatment fail = \$36,000 2. Lower Blum Lake: approx. 60 acre-feet in volume; 12 units to treat lake and outlet stream at up to 8 ppb plus another 12 units should the first treatment fail = \$10,800	0	\$46,800	0
Equipment	<ul style="list-style-type: none"> Gillnets: 15 per lake (60 nets, \$300 ea) plus two replacement nets in years 2 and 3 = \$19,200 LR-24 Electrofisher (2) (battery powered, 24 volt backpack mounted) = \$9,373 Electrofisher accessories (2 each, includes 6' one-piece anode pole and ring, rat-tail cathode, 24volt 7Ah sealed battery, BC-24PS battery-charger, 10 KV electrical safety gloves) = \$2,987 Float tubes (3) and Chest waders (5): \$927 Knaack Box (2) for caching gear on site = \$1,030 Backpacks (4), tents (2), misc. camping gear = \$1,500 Replacement Gear for years 2 and 3 = \$2,000 Total Equipment Cost: \$37,017	\$33,817	\$1600	\$1600
Contractor and Cooperator Costs	Zooplankton and macroinvertebrate sample analyses (necessary for pre- and post treatment monitoring)	\$12,360	\$13,390	\$14,420
Other Costs (incl. Overhead Costs)	Restricted use pesticide applicator license: \$125 for year two On-site restricted use pesticide applicator training for field crews, 1.5 day course by Washington State Department of Ecology: \$1,000 for year two.	0	\$1,125	0
Subtotals		\$125,541	\$150,899	\$106,694
Total Funding Requested		\$383,134		



Comments and Responses

RESPONSES TO SUBSTANTIVE COMMENTS
ON THE DRAFT PLAN /
ENVIRONMENTAL IMPACT STATEMENT

RESPONSES TO SUBSTANTIVE COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Pursuant to the *National Environmental Policy Act* (NEPA), its implementing regulations, and National Park Service (NPS) guidance on meeting the Service's NEPA obligations, the park must assess and consider comments submitted on the draft Environmental Impact Statement (EIS) and provide responses. This appendix outlines and describes how the NPS considered public comments and provides the necessary responses to those comments.

The Environmental Protection Agency Notice of Availability (NOA) was published on May 31, 2005. The publication of the NOA initiated an 83-day public comment period that ended August 15, 2005.

Correspondence received during the public comment period included letters, electronic mail, transcripts from public meetings, and comments on the NPS Planning, Environment and Public Comment (PEPC) website. The park received correspondence from 75 individuals, 8 correspondences from representatives of 7 recreational groups, 1 business, 2 federal government agencies, 1 state government, and 4 conservation/ preservation groups. The correspondence contained 475 comments on various topics. All correspondence received during the public comment period may be viewed at the park headquarters during regular business hours.

At the close of the public comment period, the NPS began analyzing the correspondence received on the *Draft Mountain Lakes Fishery Management Plan / Environmental Impact Statement* (Draft Plan/EIS). Content analysis consisted of a five-step process:

1. developing a coding structure
2. employing a comment database for comment management
3. reading and coding public comments
4. interpreting and analyzing the comments to identify issues and themes
5. preparing this comment summary

A coding structure was developed to help sort comments into logical groupings, or topics. The coding structure was derived from an analysis of the range of topics discussed during internal NPS scoping, past planning documents, and the comments themselves. The coding structure was designed to capture all comment content rather than to restrict or exclude any ideas. Each comment was categorized by topic using the established coding structure.

The comments were identified as substantive or nonsubstantive as they were being coded, according to criteria described in the Council on Environmental Quality regulations (40 CFR 1500). These criteria state that substantive comments raise an issue regarding law or regulation, agency procedure or performance, compliance with stated objectives, validity of impact analyses, or other matters of practical or procedural importance. Nonsubstantive comments offer opinions or provide information not directly related to the issues or impact analysis. Nonsubstantive comments were acknowledged and considered, but do not require responses from the NPS.

The majority of comments received focused on various aspects of the alternatives proposed in the Draft Plan/EIS. Of the 97 comments addressing the alternatives, 31 comments addressed the preferred alternative (alternative B). Thirty-five comments regarded alternatives that had been eliminated for consideration in the draft plan/EIS and suggestions for new alternatives or alternative elements accounted for 6 comments. Other topics that received numerous comments included the Park Legislation and Authority section in the Purpose and Need for the Plan

(71 comments) as well as comments related to impacts of the proposal and alternatives on aquatic organisms (36 comments) and wilderness minimum requirements analysis (32 comments).

Concern statements were developed by code to summarize the views expressed in the substantive comments. All together, 254 substantive comments were identified and coded. From those substantive comments 78 concern statements were developed. The NPS then developed response statements addressing each concern statement. This report provides the concern statements, the representative comments that led to the development of those concern statements, and the NPS responses to these substantive comments.

Reading, coding, and analyzing comments helps the NPS decide if substantive issues raised by the public warrant further modification and analysis of the alternatives, issues, and impacts. Comment analysis also helped the NPS identify any Draft Plan/EIS text where clarification was helpful or factual errors needed correction. If editorial clarifications or factual changes were required, the text changes are reflected in this *Final Mountain Lakes Fishery Management Plan/Environmental Impact Statement*.

The indices in this report provide commenters with various means to track the way NPS addressed their comments. Each correspondence was assigned an ID number that can be found in Index A. Next to the ID number are all of the codes that NPS assigned to each individual correspondence. All of these comments were then used to develop the concern statements and responses. In addition, Index B provides an index broken out by code to show which organizations/individuals provided comments related to each code. Index B provides the full text of all of the letters submitted by businesses, organizations, and government agencies.

COMMENT DISTRIBUTION BY CODE

(Note: Each comment may have multiple codes. As a result, the total number of comments may be different than the actual comment totals)

Code	Description	Number of Comments
AL 1100	Common to All Action Alternatives – Implementing Plan	1
AL 1300	Common to All Action Alternatives – Adaptive Management	6
AL 1400	Common to All Action Alternatives – Mechanical Methods	2
AL 1500	Common to All Action Alternatives – Chemical Methods	5
AL 1550	Common to All Action Alternatives – Oppose Chemical Methods	1
AL 1700	Proposed Lake Treatments	2
AL 3101	Alternative A – Support (nonsubstantive)	4
AL 3103	Alternative A – Oppose (nonsubstantive)	1
AL 3110	Alternative A – Current Management Framework	1
AL 3200	Alternative B – Support	2
AL 3201	Alternative B – Support (nonsubstantive)	13
AL 3210	Alternative B – Proposed Management Framework	9
AL 3230	Alternative B – Proposed Mitigation	1
AL 3260	Alternative B	6
AL 3270	Alternative D	6
AL 3301	Alternative C – Support (nonsubstantive)	1
AL 3303	Alternative C – Oppose (nonsubstantive)	1
AL 3400	Alternative D – Support	3
AL 3401	Alternative D – Support	1
AL 3401	Alternative D – Support (nonsubstantive)	19
AL 3402	Alternative D – Oppose	1
AL 3403	Alternative D – Oppose (nonsubstantive)	4
AL 3410	Alternative D – Proposed Management Framework	1



Code	Description	Number of Comments
AL 4000	Alternatives – New Alternatives or Elements	6
AO 2000	Aquatic Organisms – Methodology and Assumptions	3
AO 4000	Aquatic Organisms – Impact of Proposal and Alternatives	36
AO 4500	Aquatic Organisms – Impact of Proposal and Alternatives (nonsubstantive)	6
CC 1000	Consultation and Coordination – General Comments	1
CC 1000	Consultation and Coordination – General Comments	2
CR 2000	Cultural Resources – Methodology and Assumptions	1
CR 2500	Cultural Resources – Methodology and Assumptions (nonsubstantive)	1
CR 4000	Cultural Resources – Impact of Proposal and Alternatives	1
CU 1000	Cumulative Impacts	3
ED 1000	Editorial	5
MT 1000	Miscellaneous Topics – General Comments	1
MT 1500	Miscellaneous Topics – General Comments (nonsubstantive)	2
PN 1002	Summary and Application of Existing Research	17
PN 3000	Purpose and Need – Scope of the Analysis	5
PN 4000	Purpose and Need – Park Legislation/Authority	71
PN 6000	NPS Management Policies and Mandates	22
PO 1000	Park Operations – Guiding Policies, Regs and Laws	31
PO 6000	Congressional Legislation – Support	3
PO 6500	Congressional Legislation – Oppose	4
PO 6600	Congressional Legislation – Oppose (nonsubstantive)	3
SE 4000	Socioeconomics – Impact of Proposal and Alternatives	1
SO 4500	Social Values – Impact of Proposal and Alternatives (nonsubstantive)	7
SS 1000	Soundscapes – Impact of Proposal and Alternatives	1
TE 2000	Threatened and Endangered Species – Methodology and Assumptions	1
TE 4000	Threatened and Endangered Species – Impact of Proposal and Alternatives	4
VE 4000	Visitor Experience – Impact of Proposal and Alternatives	4
VE 4500	Visitor Experience – Impact of Proposal and Alternatives (nonsubstantive)	4
VR 2000	Vegetation and Riparian Areas – Methodology and Assumptions	3
VR 4000	Vegetation and Riparian Areas – Impact of Proposal and Alternatives	11
VU 2000	Visitor Use – Methodology and Assumptions	7
VU 3200	Visitor Use – Recreational Use – Support Fish Stocking	2
VU 3300	Visitor Use – Recreational Use – Support Fish Stocking (nonsubstantive)	28
VU 3500	Visitor Use – Recreational Use – Oppose Fish Stocking	1
VU 3600	Visitor Use – Recreational Use – Oppose Fish Stocking (nonsubstantive)	5
VU 4000	Visitor Use – Impact of Proposal and Alternatives	12
VU 4500	Visitor Use – Impact of Proposal and Alternatives (nonsubstantive)	11
WH 4000	Wildlife and Wildlife Habitat – Impact of Proposal and Alternatives	10
WH 4500	Wildlife and Wildlife Habitat – Impact of Proposal and Alternatives (nonsubstantive)	1
WH 5000	Wildlife and Wildlife Habitat – Cumulative Impacts	1
WI 1000	Wilderness – Guiding Policies, Regs, Laws	13
WI 2500	Wilderness – Minimum Requirement Analysis	32
WI 4000	Wilderness – Impact of Proposal and Alternatives	12
WI 4500	Wilderness – Impact of Proposal and Alternatives (nonsubstantive)	14

CORRESPONDENCE
SIGNATURE COUNT BY
ORGANIZATION TYPE

Organization Type	Number of Correspondences
Business	1
Federal Government	2
Conservation/Preservation	4
Recreational Groups	7
State Government	1
Unaffiliated Individual	75
Total	90

CORRESPONDENCE
DISTRIBUTION BY STATE

State	Percentage	Number of Correspondences
NJ	1.05%	1
VA	1.05%	1
IL	2.11%	2
MT	1.05%	1
CO	6.32%	1
WA	81.05%	77
OR	1.05%	1
Total		90



Comment Concern Statements and Responses

AL 1100 – Common to All Action Alternative – Implementing Plan

Concern ID: 10000
CONCERN
STATEMENT: Several comments were concerned about the goal of 100% eradication of reproducing fish. 100% eradication may not be possible by current methods in all lakes slated for removal, and the eradication effort at a few lakes may cause more harm than benefit to the wilderness.

Representative Quote(s): The Hi-Lakers submit that the only alternative in the draft [Environmental Impact Statement (EIS)] that is reasonably consistent with Wilderness Act standards is Alternative B. However, most Hi-Lakers that frequent this wilderness are concerned about the goal that appears in all alternatives for 100% eradication of reproducing fish. Note the comments of Mike Swayne and Pete Smith. Hi-Lakers support removing reproducing fish populations that harm the ecosystem where such eradication is practical. However, some of the EIS conclusions regarding huge overpopulation of fish are only assumptions made because of lack of complete data. An additional problem is that 100% eradication may not be possible by current methods in all those lakes, and the eradication effort at a few lakes may cause more harm than benefit to the wilderness. (69)

Response: “Feasibility of Fish Removal” has been revised on pages 94 and 95.
[Note: Text was changed from “9 lakes” to “10 lakes” as appropriate.]

AL 1300 – Common to All Action Alternatives – Adaptive Management

Concern ID: 10001
CONCERN
STATEMENT: One comment stated that alternative D does not provide an opportunity to adaptively manage fish stocking. It is possible that adaptive management over the long haul applied to alternative B will result in the same outcome as alternative D would.

Representative Quote(s): “Adaptive management is based on the premise that managed ecosystems are complex and unpredictable. Adaptive management is an analytical process for adjusting management and research decisions to better achieve management objectives. This process recognizes that our knowledge about natural resource systems is uncertain... The goal of such experimentation is to find a way to achieve the objectives while avoiding inadvertent mistakes that could lead to unsatisfactory results (Goodman and Sojda 2004).” (pg 183) This is an excellent description of how this critical management practice works and of its benefits. Alternative D is a poor choice as an outcome of this [National Environmental Policy Act] process for precisely the reason that it does not manage the existing situation using this excellent adaptive management process. “The adaptive management process for the 91 lakes in the study area would evaluate the effects of management actions ... on biological resources at an individual lake and identify whether the management action should be modified to meet the objectives for the lake.” (pg 83) Well said. This sentence describes well why alternative D is a poor choice since alternative D does not provide an opportunity to adaptively manage fish stocking. It is possible that adaptive management over the long haul applied to alternative B will result in the same outcome as alternative D would, but getting there via adaptive management is the safer and more conservative way to get there. (31)

Response: Please note that alternative D does provide opportunities for adaptive management, but only in the context of fish removal methods to be used, not fish stocking.

Concern ID: 10002

CONCERN STATEMENT: Several comments are concerned about the costs of implementing components of the plan, including fish removal, adaptive management, and monitoring.

Representative Quote(s): In addition, the [National Park Service (NPS)] has not demonstrated that it can implement adaptive management or any long-term management policy, and there are no managerial or fiscal assurances that it could be successful in this instance. (anonymous)

I wanted to speak a little more about B, just my own concern looking, I guess, down at the future and the adaptive management plan and some of the ideas that are contained there. My worry would be that there's enough ambiguity and wiggle room and budgetary excuses that we'll run into the same problems in the future that we have right now because of the confusions with the Memorandum of Understanding in the past, and my worry as a high laker and a high-lake fisherman is that we will remove fish from some lakes and maybe remove fish from lakes that are overstocked, which is good, but the other side of the coin to the adaptive management plan and thought to restock some of the lakes, that will not happen, and so I would encourage the Park Service to consider an informal linkage among the various components of Plan B, in other words, not necessarily a one-to-one quid pro quo, but some sort of linkage that if and before we remove stocking from certain lakes, we proceed with the -- or you proceed with the other components of the plan. If we're going to remove stocking from certain lakes by whatever means and then reconsider whether those lakes will have fish again, that some of those lakes be considered and decisions made before the fish are removed from some lakes. And if it doesn't quite happen in that order, at least have some sort of written understanding that there's a component of linkage informally between them so that 5 years from now or 10 years from now or 15 years from now when there's no budgetary money for the monitoring because it's so expensive, or for the expense of detailed adaptive management analysis we don't get the shaft of all the lakes being taken out of circulation for fish and none put back in. (47)

Response: The adaptive management framework for alternative B will govern all elements of fishery management, including fish removal and/or fish stocking. This adaptive management approach is proposed because there is some uncertainty as to how native species will respond in lakes where stocking has been discontinued and when restocking begins. In light of this uncertainty, the decision to restock some lakes cannot be made at this time. Instead, the decision must await the results of monitoring the response of native organisms after stocking is discontinued. This informed approach will help to meet the objective using the "best available science" to guide decision-making.

However, the NPS will pursue all available means to manage the fishery as proposed, such as seeking partnerships among stakeholders and with the research/scientific community. The six steps on page 83 further explain the adaptive management approach.



Concern ID: 10003

CONCERN STATEMENT: Several comments questioned if the North Cascades Complex experiences budget shortfalls, would it default to alternative A?

Representative Quote(s): There needs to be a substantial dose of reality applied here. The management and monitoring processes for adaptive management are commonly much more expensive than conventional management and have not been sustained over the period required in publicly funded efforts [15 years in this instance]. NCCC [North Cascades Conservation Council] has great concern that even the limited set of costs identified for the first round of fish removals under various scenarios Tables 33, 34, and 35 are only a small indication of the funding needed for a full adaptive approach [especially the monitoring component] as outlined in the Mountain Lakes Management Plan. [The North Cascades Conservation Council] concern is increased when these levels of funding are compared with the whole [North Cascades Complex] operational budget Table 30. What is the likelihood that the proposed fish ecosystem management program can receive adequate increment funding to do what is outlined? What is not going to get done if no new resources are available to implement the adaptive management plan? Or do we simply default to Alternative A because we cannot afford to live up to the implementation of Alternatives B and C. Alternatives B and C represent considerable improvements over Alternative A but they involve even more management difficulties than those associated with Alternative D. Perhaps the [North Cascades Conservation Council] is overestimating the task and cost of implementing these alternatives or underestimating the ability of the NPS to do this job as proposed. The [North Cascades Conservation Council] needs far greater assurance that this adaptive management approach can work as proposed and that the resources are guaranteed to ensure success than is presented in this document. (18)

Response: It is widely recognized that adaptive management can be costly. For example, a task force report to the Council of Environmental Quality entitled “Modernizing NEPA Implementation” (September 2003; <http://ceq.eh.doe.gov/ntf/report/htmltoc.html>) noted the potential additional expense associated with the monitoring necessary to successfully implement adaptive management. The task force recommended that the *National Environmental Policy Act* process should identify the additional expenses associated with the adaptive management approach to ensure that funding needs for monitoring as well as for any adaptive measures are considered and reflected in the decision documents. The NPS has fully considered these recommendations. The plan/EIS includes a detailed fish removal implementation plan (new appendix N). The plan/EIS also provides cost estimates for each alternative, including monitoring and evaluation based on the best available information and clearly stated assumptions.

The NPS will pursue all available means to manage the fishery as proposed, such as seeking partnerships among stakeholders and with the research/scientific community.

The NPS will not default to alternative A should there be budget shortfalls that limit plan implementation. Instead, the NPS will remain committed to implementing whatever alternative is selected. Management actions will be implemented in accordance with available funding and resources.

Concern ID: 10004

**CONCERN
STATEMENT:**

Several comments questioned the success of adaptive management strategies. The problem is not with the concept but with the limited abilities of public and private management institutions to produce the process and results promised.

Representative Quote(s): The active adaptive management approach laid out in this [draft plan/EIS] [Alts. B and C] has yet to be demonstrated and sustained anywhere despite its conceptual elegance and intuitive appeal. Indeed, Carl Walters, one of the fisheries scientists who developed [along with Hollings and Hilborn] the concepts for adaptive management and once a leading proponent of the use of adaptive management has become convinced that our current management institutions are incapable of supporting such an approach [Walters comments in two public discussions, first at National Center for Ecosystem Analysis and Synthesis, Santa Barbara, CA. May 2004 and second at Workshop on Ecosystem-Based Management for Archipelagic Systems, Honolulu, Hawaii May 2905]. It is hard to disagree with Walter's perspective based on empirical studies of intended adaptive management processes. (18)

I hope that I am clear in communicating [North Cascades Conservation Council] refusal to accept continued stocking. The [National Park Service] made a valiant but desperate attempt to preserve a balance between lake restoration and continued fish stocking by introducing a new wrinkle. The new wrinkle is "active adaptive ecosystem management". This is a concept very near and dear to my heart conceptually but which has a deplorable track record in terms of empirical results. The problem is not with the concept but with the limited abilities of public [and private] management institutions to produce the process and results promised. A fully adaptive management program as described by the [National Park Service] for [the North Cascades Complex] would cost, in my estimation, at least half as much as the total [North Cascades Complex] operations budget. Thus, I [on behalf of [the North Cascades Conservation Council]] respectfully challenged the ability of the [National Park Service] to produce the planned elements of the preferred Alternative or its close second, Alt. C. (18)

Response:

Adaptive management is a system of management practices based on clearly identified outcomes; monitoring to determine if management actions are meeting those outcomes; and if not, facilitating management changes that will best ensure that outcomes are achieved. Adaptive management recognizes that knowledge about natural resource systems is sometimes uncertain. An adaptive management approach was selected for this plan/EIS because Department of Interior policies (516 DM 4.16) encourage the NPS to build adaptive management practices into *National Environmental Policy Act* compliance activities. In addition, to comply fully with 40 CFR 1505.2(c), the NPS must use adaptive management when implementing mitigation activities.

The NPS is well aware of the potential costs and challenges of adaptive management. To ensure success, the plan/EIS includes a detailed monitoring component to facilitate changes in management actions should objectives not be met. The program costs have been carefully calculated and assumptions have been plainly stated.



AL 1500 – Common to All Action Alternatives – Mechanical and Chemical Methods

Concern ID: 10005

**CONCERN
STATEMENT:**

One comment suggested that less invasive eradication methods be attempted first, such as gill netting, etc, and to follow these efforts with research to determine efficacy. Such eradication efforts should be adapted in light of any findings. Then, if several attempts at eradication are not successful, it may be beneficial to move to piscicides.

Representative Quote(s): We urge the Service to try less invasive eradication methods first such as gill netting, etc, and to follow these efforts with research to determine efficacy. Such eradication efforts should be adapted in light of any findings. Then, if several attempts at eradication are not successful, it may be beneficial to move to piscicides. It should be noted that fish have been present for some time, so any remaining amphibians or other rare species are unlikely to be extirpated simply because complete eradication of fish is not achieved in the next few years. (21)

Response: The NPS considered using gill nets exclusively to remove fish, but chose to pursue a more comprehensive strategy because many case studies have demonstrated that gill netting is only effective in relatively small, shallow lakes. If gill netting fails, then antimycin may be used, but only after completing a lake-specific *National Environmental Policy Act* analysis of treatment options. Table 7 of the plan/EIS identifies lakes that would be treated with antimycin. These lakes have been chosen for antimycin treatment because case studies have demonstrated that gill netting would most likely not prove feasible or effective. The implementation plan (appendix N) specifically identifies the first seven lakes for fish removal. Two of these lakes would be treated with antimycin.

Adaptive management would govern all fish removal actions, meaning that methods may evolve in time as more is learned about treatment efficacy.

Concern ID: 10006

**CONCERN
STATEMENT:**

Several comments are concerned with the use of antimycin for fish removal.

Representative Quote(s): We understand that antimycin degrades relatively quickly, and that many management precautions will be taken in its application. However, we are concerned that amphibians and arthropods will be impacted, and possibly extirpated by antimycin as well. We urge the Service to seek more information regarding the impacts of antimycin on amphibian populations, the recolonization of amphibians, and to analyze the use of piscicides with a strategy that aims to recover specific species in trouble in specific geographic areas. (21)

We support the spirit of Alternative D, mainly because it includes no additional fish stocking. However, we are not completely supportive of the use of antimycin or other piscicides in high mountain lakes. We are troubled by the proposed use of antimycin, because the piscicides may impact rare species such as the salamander or bull trout. The [plan/EIS] states “toxicity of antimycin to aquatic invertebrates has been found to be similar to that of fish at concentrations comparable to those that would be used in the North Cascades Complex . . .” (p. 265) The [plan/EIS] goes on to claim that “Field tests of antimycin effects have shown no observable impacts on various amphibian species at typical fish-control treatment levels.” (p. 265). We do not believe the case is this clear. According to a report by the Montana Chapter of The Wildlife Society, “The nontarget effects of another piscicides, antimycin, have apparently not been formally studied, but preliminary observations seem to indicate

that antimycin is also toxic to turtles and amphibian larvae (Patla 1998).” Also, since amphibians rely on invertebrates for food, any reduction in insect numbers may have adverse impacts on amphibians. (21)

Although it degrades relatively quickly, many amphibians and arthropods may be impacted. The National Park Service (NPS) should obtain more information regarding the impacts of antimycin on amphibian populations, the recolonization of amphibians, and to analyze the use of piscicides with a strategy that aims to recover specific species in trouble in specific geographic areas. A report by the Montana Chapter of The Wildlife Society stated that preliminary observations seem to indicate that antimycin is also toxic to turtles and amphibian larvae (Patla 1998). Also, there is no discussion of the impact on invertebrates. Since amphibians rely on invertebrates for food, any reduction in insect numbers may have adverse impacts on amphibians. –This came from the initial concern statement, need to find the Corr. ID, author, etc.

Response:

The potential impacts of antimycin have been carefully considered in the impact analysis portion of the plan/EIS [page 267 of the FEIS]. To minimize impacts, the adaptive management strategy for fish removal would begin with a pair of relatively small lakes (Middle Blum and Lower Blum lakes) where removal should prove feasible. The plan/EIS includes a detailed monitoring component so that impacts can be thoroughly evaluated (appendix N). As additional knowledge is gained, fish removal procedures will be revised accordingly.

AL 3110 – Alternative A – Current Management Framework

Concern ID: 10007

**CONCERN
STATEMENT:**

One comment stated that under the section “Current Fishery Management Program,” there is no section for “Lakes with Low Densities of Non-reproducing Fish.” All other permutations of “with fish, fishless, and reproductive status” are covered except this most crucial one upon which both alternatives B and C depend.

Representative Quote(s): CURRENT FISHERY MANAGEMENT PROGRAM (pg 76-81) This overall section does a plausible job of describing the current fishery management program; however, there is one glaring omission: there is no section for “Lakes with Low Densities of Non-reproducing Fish”. All other permutations of with fish, fishless, and reproductive status are covered except this most crucial one upon which both alternatives B and C depend. I trust this was an oversight and not yet another example of possible prejudice in favor of alternative D. (31)

Response:

This section describes current fishery management practices. It is not intended to describe how management practices could change in the future under alternatives B, C, or D based upon our knowledge that fish impacts are largely related to the reproductive status and abundance of fish in a lake. Nonetheless, we agree that it would be more accurate and consistent to describe the current stocking program under the category of “Lakes with Low Densities of Non-reproducing Fish.” The plan/EIS has been revised accordingly: the header “Current Fishery Management Program” (p. 76) has been changed to “Lakes with Low Densities of Non-reproducing Fish”



AL 3200 – Alternative B – Support

Concern ID: 10008

CONCERN STATEMENT: Comments support alternative B and also think it should be the environmentally preferred alternative.

Representative Quote(s): The [Washington Department of Fish and Wildlife] supports Alternative B as the preferred alternative. Alternative B and the adaptive management of fish in park lakes satisfies the expressed purpose of this [plan/EIS] in providing recreational fishing opportunity in this historic high lake fishery while minimizing ecological impacts. The [Washington Department of Fish and Wildlife] also supports Alternative B as the environmentally preferred alternative as defined in the Department of Interior Policy (516 DM 4.10) and the national environmental policy act (NEPA) section 101 (b)), including (b) 3. “attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences” an aspect in which alternative D, the proposed environmental preferred alternative does not address. Additionally, Alternative B offers the greatest potential for partnerships between the State, the Park, and stakeholders for implementing fish removal projects on those lakes with high-density naturally reproducing populations. By continuing to provide quality high lake fishing opportunity, Alternative B also offers the benefit of continued communication and education of back country anglers, thus reducing the potential for unsanctioned introduction of fish in high lakes. (39)

Response: The NPS agrees that alternative B would provide recreational fishing opportunities and minimize ecological impacts. The NPS also agrees that alternative B would reduce the potential for unsanctioned stocking by maintaining a positive, constructive relationship with the angling community. However, the NPS respectfully disagrees that alternative B should be considered the Environmentally Preferred Alternative. The NPS has identified alternative D as the environmentally preferred alternative because it would cause the least damage to the biological and physical environment, and it best protects, preserves and enhances the natural resources of the Complex (DM 516, 4.10(A) (5)).

AL 3210 – Alternative B – Proposed Management Framework

Concern ID: 10009

CONCERN STATEMENT: Comments wanted clarification on the number of lakes that would have fishing opportunities as proposed under alternative B.

Representative Quote(s): In Table ES-2 on page xviii, Stout, lower Stout and Trapper lakes are listed as having low-density reproducing fish under the Current Condition of Lake (as represented under alternative A). Yet in Table H-1 these lakes are tagged with the estimation of 222 fish per acre (for overproducing fish populations). This is a contradiction. If one of these is in error it should be corrected.

One comment stated that the window explaining the numbers of lakes under alternative B on the margin of page xiii is confusing. The alternative B window states, “29 lakes would have fish, 49 lakes would be fishless, 13 lakes would be evaluated”. It seems that there are actually 22 lakes that would have fish (2C, 3C, 4C). Assuming that the seven additional lakes come from action 3B, it is not clear from Table ES-1 that these lakes will be planted.

Response: For alternative B, a maximum of 42 lakes may have fish and may be fishable in the future. The actual numbers of fishable lakes may be revised downward as more data are collected. In other words, a firm number cannot be provided at this time because management actions (e.g., lakes to be stocked following removal of reproducing populations of fish) could change in the future if monitoring results indicate the objectives are not being met. Because a firm number of lakes cannot be stated until additional data are collected, the boxes in the margins oversimplify the alternatives and have been removed.

Concern ID: 10010
CONCERN STATEMENT: Several comments are concerned that after chemical fish removal, the surviving fish population may rebound to high densities after a few generations.

Representative Quote(s): “Feasibility of fish removal was assumed to be low if lake surface area exceeds 50 acres or lake volume exceeds 1,000 acre-feet. Table 7 identifies the nine lakes having characteristics that could make complete fish removal infeasible.” (Vol. 1, Pg. 93–94) Bear, Berdeen, Green, Hanging, Hozomeen, Monogram, Stout, Hidden and Trapper lakes According to Table 7, Bear, Berdeen, Green, Hanging, Hozomeen and Monogram are slated for chemical fish removal under Alternative B even though it is plainly stated it may not be successful. I believe the surviving fish population will rebound to high densities after a few generations. This management action appears to be temporary and necessitate repeated fish removal in the future. I think this decision should be reconsidered. I do not agree with planned, repeated chemical fish removal in these Wilderness lakes. I ask that these lakes be left in their current state until a method of complete fish removal is found. (81)

Response: The plan/EIS has been revised to clarify that chemical methods will not be used repeatedly or as a “stop gap” measure to limit fish abundance in lakes where complete removal is not feasible. Instead, if chemical treatment methods fail, then fish will remain in the lake until more promising methods of fish removal are identified. For some lakes, reproducing populations of fish could remain for the foreseeable future, if not forever, because complete removal may never be feasible.

The “Feasibility of Fish Removal” section (p. 95), end of last paragraph, has been amended.

Concern ID: 10011
CONCERN STATEMENT: Several comments stated that the NPS should learn much more about the removal procedures and impacts starting with the easier lakes before trying to remove fish from the more difficult lakes.

Representative Quote(s): My value system says that the Preferred Alternative B is a good balance between competing value systems. However, I'm very concerned about the potential impacts of human intervention trying to remove fish from some of the larger, deeper and pristine wilderness lakes. I advise the NPS to learn much more about the removal procedures and impacts starting with the easier lakes before trying to remove fish from the more difficult lakes. (72)

Response: The fish removal strategy is to begin with relatively small lakes to gain staff experience, monitor impacts, and refine measures for minimizing impacts to visitors and the environment before progressing to fish removal in larger, deeper lakes. The strategy also relies upon technical assistance from personnel who are experienced in fish removal procedures. Appendix N provides the Strategic Implementation Plan for Fish Removal.



AL 3230 – Alternative B – Proposed Mitigation

Concern ID: 10012

CONCERN STATEMENT: Comments stated that the text misrepresents the reproductive ability of stocked fish.

Representative Quote(s): Mitigation/Alternative B “Reproduction would be limited by inducing genetic sterility or selecting hatchery strains that cannot reproduce due to spawning habitat limitations and/or timing of spawning limitations (e.g., Mount Whitney rainbow trout).” (pg 129) The use of the underlined word “limited” is misleading. “Limited” gives the impression of reduced somewhat”. This word should be replaced with the word “eliminated” since sterile fish cannot reproduce at all. (31)

Response: In the short term, the Washington Department of Fish and Wildlife would continue to stock Mount Whitney rainbow trout, whose habitat constraints and timing of spawning should make them functionally incapable of reproducing in mountain lakes. Golden trout, coastal cutthroat trout (for westside lakes) and intermountain cutthroat trout (for eastside lakes) would be stocked in lakes with low reproductive potential (e.g., very limited spawning habitat) to diversify fishing opportunities. The Washington Department of Fish and Wildlife is also currently developing a native Upper Skagit rainbow trout brood stock for Westside lakes. The Washington Department of Fish and Wildlife is also developing genetically sterile (triploid) trout. The long-term goal would be to stock only genetically sterile fish to minimize further the risk of unwanted reproduction.

The Washington Department of Fish and Wildlife currently does not have the sole capability of stocking only sterile fish, so some lakes will continue to be stocked with reproductively viable fish provided the lake lacks sufficient habitat for spawning. Thus the possibility for reproduction remains, although though the risk would be very low because of spawning constraints.

AL 3260 – Alternative B

Concern ID: 10013

CONCERN STATEMENT: Comments are concerned that there should be no net loss in fishing opportunities in mountain lakes.

Representative Quote(s): The [King County Outdoor Sports Council] would like to go on record as supporting, with reservations, Alternative B of this [environmental impact statement]. We are somewhat worried about the wording of this alternative as it gives the impression that 42 lakes may have fish but at the same time stating that lakes where fish have been eliminated may not be restocked. We believe there should be no net loss in the number of lakes from the 40 that are now on the current [memorandum of understanding] between the [North Cascades Complex] and the [Washington Department of Fish and Wildlife]. If there is then we believe the [National Park Service] needs to mitigate this recreational loss to the people of Washington as they were promised this resource in return for supporting the creation of the [North Cascades Complex]. (45)

Response: No net loss of fishing opportunity was considered as suggested by this comment. However, this was rejected in favor of establishing science-based objectives and approaches as outlined by NPS Management Policies 2006 sections 2.3.1.4 and 4.1.1, which require planning documents to be guided by scientifically acceptable data and information. A plan based solely on no net loss of fishing opportunity would not meet NPS policy guidance.

Concern ID: 10014

CONCERN STATEMENT: Public is concerned that the National Park Service will only implement cessation of fish stocking from alternative B because of cost and ease of effort, and no other aspect of this alternative will be achieved.

Representative Quote(s): The components of Option B include removing some lakes from being stocked; removing over-reproducing fish from some lakes; and considering other lakes for stocking, especially those that been cleared of over-reproducing fish. My concern is that only the first component of Option B will be well implemented, largely because it costs nothing. The other components, critical for restoring health to aquatic ecosystems and creating quality, no-impact fishery, will take time, money and effort. The concern then is that these important parts of the Option B plan will not happen. I believe that as Option B is a complete plan, so should all components of the plan be linked in such a way that the plan advances as a whole. For example: no more than half of the lakes identified for cessation of stocking could have stocking stopped until half of the overstocked lakes destined for attention have been treated, and reviewed via the adaptive management and other policies for introduction of non-reproducing fish. This would insure that loss of fishable lakes is matched by the effort to improve lake habitats, a goal anglers support wholeheartedly. We do not want to be the only ones making sacrifices or efforts. A linkage between the Option B components would indicate and insure the good faith of the Park Service. Option B should not be a fig leaf to simply and immediately reduce the historical and valued practice of stocking in the [North Cascades Complex]. (47)

Response: We agree with the comment that all phases of the plan need to move forward as a whole. However, for reasons of practicality, we are using an adaptive management approach to test our proposal on a limited number of lakes to determine the effects of treatment, cessation of stocking, and restocking actions. This phased approach can be found in chapter 2 and an implementation strategy has been added as appendix N.

Concern ID: 10015

CONCERN STATEMENT: Comment stated that the justification for identifying the preferred alternative was not clear.

Representative Quote(s): **Corr. ID:** 130537 **Organization:** *Not Specified*

Comment ID: 17335 **Organization Type:** Unaffiliated Individual

Representative Quote: After careful review of the [plan/EIS] I was unable to find a statement that explained why the Park Service has chosen Alternative B. The only explanation was found in the ‘Frequently Asked Questions’ insert included with the [plan/EIS]. This explanation is unsatisfactory and lacks detail or clarity. The Park Service must explain in detail why the recreational fishing opportunities of a handful of people are more important than preserving the biological integrity of our high elevation lakes. Why is fostering “a continued cooperation and collaboration in fish management between the [Washington Department of Fish and Wildlife] and the [National Park Service]” important? Why would this relationship trump the protection of biological resources? Why does the “[National Park Service] believe that cooperative management between the [National Park Service] and [Washington Department of Fish and Wildlife] is essential for the successful management of the mountain lakes fishery”, if all available science and current [National Park Service] policies concludes that fish stocking should not occur? I am honestly baffled to why the [North Cascades Complex] has chosen Alternative B, and it seems that there may be a lot more going on behind the scenes. Does the Park Service feel pressured by the [Washington Department of Fish and Wildlife]? Does the Park Service fear a lawsuit by [Washington Department of Fish and Wildlife]? Does the Park Service believe



that we need to continue to stock half of the lakes, because if we don't, renegade fisher-people will illegally stock them anyway? In order for the park service to facilitate a comprehensive understanding by the public of why the Preferred Alternative was chosen, perhaps a section should be added to the [plan/EIS] entitled 'Politics'. This is not an attempt at sarcasm; the public deserves full disclosure into why the Preferred Alternative was chosen, and I believe a discussion of this nature would help with that understanding.

Response:

As a matter of policy, the decision rationale is provided in a record of decision, but not in the draft plan/EIS (DO-12, 6.2(A)(3)) because it does not want to bias or influence public review and comment. The section entitled "How Alternatives Meet Objectives" (p. 114) describes the plan/EIS objectives and how well each of the four alternatives meets the objectives.

Alternative B, which was identified as the preferred alternative, requires Congressional clarification before it can be implemented. In the absence of Congressional clarification, Alternative D will be implemented until Congressional clarification is received.

AL 3270 – Alternative D

Concern ID:

10017

CONCERN

STATEMENT:

Several comments are concerned about people illegally stocking lakes if alternative D is implemented. The potential of illegal stocking actually may make alternative D the least environmentally friendly alternative, given the ease with which it can be done.

Representative Quote(s):

Corr. ID: 131305

Organization: Trail Blazers and Hi-Lakers

Comment ID: 17708

Organization Type: Recreational Groups

Representative Quote: Illegal fish stocking is a major issue and is not given enough exposure in this draft of the [plan/EIS]. If the park were to choose alternative D and thereby essentially eliminate the historical mountain fishery which has been there for decades (well before the creation of the park), visitors to the lands of the park who fish will certainly notice the reduction or elimination of fish from their "favorite" lake. Quite innocently, they might be tempted to "help nature along" by transporting fish fry from a stream or river in the park. This is very easy to do and one person could undo tens of thousands of dollars of work in an afternoon. This scenario ought to be taken more seriously by the [National Park Service] as they consider the implications of alternative D verses alternative B. The best way to minimize the risk of unsanctioned stocking by an uninformed public is to maintain a disciplined, well-managed fishery along with public outreach and education. (31)

Response:

Unsanctioned stocking could occur under any alternative and it is too speculative to adequately measure. However, the NPS does not believe the threat of unsanctioned stocking should be used as a basis for rejecting alternative D as the environmentally preferred alternative because it best meets the criteria found in the DM. The NPS has included "Outreach and Education" as an element common to all action alternatives. The "Outreach and Education" strategy would include exhibits at visitor centers, brochures, a web site and periodic newsletters. These various media would address the risks and consequences of unsanctioned stocking so as to raise awareness of the issue and inform stakeholders.

AL 3400 – Alternative D – Support

Concern ID: 10018

CONCERN STATEMENT: Comments requested a detailed implementation plan that illustrates specific funding and staffing commitments and actions to implement the plan.

Representative Quote(s): I favor Alternative D, the environmentally preferred alternative, in principle because it potentially restores naturally fishless lakes to their original biological integrity. However, this alternative needs a specific implementation plan to remove fish within a specific timeframe (perhaps, 20 years) with the financial and personnel assistance of the Washington Department of Fish and Wildlife and others responsible for past fish stocking. Without a specific plan and funding, reproducing populations of stocked fish could remain in these lakes for years as well as recreational fishing such as has occurred in Sequoia-Kings Canyon National Parks and other NPS areas. Without committed and diligent park management, this could easily become the No Action Alternative. (Anonymous)

The [North Cascades Conservation Council] supported Alternative D which is to cease fish stocking. The [North Cascades Conservation Council] added a request to [alternative] D [which was terribly inadequately described in the [plan/EIS]] that a strategic implementation plan be developed to state the objective as eliminating non-native fish and restoring aquatic habitats to the extent possible.

Response: A detailed Implementation Plan concerning the first phase of fish removal has been added to the final plan/EIS as appendix N.

Concern ID: 10019

CONCERN STATEMENT: Comments supported alternative D because it is most closely aligned with NPS Management Policies.

Representative Quote(s): The goal for the Environmentally Preferred Alternative (Alternative D) is that all 91 lakes would be fishless. This alternative is most closely aligned with the National Park Service (NPS) Management Policies which state that exotic species will not be introduced into parks and that the NPS is not to intervene in natural biological or physical processes, except in emergency situations to restore natural ecosystem functioning that has been disrupted by past human activities. Also, by removing the nonnative fish in these lakes, Alternative D would eliminate long-term predation and competition impacts on plankton, macroinvertebrates and amphibians in the study area. While the US [Environmental Protection Agency] acknowledges that there will be short-term minor impacts resulting from the removal of the nonnative fish, the [plan/EIS] includes an adequate monitoring and adaptive management plan to assure that these impacts are minimized. (44)

Response: Alternative D has been identified as the environmentally preferred alternative because it best promotes the national environmental policy expressed in NEPA and is the alternative that best protects and preserves the biological and physical environment by eliminating the consequences of stocked and reproducing fish populations over the long term.



AL 3402 – Alternative D – Oppose

Concern ID: 10020

CONCERN STATEMENT: Comments opposed alternative D because it does not provide adequate recreation opportunities and should be omitted.

Representative Quote(s): **Corr. ID:** 131124

Organization: State of Washington Department of Fish and Wildlife

Comment ID: 17360

Organization Type: State Government

Representative Quote: [Washington Department of Fish and Wildlife (WDFW)] believes that Alternative D is not an appropriate alternative given it is in direct opposition with the purpose of the plan/EIS and its objective to “Provide a spectrum of recreational activities including sport fishing...” in the study area, which is made up of park high lakes with a history of fish presence. The intent of Alternative D is to eliminate fish in the [North Cascades Complex] high lakes, and is in direct conflict with providing sport fishing opportunity in high mountain lakes. WDFW believes Alternative D should be dropped from consideration and omitted from the Final EIS entirely.

pg 115: “As stated in the “Purpose of and Need for Action” chapter, all action alternatives selected for analysis must meet all objectives to a large degree.” “The plan’s objectives are to: ...Provide a spectrum of recreational opportunities, including sport fishing, while minimizing impacts to the biological integrity of natural mountain lakes...” “Even alternative D would provide sport-fishing opportunities in mountain lakes for a lengthy period because it would take many years to remove all reproducing fish populations from the mountain lakes...” These two sentences from this section represent a gross distortion of the concepts otherwise usually fairly presented this draft [plan/EIS] -apparently in order to justify alternative D as being acceptable. Alternative D does not meet the “sport fishing” plan/EIS objective as claimed here. Anglers do not appreciate lakes with high densities of reproducing fish any more than conservationists, or anyone else. Such lakes not only lack biological integrity, but provide essentially no quality sport fishing opportunity. Claiming that the removal of the quality fishery via the removal of all nonreproducing low density fish population, while keeping the stunted lakes to “provide sport-fishing opportunities in mountain lakes” is tantamount to making a farce of this entire [plan/EIS] document, and is insulting to those of us who have worked in good faith with the NPS for over two years on this process. (31)

Response:

Alternative D best meets NPS policies. The purpose of this plan/EIS is to guide NPS actions in order to conserve biological integrity, provide a spectrum of recreation opportunities and visitor experiences, including sport fishing and resolve the long standing debate and conflicts over fish stocking in the naturally fishless mountain lakes in the North Cascades Complex. NPS believes that Alternative D best incorporates these different purposes and objectives into the plan/EIS. The plan/EIS assesses impacts on social values to anglers wishing to continue this activity within the North Cascades Complex. The plan/EIS recognizes that some anglers may not have the same high-quality fishing experience in the North Cascades Complex and may choose to fish outside the complex. The plan/EIS also recognizes that fishing opportunities would continue to exist in the 10 deep lakes where complete fish removal may not be feasible.

AL4000 – Alternatives – New Alternatives or Elements

Concern ID: 10021

CONCERN STATEMENT: Comments suggest a new alternative where the NPS implements actions in alternative A plus an action to address overpopulated lakes only.

Representative Quote(s): I think there is another viable alternative. I call it Alternative A Modified. The original agreement in forming the [North Cascades Complex] was that fish stocking would continue. I interpreted that to mean in lakes that already had fish. (62 lakes per the plan/EIS) However, there are lakes that need some sort of Adaptive Management plan due to over-population. So my proposal for a modified Alternative A would be to address this problem through fish removal in these lakes followed by restocking with non-reproducing fish at low densities. (3)

Response: Overpopulation of lakes is only one of several ecological risk factors that were considered in the development of the alternatives. Not taking other ecological risk factors into account when developing the alternatives would fail to meet the objectives of the plan.

Concern ID: 10022

CONCERN STATEMENT: One comment stated that fishing tackle that contains lead should be banned from the entire Park Complex.

Representative Quote(s): On a final note, fishing tackle that contains lead should be banned from the entire North Cascades National Park (including Ross Lake) as soon as possible. Steel alternatives are available. Fines could be used to help cover native restoration costs. All national parks in Canada have implemented lead-free fishing to eliminate the threat that lead poses to wildlife and the environment. All fishing tackle under 50 grams containing lead, such as leaded sinkers, lead split shot, lead weighted jigs and soft lead putty wire are not allowed. (21)

Response: Most anglers do not fish for trout using lead tackle. Nonetheless, the NPS fully supports banning lead tackle from the Complex. The Washington Department of Fish and Wildlife concurs that lead fishing tackle should be prohibited. Although beyond the scope of this plan, the NPS will work with the Washington Department of Fish and Wildlife to revise the regulations so as to prohibit lead fishing tackle throughout the Complex.

Concern ID: 10023

CONCERN STATEMENT: One comment stated that since North Cascades will be a cooperating fishery manager, they should be in line for a share of the fishing license dollars from the State of Washington.

Representative Quote(s): We also feel the [North Cascades Complex], as they will be a cooperating fishery manager, should be in line for a share of the fishing license dollars from the State of Washington. The [North Cascades Complex] could sell licenses and keep half the dollars to finance their portion of fishery management. (45)

Response: Because the NPS does not have the authority to sell fishing licenses, the state would be assisting the park in indirect methods such as in-kind donations and other types of support.



AO 2000 – Aquatic Organisms – Methodology and Assumptions

Concern ID: 10024

**CONCERN
STATEMENT:**

One comment questioned if it is possible for the over reproducing fish that were not feasible to be removed from Berdeen Lake to eventually spill into Lower Berdeen Lake recreating the problem? If so, then Lower Berdeen Lake should be treated similarly to Berdeen Lake.

Representative Quote(s): Regarding 2A lake Lower Berdeen where fish will be permanently removed: Is it possible that the over reproducing fish that may not be feasible to remove in Berdeen will eventually spill into Lower Berdeen recreating the problem? If there is any chance of this I ask that Lower Berdeen be treated similarly to Berdeen. (81)

Response: For all action alternatives, both Berdeen and Lower Berdeen would be treated similarly – they would have the high-density reproducing fish removed as the first step in the management plan. Lower Berdeen would be kept fishless under all action alternatives. Under alternative B, a decision would be made to restock Berdeen with low-density nonreproducing fish after monitoring. Under alternatives C and D, Berdeen would be kept fishless.

Concern ID: 10025

**CONCERN
STATEMENT:**

Several comments suggested there are no measurable impacts on lakes when low densities of non-reproducing fish are used as supported by the Liss and Larson study. However, other comments assert impacts do occur from non reproducing fish stocking and support taking management action.

Representative Quote(s): Table ES-4 “Impacts on aquatic organisms in lakes stocked with low densities of nonreproducing fish would be the same as alternative A, except these impacts would decline further in the future as stocking is curtailed or eliminated in lakes base upon adaptive management decisions pertaining to stocking.” It needs to be made explicit in this alternative, as well as in alternative A and C, that data show there are no measurable impacts on lakes when low densities of non-reproducing fish are used. Additionally, it makes no sense to say that impacts would decline further since there is no measurable impact in those lakes today. (31)
“In contrast, in seven lakes containing fish that were either nonreproducing stocked (2 lakes) or reproducing (5 lakes), the range was drastically lower: 0 to 8 individuals per 328 feet of shoreline surveyed.” (pg 167) I find it unbelievable that the [plan/EIS] authors seem to have so little understanding of the vital conclusion of the Liss and Larson study that one can not lump reproducing and nonreproducing fish populations in the same statistic. In the context of proper mountain lake fishery management, mixing statistics from these two different data sources (reproducing and nonreproducing fish populations) is the ultimate apples and oranges story.” (31)

ZOOPLANKTON “Lower densities of fish, more typical of stocked situations, do not have as great an effect. There is not much difference in abundance of diaptomid copepods between these stocked lakes and fishless lakes (Liss et al. 1998), possibly because the densities are not as high in stocked lakes, and the zooplankton can recover between stockings.” (pg 163) These sentences should read: “Fish stocked in low densities (for example with nonreproducing fish) have little if any measurable effect. There is not much difference in abundance of diaptomid copepods between these stocked lakes and fishless lakes (Liss et al. 1998).” The phrase “not...as great” is awkward and gives the wrong impression that the difference between high density and low density fish populations is minor when just the opposite is the case. The ending phrase starting with “possibly” is speculative and likely wrong. Measurements show that the zooplankton populations simply do not depress much at

any time in the stocking cycle. The lack of effect of zooplankton is simply a matter of there being low numbers of fish at all times; there is no evidence that zooplankton populations get depressed immediately after a stocking event and then rebound over a few years as this original wording implies. Frankly, the original wording shows a significant misunderstanding by this draft [plan/EIS] author of low density stocking with nonreproducing fish since low density populations using this management technique are not primarily the result of infrequent stockings (indeed they could occur every year) but rather the result of using very low numbers of fish per acre at every stocking event. (31)

The US [Environmental Protection Agency] supports the goals of the proposed project to conserve native biological integrity, provide a spectrum of recreational opportunities and visitor experiences, and resolve the debate and conflicts over fish stocking in North Cascades National Park Service Complex. We have concerns that the Preferred Alternative (Alternative B) would allow for continued stocking of naturally fishless lakes consequently manipulating the native ecology and introducing nonnative species. Nonnative fish species have been shown to impact local biota within the study area. In particular, it has been demonstrated that nonnative fish species have long term impacts on plankton, macroinvertebrates and amphibians. Consequently, we have assigned a rating of EC-I (Environmental Concerns - Adequate) to the draft [plan/EIS]. This rating and a summary of our comments will be published in the Federal Register. A copy of the rating system used in conducting our review is enclosed for your reference. (44)

The Preferred Alternative (Alternative B) would conserve biological integrity in lakes by eliminating or reducing (if elimination proved infeasible) reproducing fish populations. This would eliminate high densities of reproducing fish populations from lakes in the study area while allowing low densities of reproducing and nonreproducing fish populations. While this management framework would minimize risks to biological integrity, it would still result in impacts on the local environment. In particular plankton and macroinvertebrates and amphibians would continue to experience long-term adverse impacts from predation and competition in all lakes that are stocked with fish. (44)

Response:

The magnitude of impacts of stocked trout on aquatic organisms (salamander larvae and copepods) is dependent on a complex interaction of several biotic and abiotic factors. The magnitude of the impact can vary with fish density; presence of reproducing or nonreproducing fish; nutrient concentrations, especially total nitrogen expressed as Kjeldahl nitrogen (TKN); and water depths. It is an over-simplification to state that nonreproducing fish have no measurable impacts. It also is an oversimplification to state that all non-native fish have measurable impacts. The series of Liss and Larsen studies conducted in 1990–1999 improved understanding of the impacts of non-native fish on resident salamander larvae and copepods in the high-elevation lakes of the North Cascades Complex. From 1990 through 1999, 28 fishless lakes, 17 lakes with nonreproducing trout, and 18 lakes with reproducing trout were studied. Very briefly, the Liss and Larson studies found higher abundances of salamander larvae and copepods in lakes with higher concentrations of nutrients, especially total Kjeldahl nitrogen (TKN). However, they also found high variability in the salamander larvae and copepod abundance data within any given set of biotic and abiotic causative factors. The impacts of introduced fish – reproducing or nonreproducing – were most readily distinguished in lakes with high TKN concentrations. In lakes with high TKN concentrations (≥ 0.055 mg/L), abundances of salamanders were lowest in lakes with reproducing fish, next lowest in lakes with nonreproducing fish, and highest in fishless lakes (Liss et al. 1998, 2002). At lower TKN concentrations (0.045–0.055 mg/L), the abundances of salamanders were lower overall and differences could only be seen between fishless



lakes and lakes with high densities of reproducing fish. In lakes with the lowest TKN concentrations (<0.045 mg/L), no differences in salamander abundances could be seen among fishless lakes, lakes with nonreproducing trout, and lakes with reproducing trout.

In the draft plan/EIS, the authors summarized the results of the OSU/USGS studies and applied the results in the impact threshold discussions. Descriptions of the Liss and Larsen results have been reviewed and revised as needed to clarify the essential concepts learned as a result of the 1990–1999 studies.

In Table ES-4 the statement in question under “Alternative B-Aquatic Organisms” has been revised.

Corresponding text in the “Alternatives” and “Environmental Consequences” chapters has also been revised.

The Liss et al. 2002 reference cited in revised text has been added to the References section. Also, the citation currently in text, Liss et al. 2002, has been changed to read: Liss et al. 2002a throughout the document.

AO 4000 – Aquatic Organisms – Impact of Proposal and Alternatives

Concern ID: 10026

CONCERN

STATEMENT: Comments state that the impacts on metapopulations of amphibians are poorly understood and the plan/EIS lacks sufficient data to make a confident decision.

Representative Quote(s): The impacts of fish stocking on metapopulations of amphibians is poorly understood and lacks sufficient data to make a confident decision one way or the other. I believe that the Park Service should error on the side of caution and choose Alternative D, to ensure that at least one small area of the entire Cascade Mountain Range can have a metapopulation of amphibians that is intact as possible. Our National Parks are supposed to be living laboratories where researchers can study amphibians and aquatic organisms in their original and natural state; it is our responsibility to restore the balance. (22)

Response:

It must be remembered that Liss and Larson and others studied amphibian populations in high mountain lakes in the North Cascades Complex for nearly 10 years (1990–1999). A synopsis of all the research was published in Ecological Impact of Introduced Trout on Native Aquatic Communities in Mountain Lakes – Phase III Final Report by Liss et al. (2002a). The role of isolation in the recolonization of extinct populations is discussed in chapter 1 (Tyler et al. 2002) of Liss et al. (2002a). The importance of protecting metapopulations is recognized and discussed in several places in the draft plan/EIS. Population isolation and its converse, connectivity, are presented in Table 1 (page 55), discussed on page 168, and used as a component of the impact thresholds for amphibians as seen in Table 31 (page 249). Two subspecies of long-toed salamanders are discussed on page 167, and the possibility of subspecies of the northwestern salamander is discussed on page 168. Finally, the context of the draft plan/EIS and fishery management plan must be considered. The North Cascades Complex has a total of 245 mountain lakes. Of these, at least 154 have always been fishless and will remain fishless. Of the 91 lakes considered in the draft plan/EIS, 29 are currently fishless and will remain fishless, even under alternative A (no action).

The first full paragraph on page 178 has been revised to refer to Shields and Liss 2003 and Thompson et al. 2006.

Also, the Thompson et al (2006) reference has been added to the References section.

Concern ID: 10027

**CONCERN
STATEMENT:**

One comment stated that no one has demonstrated that the general distribution of native amphibians has been diminished in Washington from planting trout fry into high lakes. A well-done study in the Olympics showed that native salamanders are well-distributed across their natural range despite many decades of fish planting.

Representative Quote(s): Much has been said and published about the impacts of trout in high lake ecosystems on native salamanders. There most definitely is a problem with some amphibian species in some areas, such as the yellow-legged frog in the Sierras of California. This is not California. A well-done study in the Olympics showed that native salamanders are well-distributed across their natural range despite many decades of fish planting. Here's my bottom line: No one has demonstrated -- I worded this very carefully. No one has demonstrated that the general distribution of native amphibians has been diminished in this state from planting trout fry into high lakes. While it is true that fish can temporarily depress salamanders or their larvae in some lakes under some conditions, this does not necessarily translate into species extinction, even as low as the meta-population level. The [plan/EIS] could be more accurate and complete if it made and emphasized this point in my opinion. Most of the assessment of salamander impacts was based on assumptions about their movements and various geographic criteria. I respectfully challenge those assumptions since so far I have seen no data from Washington that supports them. On the contrary, the data from the Olympics supports my position and opinion that native amphibians can coexist with responsible fishery management when viewed on a landscape level. (73)

"For example, surveys in Olympic National Park found few or no long-toed salamanders in lakes containing fish, but many populations in shallow ponds and lakes without fish (Bury and Adams 2000; Bury et al. 2000; Adams et al. 2000)." (pg 23) This sentence is misleading. One could easily conclude from this sentence that fish, regardless of fish density, decimate long-toed salamanders populations. If this sentence is to remain it needs to be qualified so that it eliminates at least the simple possibility that shallow ponds and lakes are the preferred habitat of the long-toed salamander. Furthermore, long-toed salamander population density may very well heavily depend on fish population density. For example, lithe research quoted above only looked at lakes with high densities of fish, it would be expected that long-toed salamander population densities would be lower, but in lakes with low density fish populations there may be little if any impact on long-toed salamander populations. These interactions are far too complex to simply state that there are no salamanders when fish are present. (31)

Response:

Adams et al. (2000) state that long-toed salamanders were most common in ponds without fish in Olympic National Park. Bury et al. (2000) conclude that while there is only limited concern about widespread losses of amphibians in the two parks studied (Olympic National Park and North Cascades), introduced fish may be the most serious threat in lakes and ponds and are being assessed in the draft plan/EIS. Text on page 23 (second to last paragraph) of the draft plan/EIS describing studies in Olympic National Park has been revised to state that researchers concluded that there is a negative correlation between long toed salamanders and abundance of introduced fish in the North Cascade Complex.



Concern ID: 10028

**CONCERN
STATEMENT:**

Several comments expressed concern regarding hybridization between various species of native and non-native fish. The plan/EIS also incorrectly states that brook trout are stocked in park waters. Brook trout have not been officially stocked in park waters for decades.

Representative Quote(s): Fish stocking includes the introduction of fish in historically fishless lakes, and stocking other lakes with non-native fish. The native ecosystems of these mountain high lakes are affected by the introduction of non-native fish populations. Specifically, populations of bull trout, a threatened species, are at risk of hybridizing with brook trout. The hybrid population further damages the native bull trout population by competing in and changing the fish's already fragile ecosystem. Westslope cutthroat trout also are at risk of hybridization with rainbow trout through non-native rainbows dispensing from mountain lakes. Chinook and Coho salmon are at risk of declining breeding and rearing habitat due to the presence of non-native trout dispersion from mountain lakes. (23)

SPECIAL STATUS SPECIES Fish: (pg 26) "The genetic integrity and ability to reproduce in bull trout may be affected if stocked brook trout escape from lakes?" Brook trout have not been officially stocked in the [North Cascades Complex] lakes for decades. This concern has no bearing on which plan/EIS alternative is finally selected as the Record of Decision since there is no intention in any of the alternatives to stock brook trout. Everyone would like to see these brook trout removed from [North Cascades Complex] complex waters. The implication found in this statement that brook trout might be stocked needs to be removed from this section. (31)

Response: The potential threat to genetic integrity of native fish species is discussed on page 26 of the Draft Plan/EIS (Special Status Species – Fish). Bull trout, Chinook salmon, and Coho salmon are specifically mentioned in the discussion.

The first sentence of the **Fish** paragraph has been revised.

Concern ID: 10029

**CONCERN
STATEMENT:**

One comment suggested that it is impossible to determine the species composition and abundance in those lakes prior to being stocked, along with what kind of complex interactions took place prior to human manipulation.

Representative Quote(s): Historically the lakes outlined in this plan have been naturally fishless; it is just in our more recent history that humans have managed to manipulate even the farthest reaching of natural systems. Most lakes that are stocked or have a history of stocking have unique characteristics that un-stocked lakes do not have. Therefore to compare a lake that has been stocked to a lake that has not been stocked in the North Cascades Complex, and based on those comparisons to then conclude that there are no major impacts, this is basically shoving the scientific evidence under the carpet. You need to support good science. It is impossible to determine the species composition and abundance in those lakes prior to being stocked, along with what kind of complex interactions took place prior to human manipulation. We simply cannot identify what has been lost in these stocked lakes. (85)

Response: NPS recognizes the limitations of the OSU/USGS research as presented in a series of reports by the principal researchers, Liss and Larson. An overall summary of the results is presented in the Phase III Final Report (Liss et al. 2002a). Despite the limitations of the OSU/USGS research, NPS believes that this work, which was conducted during the period of 1990 through 1999, is the best available science and is consistent with guidance given in NPS Management Policies section 2.1.2 which

states “Decision-makers and planners will use the best available scientific and technical information and scholarly analysis to identify appropriate management actions for protection and use of park resources” (2006) NPS believes there are enough data to move forward with the proposed management actions described in the final plan/EIS.

CC1000 – Consultation and Coordination – General Comments

Concern ID: 10030

CONCERN

STATEMENT:

One comment questioned why the complete list of Technical Advisory Committee members, including names and qualifications of each member, was not in the plan/EIS. NPS should disclose for the Public Record which sections of the plan/EIS were written by which subject experts.

Representative Quote(s): The only place in the EIS where I could find reference to who the members of the Technical Advisory Committee were was on page 458, which showed a very general list of the Agencies involved. (22)

Response:

The plan/EIS has been revised to include the charter of the Technical Advisory Committee (TAC) and its members. A list of preparers and consultants is provided in the “Consultation and Coordination” chapter.

CR2000 – Cultural Resources – Methodology and Assumptions

Concern ID: 11071

CONCERN

STATEMENT:

ID NUMBER

One comment stated that there may be native fish in high mountain lakes, and therefore stocking should continue.

Representative Quote(s): The plan/EIS implies -- probably states, but I missed it -- there were or are no native fish in [the North Cascades] Complex; ipso facto, no native fish equals no authority to stock fish to some. [North Cascades Complex] staff archeologist, in a paper published March, 1997, titled, An Updated Summary Statement of the Archeology of the North Cascades National Park Service Complex, has several references to fish being in the North Cascades Complex centuries ago. Here is one quote: The lands in today's park complex were occupied by human groups for at least the last 8,400 years. That's a quotation. And continue, Most of the archeological sites in North Cascades Complex consist of below-ground remains of camps and resource areas where Indian people processed and cooked food, collected specific kinds of rocks and minerals for tools and hunted, fished and collected plants, end of quote. Could Ross Lake fish be descendents from 8,400 years ago? Could fish have come up Skagit River before the Ross Lake dam was built and moved into connecting streams and lakes? Actually, could Ravens and/or Loons have dropped fry into lakes? (26)

Response:

There is strong scientific evidence that suggests there were no fish in the high mountain lakes prior to stocking, therefore the NPS stands by its assertion that fish are not native to mountain lakes. Please refer to the “Origin of Mountain Lake Biota” section in Chapter 3 for more information on how aquatic life other than fish is believed to have colonized the mountain lakes.



CR4000 – Cultural Resources – Impact of Proposal and Alternatives

Concern ID: 10031

CONCERN STATEMENT: One comment states that the cultural resources impacts section needs to be rewritten. In this section alternative B talks about impacts due to fish removal, but in alternative D where impacts are higher, no mention is made of such impacts.

Representative Quote(s): Cultural Resources- This section needs to be re-written due to similar problems that exist in the “Wildlife” section above. For example, in this section alternative B talks about impacts due to fish removal, but in alternative D where such impacts are higher, no mention is made of such impacts. Such omissions as these give the clear impression that the author has a prejudice toward favoring alternative D. (31)

Response: Impacts related to fish removal activities have been added to the discussions for alternatives C and D in the text and in tables 15 and ES-4.

MT1000 – Miscellaneous Topics – General Comments

Concern ID: 11073

CONCERN STATEMENT: Several comments stated that there are errors or typos in the plan/EIS.

Representative Quote(s): Of the lakes listed above, Hidden Thornton (Lower and Upper), and Monogram might be stocked by aircraft. --[Draft plan/EIS] Volume one P 376 That should be Middle Thornton, not Upper Thornton. Upper Thornton has no fish stocking history and will not be stocked. The middle lake is currently stocked by hand it is unlikely to be stocked by aircraft in the future. (55)

On page 114 of Volume 2 there appears to be a typo in the Species/strains historically present section. “IC” is listed as a species. (81)

Response: Page 385 has been revised to state that preference would be given to backpack stocking. Editorial changes have been made.

PN 1002 – Summary and Application of Existing Research

Concern ID: 11032

CONCERN STATEMENT: Comments believe this section should be reorganized using the concept of nonreproducing, low-density fish populations versus reproducing populations, especially those that reach high densities.

Representative Quote(s): SUMMARY OF EXISTING RESEARCH This entire section needs to be reorganized using the vital concept of nonreproducing, low density fish populations verses reproducing populations, especially those that reach high densities. This distinction is not fully appreciated in much of the research that has been done on the effects of stocked fish in high lake ecosystems. The Liss and Larson study does make this distinction and in doing so makes it clear how important it is to make this distinction when analyzing fish impact data. Since the Liss and Larson study is the best evidence we have for the [North Cascades Complex] high lake ecosystems, we should be guided by it. To mix in research results that do not make this vital distinction regarding fish densities is to mix apples and oranges invalidating any point this section could have. The organizing principle of this entire section must be to segregate scientific evidence based on nonreproducing, low density fish populations from scientific evidence based on reproducing fish populations; to do otherwise is to ignore the NPS's own funded research in the [North Cascades Complex] on the impact of fish in lakes. (31)

This summary paragraph clearly needs to be rewritten just as this entire “Summary of Existing Research” section needs to be. It is almost unbelievable that the concluding final paragraph of the science section in an EIS that depends vitally on the concept of nonreproducing, low density fish populations to differentiate among its alternatives does not even mention this vital distinction. (31)

Response:

NPS agrees that the distinction between reproducing and nonreproducing fish is a key concept that helped frame the management alternatives. It also should be remembered that in most lakes positive correlations of reproducing trout with high densities on nonreproducing trout with lower densities have been seen. The section of interest in “Summary of Existing Research” (p. 18-19) has been revised.

PN 6000 – NPS Management Policies and Mandates

Concern ID: 11033

**CONCERN
STATEMENT:**

Comments stated fish stocking is in direct violation of the original management and purpose of the National Parks and it fails to protect park resources and values and impairs the biological integrity and diversity of a native ecosystem. Alternative D is the only alternative that is not in conflict with the mandate of the NPS.

Representative Quote(s): The Organic Act of 1916 authorized the creation of National Parks, it states: “the fundamental purposes of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” The enabling legislation of the North Cascades Complex follows the spirit of Organic Act. Fishing is identified as an appropriate recreational use, and the legislation does not distinctly authorize policy variation from the norm with regard to the issue of fish stocking. To be clear: the enabling legislation does not identify fish stocking as a legal, or appropriate means of fish management. (21)

I believe that the decision should not be based on science alone, although science should inform the decision. There is a host of other things to consider, most importantly the Organic Act of 1916 and NPS Management Policies, which gives the NPS clear guidance on how to manage natural resources (4.4.3 “The Service will not stock waters that are naturally barren of harvested aquatic species.”). The scientist that worked on this project were hired in part to guide you in the decision management should support, instead of following this guidance, management instead is trying to change its enabling legislation in order to avoid following what it is directed to do. NPS Management Policies 4.1.4 states: “...the Service will develop agreements with federal, tribal, state, and local governments and organizations, and private landowners, when appropriate, to coordinate plant, animal, water, and other natural resource management activities in ways that maintain and protect, not compromise, park resources and values. If fish stocking continues, North Cascades Complex will fail to maintain and protect its resources and values. The North Cascades Complex can continue its commitment to coordination with the [Washington Department of Fish and Wildlife] by following the guidance provided by NPS Management Policies (4.4.1.1): “To meet its commitments for maintaining native species in parks, the Service will cooperate with states..., to prevent the introduction of exotic species into units of the National Park System, and remove populations of these species that have already become established in parks.” (85)

The most recent 2001 edition of National Park Service Management Policy is explicit: the Service, “will try to maintain all the components and process of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those



ecosystems.” The 2001 document is clear on the issue of fish stocking: “The Service will not stock waters that are naturally barren of harvested aquatic species.” Today, many parks have discontinued stocking, the Park Service has reaffirmed long-term policies of banning fish stocking in barren waters, and scientific evidence continues to affirm that fish stocking is detrimental to ecosystem health. It is clear that fish stocking is in direct violation of the original management and purpose of National Parks. We do not support rewriting of the North Cascades Enabling legislation, or any other federal legislation intended to perpetuate fish stocking or otherwise degrade this national treasure. (21)

Response:

NPS recognizes that fish stocking is not explicitly allowed under the enabling legislation for the North Cascades Complex and that the current NPS policies state that the NPS will not stock waters that are naturally barren of fish.

However, the impact analyses in the plan/EIS make clear that fish stocking as proposed under the preferred alternative does not threaten to impair any park resources. NPS has identified alternative D as the environmentally preferred alternative. Under alternative B, the preferred alternative, if Congress does not act to clarify that fish stocking is an appropriate activity in the North Cascades Complex, NPS would implement alternative D.

Concern ID:

10034

**CONCERN
STATEMENT:**

Several comments are concerned that NPS Management Policy 1.6 (2001) [in NPS *Management Policies 2006*, Environmental Leadership is section 1.8] Environmental Leadership is not being followed. In choosing alternative B, North Cascades is abandoning its responsibility of environmental leadership.

Representative Quote(s):

As the Superintendent you should be showing your leadership as was intended by NPS Management Policies 1.6 Environmental Leadership which states: “Given the scope of its responsibility for the resources and values entrusted to its care, the Service has an obligation, as well as a unique opportunity, to demonstrate leadership in environmental stewardship.” Later, it directs the Service to, “...tangibly demonstrate the highest levels of environmental ethic.” Do not abandon your responsibility of environmental leadership. As a leader within the NPS, you are directed to lead by example, make the example be to promote biodiversity and remove the fish from the historically fishless lakes. This is the only environmentally sound and ethical example that you should be following as a leader of the National Park Service. (85)

There is a host of Federal and National Park Service Management Policies and Acts, which must be followed: NPS Management Policy 1.6 (2001) Environmental Leadership states: “Given the scope of its responsibility for the resources and values entrusted to its care, the Service has an obligation, as well as a unique opportunity, to demonstrate leadership in environmental stewardship.” Later, it directs the Service to, “...tangibly demonstrate the highest levels of environmental ethic.” In choosing Alternative B the North Cascades Complex is abandoning its responsibility of environmental leadership. The NPS is directed to lead by example; the example the [North Cascades Complex] is creating by choosing to allow fish stocking is that of a misguided environmental ethic. Through continued fish stocking, the [North Cascades Complex] sets a precedent for neighboring land managers to perpetuate the practice of stocking exotic species into designated wilderness areas. The [North Cascades Complex] should explain to the public why it is willing to abandon this policy. (22)

Response: NPS believes it has complied with the letter and spirit of Management Policy 1.8 (2006) in the preparation of this plan/EIS. In demonstrating environmental leadership, NPS must implement the *National Environmental Policy Act* faithfully; and continually reassess its stewardship of park resources (Policy 1.8, NPS *Management Policies 2006*). Congress has given NPS the authority to determine what uses of park resources are proper and what proportion of park resources are available for uses such as recreation and conservation; however, courts have consistently interpreted the NPS *Organic Act* and its amendments to elevate resource conservation above visitor recreation. Under the preferred alternative, (alternative B) which would be implemented only if Congress clarified NPS authority, NPS would allow fish stocking to continue in select lakes while at the same time conserving the biological integrity of the resources within the North Cascades Complex. If Congress fails to provide clarification, the preferred alternative would default to alternative D, which would discontinue stocking in all of the 91 lakes in the plan/FEIS study area.

Concern ID: 10035

CONCERN STATEMENT: Several comments stated that the stocked trout species represents the introduction of a non-native invasive species to the ecosystem in North Cascades, and that the NPS has a national and local policy, including Executive Order #13112, of eradicating invasive species to the extent feasible and providing restoration of native species and habitat conditions in ecosystems that have been invaded.

Representative Quote(s): In addition, as a major directive of the Park Service, the agency has spearheaded the fight against the spread of non-native species within park boundaries. Executive Order #13112, regarding invasive species, states that park units will, “(i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them.” Under the National Park Services 1999 Natural Resource Challenge, the NPS is directed to combat the spread of non-native species. NPS Director Fran Mainella states “The presence of non-native plants, animals, and other [pest] organisms pose a major and nearly universal threat to the preservation and restoration of natural habitats.” Identifying, mapping, and evaluating non-native species is critical to an effective and well targeted effort to control their negative effects. The National Park Service must aggressively target these invaders where they threaten park resources. (23)

The National Park Service’s Management Policies specifically state that a park unit is to “warrant the highest standard of protection.” The 2001 edition of National Park Service Management Policies is the most recent articulation of this mission. The Management Policies General Management Concepts section states the Service, “will try to maintain all the components and process of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems.” The National Park Service Management Policies are clear on the issue of fish stocking, they state, “The Service will not stock waters that are naturally barren of harvested aquatic species.” In an article commissioned by the Aldo Leopold Wilderness Research Institute, the authors state, “Stocking of fish in NPS wilderness must be for the purpose of preserving or restoring natural aquatic habitats and the natural abundance and distribution of native aquatic species.” (23)



Under the Environmental Alternative, the Park can continue its commitment to coordination with the [Washington Department of Fish and Wildlife] by following the guidance provided by current NPS Management Policy 4.4.1.1(2001): “To meet its commitments for maintaining native species in parks, the Service will cooperate with states to prevent the introduction of exotic species into units of the National Park System, and remove populations of these species that have already become established in parks.” (22)

[North Cascades Complex] stocking of the Mountain Lakes even under strictly modified conditions, e.g., stocking not reproducing fish, is an artificial practice and is founded on an “invasive” species mentality in its approach to management of these otherwise fish-free [“barren” areas]. Of course, these are not barren areas as they support a rich flora and fauna of high lake ecosystems and, left alone, could serve over time as ecological reference points for much of the Anthropocene. (18)

Response:

NPS recognizes that the preferred alternative would allow the introduction of non-native species to continue in select lakes within the North Cascades Complex. While the continued introduction of non-native species would be allowed, the species of fish proposed to be stocked would not be capable of reproducing and thus would not be considered invasive. Executive Order #13112 is aimed at stopping the spread of invasive species. The Order requires that agencies control invasive species, which can be accomplished by eradication, but also by management when there is a benefit to the presence of the non-native species.

Under the preferred alternative, reproducing fish populations that could be considered to be invasive would, where feasible, be removed from the high mountain lakes in the Complex, consistent with NPS *Management Policies 2006*, section 4.4.1.1. To the extent that continued fish stocking violates current NPS policies, the preferred alternative would ask Congress to clarify whether continued fish stocking in the high mountain lakes is appropriate. If Congress fails to provide clarification, the preferred alternative would default to alternative D, which would discontinue stocking in all of the 91 lakes in the plan/EIS study area.

PN3000 – Purpose and Need – Scope of the Analysis

Concern ID: 10036

CONCERN STATEMENT: Several comments stated that even though the plan/EIS claimed that the analysis occurred on a landscape scale, it actually only considers a certain subset of the park.

Representative Quote(s): The scope of the analysis: The [plan/EIS] states, (Volume 1, page 459) “The public also expressed a concern that the analysis occur on a landscape scale, so the Technical Advisory Committee took a broad look at lakes in the [North Cascades Complex] and selected a representative number of lakes to remain fishless under each alternative.” Then it goes on to say, (Volume 1, page 48) “A total of 245 mountain lakes are in the [North Cascades Complex], and at least 154 of these lakes have always been fishless and would continue to be fishless under any alternative. Because they would remain fishless and because they have never been part of the managed fishery, these 154 lakes were not analyzed in this plan/EIS.” (6)

The Draft should note in clear language that most of the 561 bodies of water in the Complex have not been surveyed and the range and density of existing habitat for sensitive species is uncertain. Also, that the geography covered by the 22 well-managed lakes with continued stocking under Alternative B is insignificant compared to the probable overall habitat for most of the amphibian, zooplankton and macroinvertebrate species in the Complex. I believe the EIS draft casually dismisses the fact that only 91 lakes out of 245 were studied. This gives a false inflated impression of the extent of impacts documented from fish densities in lakes. (81)

The public also expressed a concern that the analysis occur on a landscape scale, so the Technical Advisory Committee took a broad look at lakes in the [North Cascades Complex] and selected a representative number of lakes to remain fishless under each alternative.” –[The draft plan/EIS] Volume one P 459 This is an important statement. The [plan/EIS] should be looking at lakes on a landscape scale and the above statement would lead us to believe it does. But look at this: A total of 245 mountain lakes are in the [North Cascades Complex], and at least 154 of those lakes have always been fishless and would continue to be fishless under any alternative. Because they would remain fishless and because they have never been part of the managed fishery, these 154 lakes are not analyzed in this plan/EIS. The 91 lakes addressed in this plan/EIS. --[The draft plan/EIS] Volume one P 48 So only 91 lakes were considered in the plan/EIS. If 245 lakes are in the complex analyzing only 91 of them is not analyzing on a landscape scale. That leaves the final plan to understate the number of lakes that should be stocked in the future. By only considering the 91 lakes with a history of fish stocking and eliminating some lakes from consideration for stocking based on this subset the [Technical Advisory Committee] was forced to eliminate some lakes that shouldn't have been eliminated had the analysis truly been landscape wide. The lake by lake analysis needs to be redone before the final plan is produced and consideration needs to be given to lakes that have never been stocked if they will serve as representative undisturbed habitat that would allow more lakes with previous management history to continue to be stocked. The wishes of the public, as expressed in the scoping meetings should be fully addressed, not swept aside with disingenuous doublespeak. (55)

Response:

The 91 lakes with a history of fish stocking are scattered across the entire landscape of the park. The decision to limit management to 91 lakes with a history of fish stocking was made out of an abundance of caution and concern for avoiding impacts to lakes that have never been stocked (see Project Site Location, page 6). The Washington Department of Fish and Wildlife supported this decision. Although management actions would be limited to the 91 lake subset of all lakes in the North Cascades Complex, the entire landscape was considered when developing management alternatives (e.g., Tables 1 and 2 in the “Alternatives” chapter) and evaluating the potential impacts (e.g., “Environmental Consequences” chapter).

Concern ID:

10037

**CONCERN
STATEMENT:**

Comments question the 15-year life span of the management action is too short a time span.

Representative Quote(s):

“Upon conclusion of the plan/EIS and decision-making process, one of the four alternatives would become the “Mountain Lakes Fishery Management Plan” and guide future fishery management actions for a period of 15 years.” I think 15 years is too short a time span. 11 million dollars of research and this [plan/EIS] process is a lot of public money and effort for such a short time period. This is the lifespan of 2-3 generations of fish and not enough time to adaptively manage the lakes. I would like to see science and monitoring determine the long-term management of these lakes and not an arbitrary time period. (81)



Response: The NPS agrees that 15 years is probably too short a time span to fully implement management actions addressed in the Plan. To clarify, the 15-year timeframe was used to define the impact analysis period. This timeframe was selected because predicting impacts beyond 15 years would be too conjectural due to changing conditions.

PN4000 – Purpose and Need – Park Legislation/Authority

Concern ID: 10038

CONCERN STATEMENT: Several comments stated that it is clear in the congressional record of the North Cascades proceedings that Congress intended fish to continue to be a part of this national park experience.

Representative Quote(s): The following very telling exchange occurred between Congressman Lloyd Meeds, Congressman Morris Udall, and National Park Service Director George Hartzog during a hearing on these House bills. The exchange seems to make clear to the Committee members that fishing and fish stocking would be permitted in the proposed park. This exchange was later referred to by State of Washington officials and citizens as part of the basis for their belief that the establishment of a National Park would not interfere with the state's highly successful stocking program for the high lakes in the area. Meeds: "Mr. Campbell, this is the second time I have heard this statement today and if I may, Mr. Chairman, I would like to ask Mr. Hartzog, Director of the Parks, a question which I do not know the answer to, through Mr. Campbell. " Udall: If you are willing to run the risk of the answer, I will let you ask Mr. Hartzog." Meeds: "Mr. Hartzog, I see in this testimony a statement that the Park Service 'limits planting of fish in lakes with no native fish populations that are now planted by the Forest Service and the State game department working together.' Is that a true statement?" Hartzog: "It is not, and I do not know how on earth this information goes around, Mr. Meeds. We have an active fish-planting program in every single major park and for many years we had a Fish and Wildlife Service hatchery operated in Yellowstone National Park. Now, if the stream already has its limit of fish comparable with its food-carrying capacity, then obviously, we do not engage in put-and-take fishing program. But, we plant fish in practically every area that I can think of off the top of my head now, including all of our major national parks. Meeds: "Thank you, Mr. Chairman, I really did not know the answer. I heard that twice this morning and it was my understanding the Forest Service did allow planting of fish. I am glad to get that cleared up." (31)

The [plan/EIS] claims that congressional clarification is required to give [the North Cascades Complex] authority to continue fish stocking--because nothing is contained in the legislation authorizing fish stocking. Many management actions were NOT spelled out in 1968 enabling legislation. Is legislation needed to build a bridge on a trail? Or even to build a trail itself? Is legislation needed to repair a trail? Does the legislation authorize campfires to be allowed? Congress intended hiking and trail building to be continued once the park complex was established. In the same way, the congressional record shows that fishing, along with proper fish stocking, also was intended. The [plan/EIS] statement that fish stocking cannot continue without legislative clarification is unjustified, given the [North Cascades Complex's] history as evidenced in the congressional hearings, and by [North Cascades Complex] management actions to now. (26)

It is a -- fish stocking is the only way to continue with the recreational fishery of any sort in the national park -- North Cascades National Park. In 1967 Washington's congressional delegation was assured by the director of the NPS, Mr. Hertzog, that fish stocking would continue. We believe he convinced our delegation of that fact, or they would have insisted language be added to the enabling legislation so there would be no mistake as to their desires and recreational fishing in this park. (71)

Current members of our club were actively involved with the Washington State congressional delegation, particularly Repr. Lloyd Meeds and Senator Henry Jackson during the many discussions that were held during the creation process for the [North Cascades Complex]. We have no doubt that there was a clear understanding, reached by our congressional delegation, with the Secretary of the Interior, Stewart Udall that the WDG (WA Dept. of Game), would continue to manage these mountains lakes, including restocking of the fish upon creation of the [North Cascades Complex] in our state. (41)

Response:

NPS recognizes that many local residents believe they were promised that fish stocking would continue after the North Cascades Complex was established. While the NPS Director at the time did make statements to the effect that stocking would be allowed to continue, during the same timeframe the Director made conflicting statements that stocking would not be allowed to continue. Because of these conflicting statements, the record is unclear as to whether stocking was intended to continue. NPS policies regarding fish stocking have changed significantly since the North Cascades Complex was established. Furthermore, there are no references to fish stocking in the legislative histories of the North Cascades Complex, the *Wilderness Act*, or the *Washington Parks Wilderness Act*. The preferred alternative attempts to resolve the controversy permanently by having Congress clarify whether stocking is an appropriate activity within the North Cascades Complex.

Concern ID:

10039

**CONCERN
STATEMENT:**

Comments state that other recreational activities are not called out in enabling legislation, similar to fish stocking.

Representative Quote(s):

ALTERNATIVE A (pg 72) IMPLEMENTING THE FISHERY MANAGEMENT PLAN THROUGH CONGRESSIONAL ACTION “The enabling legislation for the North Cascades Complex does not mention fish stocking, and the legislative record regarding fish stocking in the North Cascades Complex is not clear. Therefore, the language in the enabling legislation for the portions of the North Cascades Complex in the national recreation areas does affirm that fishing is an important recreational use, but it does not mention fish stocking as being an appropriate means of fishery management. The Washington Park Wilderness Act of 1988 (WPWA) established 93% of the North Cascades Complex as Stephen T. Mather Wilderness and directed the NPS to manage the wilderness in accordance with the Wilderness Act of 1964. At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters, and the WPWA did not include a provision for allowing stocking. (For more detail on legislation and history, please refer to the “History of Fish Management in North Cascades Mountain Lakes” section in the “Purpose of and Need for Action” chapter and Louter 2003).” (PG 73) As in other places in the draft [plan/EIS], this paragraph is misleading since it creates the impression that other activities besides fishing and fish stocking are mentioned in the [North Cascades Complex] enabling legislation and/or the WPWA. That is not the case. None of the typical visitor activities such as fishing, hiking, horse back riding, or camping are mentioned in either document; nor are NPS supporting management actions such as trail maintenance or trail bridge building mentioned. Such paragraphs as these are misleading, and actually seem to expose a prejudice against fishing and



fish stocking as an accepted activity within the NPS regardless of the historical context in which legislation was passed. (31)

Implementing The Fishery Management Plan Through Congressional Action “The Washington Park Wilderness Act of 1988 (WPWA) established 93% of the North Cascades Complex as Stephen T. Mather Wilderness and directed the NPS to manage the wilderness in accordance with the Wilderness Act of 1964. At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters, and the WPWA did not include a provision that allowed stocking.” These sentences are quite misleading since they seem to build the case with no justification that somehow these two pieces of wilderness legislation intended to prohibit fishing or fish stocking. This is absolutely not the case. As in the other instances above both of these acts are silent on fish stocking, just as they are silent on most, if not all, accepted visitor activities. (31)

Response:

NPS recognizes that recreational activities do not need to be specifically authorized in enabling legislation in order to be considered acceptable and appropriate uses in national parks. In this case, the practice of fish stocking is currently in direct violation of NPS management policies. Furthermore, all but one (Thunder Lake) of the high mountain lakes analyzed in this plan/EIS are located in a designated wilderness area. There are no references to fish stocking in the legislative histories of the North Cascades Complex, the *Wilderness Act*, or the *Washington Parks Wilderness Act*. The preferred alternative attempts to resolve the controversy permanently by having Congress clarify whether stocking is an appropriate activity within the North Cascades Complex.

Concern ID:

10041

**CONCERN
STATEMENT:**

Comments oppose alternative D as the default alternative.

Representative Quote(s):

This comment challenges the draft [plan/EIS] conclusions that fish stocking under Alternatives A, B and C require congressional clarification and that Alternative D will be implemented until clarification is received. (69)

This policy is not dependent on approval by Congress, and as such the provisions of this draft [plan EIS] that proclaim that alternative D must prevail until such congressional clarification is obtained are in contradiction to this NPS policy adopted at the highest NPS level in 1986. (31)

[The Washington Department of Fish and Wildlife] recognizes the Park's intent to gain clarification of the enabling legislation that would explicitly allow for the stocking of fish to continue within the park. However, in our view the intent of congress in the enabling legislation is clear and the continuation of active fisheries in the Park was expected. While [the Washington Department of Fish and Wildlife] supports clarification on the enabling legislation we also recognize that such action may take several years and that until that clarification is received a default position must be held. Alternative B should be adopted as the default position until clarification is received for the following reasons: 1. It is based on a fish management plan developed from the best available science, 2. It is consistent with the expressed purpose of this [plan/EIS], and 3. It addresses all aspects of the environmentally preferred alternative as defined. (39)

“Congressional action to clarify enabling legislation is an intricate process that could take several years. If the NPS does not receive clarification from Congress by the time a record of decision for this plan/EIS is issued, alternative D (91 Lakes Would Be Fishless) would be implemented until clarification is received.” There does not seem to be any basis for picking alternative D as this fallback, and presumably

temporary, course of action. If the NPS continues to feel that it needs congressional clarification before it has proper guidance to make a decision, I suggest that alternative A is a more appropriate choice. As in most legal or public actions, the expected default course when a definitive decision can not yet be made is normally to retain the status quo (i.e., alternative A). Choosing alternative D in the face of lack of clarification is tantamount to making a de facto decision not based on the evidence in the [plan/EIS], but on the political climate in Congress. Surely maintaining the status quo would be a less drastic action until the clarification from Congress can be obtained. (31)

We also find it repugnant that Alternative D will automatically be in effect, after 2 years, if congress fails to pass legislation stating that fish planting is allowed in the [North Cascades Complex]. The “then” Secretary of the Interior, Stewart Udall, and the “then” Director of the National Park Service, George Hertzog, both assured the congressional delegation of this state that fish planting would continue if a park were to be created. Under those circumstances it is no wonder that congress felt no need to insert fish stocking language into the enabling legislation for the [North Cascades Complex]. (45)

I don't see why Alternative D is the default in case of missing legal justification. An alternative would be to extend the [memorandum of understanding] until legal approval is reached if necessary. (3)

Response: NPS recognizes that some comments disagree with the selection of alternative D as the default alternative. NPS has selected alternative D as the default alternative because it is most closely aligned with the spirit and letter of current NPS policies and legal mandates. Alternative D would be implemented unless or until Congress affirms that stocking is appropriate.

Concern ID: 10042

CONCERN STATEMENT: Several comments stated that NPS has committed to make North Cascades fish stocking decisions based upon information, not based upon law change, and that a law change is not necessary.

Representative Quote(s): NPS has committed itself to make North Cascades fish stocking decisions based upon information (facts and science), not based upon law change. In the 1985 Memorandum of Understanding the NPS and [Washington Department of Fish and Wildlife] agreed to consult with each other regarding research and regulation and transplanting offish, and they agreed to establish Technical Study Task Forces. The 1986 NPS Memorandum directs that some of the North Cascade Park lakes be stocked with species native to the Park or ecological region for recreational purposes and directed that some be left fish free; and it encouraged a research effort to monitor impacts and determine changes over time. The intent of the research was to provide an informed basis for fish stocking management in the future. The 1988 twelve year Supplemental Agreement allowed fish stocking in 17 Park lakes and allowed self sustaining populations to continue in 23 more while the NPS conducted research. The letter and spirit of all the agreements dictate that the final decisions be based upon information, not legislation. The late date insistence upon legislation prior to scientifically conducted fish stocking violates these agreements. (69)

This comment further submits that the National Park Service (NPS) has instituted policies and executed agreements that require it to make fish stocking decisions based upon the local facts and scientific findings and not contingent upon a change in the law. (69)

“These data will help provide an informed basis for determining whether changes in our fish-stocking management actions may be needed in the future.” (pg 9) Here the



memo provides the basis of the very [National Environmental Policy Act process underway now- a part of which is this [plan/EIS]. Mott's vision does not include any statement, or even concern, that congressional clarification is required. Mr. Mott apparently felt in 1986 that as Director of the NPS he had full authority to establish a fish stocking policy for the [North Cascades Complex], and he anticipated the day when scientific research and data would bring the [North Cascades Complex] to the point of having being able to adopt a preferred alternative (alternative B) which would then implement those "changes in our fish-stocking management actions". (31)

"The agreement expired in December 2006, and any future agreements between the NPS and [Washington Department of Fish and Wildlife] concerning mountain lakes fishery management, including fish stocking in the national park, will depend on the outcome of this plan/EIS process." The underlined phrase is incorrect. This agreement has been extended to December 2006. (31)

Response: NPS is committed to making decisions based on science, and believes it is doing so through this plan/EIS process. However, NPS cannot ignore legal and regulatory mandates. In addition, Director Mott's memorandum was issued prior to the designation of much of the Complex as wilderness in 1988. The preferred alternative attempts to resolve the controversy permanently by having Congress clarify whether stocking is an appropriate activity within the North Cascades Complex.

Concern ID: 10043
CONCERN STATEMENT: One comment requested that the May 1967 quote from Director Herzog be rewritten.

Representative Quote(s): "In May 1967 he stated that within the park the NPS would not participate in a 'put and take' program, and would not concur with stocking lakes that historically did not have fish." (pg 14) This sentence needs to be re-written for clarity. Since the draft [plan/EIS] specifically excludes lakes that do not have a history of fish stocking, the wording of this sentence points to the Tong qualification. It should be recast along the lines of: "In May 1967 he stated that within the park the NPS would not participate in a 'put and take' program, and would only concur with stocking lakes that historically had fish." Additionally, please cite a reference for this statement (I have been unable to find this quote from Director Hertzog in any of the congressional hearing transcripts). (31)

Response: Pages 13 – 14 have been revised to clarify this quote.

PO 6500 – Congressional Legislation – Oppose

Concern ID: 10044
CONCERN STATEMENT: Several comments expressed opposition to changing the enabling legislation because it is unnecessary and could set a national precedent for other areas in which fish stocking is banned.

Representative Quote(s): Further, The Wilderness Society is strongly opposed to any effort to amend the enabling legislation for the North Cascades Complex to allow for continued stocking of non-native fish in Wilderness areas. We feel that such legislation is unnecessary and could set a bad precedent for other areas in which this practice has been banned. (5)

While Alternative B, the adaptive management alternative, has aspects that certainly invite support, asking Congress to grant North Cascades Complex an exception to

NPS Management policies with the “unambiguous legal authority” to stock non-native fish in fishless lakes could set a dangerous national precedent. (Anonymous)

Even though all of the Policies and Acts stated above clearly direct the Park Service to discontinue stocking and eliminate fish from our high mountain lakes, the [North Cascades Complex] has decided to attempt to circumvent them. The [North Cascades Complex] proposal to change the enabling legislation for the creation of the park, to explicitly allow for the stocking of fish should be reconsidered. As stated in the [plan/EIS], changing the enabling legislation may endanger current policy in several other National Parks where fish stocking has been eliminated. If this is true, this strategy is selfish and very risky. The Park Service must explain why it would be willing to endanger not only the biological diversity and integrity of the [North Cascades Complex] through the continuation of stocking, but other Parks as well. Changing the enabling legislation to suit the needs of a small minority of fisher-people defeats the purpose of having all of these Policies and Acts in the first place. We have the laws already; we just need to start following them. (22)

Response:

NPS has decided to ask Congress to clarify whether fish stocking is an appropriate activity in the North Cascades Complex because of the unique nature of the controversy over fish stocking. Prior to the establishment of the Complex, the NPS Director made conflicting statements as to whether stocking would be allowed to continue once the North Cascades Complex was designated. Fish stocking in the high mountain lakes took place long before the Complex was established and has never ceased. Based on the impact analyses in the plan/EIS, NPS does not agree with assertions that if stocking is allowed to continue it would endanger the biological diversity and integrity of the North Cascades Complex.

PO1000 – Park Operations: Guiding Policies, Regs and Laws

Concern ID: 10045

CONCERN STATEMENT: Comments contend that the Mott memo was misrepresented as a waiver and was really a specific policy set for North Cascades National Park.

Representative Quote(s): “While the current NPS Management Policies and practices prohibit stocking in areas designated as national parks,” (pg 14) NPS-wide policy on fish stocking does not apply on its own to the [North Cascades Complex]. The 1986 Mott memo clearly states that the NPS adopted a specific [North Cascades Complex] only policy for fish stocking given the history of the park's creation and the controversy between the NPS and the [Washington Department of Fish and Wildlife] regarding fishery management within the park. It is misleading to imply that NPS-wide policies somehow apply to the [North Cascades Complex] without reference to these [North Cascades Complex]-specific NPS policies. (31)

Before I comment on the three specific reasons for requiring “congressional clarification” I not a reliance throughout the reasons and in the draft [plan/EIS] as a whole upon the characterization of the 1986 NPS Memorandum as a “Policy Waiver.” The draft [plan/EIS] identifies this Memorandum as a “Policy Waiver” every time it is mentioned, even in the table of contents to volume two, and in Appendix A Contents page 1 and again at page 3. In fact, the 1986 NPS Memorandum is the statement of specific North Cascades Complex fish management and stocking policy, and it says nothing about waiving any policy. This Memorandum recites local history and conditions and it states: “...you requested that we provide you with a clear statement regarding National Park Service Policy for management of fisheries resources in the North Cascades Complex.” That policy has



been applied now for 19 years, and it has been implemented through agreements with [the Washington Department of Fish and Wildlife] which also has fish management jurisdiction there. (69)

“Second, policy waivers are only temporary and do not provide a permanent solution because they can be rescinded as circumstances change. The goal of this plan/EIS is to forge a lasting solution for mountain lakes fishery management in the North Cascades Complex.” There is nothing more or less permanent about this plan/EIS as compared to a policy, or a policy waiver for that matter. The [plan/EIS] itself says elsewhere that it has a 15-year planning horizon. This is a false benefit and should be removed. (31)

“In contrast to sport fishing, the practice of stocking fish is generally prohibited in park units.” (pg 290) This is incorrect. General policy does not apply to the [North Cascades Complex] because the fish stocking policy for the [North Cascades Complex] was set by Director Mott in his 1986 memo. (31)

Response:

NPS recognizes that the memorandum from then NPS Director Mott dated June 12, 1986 states its objective is to give a clear statement regarding NPS policy for management of fisheries resources in the North Cascades Complex. Because the policy laid out in the memorandum is contrary to NPS service-wide policies, it has been referred to as a policy waiver throughout the plan/EIS. While the memorandum did lay out a specific NPS policy for fishery management at the North Cascades Complex as of June, 1986, a large portion of the Complex has since been designated as wilderness and NPS policies have been revised twice since 1986. Furthermore, the 2001 management policies (since amended in 2006) both clearly state that any previous policies that are inconsistent with current management policies are to be disregarded (*NPS Management Policies 2006*, Introduction).

Concern ID:

10046

**CONCERN
STATEMENT:**

Comment requests clarifying information on which policies were in effect at the time the Washington Parks Wilderness Act was passed and ask why the conditions of *NPS Management Policies*, section 4.4.4.1 have not been met.

Representative Quote(s):

The Executive Summary at page vii states that the 1988 Wilderness Act directed NPS to manage this wilderness in accordance with the 1964 Act, and “At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters...” Which policies are those? Do they apply to stocking fish native to the drainage and ecosystem involved, if not to the lake? If such policies existed in 1986 they should be added to Appendix D. The Background summary at page 11 refers to a 1972 policy that prohibited artificial stocking of fish species exotic to a park and prohibited stocking “naturally barren waters.” The draft quotes and cites Louter 2003 for this statement rather than the policy itself. What is the complete policy, to which parks did it apply, and over what time period was it in force? Both *Management Policies 4.4.3* and *4.4.4.1* provide for stocking of native or exotic species under specific situations that can apply here, i.e. historic stocking in a recreation area or preserve, or stocking in wilderness needed to meet the desired condition of a historic resource, but only where it is prevented from being invasive. At the bottom of page 32 of Volume One the draft [plan/EIS] summarizes policy 4.4.4.1 and follows that summary with an unsupported conclusion. The conclusion is that because not all of the 4.4.4.1 conditions have been met a “policy waiver” has been required. This conclusion is plainly contrary to the language of the 1986 NPS Memorandum. How was it determined that the conditions of 4.4.4.1 were not met? This conclusion is not correct. (69)

Response: At the time the Washington Parks *Wilderness Act* was passed, the NPS management policies in effect at that time prohibited fish stocking in naturally fishless waters on NPS lands.

As part of this EIS process, NPS reviewed the exceptions listed in current NPS management policy 4.4.4.1 (NPS *Management Policies 2006*, policy 4.4.4.1 is unchanged from 2001) that would allow the introduction of exotic species into parks and determined that none of those exceptions would apply to fish stocking activities in the North Cascades Complex. Through consultation with various cultural resources experts in the NPS and discussions with the tribes, the NPS has concluded that stocking is not a historically significant activity.

Text has been added to page 32 to clarify that, as part of this EIS process, NPS has reviewed the exceptions in policy 4.4.4.1 that would allow fish stocking and has determined that none of the exceptions apply.

Concern ID: 10047

CONCERN STATEMENT: Comments questioned the validity of the agreements allowing stocking because all of this was done without adequate National Environmental Policy Act analysis and public involvement.

Representative Quote(s): The [North Cascades Conservation Council (NCCC)] would like to point out, as a matter of public record that until NCCC started raising questions about the continued fish stocking in [the North Cascades Complex] around 1984 there was no memorandum of understanding between the State of Washington and [the North Cascades Complex]. Further, the negotiation of this memorandum of understanding in 1985, lamentably, included no other parties than the State, [the North Cascades Complex] and the proponents of fish stocking. In fact, the general public was not privileged to know what lakes were being stocked because this was seen as possibly attracting unwanted fishing pressure. Please note as well, that the NPS Variance granted in 1988 was in deference the State of Washington and two fish stocking groups but there is no mention of opposition from at least one conservation group. Most unfortunate, from the perspective of NCCC is that the [North Cascades Complex] requested the variance to continue to allow grant permission stock fish in some lakes. Need it be said that a “variance” is an exception to a standard practice by the NPS nation-wide to prohibit fish stocking. All this was done without adequate environmental assessment. As [the North Cascades Complex] is aware, the extant document is a result of the challenge from North Cascade Conservation Council to the General Management Plan for [the North Cascades Complex] over continued fish stocking after the designation of [the North Cascades Complex] (Appendix D Vol. 2). At that time of challenge, NCCC argued and [the North Cascades Complex] agreed in the 1991 Settlement Agreement, that impacts of stocking of fish in lakes of [the North Cascades Complex] were not adequately analyzed. This Settlement Agreement led to some highly productive and informative scientific research although the research was performed over a period longer than anticipated. Now we have completed that environmental assessment and it clearly shows adverse impacts -- in some cases small and in some cases large. (18)

Response: NPS recognizes that the agreements made between the State of Washington and the NPS were not subjected to environmental review or public involvement. In the Need for Action section chapter 1, text has been added to the plan/EIS to reflect this fact. NPS believes that the fish management decision that results from this plan/EIS process, with its in-depth environmental analyses and public involvement opportunities will remedy such deficiencies.



Concern ID: 10048

**CONCERN
STATEMENT:**

Comments stated that the plan/EIS mischaracterizes the agreements made in 1988 between the NPS and the Washington Department of Fish and Wildlife. Commenters believe that the agreements on which lakes are to be stocked can only be changed or terminated through mutual agreement between NPS and the Washington Department of Fish and Wildlife.

Representative Quote(s): The paragraph on page 13 beginning with “The 1988 Supplemental Agreement formalized these practices in the 40 lakes inside the park for 12 years while planned research on the effects of fish management activities could be completed and assessed...”

This paragraph mischaracterizes the agreements between the NPS and the [Washington Department of Fish and Wildlife (WDFW)]. The language gives the impression that the agreements made in 1988 were intended to be temporary and that the entire issue would be looked at afresh in 12 years. That is not the case. There was extreme tension between the NPS and the WDFW in the 1986 to 1988 period. Only the intervention of William Horn, Assistant Secretary for Fish and Wildlife and Parks, in an October 29, 1987 letter to WDFW Director Jack Wayland defused the legal confrontation. An extensive letter from Jack Wayland to Charles Odegaard, Regional Director NPS, on July 29, 1987, outlines the seriousness of the situation and the WDFW's desire to reach permanent resolution. That resolution was reached in part with the 1988 Supplemental Agreement. An investigation of the history of this agreement shows that the WDFW did not intend a temporary resolution to fish stocking in the [North Cascades Complex] with the 1988 agreement waiting for a final decision at some future date, but rather that the agreement would simply be reviewed after 12 year to consider the results of the scientific research begun after the 1988 agreement was signed (the “Liss and Larson” study). The agreement states that mutual agreement between the NPS and the WDFW would be required to modify the 1988 agreement. This is most clearly demonstrated in Article V (Termination) of the 1988 Supplemental Agreement which states: “This supplemental Agreement shall remain in full force and effect unless terminated by mutual consent and the Department and the Service.” (31)

Furthermore, the last sentence of the draft [plan/EIS] statement on page 13 is misleading since it does not make explicit that the outcome of the plan/EIS is subject to mutual agreement by the WDFW as the content of the 1988 Supplemental Agreement and its history clearly demand. (31)

It also stipulated that the list of lakes could be changed only by mutual agreement between NPS and WDFW and added that research results would be considered in future decisions. This 1988 agreement also stated: This Supplemental Agreement shall remain in full force and effect unless terminated by mutual consent of the Department and The Service. The 1991 Consent Decree provides that NPS will complete its research and conduct a National Environmental Policy Act (NEPA) review of fish stocking. The 2002 Reaffirmation extends the 1988 Supplemental Agreement to December 2006. By the memorandum, agreements and Consent Decree NPS has committed itself to a process that includes scientific research, consultation with WDFW and agreement not to revise the stocking list without WDFW agreement, and ultimate review and resolution of fish stocking issues by the NEPA process. (69)

Response:

The 1988 agreement says it shall remain in effect unless terminated by mutual consent of the Department (of Wildlife) and the Service (NPS). However, the agreement also states, “this supplemental agreement shall first be subject to mutual review and evaluation by July 2000. The intent is to give this Agreement a 12-year life and that upon mutual review the Agreement may be continued or modified based on information available at the time of review.” The review date of July 2000 was intended to give the NPS enough time to conduct research on how continued stocking practices would affect native biota in mountain lakes. Subsequent to the agreement, in a 1992 Consent Decree, NPS agreed to complete its research and then conduct a NEPA review of the fish stocking of naturally fish free lakes. The research was not completed until 2002 and work on this plan/EIS was undertaken shortly thereafter. The Supplemental Agreement was extended through December 2007 or until the Record of Decision is signed, whichever comes first. NPS views this plan/EIS as part of its review it was to undertake in 2000, per the Supplemental Agreement. NPS intends to amend the supplemental agreement and seek an agreement with the Washington Department of Fish and Wildlife that reflects the outcome of this EIS process. Text has been added to page 13 to clarify this point. Furthermore, the supplemental agreement incorporated the 1985 Memorandum of Understanding, which states, “nothing contained herein shall be construed as limiting the responsibility and authority, as defined by law, of the Regional Director, National Park Service, and the Director, Washington Department of Game, in connection with the administration and protection of lands and resources under their respective administrations.” While it is the intention of NPS to seek agreement with the Washington Department of Fish and Wildlife regarding fish stocking in the North Cascades Complex, this clause gives the NPS authority, even without the consent of the Washington Department of Fish and Wildlife to take any actions NPS deems necessary in order to protect park resources.

Concern ID:

10049

**CONCERN
STATEMENT:**

One comment stated that requesting a change in the enabling legislation in order to avoid being in violation of NPS Policies and the Wilderness Act defeats the purpose of having these laws and guidelines.

Representative Quote(s):

I hold North Cascades Complex to the highest standard when managing the natural resources of [the North Cascades Complex], this is also stated in the NPS Management Policies (see 1.2 NPS Management Policies: “[park units] warrant the highest standard of protection.”). This is especially true since all but one of the 91 lakes considered in the [plan/EIS] are within a specially designated area (wilderness), which means there are additional management requirements. These requirements include keeping wilderness untrammeled, or unhindered and free from intentional modern human control or manipulation; and natural, or substantially free from the effects of modern civilization. Continued fish stocking impacts both of these qualities and wilderness character is deeply impacted as a result. [The North Cascades Complex] preferred alternative to continue stocking these historically fishless lakes is contrary to the intent of NPS Management Policies as well as the Wilderness Act. Doesn't requesting a change in the enabling legislation in order to avoid being in violation of NPS Policies and the Wilderness Act defeat the purpose of having these laws and guidelines? (85)



Response: The preferred alternative attempts to resolve the controversy permanently by having Congress clarify whether stocking is an appropriate activity within the North Cascades Complex. The superintendent, in cooperation with the Pacific West regional director, is seeking this clarification because they believe the *Wilderness Act* is ambiguous in this issue. The intent of asking Congress for a clarification regarding the appropriateness of fish stocking at the North Cascades Complex was not to avoid being in violation of NPS policies or the *Wilderness Act*.

The Director of the NPS could issue a waiver in order to allow stocking to continue. However, NPS is seeking a long-term solution; a policy waiver is only temporary and may be rescinded at any time.

SS1000 – Soundscapes – Impact of Proposal and Alternatives

Concern ID: 10050

CONCERN STATEMENT: Several comments stated that the impact analysis needs to be reworked because NPS understated the impact associated with noise due to fish removal activities.

Representative Quote(s): Helicopters hovering overhead are known to generate noise levels of about 70 to 90 decibels, compared to background levels of 20 to 40 decibels. --[The draft plan/EIS] Volume one P287 According to table 33 on page 283 helicopters generate 70 to 90 decibels at 1000 feet. For fish removal the choppers are not going to hover at 1000 feet. They are going to land. Calculating the noise level, based on 90 db at 1000 feet to a more realistic 31 feet I arrive at 120 decibels. That is a huge difference. 120 db is extremely loud. Loud enough to cause damage to human hearing. This is illustrative of how impacts of fish removal are consistently soft peddled in the draft plan/EIS while impacts of fish stocking are consistently over stated. (55)

Response: This comment identified an error in the impact analysis regarding noise-related impacts from fish removal. This error was corrected in the respective “Environmental Consequences” section of the plan/EIS. There has been no intentional manipulation of the plan to favor fish removal over fish stocking.

Concern ID: 10051

CONCERN STATEMENT: Several comments stated that aircraft are not necessary to carry out stocking activities.

Representative Quote(s): Furthermore, no mention is made of the fact that the vast majority of stocking does not require aircraft, and in fact, all aircraft activity for stocking could be eliminated under alternatives A, B, or C if the Park chose to take that action (for example, using horse packers for the larger lakes now one via fixed wing aircraft). (31)

Response: The NPS and Washington Department of Fish and Wildlife agree that in most instances aircraft stocking should not be necessary. Whenever possible, preference would be given to backpack stocking; however, the Washington Department of Fish and Wildlife wishes to retain the option of continuing to stock more inaccessible lakes via aircraft. The decision about which stocking method to use would be determined by a subsequent minimum tool analysis.

VE4000 – Visitor Experience – Impact of Proposal and Alternatives (Substantive)

Concern ID: 10052

CONCERN STATEMENT: One comment stated that the plan/EIS does not provide adequate protection of the park’s fishing heritage.

Representative Quote(s): The North Cascades Draft Fish Management [Plan/EIS], while an extensive and elaborate document, is remiss in not providing adequate protection for the fishing heritage that was very influential in the original formation of the park. Specifically, none of the alternatives provides the proper level of present and future quality fishing opportunity (QFO) so necessary in maintaining the unique characteristics of one of the finest national parks in our country. (16)

Response: Through consultation with various cultural resources experts in the NPS and discussions with the tribes, the NPS has concluded that stocking is not a historically significant activity; however, NPS does acknowledge in the plan/EIS that for some visitors, fishing in high mountain lakes has been an important experience, and that experience may be impacted.

VR2000 – Vegetation and Riparian Areas – Methodology and Assumptions

Concern ID: 10053

CONCERN STATEMENT: One comment questioned why North Cascades National Park found it necessary to conduct long term studies on aquatic organisms, amphibians and fish, but did not find it necessary to conduct any studies on the impacts to shoreline vegetation or rare plants.

Representative Quote(s): The Park Service states that surveys have not been completed for plant species of special concern within the project area (p.195). Although there are no known federally listed species within the [North Cascades Complex], there are numerous S-1 State listed species which could occur within these high lake habitats (Personal knowledge). S-1 populations are those which have less than five known occurrences in the State and are considered very rare. If the Park Managers are to make a decision based on the Cumulative Impacts posed by allowing the high lakes fishery to continue, how can they make this decision without knowing first if there are any rare plants found at the 91 lakes? Simply providing a list of the potential rare plants for the project area serves no purpose. The presence or absence of these species is critical to making an informed and responsible decision. No final decision should be made until comprehensive rare plant surveys are completed at all 91 lakes. Why did the Park Service decide that plant surveys were unimportant? (22)

The description of shoreline vegetation was done using aerial photos with no ground truthing. Why was no ground truthing conducted? (22)

The methods used to analyze impacts to vegetation are based on assumptions and anecdotal evidence. I feel these issues need to be clarified in order for the Park Service to make an informed and responsible decision. Why did the [North Cascades Complex] find it necessary to conduct long term studies on aquatic organisms, amphibians and fish; but did not find it necessary to conduct any studies on the impacts to shoreline vegetation or rare plants? The entire vegetation section needs to be redone using research that can be repeated and peer reviewed. No final decision should be given until these important issues are clarified and a more complete analysis of the “true” cumulative impacts can be assessed. (22)



Response: Impacts to aquatic organisms were considered to be of primary importance in order to estimate impacts from the range of alternatives likely to be considered. Therefore, it was determined that management decisions concerning possible fish removal and stocking would require studies of current conditions of aquatic organisms in North Cascades Complex lakes and ponds. Results of what has come to be known as the Liss and Larson studies verify the complexity of aquatic communities in the lakes of the North Cascades Complex. The presence of rare plants at high mountain lakes is acknowledged but is not a driving decision factor in this programmatic plan/EIS.

VR4000 – Vegetation and Riparian Areas – Impact of Proposal and Alternatives

Concern ID: 10054

CONCERN STATEMENT: Several comments questioned the conclusions that anglers cause increased damage to vegetation, since studies conducted by Hendee, Clark, and Dailey found that non-anglers spent just as much time at the lakeshore as anglers.

Representative Quote(s): Evidence suggests that anglers use riparian areas more extensively than other visitors. --[The draft plan/EIS] Volume one P 338 There is no citation for this evidence. It is simply stated as supposed fact. Directly contradicting this assertion is research by Hendee, Clark, and Dailey where they found that nonanglers spent just as much time at the lakeshore as anglers [Hendee, John C; Clark, Roger N; Dailey, Thomas E. 1977. Fishing and other recreation behavior at roadless high lakes: some management implications. Res. Note PNW-304. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northeast Forest and Range Experiment Station. 27p.] (55)

The research cited by Hospadarsky and Brown hypothesized “that if time spent in the riparian zone were proportionate to impacts, then anglers would have up to three times as great an impact as hikers”. Immediately after this statement the sentence “This hypothesis has yet to be tested” is inserted. Why was this sentence inserted? The writer of this section did not find it necessary to say “this hypothesis has not been tested”, after the Hendee et al. statement saying “which suggests that their use patterns may not change”. It seems to be an attempt to legitimize, the “less shoreline impact by fisher-people” statement by Hendee, and discredit, the “more shoreline impact by fisher-people” statement by Hospadarsky. (22)

Response: Data on time spent in the riparian zone of lakes by anglers versus other recreational users are limited. The two studies referenced in the draft plan/EIS (Hendee et al. 1977 and Hospodarsky and Brown 1992) reached somewhat different conclusions. However, the results of these two studies have to be considered in light of the estimated low percentage of users who are anglers – approximately 10%. Text was changed on the following pages: 200 and 340.

Concern ID: 10055

CONCERN STATEMENT: One comment stated that there is no mention of the impacts on vegetation from the ground preparation required for helicopter landing pads adjacent to lakes. These impacts were only mentioned in the cultural resources section of the document.

Representative Quote(s): Here is a bombshell: In those cases where ground preparation is required for helicopter landing... --[Draft plan/EIS] Volume one P 361 ...helicopter use (and associated landing pads adjacent to lakes) --[Draft plan/EIS] Volume one p 362 Whoa, clearing off landing pads for helicopters wasn't even considered or mentioned in other parts of the [plan/EIS]. Where are the major impacts on vegetation listed that this would cause? This sort of burying and understating of impacts of fish removal while overstating the impacts of the activity of fish stocking severely undercuts the credibility of this EIS process. (55)

Response: Only a small area near a lake being treated to remove fish would potentially be impacted by any helicopter landing. Helicopter landings would be on hard surfaces (e.g., rock) to the extent possible and would avoid sensitive vegetation. The Mechanical Methods sections of alternatives C and D in chapter 4, have been updated includes the following language:

“Helicopter landings to drop off equipment and/or crew or to pick up equipment would be on hard surfaces to the extent possible and would avoid sensitive vegetation, resulting in only negligible to minor, short-term adverse impacts. Any landing pad preparation needed would be kept to the minimum necessary to ensure crew safety.”

Concern ID: 10056

CONCERN STATEMENT: Several comments stated that the impacts on special status plants from anglers and fish stockers are overstated.

Representative Quote(s): Under the discussion of the impacts of alternative D on special status plants it says: “...there would be a widespread beneficial effect.” --[Draft plan/EIS] Volume one P 333 This appears to be overstated. Earlier in the draft plan/EIS it is contended that only 10% of visitors are fishing. If only that few are using the areas it stands to reason that the benefits to riparian plants wouldn't be all that great because the majority of use, and hence, damage, is coming from non-angling users. This theme is repeated on page 334 when activities not related to angling are said to be possibly negligible to minor even after fish are removed. So fish stockers might cause major damage while non-anglers are apparently non-abusers who leave no trace of their coming. (55)

Trampling by stock (horses, mules, llamas) and visitors would likely result in negligible to minor cumulative impacts... --[Draft plan/EIS] Volume one P 334 Wow, trampling by stock is, at worst, minor, but damage by fish stockers could be major. Outrageous and ridiculous. The ludicrousness of this whole line of thinking is brought home to roost on page 337. On that page is a photo that shows major trampling in a highly used area. But the lake in the photo is hundreds of feet below the trampled area. The photo shows excessive trampling by non-anglers. The ones who are only supposed to cause negligible to minor cumulative impacts on native plants. (55)

Response: Both sections of the Environmental Consequences chapter have been reviewed and revised to correct any inconsistencies in impact levels. The photograph on page 339 is a good example of trampling impacts to vegetation and serves to support the general discussion of vegetation impacts on pages 337-340. It does not illustrate the impacts of trampling along a lake shoreline. Text referring to impacts and conclusions has been revised to ensure consistency within each environmental resource area (special status plants and vegetation) and between the two resource areas.

Summary tables also have been revised to be consistent with the revised text.



VU2000 – Visitor Use – Methodology and Assumptions

Concern ID: 10057

CONCERN STATEMENT: Several comments questioned the data used to analyze impacts of anglers.

Representative Quote(s): If there is no data on the levels of indirect impacts anglers may have on lakeshore environments; why did the [North Cascades Complex] not conduct or contract out research to answer this question? (22)
Also, data from the 2003 season was used to estimate the percent backcountry overnight users that were engaged in fishing. However, the data utilized was not provided, nor accessible online. We hope this information can be provided in future documents. (21)

Response: The NPS believes the data from the 2003 season was adequate enough to address all potential impact topics. Data from past studies and professional judgment were used to evaluate angler impacts (DO-12, section 4.5, (G)(3)).

Where appropriate and necessary to facilitate discussion, data were provided in the document and appendices. Upon completion of the EIS process, all relevant data will be available as part of the administrative record.

Concern ID: 10058

CONCERN STATEMENT: Several comments stated that the fishing opportunities outside the boundaries of North Cascades are abundant.

Representative Quote(s): To argue that the fishing opportunities within the boundaries of [North Cascades Complex] are irreplaceable and irreproducible elsewhere is an exaggeration. There are 1793 high lake fisheries managed by the [Washington Department of Fish and Wildlife] up and down the Cascade Mountain Range. Similar opportunities exist in the immediately adjacent Pasayten, Glacier Peak and Noisy Diobsud Wilderness Areas. The terrain of these Wilderness Areas is identical in their geologic and glacial formations. To remove the opportunity to fish in 91 out of 1793 of these lakes is not unreasonable and it is not anti fisherman. Just because fish stocking has been conducted in the past in the park, does not mean that it is right to continue to stock in the future. (22)

The [plan/EIS] demonstrates that the Environmentally Preferred Alternative (Alternative D) causes the least damage to the biological and physical environment and best preserves and enhances historic, cultural and native processes. The US [Environmental Protection Agency] acknowledges that angling in the mountain lakes within The Complex would be eliminated through the implementation of Alternative D, however, we believe that the [plan/EIS] has established that opportunities for mountain lake angling exist within close proximity of The Complex. The [plan/EIS] states that within the Cascade mountain range, there are 800 stocked and 1000 fish reproducing high mountain lakes similar in character to those in the study area. Of these lakes, there are 200 stocked lakes and 200 fish reproducing lakes within 100-miles of the study area. These lakes provide opportunities for anglers to pursue high mountain sport fishing within close proximity of The Complex. (44)

Response: NPS agrees that some members of the public feel that the fishing opportunities within the boundaries of North Cascades are irreplaceable and irreproducible, while others feel as though fishing opportunities outside of the North Cascades Complex are abundant.

VU 3200 – Visitor Use – Recreational Use – Support Fish Stocking

Concern ID: 10059

CONCERN STATEMENT: One comment stated that the high lakes fishery within current park boundaries has an important historical legacy and provides a unique wilderness fishing experience.

Representative Quote(s): [The Washington Department of Fish and Wildlife (WDFW)] supports the stated purpose of the [plan/EIS] to conserve native biological integrity, provide a spectrum of recreational opportunities including sport fishing, and resolve the debate regarding fish stocking in the Park. It has always been WDFW's position that the high lakes fishery within current park boundaries has an important historical legacy and provides a unique wilderness fishing experience. For nearly two decades WDFW and the Park have renewed short-term agreements to provide those fishing opportunities in the park complex. To that end, WDFW support the Park in its endeavor to resolve this issue through the development and implementation of a scientifically based, long-term fish management plan for the park complex. (39)

Response: NPS believes that the plan/EIS has identified alternatives that implement the purposes and objectives of this action. If a management alternative is selected that allows for fish stocking, NPS will seek clarification from Congress as to whether or not stocking is appropriate.

VU4000 – Visitor Use – Impact of Proposal and Alternatives

Concern ID: 10060

CONCERN STATEMENT: Several comments questioned the magnitude of the impact determinations in parts of the “Visitor Use and Experience” section.

Representative Quote(s): **Corr. ID:** 131302 **Organization:** *Not Specified*

Comment ID: 19233 **Organization Type:** Unaffiliated Individual

Representative Quote: All stocking in the [North Cascades Complex]] would cease. Compared to alternative A, this would cause moderate to major beneficial impacts on opportunities for solitude over the long term due to the decreased use of high mountain lakes for fishing.

--[Draft plan/EIS] Volume one P 413

Again, we have to turn to the actual definition of a major impact: “...actions would have to have a readily apparent beneficial or adverse impact on opportunities for solitude throughout the wilderness area.” (P 402) In alternative A only 25% of the lakes in the park complex would have fish. Twenty five percent of lakes ignores the fact that non-anglers have all the non-lake parts of the park to avoid anglers and the other 75% of lakes where anglers can be avoided. Because such a small part of the park is impacted the benefit for solitude can't meet the definition of major.

Corr. ID: 131302 **Organization:** *Not Specified*

Comment ID: 19226 **Organization Type:** Unaffiliated Individual

Representative Quote: In the discussion of visitor use and experience: A more reasonable scenario would involve angler displacement to relatively similar terrain found on adjacent Forest Service wilderness areas...The magnitude of impact [under alternative B] would depend on individual values and expectations and would range from negligible to minor. --[Draft plan/EIS] Volume one P 380



Looking at the impact definitions it says Minor means “Other areas in the [North Cascades Complex]] would remain available...” (p 370) and under Moderate it says “...some visitors who desire this experience would be required to pursue their choice in other available local or regional areas.” (p 370-371). And under Major it says “Some visitors who desire this experience would be required to pursue their choice in other available local or regional areas. Other visitors may not be able to duplicate their desired experience elsewhere.” (p 371). By your own definition, if B is implemented some anglers would be disbursed outside the [North Cascades Complex] and this would be a moderate to major impact, not negligible to minor.

In the discussion of visitor use under alternative C where nothing would be stocked in the park and a very limited number of lakes would be stocked in the rec areas the effect on some anglers has been increased to “moderate to major for some anglers but minor to negligible for others.” (p 385) There will be 9 lakes with fish under this alternative. On page 386 it says approximately 500 anglers will be displaced outside the park. That leaves 500 anglers to fish the 9 lakes in the rec areas. That would be interesting. Concentrating those anglers into 9 lakes certainly wouldn't be a negligible to minor impact. That would be major, as would displacing the other 500 anglers to areas outside the park.

Under alternative D where there will be no lakes managed for fishing the [draft plan/EIS] says that 50% of anglers will be “displaced from fishing in the study area lakes.” Where, exactly, are the other 50% of anglers that supposedly won't be displaced going to fish under alternative D when there are no high lakes to fish?

Response:

The beneficial impacts on opportunities for solitude (a wilderness value) for alternative D have been revised to clarify that ceasing to stock would have a slightly beneficial, long-term impact on opportunities for some visitors’ solitude in limited areas of the wilderness.

The cumulative impact analysis for alternative B evaluated the impact of angler displacement on visitor use and experience in adjacent areas (e.g., Glacier Peak Wilderness). The NPS stands by its assertion that “...anglers displaced from the North Cascades Complex would have a cumulative, adverse impact on visitor use and experience

in those [adjacent] areas. The magnitude of impact would depend on individual values and expectations and would range from negligible to minor.”

The “Impacts to Anglers” for alternative C concludes that “overall impacts [to anglers] would be moderate to major for some backcountry anglers but minor to negligible for others.” The NPS stands by this determination that anglers would experience a wide range of adverse impacts over loss of fishing opportunity because the magnitude of impact would depend upon individual values and expectations: some anglers would be displaced to other areas; some would continue to fish those lakes in the park or NRA’s that remained fishable (through continued stocking or because fish removal is not feasible); and some anglers would not want to fish elsewhere.

Concern ID:

10061

**CONCERN
STATEMENT:**

A comment stated that the plan/EIS does not disclose how many lakes will be available for stocking or how recreational losses will be mitigated.

Representative Quote(s): The plan/EIS does not clearly state how many lakes will be available for stocking or if fish stocking will even continue. In the event fish stocking is disallowed, or less than 40 lakes end up on the stocking list, the National Park Service needs to address

how they will mitigate this recreational loss to the public. (71 testimony in public meeting)

Response:

The NPS recognizes the concern for the potential loss of recreational fishing opportunities, but believes that fishing opportunities need to be determined based upon management principles intended to conserve biological integrity.

The precise number of lakes available for fish stocking in the future cannot be determined now. This number may change as additional data are gathered and management actions are adapted based on new information.

WH4000 – Wildlife and Wildlife Habitat – Impact of Proposal and Alternatives

Concern ID: 10062

CONCERN STATEMENT: Several comments questioned the adequacy of the impact analysis as it relates to human manipulation of fish populations.

Representative Quote(s): The presence of fish has also altered and likely damaged terrestrial ecosystems. The[draft plan/EIS]states on page 282, that, “Many wildlife species that historically did not inhabit the high mountain lakes have expanded their range to include new areas where fish have become abundant.” We feel this alteration is one of the many adverse impacts that fish stocking has on the natural environment; the behaviors of river otters, birds such as kingfisher, mergansers and osprey have been altered. Alternative D will help correct this disturbance: on page 292, the Draft Management Plan states, “piscivorous wildlife inhabiting high mountain lakes are not naturally occurring in the North Cascades Complex, and removal of fish would eventually return habitat to its condition prior to human manipulation.” This latter point is correct and should be the focus of this entire section. Unfortunately it was not included in the conclusion, an oversight which resulted in this section erroneously concluding that Alternative D “would be expected to result in long-term minor adverse cumulative impacts on wildlife populations and communities in the region.” (p. 293) Please update the entire Wildlife Section to further explore the various ways in which human manipulation of fish populations is detrimental to the natural ecosystem, including its natural wildlife, and to the Wilderness and National Park experience. (21)

Impacts of fish removal using the chemical antimycin would be negligible to minor. The use of small motorized boats to apply antimycin would cause short term noise disturbances to waterfowl on the lake or other species (such as beavers or otters) around the immediate lake shore; however these disturbances would be short term and negligible for these species. --[Draft plan/EIS] Volume one P 288 The use of motors would cause negligible impacts??? ...wildlife at lakes would incur short-term negligible to minor adverse impacts from periodic fixed-wing aircraft stocking (noise disturbance)... There should at least be the appearance of balance. Such blatant under evaluating fish removal impacts while over evaluating fish stocking impacts severely undermines the credibility of the whole process. (55)

Response:

The reduction or elimination of fish stocking and removal of fish would have long-term negligible to minor adverse impacts on piscivorous wildlife that have expanded their range into the stocked lakes. However, the absence or removal of fish would restore the balance of wildlife toward the native species that are not dependent on fish as prey. Descriptions of impacts of fish removal have been revised to include discussion of the positive impacts to the native wildlife from fish removal. Text has been changed on pages 284, 287, 290, and 292.



The NPS believes that the assessment of impacts from fish stocking and fish removal is balanced. The discussion of fish stocking states that stocking would occur infrequently, and that the preferred method is backpacking. If stocking is done by aircraft, the fly-over would last less than one minute. In the conclusion, impacts from fish stocking are described as short term, negligible to minor. The discussion of fish removal also describes impacts as negligible to minor.

Concern ID: 10064

CONCERN STATEMENT: One comment stated that the impacts from aircraft on wildlife are not fully discussed under all alternatives.

Representative Quote(s): Wildlife- This entire section needs to be re-written. Some of the information is completely wrong, other information is missing. For example, alternative A states that wildlife will be disturbed because of human presence and use of aircraft, yet alternative D doesn't mention this at all, even though under alternative D fish removal impacts due to both causes is the highest of all alternatives. Furthermore, no mention is made of the fact that the vast majority of stocking does not require aircraft, and in fact, all aircraft activity for stocking could be eliminated under alternatives A, B, or C if the Park chose to take that action (for example, using horse packers for the larger lakes now done via fixed wing aircraft). Beyond that it is a bit ridiculous to assign wildlife disturbance due to human presence required for fishing activities when human presence always has, and always will, exist due to hiking and camping activities. Does the [North Cascades Complex] really believe that fish stocking has any significant impact on wildlife beyond what exists already for activities such as hiking, climbing, camping, and horse travel? (31)

Response: The discussion of fish stocking on page 284 states that stocking would occur infrequently, and that the preferred method is backpacking. If stocking were done by aircraft, the fly-over would last less than one minute. Details of stocking history and methods for each of the 91 lakes are provided in Appendix E. In the Conclusion section (page 287), impacts from fish stocking are described as short term, negligible to minor. Impacts from fish removal under alternative D (Conclusion, page 295) include the impacts from the noise from humans and aircraft used to transport equipment, and supplies.

WH5000 – Wildlife and Wildlife Habitat – Cumulative Impacts

Concern ID: 10065

CONCERN STATEMENT: One comment stated that the plan/EIS fails to consider the cumulative impacts of global climate change on mountain lake ecosystems.

Representative Quote(s): The [plan/EIS] fails to consider the cumulative impacts of global climate change on mountain lake ecosystems. These high lake ecosystems are some of the most fragile in the Complex and will be the first to experience noticeable change at this latitude. The presence of fish in naturally fish-free lakes presents a totally unnecessary and additional threat to the health and survival of mountain lake ecosystems during the onset of climate change. The Park Service needs to include a section, which addresses this important issue. (22)

Response: Various climate change projections show regional warming continuing into the next century, with an average temperature increasing of about 3°F by 2020 and 5°F by 2050. The climate models also indicate that there is uncertainty as to the changes in precipitation amounts, with some showing a small decrease of approximately 7% or 2 inches while others show an increase of about 13% or 4 inches. In models where

precipitation increases are predicted, wetter winters will dominate while the pattern of precipitation in the summer months will remain largely the same as it is now (National Assessment Synthesis Team 2001). Keeping this in mind, the ultimate effects of climate change on the North Cascades Complex are too conjectural to enable a meaningful analysis in a stand-alone impact topic. Keeping with an adaptive management approach, NPS is seeking to reduce the number of lakes with fish over a wide range of elevations and depths of lakes. As a result, some lakes are expected to remain available in both categories (with and without fish) at various elevations, even if less precipitation leads to fewer shallow lakes or ponds.

Citation:

National Assessment Synthesis Team
Climate Change Impacts on the United States:
The Potential Consequences of Climate Variability and Change,
Report for the US Global Change Research Program,
Cambridge University Press, Cambridge UK, 620pp., 2001.

Concern ID:

10063

**CONCERN
STATEMENT:**

Several comments state that removal of fish at Hozomeen lake would have a greater adverse impact on loons than was represented in the plan/EIS, and may rise to the level of impairment.

Representative Quote(s):

I disagree with the impact assessments listed for the Common Loon in Alternatives B, C, and D based on the definition of these impacts on page 297; volume one of the [draft plan/EIS]. All alternatives state that allowing Hozomeen Lake to go to a fishless condition would “incur minor to moderate impacts”. Occasional responses to disturbance by some individuals would be expected, but without interference to feeding, reproduction, or other factors affecting population levels. How is permanently eliminating a species food base not considered a measurable long-term effect on native species, their habitat, or the natural processes sustaining them”? By eliminating the loons' forage they would no longer reside or nest on Hozomeen Lake creating a clear “measurable long term effect on native species, their habitat, or the natural processes sustaining them.” It would also interfere with “feeding and reproduction”. This is not the appropriate impact assessment for the Common Loon for alternatives B, C, and D. The Definition of Moderate Impacts includes: Sufficient habitat would remain functional to maintain viability of native wildlife populations. Eliminating the loons' forage in Hozomeen Lake would eliminate one of the few lakes that provide nesting habitat in Washington State. This action would cause “sufficient habitat not to remain functional to maintain the viability of native wildlife populations.” This also is not the appropriate impact assessment for the Common Loon for alternatives B, C, and D. I believe the appropriate impact assessment should be “major” for alternative B, C, and D. The definition of “major” includes Key ecosystem processes might be disrupted permanently. Adverse responses to disturbance by some individuals would be expected, with negative impacts on feeding, reproduction, or other factors resulting in a long-term decrease in population numbers...” Clearly, proposing to permanently remove fish from Hozomeen Lake would be permanently disrupting a key ecosystem process. With such low numbers of loon nests in Washington state the loss of one nest may result in a long-term population decrease, potentially adding to an increased Washington State listing status for this species. (79)

As is stated in the [plan/EIS] the Common Loon is listed by the State of Washington as a sensitive species. Implementation of alternative B, C, or D will increase the risk of the Common Loon becoming listed as Threatened within the State of Washington due to decreasing habitat and population numbers. (79)



On page 313-314 of volume one the effects of eliminating the fish the Hozomeen Lake on the common loon are discussed. Impacts are said to be minor to moderate. But it also says they may stop nesting in the complex. If this were to occur the impact would fall under the category of Impairment. So at best the [draft plan/EIS] should state that impacts on the loon will be moderate (forced to move to a nearby lake) to impaired (eliminated from the complex). (55)

Response:

The common loons in Hozomeen are feeding on brook trout and other non-native fish that have been stocked in the past. These stocked fish are non-native, and therefore, not part of a “natural process”. The NPS intends to remove brook trout from Hozomeen, regardless of the loons, for the following reasons: (1) brook trout have the potential to hybridize with bull trout, a federally threatened species protected under the *Endangered Species Act* (16 USC 1531 et seq.), and (2) Hozomeen is the only deep, low-elevation lake in the North Cascades Complex and because of its unique physical characteristics should be returned to a fishless state. Despite the objective of removing all fish from Hozomeen, it probably is not feasible to remove all fish from the lake because of its depth and size. Therefore, the common loon will likely have fish to feed on for the foreseeable future. For the reasons described here, the impacts listed under alternatives B, C, and D in the draft plan/EIS (minor to moderate adverse impacts) are appropriate.

NPS disagrees that the effects on the loon, should they stop nesting at Hozomeen Lake, would rise to the level of impairment to park resources and values. The impact would not contribute to the deterioration of special status wildlife resources to the extent that the purpose of the North Cascades Complex would not be fulfilled as established in its enabling legislation. For NPS methodology and policy on what constitutes an impairment, please see the final EIS, “Special Status Species” section.

WI 2500 – Wilderness – Minimum Requirement Analysis

Concern ID: 10066

CONCERN STATEMENT: Several comments stated that the Minimum Requirement Analysis does not place adequate emphasis on the historic uses of wilderness.

Representative Quote(s): Left out of conclusion is the important historical use provision of The Wilderness Act Section 4(b). An important historical use of the park would be eliminated and that fact isn't even mentioned in the conclusion. During the hearings leading up to the park's formation fish stocking was specifically asked about and it was explicitly promised that fish stocking would not cease in the park. Clearly, fish stocking and fishing are important recreational and historical uses covered under 4(b). They also do not impair park resources. For some reason park managers seem to favor some historical recreation uses that clearly impair park resources such as stock use, camping, and trails but say fish shouldn't be stocked. As a wilderness user I find trails and campsites detract from my wilderness experience while fish do not. I certainly don't mean to start a battle between hikers and anglers, but it shows how specious the conclusions reached in the [Minimum Requirement Analysis] are. Were you to apply the exact same analysis to trails as you do to fish stocking you'd have to conclude trails should be removed and no longer maintained. That would, of course, conflict with the recreational and historical use provisions of Section 4(b) just as eliminating fish stocking conflicts with the recreational and historical use provisions of Section 4(b). According to the NPS research conducted to support this [plan/EIS] fish can be stocked in low densities and they do not adversely impact native biota. Thus they do not compromise wilderness values and they fall under the pantheon of acceptable use of wilderness, just like trails. (55)

Response:

Section 6.3.8 of NPS *Management Policies 2006* provides the following guidance regarding cultural resources in wilderness:

The *Wilderness Act* specifies that the designation of any area of the park system as wilderness “shall in no manner lower the standards evolved for the use and preservation of” such unit of the park system under the various laws applicable to that unit (16 USC 1133(a)(3)). Thus, the laws pertaining to historic preservation also remain applicable within wilderness but must generally be administered to preserve the area’s wilderness character.

As described in the “Cultural Resources” section of chapter 3, the NPS groups cultural resources into five categories: archeological resources, cultural landscapes, historic structures, museum objects and ethnographic resources. Through consultation with various cultural resources experts in the NPS, and discussions with the tribes, the NPS has concluded that stocking is indeed a longstanding practice, but not a historically significant activity because it does not fall into any of the five categories of cultural resources that could be considered worthy of continued protection in wilderness. This is why the MRA did not place any emphasis on stocking as a historical use of wilderness. The NPS, however, recognizes that WDFW and others disagree with the NPS and believe stocking is appropriate in wilderness for several reasons, including the assertion that stocking is an acceptable historic use. A rebuttal from WDFW on the Minimum Requirements Analysis is included in Appendix K.

Concern ID:

10067

**CONCERN
STATEMENT:**

Comments state that they believe the Minimum Requirement Analysis has been misapplied. Comments believe that the Minimum Requirement Analysis should only be applied to activities prohibited in section 4c of the wilderness act, and that fishing is not one of those prohibited activities.

Representative Quote(s):

[The Washington Department of Fish and Wildlife (WDFW)] continues to disagree with the application of the Minimum Requirement Analysis (MRA) with regard to fisheries management within the park. Fish stocking is not one of the ten prohibited activities as defined in section 4(c) of the Wilderness Act. The MRA should only be applied to those prohibited activities, and not be used to determine new prohibited activities. However, if the MRA is used to evaluate the need for fish stocking, WDFW has concluded that limited, biologically based stocking of non-reproducing trout is necessary for the administration of the Stephen Mather Wilderness because it is necessary for the implementation of the preferred alternative of this EIS, which would provide many unique benefits. (39)

One of the items I disagree with in particular is the use of the MRA. I believe the National Park Service misused the Minimum Requirements Analysis -- or I'll abbreviate it MRA -- methodology in Appendix K of the draft plan/EIS. The 1964 Wilderness Act, in Section 4(c), reads exactly as follows: “Section 4(c): Except as specifically provided for in this act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act, including measures required in emergencies involving the health and safety of persons within the area. There shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.” Nowhere in the aforementioned list of “prohibited uses” is fish stocking listed.



Then my next concern was over the MRA, and I think that Jeff's comments really covered pretty much mostly what I had planned to say on that very nicely. It says -- the one sentence that really says it, it says on Page 75 that "stocking is not expressly prohibited in the Act," and then it goes on to say that according to Section 4(c) of the Wilderness Act agencies may engage in management actions that may otherwise be prohibited in the wilderness provided they are necessary," and I think that sentence is incorrect. It should read "that are otherwise prohibited in the Act" because it lists the express -- it expressly lists the items that are prohibited for which an MRA is required. And those acts, of course, include helicopters and outboard motors that are proposed to be used for elimination of fish in some of these lakes, so those are the tools that the MRA needs to be applied to. (55)

The biggest misstep in the [plan/EIS] is the egregious misapplication of the Minimum Requirements Analysis (MRA). The Wilderness Act is quite clear and unambiguous about what activities are prohibited without considering minimum requirements: ...except as necessary to meet the minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area) there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area. --The Wilderness Act: Section 4 (c) Because fish stocking does not require any of the acts prohibited under section 4(c) it should not be subject to the MRA process. The absurdity of using the MRA process to cover fish stocking is made explicit in the MRA question A: Are there valid existing rights or is there a special provision in wilderness legislation ...that allows consideration of action involving Section 4(c) uses. --[Draft plan/EIS] Volume two P. 288. Fish stocking does not involve "Section 4(c) uses" therefore MRA section A should be marked not applicable. Fish removal sometimes does involve prohibited uses so the MRA should be applied to those activities. But answering a question about an "action involving 4(c) uses" when the action does not involve the prohibited uses is nonsensical. (55)

The final reason stated for requiring "congressional approval" is that the minimum requirement analysis indicates that fish stocking is not necessary to meet the minimum requirements of the area and the Wilderness Act is unclear whether stocking is allowed. The lack of Wilderness Act clarity is dealt with above. The Act provides the standards; it is NPS job to formulate local policy. The minimum requirements analysis was misapplied to fish stocking. If a MRA is required it must be based upon the policy that requires it; and if that policy is applied then low density stocking of nonreproducing fish will be determined to be appropriate or necessary to the administration of the areas. This latter issue is the subject of extensive comment in my July 27, 2005 submission, a copy of which is resubmitted herewith. (69)

Response:

NPS has undertaken its minimum requirements analysis in this case because it is required to under NPS Management Policy 6.3.5. Policy 6.3.5 states that all management actions (even those actions not explicitly prohibited in section 4(c) of the *Wilderness Act*) that affect wilderness must be consistent with the minimum requirement concept. According to the policy, the minimum requirement concept will be applied as a two step process that determines (1) whether the proposed management action is appropriate or necessary for administration of the area as wilderness; and (2) the techniques and types of equipment needed to ensure that impact to wilderness resources and character is minimized. As required by Policy 6.3.5, NPS has conducted a minimum requirement analysis for fish stocking and has completed the first step of the minimum requirements analysis for fish removal (see appendix K).

Concern ID: 10068

**CONCERN
STATEMENT:**

Comments state that fishing should be viewed as an acceptable activity, just as hiking, camping, and mountain climbing are; comments state that the Minimum Requirements Analysis cannot conclude that low density stocking is inappropriate any more than it could conclude that construction of trails are inappropriate.

Representative Quote(s): On Page 294 of Volume II, the [Minimum Requirement Analysis] asks: “Is it necessary to take action?” I believe this exercise demonstrates that the reasoning in the [Minimum Requirement Analysis] must have been manufactured to reach a predetermined conclusion. I substituted “hiking” and “trail building” for “fishing” and “fish stocking.” If the park were to do a similarly reasoned [Minimum Requirement Analysis] on the building or maintaining of trails in the park, it would presumably once again conclude that trail building or maintenance should stop in the park. “Is it necessary to take action? Trail building, no. Building trails into the high mountain lakes” -- now listen to how this perfectly makes sense -- “building trails into the high mountain lakes would continue to benefit the recreational” -- I screwed up here. “Building trails into the high mountain lakes would continue to benefit the recreational wilderness experience for certain wilderness hikers. Trails, however, would adversely impact the wilderness experience for other wilderness users. Trail building would also adversely impact to varying degrees the scientific conservation and natural purposes of the wilderness. If trails were not built, opportunities for hiking to the high mountain lakes would be severely limited. However, various opportunities for trail hiking would remain in the low land areas, and other types of primitive and unconfined forms of recreation would still exist in the Steven Mather Wilderness. Therefore, the National Park Service believes that trail building is not required for the administration of the areas of the wilderness.” The logic has nothing to do with reaching a conclusion. You could apply the same logic to essentially any management action the Park takes and presumably reach the very same conclusion; namely, that the action ought to stop. Clearly the reasoning was written after the conclusion had already been reached. (31)

The minimum requirement analysis or [Minimum Requirement Analysis] has been misapplied. Fishing needs to be viewed as an accepted recreational activity, just as hiking and camping and mountain climbing are. The [North Cascades Complex] routinely does various management actions to provide trail building, trail maintenance, campsite construction with minimum impact. Fish stocking is an equivalent management action to provide an ecologically sound mountain lake fishery. [Minimum Requirement Analysis] cannot sensibly conclude that low-density fish stocking is inappropriate, and it could conclude that properly constructed trails are inappropriate. When the park was created, it committed to provide hiking, camping and fishing, and I will not get into the hearings. [Minimum Requirement Analysis] can no longer conclude that properly managed fishing should be eliminated, and it can't conclude that properly managed hiking should be eliminated. The [plan/EIS] claims it can press no clarification as required to give [North Cascades Complex] authority to continue fish stocking because nothing is complained in the legislation authorizing fish stocking. (26)

The idea that some how trails can be built and maintained as natural in a wilderness while regulated fish stocking and fishing are not permitted is mistaken. While trails should be permitted and maintained under most circumstances, engineered and graded trails are no more natural than rational fish stocking and fishing. That Congress is required to authorize fish stocking and fishing in the North Cascade complex before it can continue and not have to authorize trails and trail building, for it to continue is not rational. (43)



Response: The management actions in this plan/EIS that are proposed to take place in wilderness are fish stocking and fish removal, not trail building. As such, in accordance with NPS Management Policy 6.3.5, NPS has conducted a minimum requirement analysis for such activities. To assist with its minimum requirement analysis, NPS used the Minimum Requirement Decision Guide from the Carhart National Wilderness Training Center, which was developed in consultation with the Department of the Interior. The Decision Guide and its instructions can be found in appendix K of the Draft Plan/EIS. In answering the questions posed in the Decision Guide, NPS determined that fish stocking is not necessary for the administration of the area as wilderness, while removal of reproducing fish populations is necessary.

Concern ID: 10071
CONCERN STATEMENT: Comments state that the Minimum Requirement Analysis is a precedent setting programmatic example.

Representative Quote(s): In my opinion the [Minimum Requirement Analysis (MRA)] found in this draft [plan/EIS] is the most sweeping use of an MRA that has ever been done in the NPS. In none of the other three programmatic MRAs is an historic management activity disapproved across an entire park. These other three programmatic MRAs allow the management activity to continue, but simply restrict certain instances of its use where harm can be shown. Frankly, that is not unlike what preferred alternative B attempts to accomplish within the overall [National Environmental Policy Act (NEPA)] process; namely, the continuance of the use of fish stocking, but limiting it in situations where harm can be shown. There is no justification for a separate MRA procedure to usurp the overall objective of the NEPA process by pushing the use of the MRA procedure to the most extreme use it has ever been subjected to. This [North Cascades Complex] fish stocking NEPA process is filled with enough controversy without unnecessarily introducing the use of a fairly new procedure in a way that pushes its use to an extreme limit -especially just as efforts are underway within the NPS and the [National Forest Service] to evolve the MRA procedure to its next incarnation which is very likely to restrict or even eliminate "programmatic" MRAs such as the one unwisely included in this draft [plan/EIS]. (31)

Incidentally, and interestingly enough, current Forest Service policy also agrees with the Department of Fish & Wildlife view. The Forest Service, which manages far more wilderness than the Park Service does, has never done an MRA on a management action of this type. It would simply be against their policy to do so. (31)

Response: The NPS has different mandates, management policies, and legislative requirements than the Forest Service. While programmatic minimum requirements analyses have not been widely used, NPS has conducted and used programmatic minimum requirements analyses in the past. NPS believes its use of the programmatic analysis in this document is in full compliance with Policy 6.3.5, which requires a minimum requirements analysis to be completed before any management action can be taken in wilderness. Here, the action at issue is the implementation of a fish stocking program that contemplates fish stocking and fish removal from naturally fish free lakes in designated wilderness. Thus, those are the actions broadly analyzed by the minimum requirements analysis.

Concern ID: 10072
CONCERN STATEMENT: Comments state that the Minimum Requirement Analysis should be done for fish removal.

Representative Quote(s): And finally, in my opinion, the Draft [plan/EIS] errs by incorrectly applying the Minimum Requirements Analysis protocol. I suspect a more detailed critique of this will be submitted by the sport fishing groups. I believe a [Minimum Requirement Analysis] should only address those actions explicitly prohibited by the Wilderness Act, such as use of motorized vehicles or aircraft. Fish planting, per se, is not prohibited and should not be the subject of a [Minimum Requirement Analysis]. I think we all agree that backpack planting of fry is a minimum tool. On the other hand, a [Minimum Requirement Analysis] should be done for the needed fish removals in some lakes since that would involve some of the actions prohibited by the Wilderness Act, that is, aircraft use. (73)

Response: NPS has completed step 1 of the minimum requirement analysis for fish removal (see appendix K) and determined that removal of reproducing populations of fish is necessary for the administration of the designated wilderness areas in the North Cascades Complex. NPS has also taken the initial steps to complete step 2 of the minimum requirement analysis (minimum tool analysis) by describing the various fish removal methods that may be used under each alternative. NPS will complete the minimum requirements analysis prior to taking any fish removal actions in wilderness.

Concern ID: 10073
CONCERN STATEMENT: One comment stated that the Minimum Requirement Analysis misrepresents the 1985 memorandum of understanding between the NPS and the Washington Department of Fish and Wildlife and that it applies to both fish stocking and fish removal.

Representative Quote(s): [Draft plan/EIS] Volume two P 289 Under “Fish Stocking” in this section NPS policies against stocking fish are cited. But then under “Fish Removal” the 1985 [memorandum of understanding (MOU)] between the NPS and [The Washington Department of Fish and Wildlife] is cited. You can't have it both ways. The MOU also applies to fish stocking, not just fish removal. And finally, the decision: Is it necessary to take action? The [Minimum Requirement Analysis] concludes that it is necessary to remove fish but not necessary to stock fish. (55)

Response: The text has been changed to reflect that the memorandum of understanding applies to fish stocking and fish removal.

WI1000 – Wilderness – Guiding Policies, Regs, Laws

Concern ID: 10074
CONCERN STATEMENT: Comments believe fish stocking, the presence of exotic fish, and the mechanized equipment, poisons, and human traffic that accompany stocking is out of character with Wilderness designation.

Representative Quote(s): In 1988, 93% of the North Cascades Complex was designated Wilderness. The Wilderness Act prescribes that Wilderness is “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain . . .” and “and retains its primeval character and influence without permanent improvements . . .”. Recreational activities such as hunting and fishing can be compatible with Wilderness areas, especially since Wilderness areas provide



excellent habitat. However, fish stocking and the presence of exotic fish is clearly out of character with the Wilderness designation of these areas. The fish alter the ecosystem and character of the lakes and streams, and alter the behavior of the native flora and fauna. The mechanized equipment, poisons and additional human traffic that accompany fish stocking do not fit within the character of Wilderness either. (21)

The presence of native fish and wildlife at naturally fluctuating population levels is an important component of wilderness character. However, the continued stocking of non-native fish populations into naturally fishless lakes is an action we consider incompatible with the purpose and value of designated Wilderness. We express further concern with some of the mechanical and chemical methods proposed to remove non-native reproducing fish populations under Alternatives B, C, and D. Moreover, stocking of non-native fish populations directly contradicts the Park Service's own Management Policies directing the restoration of natural systems. See Management Policies, Chapter 4. (5)

NPS Management Policy 6.4.3(2001) states "Recreational uses in NPS wilderness areas will protect and preserve natural conditions and preserve wilderness in unimpaired conditions". How does fish stocking achieve the goal of preserving wilderness in unimpaired conditions when best available science documents loss of biodiversity? (22)

Response:

NPS recognizes that there are many purposes to wilderness listed in the *Wilderness Act*, including recreation, conservation, and scientific study. In this plan/EIS, NPS recognizes that certain individuals have different perspectives on wilderness. While the *Wilderness Act* generally prohibits the building of permanent roads and structures and the use of motorized equipment, fishing is a recognized use of wilderness and fish stocking is not specifically prohibited in the Act. Furthermore, this plan/EIS shows that no NPS resources would be impaired if stocking were allowed to continue as proposed under the preferred alternative. At the same time, the *Wilderness Act* states that wilderness should be protected and managed so as to preserve its natural conditions. Therefore, in its preferred alternative, NPS would ask Congress to clarify whether fish stocking is appropriate within the North Cascades Complex. Alternative D would be implemented unless or until Congress affirms that stocking is appropriate.

Concern ID:

10075

**CONCERN
STATEMENT:**

Comments state use of airplanes to stock violates wilderness designation.

Representative Quote(s):

The airplane fish stocking in alternatives A, B, and C are a violation of Wilderness designation because Section 4(c) of the Wilderness Act provides two narrow exceptions that allow motorized or mechanized uses in wilderness for administrative purposes: 1) in emergencies involving the health and safety of persons within the area; and 2) when a motorized or mechanized action is necessary as the minimum requirement for proper protection and administration of the area as wilderness. The use of airplanes to spread exotic species does not fit either definition. (21)

Wilderness Act of 1964: The Wilderness Act requires that the Stephen Mather Wilderness be kept "untrammeled, or unhindered and free from intentional modern human control or manipulation; and natural, or substantially free from the effects of modern civilization". The continuation of stocking under Alternative B disregards all of these qualities and the Parks wilderness character is deeply impacted as a result. The Park Service needs to explain how fish stocking can be considered "free from intentional human control or manipulation". (21)

Response: The NPS agrees that aircraft stocking may violate the *Wilderness Act*. For this reason, stocking would only continue if Congress clarified, through legislation, that stocking is appropriate in the Stephen T. Mather Wilderness.

Concern ID: 10076

CONCERN STATEMENT: Comment questioned National Park Service's implementation of the Wilderness Act and the effect of state jurisdiction and responsibilities.

Representative Quote(s): In managing our wilderness, I believe we need to respect both wilderness values, the ecological integrity, and the wilderness experience, which are entitled to all park visitors, including anglers. No one wilderness value should take precedence over the other. Finally, I would like to point out in the Wilderness Act it reiterates that "Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of several states with respect to wildlife and fish in the national forests." All federal agencies, including the U.S. Forest Service, the National Parks and the Bureau of Land Management and the U.S. Fish and Wildlife Service are under this directive. (66)

Response: NPS believes the clause cited by comment applies to the US Forest Service, not the NPS. Furthermore, NPS does not believe that it is taking any action that encroaches on the State's jurisdiction over fish and wildlife in National Forests.

Concern ID: 10077

CONCERN STATEMENT: Comments point out that the Wilderness Act is silent regarding fish stocking. Some comments stated that because the Wilderness Act is silent the NPS has the authority to stock fish in wilderness, while others stated that because the Act is silent the NPS does not have authority to stock.

Representative Quote(s): "Fish Stocking: There is no provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that explicitly allows for fish stocking." (pg 289) Neither is there any provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that forbids stocking. In addition there is no provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that allows for trail building, trail maintenance, bridge building, campsite construction, or dozens of other actions the park engages in every day. This reference to these pieces of legislation is at best a red herring since such legislation is designed to leave such details to the administering agency as is proven by the total lack of such authorization for any action. Why expect these pieces of legislation to authorize fish stocking when it authorizes none of these other actions? Beyond these considerations is the fact that the Wilderness Act permits fishing, and today's science clearly shows that the only way to provide biological integrity is to stock with nonreproducing fish in low densities. (31)

NPS has the Authority and Duty to Decide Fish Stocking Issues The applicable Wilderness Acts of 1964 and 1988 set broad standards for the management and administration of the wilderness areas, and direct the Secretary and NPS to apply those standards and to make and implement local decisions. NPS is directed by statute to bring to this process "the highest quality science and information." 16 USC Sec 5932. NPS is further directed to "assure the full and proper utilization of the results of scientific studies for park management decisions." 16 USC Sec 5936. There is nothing ambiguous about the Wilderness Acts. They are not written to provide bright line decisions to specific local issues. 16 USC Sec 1133 provides:



(b) Agency responsibility for preservation and administration to preserve wilderness character; public purposes of wilderness areas. Except as otherwise provided in this act each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historic use. This responsibility is specifically acknowledged in NPS Management Policy 6.1. It is the agency's authority and duty to find the local facts and science and to weigh those in light of the public purposes specified in the Act, here they are primarily recreation, conservation and historical use. That is exactly what NPS is doing though the EIS process. NPS Management Policy 6.3.4.3 outlines the National Environmental Policy Act processes to use, including EIS. Would NPS go to Congress to approve a plan for a new trail system or an area of educational or safety signage? (69)

Fish have been a part of the lakes in the North Cascades for a very long time. Since well before it was a National Park. It is clear in the congressional record of the North Cascades National Park proceedings, that Congress INTENDED fish to continue to be a part of this national park experience. They did not think that the sight of a fish rising in an alpine lake would somehow destroy an individuals "wilderness experience." In fact, it could be argued that sighting a fish in an alpine lake would have less of an impact on a persons wilderness experience than coming upon a manmade foot bridge over a creek on a trail cut by a trail crew through the same national park land. Fish in the lakes of the North Cascades are wonderful. If they do no harm they should remain. (14)

We do not understand the need for "Congressional clarification". The enabling legislation can not be expected to list all of the activities and that will be allowed in the Park. The Wilderness Act does specifically protect some activities; that has probably been helpful to managers. We are not against Congressional clarifications but it certainly is not required to allow activities. I could list a multitude of things allowed in the Park which have never received Congressional approval. We should not stop doing historically acceptable things while Congress decides if it is OK. (42)

WI4000 – Wilderness – Impact of Proposal and Alternatives

Concern ID: 10078

CONCERN STATEMENT: Several comments stated that the presence of fish in an alpine lake does not destroy an individual's wilderness experience, and that the plan/EIS does not give appropriate weight to the recreational values available to park visitors, while others feel wilderness protection should be paramount.

Representative Quote(s): Fish have been a part of the lakes in the North Cascades for a very long time. Since well before it was a National Park. It is clear in the congressional record of the North Cascades National Park proceedings, that Congress INTENDED fish to continue to be a part of this national park experience. They did not think that the sight of a fish rising in an alpine lake would somehow destroy an individuals "wilderness experience". In fact, it could be argued that sighting a fish in an alpine lake would have less of an impact on a persons wilderness experience than coming upon a manmade foot bridge over a creek on a trail cut by a trail crew through the same national park land. Fish in the lakes of the North Cascades are wonderful. If they do no harm they should remain. (14)

Due to the cessation of stocking in national park lakes, long-term moderate beneficial cumulative impacts on wilderness values would be expected. This statement should be removed. There is no development of the connection between

“wilderness values” and lakes with nonreproducing fish in low densities in these tables. Elsewhere in the text of the draft [plan/EIS] an unconvincing case is attempted in order to “prove” that such populations of fish harm wilderness values. At best that case is a red herring. How can a few fish, mostly unseen, harm a visitor’s wilderness experience? (31)

On the other hand, some informed wilderness users would be aware of nonnative fish in the lakes due to stocking. They would also experience the indirect effects of angling, such as social trails along lakeshores, fire rings, and lost or discarded fishing tackle and equipment. The magnitude of adverse impact would vary among individuals. Those with strong biocentric views (support protection of natural processes in wilderness areas) of wilderness would experience major long-term adverse impacts from the continued fishery management practices under alternative A. --[Draft plan/EIS] Volume one P 404 (also see page 408). To meet the definition of a Major impact the “Human-caused impacts...on the natural environment would be readily apparent throughout the wilderness.” If users have to be “informed” to be aware of the fish the management action is not “readily apparent.” And, even in alternative A only 62 out of the 245 lakes in the park would have fish. That represents 25% of the lakes and that doesn’t represent an impact “throughout the wilderness.” There is no way to classify the effect on anybody as “major”. You might be able to make the case for moderate, but even that isn’t clear. (55)

The displacement of anglers to other wilderness areas would result in long-term negligible adverse cumulative impacts even if all anglers decided to fish elsewhere. - [Draft plan/EIS] Volume one P 417 Negligible? Moving anglers generates major benefits for solitude in the park, but only negligible impacts on solitude outside the park? That makes no sense. The impact has to be commensurate. (55)

Response:

The plan/EIS recognizes that different people have different perspectives on wilderness. The text was changed throughout this section from ‘major’ to ‘moderate’ impacts. With regard to the NPS conclusion regarding the displacement of anglers to other wilderness areas, NPS made the conclusion of negligible adverse cumulative impacts because of the small number of anglers that would be displaced to a large number of lakes in the region.

Concern ID:

10079

**CONCERN
STATEMENT:**

Comments state that by allowing fish stocking, NPS is setting a precedent for other land management agencies to stock exotic species in wilderness.

Representative Quote(s):

Through continued fish stocking, [North Cascades Complex] sets a precedent for neighboring land managers to perpetuate the practice of stocking exotic species into designated wilderness areas. (22)

Response:

Other federal land managers adjacent to the park have different mandates, management policies, and directives. The degree to which receiving clarification would affect lands managed by other federal agencies is too speculative to address.



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Roy Zipp
06/06/2005 02:01 PM
MOT

To: Shelley Kluz/NOCANPS
cc:
Subject: e-mail comment re: EIS

Hi Shelley,
Please log this one into the record.
Thanks!
Roy

----- Forwarded by Roy Zipp/NOCANPS on 06/06/2005 12:59PM -----

To: Roy Zipp/NOCANPS@NPS
From: Tim Manns/NOCANPS
Date: 06/06/2005 12:40PM
Subject: Fw: From ParkNet - public comment on federal register of 5/3/05 vol 70 no 103 pg 30970

Roy,

This e-mail came in via the park's website.

Tim

Timothy Manns
Chief Interpreter
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284
phone 360/856-5700 ext.365
fax 360/856-1934
website www.nps.gov/noca
----- Forwarded by Tim Manns/NOCANPS on 06/06/2005 12:40 PM -----

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om of 5/3/05 vol 70 no 103 pg 30970

06/05
/2005
12:42
PM
AST

This message was sent from <http://www.nps.gov/noca/pphtml/contact.html>

Please respond to the address below.

This email was sent by: jeanpublic@yahoo.com

re us doi nps eis fish mgt plan - whatcom, skagit and chelan counties - noa - there are
no more "native" species. they have been completely wiped out by now. let's move on. i
think the following should be completely banned in this area: ban 1 hunting 2 trapping 3

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no more "native" species. they have been completely wiped out by now. let's move on. i
think the following should be completely banned in this area: ban 1 hunting 2 trapping 3
new roads 4 all two stroke vehicles of any kind 5 grazing 6 mining or drilling 7 logging 8
prescribed burning which releases fine particulate matter from smoke which travels
thousands of miles causing injury and death to other americans through lung cancer,
heart attacks, strokes and asthma. b. sachau 13 elm st florham park nj 07932





July 25, 2005

Bill Palek, Superintendent
Mountain Lakes Fishery Management Plan/EIS
North Cascades National Park Service Complex
810 State Route 20
Sedro-Wooley, WA 98294-1239

Comments related to Mountain Lakes Fisheries Management Plan, or EIS

- 1 - The Minimum Requirement Analysis (MRA) has been misapplied. Fishing needs to be viewed as an accepted recreational activity, just as hiking and camping and mountain climbing are. NCNP routinely does various management actions to provide trail building, trail maintenance, and campsite construction with minimum impact. Fish stocking is an equivalent management action to provide an ecologically sound mountain lake fishery. MRA cannot sensibly conclude that low density fish stocking is inappropriate than it could conclude that properly constructed trails are inappropriate. When the park was created, it committed to provide hiking, camping, AND fishing. MRA can no longer conclude that properly managed fishing should be eliminated than it can conclude that properly managed hiking should be eliminated.
 - 2 - The EIS claims that congressional clarification is required to give NCNP authority to continue fish stocking--because nothing is contained in the legislation authorizing fish stocking. Many management actions were NOT spelled out in 1968 enabling legislation. Is legislation needed to build a bridge on a trail? Or even to build a trail itself? Is legislation needed to repair a trail? Does the legislation authorize campfires to be allowed? Congress intended hiking and trail building to be continued once the park complex was established. In the same way, the congressional record shows that fishing, along with proper fish stocking, also was intended. The EIS statement that fish stocking cannot continue without legislative clarification is unjustified, given NCNP's history as evidenced in the congressional hearings, and by NCNP's management actions to now.
- Conclusions: the MRA in draft EIS is flawed, because if its reasoning were impartially applied to hiking, trail maintenance, and mountain climbing as it does to fishing and fish stocking, it would have to conclude that trails should be eliminated, bridges should be eliminated, campfires should be eliminated, etc. The EIS claim that congressional clarification is required is flawed for same reasons: legislation is not needed to build trails, build bridges, build campfires, etc. The Congressional Record of hearings conducted for the enabling legislation that created NCNP clearly shows that Congress understood that, and intended for historical use of fishing and fish stocking was to continue.

Virgil E. Harder
Virgil E. Harder

Bill Palek, Superintendent
Mountain Lakes Fishery Management Plan/EIS
NCNP Service Complex
810 State Route 20
Sedro-Wooley, WA 98294-1239

July 10, 2005

Dear Superintendent Palek:

I am a biology teacher (retired), member of the H.L.akers (fishing club), the Snohomish Sportsman's Club and the Washington Outfitters & Guides Association. My academic training in mountain biology and aquatic invertebrates has served me well in my teaching and recreational pursuits. I am also happy to see that the North Cascades National Park has an interest in science based management of our recreational opportunities in the Park and the Recreation Areas. I am looking forward to having the issues between the Park, WDFW and the various user groups being finally resolved and clarified.

As I read the EIS I could not help but feel that the authors showed a bias toward eliminating the fishery recreation that now exists. Statements such as the following imply that impacts need to be minimized: "After monitoring and evaluation, restocking.....would be allowed in certain lakes only if biological impacts could be minimized". The current practice of planting fish in low numbers and only in lakes where populations are non-reproducing has already minimized historical impacts (no minimization is needed).

The preferred alternative 3 seems to be filled with provisions which could lead to the loss of the fishery in many if not all lakes. We already know that a healthy fishery, where over population if fish is not a concern, can and does coexist nicely with the other biota. These fisheries provide a quality recreational opportunity in beautiful country for those of us who enjoy casting a fly (catch and release in non-reproducing waters would certainly meet with my approval). I believe that the EIS significantly under estimates the current use of the fishery by the public; you monitor and get counts in heavily used areas but never see evidence of fishing in the lakes that many of us who love solitude prefer to visit. Enabling legislation that recognized that this important recreational use should be maintained by stocking is appropriate and needed. The present management practices should be continued until such legislation is obtained.

Clearly, it is important to manage the populations in lakes where the fish are stunted and putting pressure on the invertebrates and perhaps the amphibians.

Recreation for the public is important. Not everyone enjoys Disney land. Some choose to back pack on their own, hike with guides and go on outfitted trips with professional outfitters. We should find ways to maintain recreation; not to mention living up to the promises made when the Park was first being planned and established.

Respectfully Submitted,

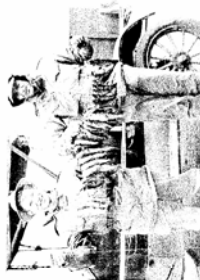
Dale Wick

Dale Wick



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Dr. Virgil E. Harder

July 28, 2005

Bill Palek, Superintendent
Mountain Lakes Fishery Management Plan/EIS
North Cascades National Park Service Complex
810 State Route 20
Sedro-Wooley, WA 99294-1239

Comments related to Mountain Lakes Fisheries Management Plan, or EIS

1 - "Wilderness" is in EIS volume I 333 times. It is in the EIS Appendix volume II 199 times." The EIS leans rather strongly toward blaming fishers for damaging the "wilderness value" of lakes. Are only fishers at lakes?

Which is more likely to detract from a wilderness experience or wilderness values? Fish in lakes? Or books/brochures/websites/etc. that list lakes and describing how to get to them? I could cite a litany of lakes that have ruined the "wilderness experience" because they appeared in "Hikes" books. For the EIS to meld fishers into number of visitors at various NCNP Complex locations/areas, generates fictitious, inaccurate numbers for fishers-at lakes. Besides, most fishers go to lakes with no trails to them, and the fishers' credo is "leave no trace." In other words, for the EIS single out fishing and claim that fishing detracts from wilderness values is preposterous. Why should it ban fish? Fishing ADDS to wilderness values just like hiking, mountain climbing, and camping do. Ban "hike" books: then people will indulge in wilderness experiences. Whether they, as a consequence, will ENJOY their wilderness experience, however, is an unknown factor.

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Bill Palek

July 28, 2005

2 - The EIS implies--probably states, and I missed it--there were or are no NATIVE fish in NCNP Complex; ipso facto, no native fish equals no authority to stock fish. NCNP staff archeologist, in a paper published in March 1997, titled "AN UPDATED SUMMARY STATEMENT OF THE ARCHEOLOGY OF THE NORTH CASCADES NATIONAL PARK SERVICE COMPLEX, has several references to fish being in NOCA centuries ago. Here's one quote: "The lands in today's park complex were occupied by human groups for at least the last 8,400 years...Most of the archeological sites in NOCA consist of below-ground remains of camps and resource areas where Indian people processed and cooked food, collected specific kinds of rocks and minerals for tools, and hunted, fished, and collected plants." Could Ross Lake fish be descendants from 8,400 years ago? Could fish have come up Skagit River before the Ross Lake dam was built, and moved into connecting streams and lakes? Could Ravens and/or Loons have dropped fry into lakes?

The EIS needs to quit its bias and be objective. It needs to use science, not domineering or unsupportable declarations.

Virgil E. Harder



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energy. We have watched a pair of loons at Ferry Lake in Ferry County attempt to raise chicks this way, and without intervention they are unsuccessful.

I am an advocate of letting ecological processes dominate the landscape and am not in favor of feeding wildlife. However, the management decisions we have made over time have affected our wildlife populations. In the case of loons, human disturbance has probably displaced nesting pairs on most of their historical territories in the western states. People have also put fish into lakes that are naturally fishless. That the loons have had some success on stocked lakes has essentially kept Washington's population from being decimated. That the Park Service has managed Hozomeen Lake for loons is recognition of the importance of keeping the population extant. The EIS states that losing one loon pair would cause only minor to moderate adverse impacts on the state's common loon population. Perhaps, though with such low numbers of chicks fledged annually, I'm not sure how that conclusion is justified. However, I cannot agree that the pair of loons nesting at Hozomeen would sustain only minor to moderate adverse impacts. The loons occupying this territory are unlikely to be successful again.

Though I am writing this letter as an individual, as part of my work for the USDA Forest Service I have developed an educational program on the common loon, and have delivered it to children's camps on lakes where loons nest for the last ten years. The program emphasizes that the decisions kids make as members of society have an affect on wildlife and wildlife habitat. I urge you as professionals to include Hozomeen Lake in the list of lakes that will continue to have fish in the North Cascades National Park, and if possible, choose Willow or Ridley Lake to become fishless.

Sincerely,



Patti Baumgardner

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Bill Paleck, Superintendent
Mountain Lakes Fishery Management Plan/EIS
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239

Dear Mr. Paleck,

Thank you for the opportunity to comment on the North Cascades National Park Service Complex Draft Mountain Lakes Fishery Management Plan Environmental Impact Statement (EIS). In general, I applaud your efforts to return the North Cascades Park and environs to a more natural state by increasing the number of fishless lakes in the complex. This move is likely to have a beneficial affect on your indicator species and presumably will move the area towards a more ecologically intact state. However, I am concerned about the affects of the proposed action alternative (alternative B) on the common loon.

As stated in the EIS, a nesting pair of common loons has occupied Hozomeen Lake since 1971. According to your document, this is only one of 20 lakes in Washington where loons have been known to nest from that time to the present. The Park Service has actively managed Hozomeen to protect the loons by closing the lake to visitors during the nesting season, and records show the pair has successfully produced chicks. Not mentioned in your document is that in recent years, only six to twelve loon chicks have been known to fledge annually in the entire state.

The EIS states that adequate fish sources for the loons occur in nearby Ross, Ridley, and Willow Lakes. It is unclear whether this statement presumes that the loons will move their nesting territory, or use these lakes for their food source. Either way, the chances of the loons being successful will be greatly reduced. In the first instance, it takes more than an adequate supply of fish to induce a pair of loons to nest. Efforts throughout the state to attract loons to nest on lakes where they historically reproduced have largely failed. Given what we have learned about loons returning to their neonatal territories to establish nesting sites, I assume that if the habitats on the three nearby lakes mentioned in the EIS were suitable, they would be occupied with loons that had been hatched on Hozomeen Lake. Once a pair does establish a territory, it generally remains faithful, even after repeated nest failures (as on Blue Lake in Okanogan County). I also assume that it will not be easy to dislodge the Hozomeen pair from a nesting territory that has been occupied for so many years. In the second instance, loons do fly to other lakes to feed, and even bring small fish back to nourish chicks. This however takes an enormous amount of



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Mr. Paleck
August 16, 2005
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where fish stocking and wilderness angling are longstanding historical practices. This alternative has been determined by the analyses documented in the EIS to conserve biological integrity of park lakes and their biota, leaving no permanent evidence of human presence and allowing natural processes to prevail. We do not believe legislative action is necessary for you to adopt this alternative.

WDFW would like to compliment the North Cascade National Park staff for their fine effort in the development of the Mountain Lakes Fishery Management Plan and this EIS. It is a well-written and professional piece of work. This document in conjunction with our recommendations above will result in an outcome that will best serve the citizens of Washington State and all visitors to the North Cascade National Park.

Please let me know how we can be of further assistance in this matter.

Sincerely,


Jeff Koenings, Ph.D.
Director

cc: Senator Maria Cantwell
Congressman Norm Dicks
Congressman Rick Larsen
Congressman Doc Hastings
Bob Everett
Lew Atkins
Jo Wadsworth
Tom Davis
Trailblazers
The Washington State Hi-Lakers

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August 16, 2005
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environment without degradation, risk to health or safety, or other undesirable and unintended consequences an aspect in which alternative D, the proposed environmental preferred alternative does not address. Additionally, Alternative B offers the greatest potential for partnerships between the State, the Park, and stakeholders for implementing fish removal projects on those lakes with high-density naturally reproducing populations. By continuing to provide quality high lake fishing opportunity Alternative B also offers the benefit of continued communication and education of backcountry anglers, thus reducing the potential for unsanctioned introduction of fish in high lakes.

WDFW believes that Alternative D is not an appropriate alternative given it is in direct opposition with the purpose of the plan/EIS and its objective to "Provide a spectrum of recreational activities including sport fishing..." in the study area, which is made up of park high lakes with a history of fish presence. The intent of Alternative D is to eliminate fish in the Park's high lakes, and is in direct conflict with providing sport fishing opportunity in high mountain lakes. WDFW believes Alternative D should be dropped from consideration and omitted from the Final EIS entirely.

WDFW recognizes the Park's intent to gain clarification of the enabling legislation that would explicitly allow for the stocking of fish to continue within the park. However, in our view the intent of congress in the enabling legislation is clear and the continuation of active fisheries in the Park was expected. While WDFW supports clarification on the enabling legislation we also recognize that such action may take several years and that until that clarification is received a default position must be held. Alternative B should be adopted as the default position until clarification is received for the following reasons:


1. It is based on a fish management plan developed from the best available science,
2. It is consistent with the expressed purpose of this EIS, and
3. It addresses all aspects of the environmentally preferred alternative as defined.

WDFW continues to disagree with the application of the Minimum Requirement Analysis (MRA) with regard to fisheries management within the park. Fish stocking is **not** one of the ten prohibited activities as defined in section 4(c) of the Wilderness Act. The MRA should only be applied to those prohibited activities, and not be used to determine new prohibited activities. However, if the MRA is used to evaluate the need for fish stocking, WDFW has concluded that limited, biologically based stocking of non-reproducing trout is necessary for the administration of the Stephen Mather Wilderness because it is necessary for the implementation of the preferred alternative of this EIS, which would provide many unique benefits.

In summary, WDFW strongly recommends that the Park Service adopt alternative B, the preferred alternative. It is a fishery management program that is biologically based on limited stocking of non-reproducing trout to provide high lakes recreational angling in park waters



Thank you for all the effort you and the NPS staff have put into the development of this EIS. It is without a doubt the most comprehensive study of a high lake fishery ever done. Although some of my comments at first might not be considered substantive because they describe feelings or desires, it is the deeply felt feelings that drive my desire to maintain a mountain lake fishery. While a deeply felt armchair philosophy about wilderness values is important in helping preserve those values through contributions to organizations that promote those values through science, education and legal action, I believe people who have actually spent a lot of time on the ground in the wilderness should be listened to very carefully. Also, the armchair wilderness philosopher and the wilderness user who fishes, and eats the berries and mushrooms have a lot more in common than either of them may realize. Because it is through the very acts of walking and climbing and catching and picking and eating and drinking and breathing and seeing and listening and feeling and smelling and sleeping on the land that many wilderness advocates are made.

Aug 17, 2005
To: Bill Paleck
From: Mike Swayne 
Subject: Comments on Mountain Lakes Fishery Management Plan/EIS

I was born and raised in the North end of Seattle. I have been a member of the Trail Blazers since 1958. I have a PhD in environmental science and engineering from the University of Washington and worked on many large environmental data management projects. But most important regarding this EIS, I am a lover of our North Cascade mountains and lakes. Therefore, I spent a lot of time becoming familiar with the data that went into the EIS, reviewed the EIS analysis and recommendations, and submit the following written comments on the Draft Mountain Lakes Fishery management Plan/EIS. I am submitting the comments as MS WORD DOC and PDF files on CD with the intention of facilitating EIS staff review.

Please consider my comments part of an overall Trail Blazers response. Due to limited time, the Trail Blazers were not able to compile all member comments into one document. My comments are organized according to the EIS Table of Contents and are inserted into the EIS Table of Comments using a red color font.

I would like to lead off by saying that the oral statement I made in Bellevue summarizes what has driven me to go on so many high lake stocking and survey trips, develop a database of high lake fish stocking and surveying, and work with the Washington Dept of Fish and Wildlife and NPS on data collection and management. The mountain lake fishery is not only important to me personally and culturally but led me to a lifetime of work on environmental issues and problems. I have come to believe that better information is the key not only to better environmental management but also in minimizing or eliminating problems to begin with. I have seen this not only in working with industrial plant managers but with high lake fishers as well. Many people join the Trail Blazers wanting to know where to go to catch fish. After a few years, they begin to understand the high lakes typically do not support very many fish and the habitat is sensitive, so they become much more careful about how they fish and camp and travel. They do not take very many fish, they do not build big camps or cut trees or boughs, they do not leave garbage, they do not trample the shoreline and many do not even like to leave footprints. What causes this change in behavior? It is the information they receive from the Trail Blazers and working with the land management and fish and wildlife agencies.

I believe the most important part of the whole NPS Mountain Lakes Fishery Management Plan/EIS effort in the future will be seen to be the cultural connection many people have to the high lakes and the information and knowledge that was gained. I encourage the NPS to view the information developed for this EIS to be not only useful for making one tactical decision on fish stocking but as part of an important baseline of information to be built on in perpetuity. For how can managers manage and how can scientists do science without knowing the history of the physical, biological, chemical and social conditions? Future generations of a better-educated public will also get much more enjoyment out of their visits to the mountain lakes by knowing more about them. How were the mountains and lakes formed? How did plants and animals colonize the mountain lakes after the ice age? How did the lake environments come to have introduced plants, animals, and fish? Many people think they have always been there. Some people think that stocked fish are interfering with "native" fish, not knowing that all the fish were introduced. How human use of the lakes has changed with our social development. So many things will be of interest to managers, scientists and the public in the future.

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David A. Berger

August 19, 2005

This letter is follow-up to oral testimony given on July 26 in Bellevue, WA, regarding fish stocking in the NCNP.

It concerns Option B, and to a much lesser extent C. Option B contains several component items. These components are geared toward improving the health of the ecosystem and preserving some fish stocking. Please note that per the finding of the Lis & Larson scientific report, these are not exclusive goals. Indeed, careful fish stocking has no measurable effect on the health of the ecosystem, according to that exhaustive report.

The components of Option B include removing some lakes from being stocked; removing over-reproducing fish from some lakes; and considering other lakes for stocking, especially those that been cleared of over-reproducing fish.

My concern is that only the first component of Option B will be well implemented, largely because it costs nothing. The other components, critical for restoring health to aquatic ecosystems and creating quality, non-impact fishery, will take time, money and effort. The concern then is that these important parts of the Option B plan will not happen.

I believe that as Option B is a complete plan, so should all components of the plan be linked in such a way that the plan advances as a whole.

For example: no more than half of the lakes identified for cessation of stocking could have stocking stopped until half of the overstocked lakes destined for attention have been treated, and reviewed via the adaptive management and other policies for introduction of non-reproducing fish.

This would insure that loss of fishable lakes is matched by the effort to improve lake habitats, a goal anglers support wholeheartedly. We do not want to be the only ones making sacrifices or efforts. A linkage between the Option B components would indicate and insure the good faith of the Park Service. Option B should not be a fig leaf to simply and immediately reduce the historical and valued practice of stocking in the NCNP.

Yours,

David Berger

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Steelhead Trout Club of Washington

Russ Simpson, President

Dan Miller, Vice President



En County, Washington

August 22, 2005

Bill Peltok, Superintendent
North Cascades National Park
810 State Route 20
Sedro-Woolley, WA 98284-1230

Subject: NCNP - MOUNTAIN LAKES FISHERY MANAGEMENT PLAN

The Steelhead Trout Club of Washington is in agreement with the WDFW (WA Dept. of Fish and Wildlife) and supports Alternative B for the subject, NCNP's DEIS. We firmly believe that the fish stocking of the sixteen mountain lakes in the NCNP, enhances the public's wilderness experience while valuing these mountain lakes.

Current members of our club were actively involved with the Washington State congressional delegation, particularly Rep. Lloyd Meeds and Senator Henry Jackson during the many discussions that were held during the creation process for the NCNP (North Cascades Park). We have no doubt that these were well-informed, rational discussions, reached by our congressional delegation, and the Secretary of the Interior, Stewart Udall, in the WDFW (WA Dept. of Fish and Wildlife), would continue to manage these mountain lakes, including restocking of the fish upon creation of the NCNP in our state.

A major issue raised by the NCNP in recent years, was whether the fish stocking of the mountain lakes impacted the lakes ecosystem. This question was answered by the NCNP's funded study, of 15 years duration, that was carried out by "Lee and Larson". The scientific conclusion reached in the study was that no measurable impact on these mountain lakes ecological systems would result from fish management using, low-density, non-reproducing fish. Alternative B, in the DEIS, satisfies this criterion.

The current DEIS states that clarification is required by the congress to give the NCNP the authority to continue the current program of fish stocking these mountain lakes. We find this repugnant that this NCNP's DEIS is again raising this issue, when the Secretary for the Dept. of the Interior, Stewart Udall, was in agreement with our congressional delegation that the WDO would continue to restock fish in these mountain lakes.

The Steelhead Trout Club of Washington urges adoption of Alternative B for the subject, NCNP - DEIS. The current recreational fishing in the NCNP is a very enjoyable wilderness experience for the public.

Sincerely,

Russ Simpson
President, Steelhead Trout Club of Washington

SINCE 1928





Bill Paleck, Superintendent
Fishery Management EIS
North Cascades National Park
810 State Route 20
Sedro Woolley, WA 98284

Dear Superintendent Paleck & Staff:

We are concerned about the Park's apparent lack of commitment to maintain the recreational values that were promised to our citizens and visitors when the Park was established.

1. **Continuation of historical fish stocking** is assured to us in the Wilderness Act and was also promised when the Park was established. There are no studies that show that stocking of fish have an impact "scientifically significant" on other fauna or flora. We support continued stocking in lakes with low or no reproduction and management of those lakes with highly reproducing populations to reduce the impact they seem to have on amphibians and invertebrates.
2. **The Wilderness Act and the Park establishing legislation provides for recreational uses.** It seems to us that the EIS does not give appropriate weight to the recreational values available to Park visitors. Some preservationist groups seem to want to "renegotiate" (ignore) the Wilderness Act by eliminating the historical recreational values that are preserved for future generations. The EIS seems to interpret "wilderness values" as some concept that prevents people from recreating at and fishing our beautiful lakes.
3. **We do not understand the need for "Congressional clarification".** The enabling legislation can not be expected to list all of the activities and that will be allowed in the Park. The Wilderness Act does specifically protect some activities, that has probably been helpful to managers. We are not against Congressional clarifications but it certainly is not required to allow activities. I could list a multitude of things allowed in the Park which have never received Congressional approval. We should not stop doing historically acceptable things while Congress decides if it is OK.
4. **Fishing, along with hiking and camping are compatible with wilderness values.** We see no evidence in the EIS's scientific research to cause the Park to have a concern about stocking of fish. Obviously, those fish stockings should use species and be in lakes where reproduction will not cause a high fish density.

Page 1 of 2

Bruce & Sandy Wick -

5. I know that the **MRA is focused on fishing** but if those same standards were applied to other valuable forms of visitor activities you may conclude that we should lock the Park gates and keep everyone out. Hopefully you will take another look at how the Minimum Requirement Analysis is being used in Appendix K.

6. **Recreation and biologically appropriate preservation.** Managers should continue to support the intent of the Park's enabling legislation's. We were promised that the Park would open the North Cascades to the public and provide a wonderful area to recreate. Fishing is an important part of that recreation. It either is the reason or is an important adjunct to the reason for visitors to hike the trails and visit the area. Unless strong scientific evidence comes to light to require a discontinuation of fish planting, fishing opportunities should continue to be available as it has for many decades before the Park was created.

Thanks you for considering our comments. We look forward to having this process completed and the right to continue fishing the North Cascades secured for many generations.

Sincerely,

Bruce Wick

Bruce & Sandy Wick



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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Shaw Avenue
Seattle, WA 98101



AUG 24 2005

Reply To
Attn Of: ETPA-088
Ref: 03-004-NPS

Bill Paleck, Superintendent
North Cascades National Parks Service Complex
810 State Route 20
Sedro-Wooley, WA 98284-1239

Dear Mr. Paleck:

The U.S. Environmental Protection Agency (EPA) has reviewed the draft Environmental Impact Statement (EIS) for the **Mountain Lakes Fishery Management Plan** (CEQ No. 20050203), in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. Section 309, independent of NEPA, specifically directs EPA to review and comment in writing on the environmental impacts associated with all major federal actions and the document's adequacy in meeting NEPA requirements.

The draft EIS evaluates a range of alternatives and management actions for 91 mountain lakes in the North Cascades National Park Complex (The Complex) in Washington. These lakes under natural conditions would be fishless, and currently have, or at one time had, fish presence as a result of fish stocking activities. The EIS assesses impacts that could result from the continuation of the current management framework (No Action Alternative) and three proposed action alternatives. The Action alternatives range from eliminating high densities of reproducing fish populations from lakes while allowing low densities of reproducing and non-reproducing fish populations in select lakes (Preferred Alternative - 42 lakes may have fish) to the elimination of all fish from the mountain lakes in the study area (Environmentally Preferred Alternative - all 91 lakes would be fishless).

We support the goals of the proposed project to conserve native biological integrity, provide a spectrum of recreational opportunities and visitor experiences, and resolve the debate and conflicts over fish stocking in North Cascades National Park Service Complex. We have concerns that the Preferred Alternative (Alternative B) would allow for continued stocking of naturally fishless lakes consequently manipulating the native ecology and introducing nonnative species. Nonnative fish species have been shown to impact local biota within the study area. In particular, it has been demonstrated that nonnative fish species have long term impacts on plankton, macroinvertebrates and amphibians. Consequently, we have assigned a rating of EC-1 (Environmental Concerns - Adequate) to the draft EIS. This rating and a summary of our comments will be published in the *Federal Register*. A copy of the rating system used in conducting our review is enclosed for your reference.

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Comment on the Draft Mountain Lakes Fishery Management Plan /
Environmental Impact Statement, North Cascades National Park Service Complex

August 21, 2005

Martin Messing

Of the four alternates, A, B, C, and D, I support Alternate B, despite its short comings as the best for the park and the people enjoying it. I base my opinion on the following reasons.

1. US Senator Jackson Committee held hearings in Seattle, on Interior and Insular Affairs north Cascades - Olympic Park. Hearings on the study team report of recreational opportunities in the State of Washington. (February 11 and 12, 1966, 89 th cong. 2d Sess. 1966 pp 26.) In hearings to establish the park during negotiations with the Washington state congressmen and state officials, representatives of the Interior Department repeatedly assured, them that fishing and fish stocking would not be forbidden. A quote from Stewart Udall Secretary of the Interior is as follows; " Fishing of course will be permitted use in both the national recreational area and the national park." (Hearings # 2 pp 12.) Numerous other assurances could be quoted from the same hearings.
2. The idea that some how trails can be built and maintained as natural in a wilderness while regulated fish stocking and fishing are not permitted is mistaken. While trails should be permitted and maintained under most circumstances, engineered and graded trails are no more natural than rational fish stocking and fishing. That congress is required to authorize fish stocking and fishing in the North Cascade complex before it can continue and not have to authorize trails and trail building, for it to continue is not rational.
3. The North Cascade Park funded and sponsored study by " Liss and Larson " of the North Cascade lakes, found that lakes with low numbers of non reproducing trout have minimal impact or damage on the ecology of these lakes. Depending on the size and condition of North Cascade lakes, limited numbers of non reproducing trout should be permitted.
4. Most climbers and hikers generally seek out lakes and ponds to camp and in some cases as a destination. It shouldn't be assumed that fisherman are the most likely to cause most camping and shoreline impact.
5. Parks should be for people to enjoy and get in touch with nature, climbing, hiking, camping and fishing are part of that. The citizens of Washington state have a tradition of doing those things in the North Cascades before the Park was established, they should be allowed to continue with the least possible restrictions.



The Preferred Alternative (Alternative B) would conserve biological integrity in lakes by eliminating or reducing (if elimination proved infeasible) reproducing fish populations. This would eliminate high densities of reproducing fish populations from lakes in the study area while allowing low densities of reproducing and nonreproducing fish populations. While this management framework would minimize risks to biological integrity, it would still result in impacts on the local environment. In particular plankton and macroinvertebrates and amphibians would continue to experience long-term adverse impacts from predation and competition in all lakes that are stocked with fish.

The goal for the Environmentally Preferred Alternative (Alternative D) is that all 91 lakes would be fishless. This alternative is most closely aligned with the Naton Park Service (NPS) Management Policies which state that exotic species will not be introduced into parks and that the NPS is not to intervene in natural biological or physical processes, except in emergency situations to restore natural ecosystem functioning that has been disrupted by past human activities. Also, by removing the native fish in these lakes, Alternative D would eliminate long-term predation and competition impacts on plankton, macroinvertebrates and amphibians in the study area. While we acknowledge that there will be short-term minor impacts resulting from the removal of the native fish, the EIS includes an adequate monitoring and adaptive management plan to assure that these impacts are minimized.

The EIS demonstrates that the Environmentally Preferred Alternative (Alternative D) causes the least damage to the biological and physical environment and best preserves and enhances historic, cultural and native processes. We acknowledge that angling in the mountain lakes within The Complex would be eliminated through the implementation of Alternative D, however, we believe that the EIS has established that opportunities for mountain lake angling exist within close proximity of The Complex. The EIS states that within the Cascade mountain range, there are 800 stocked and 1000 fish reproducing high mountain lakes similar in character to those in the study area. Of these lakes, there are 200 stocked lakes and 200 fish reproducing lakes within 100-miles of the study area. These lakes provide opportunities for anglers to pursue high mountain sport fishing within close proximity of The Complex.

Due to the long term biological impacts that would result from Alternative B, and the availability of high mountain sport fishing opportunities within close proximity of The Complex, EPA recommends that the NPS select Alternative D for the Mountain Lakes Fishery Management Plan.

Thank you for the opportunity to review this draft EIS. If you would like to discuss these comments in detail, please contact Mike Letourneau at (206) 553-6382 or myself at (206) 553-1601.

Sincerely,



Christine Reichgott, Manager
NEPA Review Unit

Enclosure



U.S. Environmental Protection Agency Rating System for
Draft Environmental Impact Statements
Definitions and Follow-Up Action*

Environmental Impact of the Action

LO - - Lack of Objections

The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC - - Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO - - Environmental Objections

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU - - Environmentally Unsatisfactory

The EPA review has identified where environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 - - Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 - - Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts. The reviewer has identified specific areas where more information is needed. EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 - - Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts. The reviewer has identified areas where the EIS has not analyzed available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussion needed to adequately assess the environmental impacts of the action is not available. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

FINAL MOUNTAIN LAKES FISHERY MANAGEMENT PLAN

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EIS. Would NPS go to Congress to approve a plan for a new trail system or an area of educational or safety signage?

Congress does not act upon all issues referred to it. Congress has broader, more important decisions demanding its attention. Specific local decisions were delegated to NPS for a reason. HI-1 akers have no objection to an amendment to the law specifically authorizing scientifically controlled fish stocking in the North Cascades Complex; the organization supports that effort. We do object to the plan's conclusion that lack of congressional action means the best solution is barred.

Before I comment on the three specific reasons for requiring "congressional clarification" I note a reliance throughout the reasons and in the draft EIS as a whole upon the characterization of the 1986 NPS Memorandum as a "Policy Waiver." The draft EIS identifies this Memorandum as a "Policy Waiver" every time it is mentioned, even in the table of contents to volume two, and in Appendix A Contents page 1 and again at page 3. In fact, the 1986 NPS Memorandum is the statement of specific North Cascades Complex fish management and stocking policy, and it says nothing about waiving any policy. This Memorandum recites local history and conditions and it states:

"...you requested that we provide you with a clear statement regarding National Park Service Policy for management of fisheries resources in the North Cascades Complex."

That policy has been applied now for 19 years, and it has been implemented through agreements with WDFW which also has fish management jurisdiction there.

The Executive Summary at page vii states that the 1988 Wilderness Act directed NPS to manage this wilderness in accordance with the 1964 Act, and "At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters..." Which policies are those? Do they apply to stocking fish native to the drainage and ecosystem involved, if not to the lake? If such policies existed in 1986 they should be added to Appendix D. The Background summary at page 11 refers to a 1972 policy that prohibited artificial stocking of fish species exotic to a park and prohibited stocking "naturally barren waters." The draft quotes and cites Louter 2003 for this statement rather than the policy itself. What is the complete policy, to which parks did it apply, and over what time period was it in force? Both Management Policies 4.4.3 and 4.4.4.1 provide for stocking of native or exotic species under specific situations that can apply here, i.e. historic stocking in a recreation area or preserve, or stocking in wilderness needed to meet the desired condition of a historic resource, but only where it is prevented from being invasive. At the bottom of page 32 of Volume One the draft EIS summarizes policy 4.4.4.1 and follows that summary with an unsupported conclusion. The conclusion is that because not all of the 4.4.4.1 conditions have been met a "policy waiver" has been required. This conclusion is plainly contrary to the language of the 1986 NPS Memorandum. How was it determined that the conditions of 4.4.4.1 were not met? This conclusion is not correct.

However, let us assume for analysis purposes that the Executive Summary statement is literally correct; "At the time the WPWA was passed, NPS policies prohibited fish

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necessary to the administration of the areas. This latter issue is the subject of extensive comment in my July 27, 2005 submission, a copy of which is resubmitted herewith.

B. NPS has committed itself to make North Cascades fish stocking decisions based upon information (facts and science), not based upon law change.

In the 1985 Memorandum of Understanding the NPS and WDFW agreed to consult with each other regarding research and regulation and transplanting of fish, and they agreed to establish Technical Study Task Forces. The 1986 NPS Memorandum directs that some of the North Cascade Park lakes be stocked with species native to the Park or ecological region for recreational purposes and directed that some be left fish free; and it encouraged a research effort to monitor impacts and determine changes over time. The intent of the research was to provide an informed basis for fish stocking management in the future. The 1988 twelve year Supplemental Agreement allowed fish stocking in 17 Park lakes and allowed self sustaining populations to continue in 23 more while the NPS conducted research. It also stipulated that the list of lakes could be changed only by mutual agreement between NPS and WDFW and added that research results would be considered in future decisions. This 1988 agreement also stated:

This Supplemental Agreement shall remain in full force and effect unless terminated by mutual consent of the Department and The Service.

The 1991 Consent Decree provides that NPS will complete its research and conduct a NEPA review of fish stocking. The 2002 Reaffirmation extends the 1988 Supplemental Agreement to December 2004.

By the memorandum, agreements and Consent Decree NPS has committed itself to a process that includes scientific research, consultation with WDFW and agreement not to revise the stocking list without WDFW agreement, and ultimate review and resolution of fish stocking issues by the NEPA process. The letter and spirit of all the agreements dictate that the final decisions be based upon information, not legislation. The late date insistence upon legislation prior to scientifically conducted fish stocking violates these agreements.

Conclusion

The draft EIS is a mostly objective document of considerable depth. The whole of the document is tarnished by imposing upon it a web of strained facts and logic in order to support a conclusion the no fish stocking will be allowed without "congressional clarification." We request that this conclusion and its supporting arguments be removed from the draft EIS along with the characterizations of the 1986 NPS Memorandum as a "policy waiver" throughout.

Submitted:

Dale Riveland, HI-Laker
20028 18th Ave NW
Shoreline, WA 98177
drmoom@emc.net



SUBSTANTIVE NORTH CASCADES EIS COMMENT
DALE RIVELAND, HI-LAKER
July 27, 2005

Issue Discussed
This comment questions the application in Appendix K of the Minimum Requirements Decision Guide (MRDG) to the fish stocking decisions. The Step 1 of the MRDG provides: "Is it necessary to take action?" This is not a proper question regarding fish stocking. The MRDG questions were designed for decisions to overcome one of the ten statutory prohibitions, not for general management decisions. The result of answering a misleading question is that the minimum requirements analysis provides a misleading answer.

Comment
The Washington Department of Fish and Wildlife (WDFW) Comments on the Minimum Requirements Analysis (Appendix K, p.299-300) are correct in concluding that no MRA is required for continuation of century old fish stocking in limited lakes selected by biologists in order to maintain biological integrity. If it is determined that an MRA is required, then the correct standards are those specified in National Park Service (NPS) management policy 6.3.5. Apparently when the WDFW comments were authored the WDFW did not have before it the language of NPS management policy 6.3.5. I submit these comments as my supplement to those of the WDFW.

The MRDG states that it is derived from Section 4(c) of the Wilderness Act, Instructions-p.1. If an MRA is required at all for fish stocking, it is not because fish stocking is one of the ten prohibited activities in Section 4(c), but because NPS has issued policy 6.3.5 which provides:

All management decisions affecting wilderness must be consistent with the minimum requirement concept.

Policy 6.3.5 describes a two step process that is significantly different than the MRGD process. The two step process under this policy is:

Whether the proposed management action is appropriate or necessary for administration of the area as wilderness and does not pose a significant impact to wilderness resources and character; and the techniques and types of equipment needed to ensure that impact to wilderness resources and character is minimized. Emphasis supplied.

In accordance with this policy, superintendents will apply the minimum requirement concept to the context of wilderness management planning, as well as to all other administrative practices, proposed special uses, scientific activities, and equipment use in wilderness. When determining minimum requirement, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness resources or character is unavoidable,

necessary to the administration of the areas. This latter issue is the subject of extensive comment in my July 27, 2005 submission, a copy of which is resubmitted herewith.

B. NPS has committed itself to make North Cascades fish stocking decisions based upon information (facts and science), not based upon law change.

In the 1985 Memorandum of Understanding the NPS and WDFW agreed to consult with each other regarding research and regulation and transplanting of fish, and they agreed to establish Technical Study Task Forces. The 1986 NPS Memorandum directs that some of the North Cascade Park lakes be stocked with species native to the Park or ecological region for recreational purposes and directed that some be left fish free; and it encouraged a research effort to monitor impacts and determine changes over time. The intent of the research was to provide an informed basis for fish stocking management in the future. The 1988 twelve year Supplemental Agreement allowed fish stocking in 17 Park lakes and allowed self sustaining populations to continue in 23 more while the NPS conducted research. It also stipulated that the list of lakes could be changed only by mutual agreement between NPS and WDFW and added that research results would be considered in future decisions. This 1988 agreement also stated:

This Supplemental Agreement shall remain in full force and effect unless terminated by mutual consent of the Department and The Service.

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By the memorandum, agreements and Consent Decree NPS has committed itself to a process that includes scientific research, consultation with WDFW and agreement not to revise the stocking list without WDFW agreement, and ultimate review and resolution of fish stocking issues by the NEPA process. The letter and spirit of all the agreements dictate that the final decisions be based upon information, not legislation. The late date insistence upon legislation prior to scientifically conducted fish stocking violates these agreements.

Conclusion

The draft EIS is a mostly objective document of considerable depth. The whole of the document is tarnished by imposing upon it a web of strained facts and logic in order to support a conclusion the no fish stocking will be allowed without "congressional clarification." We request that this conclusion and its supporting arguments be removed from the draft EIS along with the characterizations of the 1986 NPS Memorandum as a "policy waiver" throughout.

Submitted:

Dale Riveland, HI-Laker



only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

It is indeed logical that a lesser standard be applied in the general decision process affecting wilderness than in decisions to overcome statutory prohibitions. There is no logic in using a strict "necessity" standard when deciding whether to go left or right in general management decisions. For the fish stocking issue the proper Step 1 is:

Is the proposed management action "appropriate or necessary for administration of the area as wilderness," and does it "not pose a significant impact the wilderness resources and character?"

That is the language of the policy. This corrected question elicits a different answer that already appears in the MRA. The correct answer is the paragraph that appears immediately before the Step 1 question as follows:

Following removal of reproducing, self-sustaining populations of trout, restocking of some lakes with nonreproducing populations of trout, as proposed in two alternatives, would support recreational and historical use purposes of the wilderness area while minimizing impacts to biological integrity. (Appendix K, p.293).

It would be violation of NPS policy to apply a decision standard far more stringent than the policy requires.

The minimal tool for fish stocking is hand stocking by backpack access.

KING COUNTY OUTDOOR SPORTS COUNCIL

August 24, 2005

Bill Palek, Superintendent
Mountain Lakes Fishery Management Plan/EIS
North Cascades National Park Service Complex
810 State Route 20
Sedro-Wooley, WA 98284-1239

Dear Superintendent Palek:


The KCOSC would like to go on record as supporting, with reservations, Alternative B of this EIS. We are somewhat worried about the wording of this alternative as it gives the impression that 42 lakes may have fish but at the same time stating that lakes where fish have been eliminated may not be restocked. We believe there should be no net loss in the number of lakes from the 40 that are now on the current MOU between the NCNP and the WDFW. If there is then we believe the NPS needs to mitigate this recreational loss to the people of Washington as they were promised this resource in return for supporting the creation of the NCNP.

We would also like to comment on the use of two preferred alternatives. You only obfuscate the issue rather than focusing on the issue as laid out in the Consent Decree. The merits of fish stocking were supposed to be determined on the science gathered by Liss & Larson rather than environmental emotion. And, the science from that report clearly shows that low density fish stocking, using non-reproducing fish, have not created a biological problem.

We also find it repugnant that Alternative D will automatically be in effect, after 2 years, if congress fails to pass legislation stating that fish planting is allowed in the NCNP. The "then" Secretary of the Interior, Stewart Udall, and the "then" Director of the National Park Service, George Herzog, both assured the congressional delegation of this state that fish planting would continue if a park were to be created. Under those circumstances it is no wonder that congress felt no need to insert fish stocking language into the enabling legislation for the NCNP.

We also feel the NCNP, as they will be a cooperating fishery manager, should be in line for a share of the fishing license dollars from the State of Washington. The NCNP could sell licenses and keep half the dollars to finance their portion of fishery management.

The King County Outdoor Sports Council is an umbrella sports organization, formed in 1933, and represents 12 sports clubs with over 10,000 members.

Sincerely,

J. Ray Leebetter, President



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These 91 lakes that the EIS refers to should be allowed to return to their natural and native status, thereby allowing the native flora and fauna to restore itself. Thus, we support Alternative D and ask you to please make the appropriate choice for our Park. Thank you for the opportunity to comment.

Sincerely,

Marlene & Jurian Renwyck

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August 23, 2005
Bill Paleck, Superintendent
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239
Re: Mountain Lakes Fishery Management Plan/EIS
Dear Mr. Paleck,

Please accept these comments on the Mountain Lakes Fishery Management Plan/EIS on behalf of my family who regularly visit and recreate in North Cascades National Park. Having spent numerous years living in Bellingham, Washington, we are very familiar with the Park and though we no longer live in the area, we greatly value the North Cascades and enjoy coming back to spend time there.

The North Cascades stand out as an extremely unique and valuable Park because it is largely undeveloped; especially when compared to our other parks, such as Yellowstone, which we now live near. The North Cascades is an incredibly important ecosystem and harbors a great amount of diversity that has otherwise been lost in most of the northwest. This diversity includes mountain lake flora, amphibians and insects which have been notably affected by the introduction of fish species.

As a family who fishes, we feel strongly that fish should not be introduced or maintained in areas where they naturally and historically did not occur. It is disturbing and negatively affects our 'wilderness experience' to hike into a high elevation lake to find fish present. The damage to the ecosystem is unacceptable and difficult to measure and or remediate. National Parks are the pinnacle of our most cherished and protected lands, including the diversity of flora and fauna within. We should strive to protect this diversity and preserve it to all extents, including undoing the mistakes of our past.

Here, where we live now, Yellowstone National Park is fighting to rid themselves of non-native fisheries within the Park in order to save native fish populations from demise. Private landowners and the National Forest Service in and around our area poison creeks in order to rid them of non-native fisheries. Please don't continue this unacceptable practice by choosing to continue to stock these mountain lakes. Furthermore, you tread on dangerous ground by setting a precedent that it is not only acceptable, but legal to alter our National Parks in such a manner.



Phil Leatherman

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or, fax comments to 360-856-1934

☐ I would like to receive a CD of the final plan/EIS

☒ I would like to receive a paper copy of the final plan/EIS

☐ I would like to receive only the Executive Summary of the final plan/EIS

☐ I will download the final plan/EIS from the NPS website

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Superintendent Bill Paleck
Mountain Lakes Fishery Management Plan
North Cascades National Park Complex
810 State Route 20
Sedro Wooley, WA 98284-1239

Dear Superintendent Paleck:

First of all, I wish to thank the National Park Service for the thorough scientific job they have done in preparing the two volumes of the EIS/mountain lakes management plan. The individuals that did the preparation have done a most worthy job. It will be a most useful document far beyond what the scope of this EIS decision.

I approve of the fact if the Plan D EIS was or was not to be adopted and if Congress takes no further action, then Plan D would automatically be the management plan. Plan D is the proposal which I personally support. If Plan D is adopted I feel that it would have far reaching precedents for all other parks in the National Park system. Leaving lakes un-stocked and in their natural states would be the right direction for the National Parks and fit with the high ideals the people have set for their National Parks.

The lakes are a natural linkage of aquatic and semi-aquatic animals, and fish appear to be non-native within these lakes. By stocking these lakes we have been dramatically changing the ecosystem with devastation of the natural food web: the major loss of plankton (phytoplankton and zooplankton), amphibians, crustaceans, amphipods, other micro invertebrates, and the three toed salamander (the top natural predator for the lakes). The streams of the North Cascades Complex have numerous species of fish none of which seem to have impacted the lakes.

The lakes of the North Cascades National Park Complex present nature with a delicate ecosystem. We can see that the stocking of lakes changes this ecosystem. This should not be allowed.

It is enlightening to see that the North Cascades National Park Complex is undertaking a Forest Carnivore Inventory. A management plan here should seek ways in restoring the Pacific fisher to the park. The Grizzly bear, too, was once a native species to the park and should be considered within the carnivore management plan. Non-confirmed reports indicate the possibility it is here now. The park has many excellent habitat conditions that would help many bird and animal species thrive.

With appreciation for the fine effort,

Philip A. Zalesky
Philip Zalesky

August 11, 2005
Dear Sir: I have been helping
plant lakes in the North Pacific
since 1948. I know the lakes
before a lot of them were
in the National Park
Bundones enjoyed the area
and would like to contribute
to the future of the park
stocking increasing every
year. I don't hope we can
put together a good plan
in the future.
Sincerely Yours
George B. Bundones

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September 1, 2005

Bill Paleck
Fishery Management EIS
North Cascades National Park
810 State Route 20
Sedro-Woolley, WA 98284-1239

Dear Bill:

The Trail Blazers wish to congratulate the team that put this impressive draft EIS (DEIS) together. It is well thought out, organized, and thorough. On the other hand, the Trail Blazers have a number of disagreements with both the content and the tone of the DEIS. Individual Trail Blazers and Hi-Lakers have submitted oral and written comments on the DEIS. The Trail Blazers, as an organization, adopts and submits these comments on the members of both organization as the Trail Blazers' response to the DEIS. The Trail Blazers organization specifically adopts the written comments of the following persons:

Brian Curtis
Sandy McKean
Dale Riveland
Mike Swayne

In general, our combined comments revolve around, but are not limited to:

- The appearance of bias in many of the DEIS sections where the cessation of fish stocking seems to be given favorable treatment as opposed to the continuation of fish stocking (as judged by scientific and historical fact). This may only be a reflection of a few of the several authors that contributed to the DEIS, but in any case, such bias ought to be removed.
- Insufficient emphasis on the central role the concept of fish stocking with non-reproducing fish in low densities must play in the development of an effective and balanced adaptive management plan for fish stocking in the NCNP.
- Our strong objection to the premise that having fish in lakes at low densities is destructive, in some ethereal sense, to a park visitor's "wilderness experience".

"BETTER ALPINE FISHING"



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(Note that fish might well be in Cascade lakes naturally if stream gradients were not so steep.)

- Our disagreement that congressional clarification is required for preferred alternative B to become the Record of Decision in this NEPA process. We would certainly welcome a clarification from Congress that it intended for fish stocking to continue after the Park's formation as was mentioned in the hearings in 1967, but we do not agree with the DEIS that alternative D must prevail until such time as congressional clarification is forth coming.

- We are convinced that the MRA analysis as presented in the DEIS is heavily flawed.

Overall the Trail Blazers support the adaptive management approach as presented in alternative B.

Sincerely,

Mick Scott
President

"BETTER ALPINE FISHING"

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Sandy McKean

September 9, 2005

Comments from Sandy McKean are shown in red. In most cases the EIS language is quoted first (in black font) and my response follows (in red font).

Note that I have not made an attempt to comment on every single instance in the Executive Summary or the main body of the EIS where that comment might apply. Rather I have made the comment once, and I leave in the capable hands of the NPS professionals who will create the final EIS to find all the areas where accepted comments need be applied again in order to make the final document consistent.

Volume One

Executive Summary

"...the 1968 enabling legislation for the North Cascades Complex does not define the fishing and fish-stocking activities that would be allowed within its boundaries"

This phrase is misleading. It implies that if Congress intended for fishing and fish stocking to be allowed within its boundaries that the enabling legislation would have explicitly stated that intention. In fact the enabling legislation doesn't mention any of the visitor activities or park maintenance actions required to support such activity. For example, the enabling legislation does not mention hiking or trail maintenance either; nor does it mention camping. If the EIS is to make the statement it does, then it should indicate that Congress gave no guidance for most, if not all, accepted visitor activities, and that the NPS has taken the authority over the years to make decisions regarding such activities (be it fishing, hiking, snowmobile use, or any other visitor use) without relying on congressional direction.

"Because of the differences in policies and missions between the WDFW and the NPS....."

This should say:

"Because of the differences in policies, missions, and interpretation of historical events since the park's creation between the WDFW and the NPS....."

BACKGROUND

HISTORY OF FISH MANAGEMENT IN THE NORTH CASCADES MOUNTAIN LAKES

This history section needs an additional paragraph (or more) to describe the history of the congressional hearings in 1966 and 1967 that lead to the establishment of the park. Much of the disagreement between the NPS and the WDFW stems from differing interpretations of congressional intent as expressed in these hearings. Louter does not cover this issue well enough to be the sole source. I recommend to you the "Historical Case for Fish Stocking the High Lakes in the North Cascades" that I wrote (Sandy McKean). This document has previously been submitted to the NPS and can be found on the NPS website devoted to this NEPA process (<http://www.nps.gov/noca/highlakes.htm>).

Sandy McKean Comments on NCNP DEIS Comments

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September 9, 2005

Bill Paleck
Fishery Management EIS
North Cascades National Park
810 State Route 20
Sedro-Woolley, WA 98284-1239

Dear Bill:

Attached are my comments on the Draft EIS regarding fish stocking in the NCNP.

I think you will agree that I have put significant effort into thoroughly reading and understanding the DEIS. I have been equally diligent in giving thoughtful consideration to the material presented in the DEIS, and in presenting to you well considered, substantive comments. I have attempted to be as factual as I can and as fair as I can. I know you will consider my comments seriously.

You may react a bit to the number of times I have suggested that there is a bias to some of the concepts and language in this DEIS. I assure you I have only made such comments where I believe they are warranted. I believe this bias resulted from a pre-existing mind set of only some of the authors that worked on this DEIS. Overall, I consider the DEIS an excellent piece of work.

I sincerely believe that the many changes I suggest in these comments will improve the EIS such that it will provide a superior basis for the decisions you must make regarding fish stocking in the NCNP. If the DEIS can be edited to be more neutral, to be less speculative about the relationship between properly managed fish stocking and "wilderness values", and to more strongly emphasize the vital concept of fish stocking with non-reproducing fish in low densities, the resulting final version of the EIS will be an important document not only for the development of an adaptive management plan for fish stocking in the NCNP, but also for anyone interested in truly understanding the relationship between recreational fishing and the preservation of the wilderness.

Finally I'd like to compliment the complete professionalism displayed by you and Roy Zipp throughout this NEPA process. We have not always agreed, but the consideration, openness, and willingness to allow us citizens to participate, the two of you have shown has quite simply been the finest example of high integrity public service in my experience.

Sincerely,


Sandy McKean



"Fish stocking in the mountain lakes took place for many years prior to the establishment of the North Cascades Complex in 1968; however, the enabling legislation for this newly formed unit of the national park system did not define the fishing and fish-stocking activities..."

The underlined phrase is misleading. It should also indicate that congress gave no guidance for most, if not all, accepted visitor activities.

"The agreement expired in December 2004, and any future agreements between the NPS and WDFW concerning mountain lakes fishery management, including fish stocking in the national park, will depend on the outcome of this plan/EIS process."

The underlined phrase is incorrect. This agreement has been extended to December 2006.

IMPLEMENTING THE FISHERY MANAGEMENT PLAN THROUGH CONGRESSIONAL ACTION

"The Washington Park Wilderness Act of 1988 (WPWA) established 93% of the North Cascades Complex as Stephen T. Mather Wilderness and directed the NPS to manage the wilderness in accordance with the Wilderness Act of 1964. At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters, and the WPWA did not include a provision that allowed stocking."

These sentences are quite misleading since they seem to build the case with no justification that somehow these two pieces of wilderness legislation intended to prohibit fishing or fish stocking. This is absolutely not the case. As in the other instances above both of these acts are silent on fish stocking, just as they are silent on most, if not all, accepted visitor activities. NPS policies may have prohibited fish stocking when the WPWA was passed, but neither piece of wilderness legislation did. These acts and the NPS policies should not be conflated into these sentences. The draft language makes it far too easy for the reader to be confused as to whether the legislation or the policies restrict fish stocking. Not only that, but NPS policies ~~do~~ allow fish stocking in some cases (see written response from Dale Riveland for details).

"However, some disagree with these views and maintain that if nonnative fish were stocked appropriately, there would be no unacceptable adverse impacts on wilderness values because biological integrity would be conserved."

This sentence is incomplete since it leaves out a vital piece of information. It is true that "some disagree", but more importantly the NCNP's own research study (Liss & Larson study), widely referenced in this EIS, also disagrees. One of that study's major conclusions is that the stocking of non-reproducing fish in low densities also causes "no unacceptable adverse impacts on wilderness values because biological integrity would be conserved". Such an important finding can not be simply swept away with the simple phrase "some disagree".

"Fish stocking has been allowed to continue in the North Cascades Complex under a 1986 policy waiver."

The Trail Blazers, Hi-Lakers, and perhaps the WDFW do not agree with the characterization of 20 years of fish stocking as having occurred under a waiver of policy. On the contrary, in a 1986 NPS memo from NPS Director Mott (reproduced in Appendix A), it is quite clear that the NPS set policy specific to the NCNP that allows fish stocking under a mutual agreement with the WDFW. That policy and the subsequent 1988 Supplemental Agreement (also in Appendix A) requires mutual agreement between the NPS and the WDFW to change. The WDFW would never have agreed in 1986 to a simple policy waiver. Mott's memo was clearly intended to settle the dispute, not simply postpone it. That intent is clear, given that the 1988 Supplemental Agreement clearly specifies the need for mutual agreement to change the policy. (For more detail and a legal perspective on the subject of "policy waiver", see the written response of Dale Riveland.)

"Should a management alternative that allows for continued stocking be selected through this plan/EIS decision-making process, a new policy waiver may not be granted for several reasons. First, various national parks (Sequoia-Kings Canyon National Park, Yosemite National Park, Glacier National Park, Rocky Mountain National Park, and Yellowstone National Park) have discontinued stocking."

This NEPA process is about the NCNP, not a NPS-wide analysis. I fail to see what actions in other parks that have different histories and different requirements have to do with this decision in the NCNP. Beyond that as

stated above, it appears that the NPS has already made a separate policy on fish stocking for the NCNP in 1986. References such as these to other parks should be removed.

"If this plan/EIS process resulted in the selection of an alternative that allowed for continued stocking, issuance of a policy waiver to the North Cascades Complex could encourage other state fish and wildlife agencies to revisit the issue of stocking in NPS units where stocking has been discontinued."

Once again, what does this have to do with a NEPA process for the NCNP? Furthermore, policy for fish stocking in the NCNP was set in 1986, so no waiver is required to continue the practice.

"Second, policy waivers are only temporary and do not provide a permanent solution because they can be rescinded as circumstances change. The goal of this plan/EIS is to forge a lasting solution for mountain lakes fishery management in the North Cascades Complex."

There is nothing more or less permanent about this plan/EIS as compared to a policy, or a policy waiver for that matter. The EIS itself says elsewhere that it has a 15-year planning horizon. This is a false benefit and should be removed.

"Finally, the minimum requirement analysis for fish stocking in the Stephen T. Mather Wilderness indicates that stocking is not necessary to meet the minimum requirements for administration of the area, and the Wilderness Act is unclear whether stocking is allowed in designated wilderness areas."

The Trail Blazers and Hi-Lakers strongly disagree with the use of the MRA procedure as it is used in a "programmatic" way regarding fish stocking, and ultimately fishing itself (since fish stocking is the only scientifically proven way to provide the historical fishery without ecological damage). See the MRA section later in this response for detail.

"For these three reasons, a policy waiver would not be pursued if this plan/EIS process resulted in the selection of an alternative that included continued fish stocking."

This is a bogus conclusion since one, two, or even all three of its justifications, are weak, or perhaps even false.

"If Congress should choose to allow stocking through a change in the enabling legislation, it will have clarified that fish stocking is an appropriate activity in the North Cascades Complex."

This is a truism that sheds no light on the issues the EIS is attempting to analyze. Of course such clarification would clarify the situation, but it is not necessary. There are many management actions that have or could be contemplated by the NCNP for which this statement could be made. It is akin to a "motherhood and apple pie" statement. Trail maintenance is allowed in the park, but Congress has given no additional clarification to the statement. Trail maintenance legislation for that activity. There is no clarification for camping, for fire building, for horse travel, or nearly any other historical use of the park lands. Why does fish stocking require such clarification when none of these other activities have required it? Is not this NEPA process itself the intended process by which such decisions are made by park management? Could one not argue just as well that if Congress intended for fish stocking to cease when the park was created via the enabling legislation that it could have included a prohibition against it? The Trail Blazers and Hi-Lakers would welcome such a clarification from Congress, but we certainly don't agree that such clarification is necessary for the preferred alternative (Alternative B) to become the Record of Decision.

"That unambiguous clarification would allow the NPS to implement any of the management alternatives that include the practice of stocking. Congressional action to allow fish stocking would also honor various verbal commitments in support of stocking that proponents believe were made by federal officials prior to establishing the North Cascades Complex but never codified in law."

I proclaim my objection to the use of the underlined word "believe" in the sentence quoted above. The word "believe" is used in this fashion throughout the draft EIS and needs to be changed. Consistently in the draft EIS, when various individuals or groups are referenced to provide evidence that fish stocking should not continue (e.g., see the previous paragraph above which states what Congress might have done), the sentence contains a verb that indicates fact or a decision, but with evidence such as this (e.g., statements made in the congressional hearings which support fishing and fish stocking), the draft EIS condescends to that equally valid evidence and



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distinction of both alternatives B and C. Without that distinction being presented, there is no way to differentiate among the alternatives relating to fish stocking as there is for fish removal in element #4.

ALTERNATIVE B

"The restocking of nonreproducing fish would be allowed only where impacts on biological resources could be minimized."

As worded this statement can be misunderstood. It should say:

According to existing scientific data, the restocking of nonreproducing fish in low densities would be allowed except where impacts on biological resources could be shown to exist.

ISSUES AND IMPACT TOPICS

Predation and competition. Nonnative fish have measurably changed the composition and abundance of native aquatic organisms in some lakes. The most significant impacts are caused by reproducing populations of stocked fish that have become self-sustaining.

As worded this statement can be misunderstood. It should say:

Predation and competition. Non-native fish have measurably changed the composition and abundance of native aquatic organisms in some lakes. Research has shown that the most significant impacts are caused by reproducing populations of stocked fish that have become self-sustaining and overly abundant; in contrast, the research has also shown that there is no measurable impact on lakes that contain populations of nonreproducing fish in low densities.

TABLES

TABLE ES-4

Aquatic Organisms/Alternative B

"Impacts on aquatic organisms in lakes stocked with low densities of nonreproducing fish would be the same as alternative A, except these impacts would decline further in the future as stocking is curtailed or eliminated in lakes based upon adaptive management decisions pertaining to stocking."

It needs to be made explicit in this alternative, as well as in alternative A and C, that data show there are no measurable impacts on lakes when low densities of non-reproducing fish are used. Additionally, it makes no sense to say that impacts would decline further since there is no measurable impact in those lakes today.

Aquatic Organisms/Alternative D

"Short- and long-term adverse cumulative impacts on aquatic organisms from threats other than non-native fish would be similar to alternative A."

The sentence above is also found in alternatives B and C. It should also be in alternative D since alternatives B, C, and D are all the same in this regard with respect to alternative A.

Wildlife

This entire section needs to be re-written. Some of the information is completely wrong, other information is missing. For example, alternative A states that wildlife will be disturbed because of human presence and use of aircraft, and yet alternative D doesn't mention this at all, even though under alternative D fish removal impacts due to both causes is the highest of all alternatives. Furthermore, no mention is made of the fact that the vast majority of stocking does not require aircraft, and in fact, all aircraft activity for stocking could be eliminated under alternatives A, B, or C if the Park chose to take that action (for example, using horse pickers for the larger lakes now done via fixed wing aircraft). Beyond that it is a bit ridiculous to assign wildlife disturbance due to

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says, as it does here, something akin to "proponents believe" as if these proponents present this evidence as an article of faith rather than of fact. This is a subtle objection, but in its very subtlety, it seems to uncover some possible prejudice in the human beings who wrote this language. Humans are fallible. The initial use of this objectionable language in a draft can be forgiven, but the appearance of condescension that this draft language creates should be removed in the final EIS. In summary, particular attention needs to be paid to the recurring use of the word "believe" throughout the draft EIS.

"Congressional action to clarify enabling legislation is an intricate process that could take several years. If the NPS does not receive clarification from Congress by the time a record of decision for this plan/EIS is issued, alternative D (91 Lakes Would Be Fishless) would be implemented until clarification is received."

There does not seem to be any basis for picking alternative D as this fallback, and presumably temporary, course of action. If the NPS continues to feel that it needs congressional clarification before it has proper guidance to make a decision, I suggest that alternative A is a more appropriate choice. As in most legal or public actions, the expected default course when a definitive decision can not yet be made is normally to retain the *status quo* (i.e., alternative A). Choosing alternative D in the face of lack of clarification is tantamount to making a *de facto* decision not based on the evidence in the EIS, but on the political climate in Congress. Surely maintaining the *status quo* would be a less drastic action until the clarification from Congress can be obtained.

APPLICATION OF RESEARCH

"To relate the purpose of "conserving biological integrity" to mountain lakes fishery management, the Technical Advisory Committee drew upon one of the principle conclusions of the OSU research: the ecological effects of nonnative trout are related to the reproductive status and abundance of trout in lakes. The Technical Advisory Committee interpreted this finding to mean that lakes with the lowest degree of biological integrity (or greatest departure from biological integrity or pristine conditions) contained reproducing populations of nonnative trout or char that had achieved high densities. On the other end of the biological integrity spectrum, the Technical Advisory Committee assumed mountain lakes that had never been stocked represented the highest degree of biological integrity."

I have no objection to what is said here except that it is incomplete. Besides those considerations mentioned here, equally important was a major conclusion of the Liss & Larson study that determined that non-reproducing fish populations stocked in low densities show no evidence of harming biological integrity. This vitally important aspect of the science needs to be explored in this paragraph in the same way as the other considerations are.

"This conceptual framework was used to craft management alternatives B and C based on the hypothesis that the biological integrity of mountain lakes could potentially be conserved by managing for non-reproducing trout at low densities in some lakes and managing for fishless conditions in other lakes."

The underlined word "potentially" should be removed. There is no justification to select one of the Liss & Larson study conclusions and qualify it with the word "potentially". Other Liss & Larson study conclusions are quoted in this draft EIS without using this word. Nonreproducing trout at low densities is just as valid a conclusion as any other in the study. The evidence is there in the study's data; there is nothing "potential" about it. The data clearly shows no statistically significant difference between fishless lakes and lakes stocked with nonreproducing trout at low densities. If this conclusion needs to be qualified because of the possibility of more data in the future, then so must all the evidence presented in this EIS be so qualified. Indeed, is not the whole idea of "adaptive management" so eloquently discussed in this EIS the very tool to use to handle situations where future data causes a re-evaluation of current management actions?

ALTERNATIVES

This section addresses elements some or all alternatives have in common. Elements relating to the removal of fish are discussed in element #4, but there is no element for fish stocking. A fifth element should be added that discusses, at a minimum, the concept of low density stocking with non-reproducing trout since that is a key

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human presence required for fishing activities when human presence always has, and always will, exist due to hiking and camping activities. Does the NCNP really believe that fish stocking has any significant impact on wildlife beyond what exists already for activities such as hiking, climbing, camping, and horse travel?

Cultural Resources

This section needs to be re-written due to similar problems that exist in the "Wildlife" section above. For example, in this section alternative B talks about impacts due to fish removal, but in alternative D where such impacts are higher, no mention is made of such impacts. Such omissions as these give the clear impression that the author has a prejudice toward favoring alternative D.

Recreational Use/Alternative B

"Major adverse impacts would occur to some anglers who believe fishing in North Cascade Complex lakes is a truly unique experience that cannot be duplicated elsewhere."

Here is another example of the selective use of the word "believe." This same unnecessary use is in the entry for alternative D also. The draft EIS does not shy away from making declarative statements throughout its text when there is reasonable evidence to support the statement; so why when it comes to considering the continuation of fish stocking does this word "believe" invariably come into the text? It is a fact that fishing in the North Cascades is a truly unique experience for anglers; it is not just a belief that some people take as an article of faith. If the experience were not unique visitors who must travel a long distance to see and use the NCNP would simply visit a park or wilderness area nearer to home. Surely every national park managed by the NPS considers that it provides a unique experience.

Social Values/Alternative B

This section needs to briefly address the history of the Park's formation. It makes no sense to comment on the impacts on social values of various groups (such as conservationists) without defining the agreements these social groups accepted when the enabling legislation was discussed and approved via the political process in the 1960s. As is mentioned elsewhere, fishing and therefore the maintenance of a fishery was promised in congressional hearings when the park was created. It is illogical now to say that various groups who oppose the fishery that existed prior to the park's formation can now obtain any benefit due to a management action that attempts to undo this history. Such statements make no sense unless this background history is also given.

"Cumulative impacts related to flood damage to upper Stuehkin Valley Road would be minor to moderate, adverse, and long term."

This should be removed. This observation, if it is even true, has no bearing on fish stocking. Beyond that this sentence only appears in alternative B but it is totally unclear why it should only appear there. I can find no basis for this statement anywhere else in the draft EIS.

Wilderness Values/Alternative B

"There would be a long-term major adverse cumulative impact on those who believe that the continued stocking (as proposed under alternative B) in wilderness and continued presence of reproducing populations of fish would compromise natural processes in wilderness."

This is in error. Alternative B is no different than alternative D regarding reproducing fish populations. The correct statement is the one found under alternative D.

Wilderness Values/Alternative D

"This would result in long-term moderate to major beneficial impacts on opportunities for solitude in areas where fishing opportunities are eliminated."

This statement is a gross exaggeration. All but a few of the lakes with fish are quite remote and it is unlikely that two or more parties would be there together except rarely. On the other hand, some lakes that have easy access will see less people, but these same lakes have so many visitors that a few more or less visitors will not make a

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difference in solitude. This statement is best removed, or at least the benefit level ought to be changed to "minor."

Due to the cessation of stocking in national park lakes, long-term moderate beneficial cumulative impacts on wilderness values would be expected.

This statement should be removed. There is no development of the connection between "wilderness values" and lakes with nonreproducing fish in low densities in these tables. Elsewhere in the text of the draft EIS an unconvincing case is attempted in order to "prove" that such populations of fish harm wilderness values. At best that case is a red herring. How can a few fish, mostly unseen, harm a visitor's wilderness experience? This claim becomes ludicrous when you consider that trails cross meadows without any regard for "wilderness values", or that horses are allowed in the wilderness, or even that humans are allowed in wilderness. Since properly managed fish populations have been shown scientifically to cause no harm to the ecosystem, the presence of such fish in lakes is no doubt more in keeping with "wilderness values" than are any of these other accepted practices. It should be remembered that these lakes are a natural environment for these stocked fish, and that such fish would naturally be in these lakes but for the minor fact that the stream gradients in the North Cascades area just happen to be too steep to be navigated by fish. These fish are not unnatural in these lakes, they just happen to be missing.

Purpose And Need For Action

INTRODUCTION

OBJECTIVES IN TAKING ACTION (pg 5)

This plan/EIS must also be consistent with the following mission statement for the North Cascades Complex, which is derived from its enabling legislation (PL 90-544):

As a unit of the National Park Service, the North Cascades National Park Service Complex is dedicated to conserving, unimpaired, the natural and cultural resources and values of North Cascades National Park, Ross Lake National Recreation Area and Lake Chelan National Recreation Area for the enjoyment, education, and inspiration of this and future generations. We also share responsibility for advancing a great variety of national and international programs designed to extend the benefits of natural and cultural resource conservation and outdoor recreation.

There is no foundation in the EIS for this mission statement. Where does it come from? Why is it relevant to this draft EIS? At a minimum the mission statement is incomplete as a mission statement for a national park since it leaves out the park's mission to provide recreational opportunities except to support "national and international programs" - whatever those are.

The enabling legislation mentioned above only contains a broad reference to the August 25, 1916 legislation that established the NPS. Therefore one must look at the NPS's policies to see what the NCNP mission encompasses. The NPS's own policies (see page 67 in the Appendices volume) state in part:

8.2.2 Recreational Activities

The National Park Service will encourage, allow, or not allow recreational activities according to the criteria listed in section 8.2. Examples of recreational activities that may be encouraged or allowed include, but are not limited to, boating, camping, bicycling, fishing, hiking, horseback riding and packing, outdoor sports, picnicking, scuba diving, cross-country skiing, caving, mountain and rock climbing, and swimming.)

8.2.2.5 Fishing

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Recreational fishing will be allowed in parks when it is authorized, or not specifically prohibited, by federal law, provided that it does not jeopardize natural aquatic ecosystems or riparian zones.

The mission statement provided clearly needs to be updated to include not only its "preserve and protect" role, but to include the equally important mission of providing recreational opportunity, particularly as it relates to fishing.

BACKGROUND

ADMINISTRATIVE BACKGROUND

HISTORY OF FISH MANAGEMENT IN NORTH CASCADES MOUNTAIN LAKES

"When the North Cascades Complex was established in 1968, its enabling legislation did not define the fishing activities that would be allowed within its boundaries." (pg 11)

This is misleading. The enabling legislation did not define any activities that would be allowed in the park. The undefined word "fishing" should be removed.

"To resolve differences in policy and to foster a spirit of cooperation, the NPS and WDFW negotiated a series of agreements beginning in 1979 that allowed stocking to continue in selected lakes in the North Cascades Complex." (pg 12)

This statement is incomplete. It leaves out the most important and fundamental disagreement between the NPS and the WDFW regarding the intent of Congress when the park was created in 1968. There is a complex history of agreements between these 2 organizations. Much more of this history needs to be included here especially those areas where the NPS and the WDFW have disagreed. (See the "Historical Case for Fish Stocking the High Lakes in the North Cascades" document referred to earlier for a complete discussion of this nearly 40-year dispute.)

"To be able to continue stocking in light of NPS policies generally prohibiting it, a memorandum from the NPS Director was issued in 1986 (hereinafter referred to as the "policy waiver")." (pg 13)

It is incorrect to characterize this memo as a policy waiver. In fact, it is a clear state of policy for the NCNP. (See my earlier discussion of this issue, and in particular see the written response from Dale Riveland for details.)

"The 1988 Supplemental Agreement (also known as the Fisheries Management Agreement) formalized these practices in the 40 lakes inside the park for 12 years while planned research on the effects of fish management activities could be completed and assessed. Any additions or deletions to the list of lakes in the park would be made only by mutual agreement, and the two agencies would consult on the number and species of fish, specific lakes, and the schedule for the lakes to be stocked. The agreement added the caveat that research results would be considered in future decisions. A long-term research study was initiated by Oregon State University soon after the 1988 Supplemental Agreement was finalized. The Supplemental Agreement between the NPS and WDFW that permits fish stocking in the national park was reaffirmed in February 2000 and again in July of 2002. The agreement expired in December 2004. Any future agreements between the NPS and WDFW concerning mountain lakes fishery management, including fish stocking in the national park, would depend on the outcome of this plan/EIS process." (pg 13)

This paragraph mischaracterizes the agreements between the NPS and the WDFW. The language above gives the impression that the agreements made in 1988 were intended to be temporary and that the entire issue would be looked at fresh in 12 years. That is not the case. There was extreme tension between the NPS and the WDFW in the 1986 to 1988 period. In October 1987 John Reynolds, NCNP Superintendent, even threatened to prosecute WDFW employees if they entered the park to stock fish as the WDFW insisted they would do. Only

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the intervention of William Horn, Assistant Secretary for Fish and Wildlife and Parks, in an October 29, 1987 letter to WDFW Director Jack Wayland defused the legal confrontation. Furthermore, an extensive letter from Jack Wayland to Charles Odegaard, Regional Director NPS, on July 29, 1987, clearly outlines the seriousness of the situation and the WDFW's desire to reach permanent resolution. That resolution was reached in part with the 1988 Supplemental Agreement referenced above. An investigation of the history of this agreement clearly shows that the WDFW did not intend a temporary resolution to fish stocking in the NCNP with the 1988 agreement waiting for a final decision at some future date, but rather that the agreement would simply be reviewed after 12 years to consider the results of the scientific research begun after the 1988 agreement was signed (this research is what we now call the "Lass and Larson" study). In support of that intention, the agreement states that mutual agreement between the NPS and the WDFW would be required to modify the 1988 agreement. This is most clearly demonstrated in Article V (Termination) of the 1988 Supplemental Agreement which states:

"This Supplemental Agreement shall remain in full force and effect unless terminated by mutual consent and the Department and the Service."

Furthermore, the last sentence of the draft EIS statement quoted above is misleading since it does not make explicit that the outcome of the plan/EIS is subject to mutual agreement by the WDFW as the content of the 1988 Supplemental Agreement and its history clearly demand.

(Also see the written response from Dale Riveland for additional details.)

"In May 1967 he stated that within the park the NPS would not participate in a 'put and take' program, and would not concur with stocking lakes that historically did not have fish." (pg 14)

This sentence needs to be re-written for clarity. Since the draft EIS specifically excludes lakes that do not have a history of fish stocking, the wording of this sentence points to the wrong qualification. It should be re-cast along the lines of:

"In May 1967 he stated that within the park the NPS would not participate in a 'put and take' program, and would only concur with stocking lakes that historically had fish."

Additionally, please cite a reference for this statement (I have been unable to find this quote from Director Hertzog in any of the congressional hearing transcripts).

"Then, in July 1968, Director Hertzog stated, '[w]e have an active fish-stocking program in every single major park . . . [n]ow, if the stream already has its limit of fish comparable with its food-carrying capacity, then obviously, we do not engage in a put-and-take fishing program. But, we [stock] fish in practically every area that I can think of off the top of my head now, including all of our major parks.'" (pg 14)

This quotation should be expanded to include the entire interchange between Director Hertzog and Congressman Needs (it is only longer by a few lines). To select just this one portion of that interchange too greatly changes its implication. (See the congressional record or the "Historical Case for Fish Stocking the High Lakes in the North Cascades" document referred to earlier for the entire interchange.)

Proponents of stocking believed they were promised that stocking would continue after the park was established... (pg 14)

Once again, it is inappropriate to say proponents simply display an article of faith when they state these promises were made. The promises were made. They can be read in the congressional record (See the congressional record or "Historical Case for Fish Stocking the High Lakes in the North Cascades".)

"While the current NPS Management Policies and practices prohibit stocking in areas designated as national parks...." (pg 14)

NPS-wide policy on fish stocking does not apply on its own to the NCNP. The 1986 Mott memo clearly states that the NPS adopted a specific NCNP only policy for fish stocking given the history of the park's creation and the controversy between the NPS and the WDFW regarding fishery management within the park. It is

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misleading to imply that NPS-wide policies somehow apply to the NCNP without reference to these NCNP-specific NPS policies.

SUMMARY OF EXISTING RESEARCH

This entire section needs to be reorganized using the vital concept of nonreproducing, low density fish populations versus reproducing populations, especially those that reach high densities. This distinction is not fully appreciated in much of the research that has been done on the effects of stocked fish in high lake ecosystems. The Liss and Larson study *does* make this distinction and in doing so makes it clear how important it is to make this distinction when analyzing fish impact data. Since the Liss and Larson study is the best evidence we have for the NCNP high lake ecosystems, we should be guided by it. To mix in research results that do not make this vital distinction regarding fish densities is to mix apples and oranges invalidating any point this section could have. The organizing principle of this entire section must be to segregate scientific evidence based on nonreproducing, low density fish populations from scientific evidence based on reproducing fish populations; to do otherwise is to ignore the NPS's own funded research in the NCNP on the impact of fish in lakes.

Lake Characteristics: (pg 17)

"In terms of possible impacts to lake characteristics from fishery management practices, the literature indicates that removal of fish can result in increased water clarity, higher dissolved oxygen concentrations, reduced phosphorus cycling, and decreased ammonia concentrations (Hanson 1990; Sondergaard et al. 1990; Schindler et al. 2001). In contrast to the low-nutrient and relatively undisturbed conditions in mountain lakes analyzed in this plan/EIS, these prior studies were conducted in highly disturbed, nutrient-rich lakes containing high densities of fish. For example, researchers in the Sierra Nevada have demonstrated through modeling and paleolimnological (study of the organic and chemical history of lakes through analysis of bottom sediments) analyses that introduced fish in oligotrophic (nutrient poor) mountain lakes can nearly double the rate of phosphorus regeneration and exploit benthic (lake bottom) sources of phosphorus that would normally not be available to pelagic (open water) communities in the absence of fish. The increased availability of nutrients (such as phosphorus) made possible by stocked fish can stimulate primary productivity and fundamentally alter nutrient cycling (Schindler et al. 2001). The USGS research at the North Cascades Complex did not study the effect of fish on water quality or nutrient cycling. It instead focused on abiotic factors, such as characteristics of the drainage basin and elevation and their effects on water quality (Liss et al. 1995). It is unknown, but considered unlikely, that similar water-quality changes would be associated with the presence of fish or fish removal (Drake and Naiman 2000)."

This paragraph should be removed. There is no reason to believe that the ecosystems of the NCNP are similar to the areas studied in research mentioned here. The flora and fauna are almost certainly different. Beyond these concerns the most important reason to remove this paragraph is the research cited makes no distinction based on fish density. As the most applicable research clearly demonstrates (Liss and Larson study), fish density can strongly determine the outcome of such studies – reversing the conclusions in many cases. It is pointless to include data such as this unless fish densities are taken into account since the very premise of the preferred alternative B rests on this distinction.

Phytoplankton (pg 17)

"Phytoplankton surveys performed in mountain lakes in Mount Rainier National Park showed that, for the most part, the species of phytoplankton in individual lakes remained consistent from year to year (Larson and McIntire et al. 1999). Drake and Naiman (2000) compared fossil remains of one type of phytoplankton (diatom) in historically fishless lakes, lakes with stocked fish, and lakes where stocked fish were removed in Mount Rainier and found that in unstocked lakes, the array (variety and abundance of species) of diatoms had not changed significantly in the last 315 years. Changes had occurred in the diatom arrays in lakes where fish were introduced and are still present today. For those lakes where the stocked fish had been removed, diatom arrays did not appear to have returned to the arrays similar to those found in fishless lakes. Changes in species arrays, resembling those observed in the Drake and

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Naiman (2000) study, have also been observed in other studies, such as Douglas et al. (1994). Several studies have shown that removal of fish from lakes can result in decreased total numbers of phytoplankton (Hanson 1990; Sondergaard et al. 1990). It is difficult to quantify fish impact on nutrient cycling, especially in oligotrophic lentic (still or slow-moving water) systems, and the magnitude and variation of impact has not been fully explored (Schindler et al. 2001)."

This paragraph should be removed for the same reasons as discussed above regarding the "Lake Characteristics" section.

"Researchers found no significant differences in the density of large copepods in lakes with low fish densities (such as in many stocked lakes) and in fishless lakes (Liss et al. 1998)." (pg 18)

It is ludicrous that the only place in this entire "Summary of Existing Research" section that nonreproducing, low density fish populations is mentioned is this brief mention – and it does not mention the nonreproducing aspect at all. The distinction between non-reproducing, low density fish populations and reproducing populations, (especially those that reach high densities) is the key scientific distinction that separates alternatives A, B, and C. There can be little doubt as to the vital importance of non-reproducing, low density fish populations in this EIS. Either the authors did not understand this vital scientific distinction, or they had an existing prejudice against the stocking of fish regardless of its impact on the lake and its ecosystem.

"The OSU/USGS team came to several conclusions:

Introduced fish can reduce or eliminate large, more visible diaptomid copepods from lakes if fish abundance is excessive.

Impacts on large copepods vary with fish density, with the greatest effects occurring at high fish densities.

Impacts on large copepods from fish introductions are greater in shallow lakes.

A significant negative relationship between large diaptomid density and D. tyrrelli density exists when the species occur together; that is, it appears that larger copepods prey on the smaller D. tyrrelli." (pg 19)

Once again the lack of appreciation for the importance of the distinction between non-reproducing, low density fish populations and reproducing populations in this section is astounding. The quoted paragraph purports to summarize the Liss and Larson conclusions, but does not even mention this most vital finding that separates most of the alternatives in this EIS – including the very essence of the preferred alternative B.

"In mountain lakes that were temporarily stocked with non-reproducing salmonids, the majority of lakes sampled showed that populations of large zooplankton were significantly reduced..." (pg 19)

At what population density? Once again without specifying the type of fish population in this study, the results are meaningless for the purposes of this EIS.

Macroinvertebrates (pg 20)

"...brook trout under conditions of extreme fish density were able to deplete mayfly and caddisfly populations in a small, high altitude lake in the eastern Sierra Nevada in California."

Same basic problem. This finding may be so, but it is irrelevant to this EIS since no alternative, none, recommends "extreme fish densities". This is a red herring at best. The Liss and Larson study contains evidence on all the population types found in NCNP lakes. Why muddy the water with study results that have no bearing on this EIS?

In fact this entire section should either be removed, or the Liss and Larson data used instead. Furthermore, whatever evidence is presented, it must make the vital distinction between nonreproducing, low density fish populations and reproducing populations, (especially those that reach high densities). The information presented in this entire macroinvertebrate section is misleading at best for the purposes of this EIS.

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vital distinction for both its content and organization. The information required to make the changes I suggest below was all presented at the scoping meetings (I personally attended 3 of the 4 meeting held).

Plankton: (pg 24)

No mention of nonreproducing, low density fish populations.

Macroinvertebrates: (pg 25)

No mention of nonreproducing, low density fish populations.

Amphibians: (pg 25)

No mention of nonreproducing, low density fish populations.

Fish: (pg 25)

Here this section makes a similar mistake. The discussion on fish species makes no mention of a second vital aspect of the preferred alternative: namely, that the fish to be stocked will be sterile. Nearly all of the concerns expressed in this paragraph are mitigated by the use of sterile fish, and yet that vital aspect that will later be found in alternatives B and C is not even mentioned.

SPECIAL STATUS SPECIES

Fish: (pg 26)

"The genetic integrity and ability to reproduce in bull trout may be affected if stocked brook trout escape from lakes..."

Brook trout have not been officially stocked in the NCNP lakes for decades. This concern has no bearing on which EIS alternative is finally selected as the Record of Decision since there is no intention in any of the alternatives to stock brook trout. Everyone would like to see these brook trout removed from NCNP complex waters. The implication found in this statement that brook trout might be stocked needs to be removed from this section.

Other Vertebrates: (pg 26)

This section must distinguish between fish removal and fish stocking activities. The is no requirement for noise with fish stocking if the elimination of noise is desired.

VEGETATION (pg 26)

Other comments from the scoping meetings need to be added here. As written, this section implies that fish presence somehow increases the trampling of vegetation around lake shores. There is no evidence for that. It was stated at the scoping meetings that many believe that hikers and campers who have no intention to fish cause the vast majority of this damage. (This can easily be seen by noticing the concentration of vegetation damage near camp sites as opposed to other areas of lake shore.)

VISITOR USE AND EXPERIENCE (pg 27)

This characterization of the visitor experience does not represent what was said at the scoping meetings. I can not remember anyone having said words to this effect. Similar concerns might have been expressed, but an equally passionate defense of fish stocking, properly managed, was expressed by the majority of attendees. It is ludicrous to suggest, as this section does, that conservationists care only for natural processes. The "conservationists" that attended those meetings, as far as I could tell, hiked, camped, and built fires, and other non-natural processes. In addition there is nothing utilitarian about anglers. As was expressed clearly in the scoping meetings (but not reported in these sections), most anglers see the catching of fish in a high mountain

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Amphibians: (pg 21)

"This is likely because the skin of both the larvae and adult rough-skinned newt contains a potent toxin (Nussbaum et al. 1983)." (pg 21)

"In other parts of Washington, Cascade frogs do not occur in deeper lakes and ponds containing fish, suggesting they are vulnerable to predation." (pg 21)

"One way to interpret this information is to say that lakes with very high TKN levels can support very high densities of long-toed salamanders. When even low levels of fish are introduced into these lakes, they can reduce these salamander densities enough that it is statistically noticeable." (pg 23)

These sentences should be removed. They are speculative and do not belong in a section devoted to the presentation of scientific evidence.

".....which is probably because salamanders require a certain TKN concentration before they can occupy a habitat." (pg 22)

This phrase should be dropped since it is speculative.

"For example, surveys in Olympic National Park found few or no long-toed salamanders in lakes containing fish, but many populations in shallow ponds and lakes without fish (Bury and Adams 2000; Bury et al. 2000; Adams et al. 2000)." (pg 23)

This sentence is misleading. One could easily conclude from this sentence that fish, regardless of fish density, decimate long-toed salamander populations. If this sentence is to remain it needs to be qualified so that it eliminates at least the simple possibility that shallow ponds and lakes are the preferred habitat of the long-toed salamander. Furthermore, long-toed salamander population density may very well heavily depend on fish population density. For example, if the research quoted above only looked at lakes with high densities of fish, it would be expected that long-toed salamander population densities would be lower, but in lakes with low density fish populations there may be little if any impact on long-toed salamander populations. These interactions are far too complex to simply state that there are no salamanders when fish are present.

"Overall, the OSU/USGS team concluded that lakes with relatively high TKN concentrations (about 0.55 mg/L or greater), and those with warmer temperatures (greater than about 54°F), were favored by native biota such as phytoplankton, large copepods, and long-toed salamanders. The aquatic life in these "more productive" lakes could therefore be at highest risk of impact from high densities of reproducing fish and may benefit most from fish removal. For additional information on the OSU/USGS research, see the section titled "Application of Research" in the "Alternatives" chapter." (pg 23)

This summary paragraph clearly needs to be rewritten just as this entire "Summary of Existing Research" section needs to be. It is almost unbelievable that the concluding final paragraph of the science section in an EIS that depends vitally on the concept of nonreproducing, low density fish populations to differentiate among its alternatives does not even mention this vital distinction.

SCOPING PROCESS AND PUBLIC PARTICIPATION ISSUES AND IMPACT TOPICS

AQUATIC ORGANISMS

This section is much like the last in that it does not make the distinction between non-reproducing, low density fish populations and reproducing populations. I will not go into as much detail in this section as I did in the last, but suffice it to say that like the previous section, this section is fatally flawed by having ignored this

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lake as *part and parcel* of their social and wilderness values. In addition there is no justification for singling out fish stocking as "particularly offensive as evidence of human activity" when presumably those who feel that way are standing themselves by a lake in the wilderness having hiked there on trails, or ridden on horses, have set up their camp, and built their fire. How can anyone claim that the addition of unseen fish in that lake is "particularly offensive" when considering that other far more obvious "evidence of human activity" surrounds them and has even been increased by their very own activities?

Alternatives

ALTERNATIVES DEVELOPMENT PROCESS

APPLICATION OF RESEARCH (pg 51)

The overview part of this section (pages 51 through 54) once again gives the impression of prejudice toward alternative D by virtue of the fact that the benefits and objectives of alternative D are well discussed, but the other 3 alternatives are not discussed at all (except the single phrase "in contrast to alternatives B and C" which is used to introduce a lengthy discussion of alternative D only.

This conceptual framework was used to craft management alternatives B and C based on the hypothesis that the biological integrity of mountain lakes could potentially be conserved by managing for non-reproducing trout at low densities in some lakes and managing for fishless conditions in other lakes. (pg 51)

The underlined word "potentially" should be removed. The sentence already says that it is an hypothesis; the word "potentially" is redundant and unnecessarily prejudices the sentence.

ALTERNATIVE A (pg 72)

IMPLEMENTING THE FISHERY MANAGEMENT PLAN THROUGH CONGRESSIONAL ACTION

"The enabling legislation for the North Cascades Complex does not mention fish stocking, and the legislative record regarding fish stocking in the North Cascades Complex is not clear. Therefore, the language in the enabling legislation for the portions of the North Cascades Complex in the national recreation areas does affirm that fishing is an important recreational use, but it does not mention fish stocking as being an appropriate means of fishery management. The Washington Park Wilderness Act of 1988 (WPWA) established 93% of the North Cascades Complex as Stephen T. Mather Wilderness and directed the NPS to manage the wilderness in accordance with the Wilderness Act of 1964. At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters, and the WPWA did not include a provision for allowing stocking. (For more detail on legislation and history, please refer to the "History of Fish Management in North Cascades Mountain Lakes" section in the "Purpose of and Need for Action" chapter and Louter 2003)." (PG 73)

As in other places in the draft EIS, this paragraph is misleading since it creates the impression that other activities besides fishing and fish stocking are mentioned in the NCNP enabling legislation and/or the WPWA. That is not the case. None of the typical visitor activities such as fishing, hiking, horse back riding, or camping are mentioned in either document; nor are NPS supporting management actions such as trail maintenance or trail bridge building mentioned. Such paragraphs as these are misleading, and actually seem to expose a prejudice against fishing and fish stocking as an accepted activity within the NPS regardless of the historical context in which legislation was passed.

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"However, some disagree with these views and maintain that if nonnative fish were stocked appropriately, there would be no unacceptable adverse impacts on wilderness values because biological integrity would be conserved." (pg 73)

This is a disingenuous statement at best. The NCNP's own research (Liss and Larson study) concludes that fish stocked appropriately causes no disruption of biological integrity. To ignore this vital conclusion with the dismissive qualifier "some disagree" as is done here is unacceptable.

"Fish stocking has been allowed to continue in the North Cascades Complex under a 1986 policy waiver (see appendix A)." (pg 74)

The Trail Blazers and Hi-Lakers and, as far as I know, the WDFW do not agree that the 1988 agreement between the NPS and the WDFW represents a "policy waiver". Those agreements are binding and can not be changed without mutual agreement. If for no other reason, it is clear that the WDFW does not agree with the EIS in this draft form because of their strong objection to the MRA procedure found in Appendix K.

Throughout this draft EIS these agreements are characterized as "policy waivers". The concept of "waiver" needs to be removed from the EIS. (See the written response from Dale Riveland for additional details.)

"The NPS has determined that fish stocking in the Stephen T. Mather Wilderness would only be implemented if Congress granted the NPS the unambiguous legal authority to do so. Therefore, should a management alternative that allows for continued stocking be selected through this plan/EIS decision-making process, the NPS intends to ask Congress for a change to the North Cascades Complex enabling legislation to clarify how the mountain lakes should be managed." (pg 74)

Trail Blazers and Hi-Lakers, as well as the WDFW, do not agree with this requirement. Why has the NPS determined that it needs such direction from the Congress when no other management action the NPS takes in the NCNP is so specified by Congress (e.g., trail building, bridge building, fire management, back country campsite development)? The Trail Blazers, the Hi-Lakers, and the WDFW have no objection to seeking such clarification, and would welcome it if it resolves that issue in the minds of NPS managers, but we certainly do not agree, as is concluded at the top of page 75, that without such congressional clarification, alternative D should be implemented as some sort of default. (See the written response from Dale Riveland for additional details.)

MINIMUM REQUIREMENTS (pg 76)

"The results of the minimum requirements analysis show that stocking of nonnative fish to create and enhance an artificial recreational fishery is not necessary to meet the minimum requirements for the administration of the Stephen T. Mather Wilderness (see appendix K)." (pg 75)

The Hi-Lakers and Trail Blazers join the WDFW statement of strong objection to how the interagency Minimum Requirements Analysis (MRA) was applied in this draft EIS. The NPS may desire to eliminate the "artificial recreational fishery" that existed before the park was created, but it has greatly overstepped the MRA process in an attempt to create evidence in support of that desire. The MRA found in Appendix K seems to be the most extreme MRA ever done by the NPS, and none like it (a "programmatic" MRA) has ever been done by the three other federal agencies that use this standardized process. In fact, in the case of the Forest Service their policies would not even allow such a "programmatic" use of an MRA. (See my more extensive comments regarding the Appendix K section, as well as the written response from Dale Riveland.)

CURRENT FISHERY MANAGEMENT PROGRAM (pg 76 - 81)

This overall section does a plausible job of describing the current fishery management program; however, there is one glaring omission: there is no section for "Lakes with Low Densities of Non-reproducing Fish". All other permutations of with fish, fishless, and reproductive status are covered except this most crucial one upon which

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"Stocking naturally fishless lakes, even with nonreproducing trout, would not leave the wilderness "ideally free from human control or manipulation." (pg 101)

This is misquoted. The proper quote from the MRA guide in Appendix K is:

"Ideally free from modern human control or manipulation

Frankly, I doubt this was an oversight since there are so many other examples of apparent prejudice in the draft EIS tending to build a case against the continuation of fish stocking. The MRA procedure is designed to insure that modern methods (primarily motorized equipment) are not used if there is a more minimal method of accomplishing the task. This misquote gives the impression that the MRA procedure requires that an activity have no aspect of human manipulation. That would be a misuse of the MRA process which is no doubt why the omitted word "modern" is in the MRA criteria in the first place. Logically in fact, if this criterion were held to go human manipulation, the MRA procedure would be superfluous since no action by humans could ever be considered minimal.

PROPOSED FISHERY MANAGEMENT PROGRAM

PROPOSED MANAGEMENT FRAMEWORK

"The proposed management framework under alternative B would be to eliminate high densities of reproducing fish populations from lakes in the study area while allowing low densities of reproducing and nonreproducing fish populations. Management actions would be applied to the 91 study area lakes throughout the North Cascades Complex. The restocking of nonreproducing fish would be allowed only where impacts on biological resources could be minimized. Based on the best available science, some lakes could be restocked with low densities of nonreproducing fish once reproducing fish have been removed. Lakes where critical information is missing would not be stocked until that information becomes available. An extensive monitoring program (see appendix F) would be implemented to adjust future management and to avoid unacceptable effects on native biota from fish presence." (pg 101)

This overview of the management framework under alternative B is incomplete. This section needs to be expanded somewhat to include the justification for low density fish populations. Specifically, the following sentence could be used:

"The creation of low density fish populations under alternative B, particularly when those fish are nonreproducing, is designed to maintain the historical fishing opportunity while maintaining the biological integrity of the lakes."

ALTERNATIVE D IMPLEMENTING THE FISHERY MANAGEMENT PLAN THROUGH CONGRESSIONAL ACTION

"This alternative would not require congressional action to clarify the North Cascades Complex's enabling legislation." (pg 112)

This statement is inconsistent with many other places in the EIS where the NPS claims that the Congress was unclear or ambiguous as to its intent. Unclear or ambiguous can go in either direction. How does the NPS know that alternative D reflects the intent of Congress any more than any other alternative, and particularly more than the preferred alternative B. This statement as is once again creates the impression of prejudice against the continuation of fish stocking.

PROPOSED FISHERY MANAGEMENT PROGRAM

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both alternatives B and C depend. I trust this was an oversight and not yet another example of possible prejudice in favor of alternative D.

CURRENT STOCKING PRACTICES (PG 78)

I congratulate the EIS team for the excellent and accurate description of current stocking practices found in this section.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES (pg 82)

ADAPTIVE MANAGEMENT

"Adaptive management is based on the premise that managed ecosystems are complex and unpredictable. Adaptive management is an analytical process for adjusting management and research decisions to better achieve management objectives. This process recognizes that our knowledge about natural resource systems is uncertain; therefore, some management actions are best conducted as experiments in a continuing attempt to reduce the risk arising from that uncertainty. The goal of such experimentation is to find a way to achieve the objectives while avoiding inadvertent mistakes that could lead to unsatisfactory results (Goodman and Sojda 2004)." (pg 83)

This is an excellent description of how this critical management practice works and of its benefits. Alternative D is a poor choice as an outcome of this NEPA process for precisely the reason that it does not manage the existing situation using this excellent adaptive management process (see the next comment).

"The adaptive management process for the 91 lakes in the study area would evaluate the effects of management actions (for example, allowing management of low densities of non-reproducing fish) on biological resources at an individual lake and identify whether the management action should be modified to meet the objectives for the lake." (pg 83)

Well said. This sentence describes well why alternative D is a poor choice since alternative D does not provide an opportunity to adaptively manage fish stocking. It is possible that adaptive management over the long haul applied to alternative B will result in the same outcome as alternative D would, but getting there via adaptive management is the safer and more conservative way to get there. This is one reason why the notion that alternative D should be the "default" alternative makes no sense in the eventuality that congressional clarification does not materialize.

ALTERNATIVE B (pg 98)

GENERAL CONCEPT

"Ultimately, any lake that would contain fish from the initial implementation of this alternative could be considered for complete fish removal in the future based on the results of monitoring (see appendix F for details regarding monitoring)." (pg 98)

In order to be consistent with the "Proposed Management Framework" section on page 101, this statement must be modified to include the other logical management action which could result from monitoring; namely, that any lake could be considered for restocking with nonreproducing fish in low densities once harmful fish populations have been removed.

MINIMUM REQUIREMENTS

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PROPOSED MANAGEMENT FRAMEWORK

"...so these lakes would continue to provide residual sport-fishing opportunities for the foreseeable future, and the goal of complete removal might never be achieved." (pg 113)

This phrase should be removed. If one understands the concepts presented in this EIS, then one knows that lakes with high density fish populations are stunted and weak larvae with biological integrity. It is disingenuous to offer such a poor fishery as some sort of compensation for the loss of the quality fishery which is possible using nonreproducing fish in low densities under alternative B. At best the phrase is an attempt to justify alternative D over alternative B to the angling community. As a member of that community, I don't accept this ploy as meaningful.

"The NPS Management Policies, section 6.3.7, Natural Resources Management in Wilderness, states:

The principle of non-degradation will be applied to wilderness management, and each wilderness area's condition will be measured and assessed against its own unimpaired standard. Natural processes will be allowed, insofar as possible, to shape and control wilderness ecosystems. Management should seek to sustain the natural distribution, numbers, population composition, and interaction of indigenous species. Management intervention should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and influences originating outside of wilderness boundaries." (pg 113)

This section is incomplete without giving "equal time" to the recreation policies found in chapter 8 of the NPS Management Policies (such as sections 8.2.2 x found in Appendix D). Statements from chapter 6 alone without consideration of the balance the NPS must maintain with chapter 8 "Use of the Parks" considerations once again creates the appearance of bias toward alternative D.

HOW ALTERNATIVES MEET OBJECTIVES (pg 115)

"As stated in the "Purpose of and Need for Action" chapter, all action alternatives selected for analysis must meet all objectives to a large degree." (pg 115)

"The plan's objectives are to:

[...]

Provide a spectrum of recreational opportunities, including sport fishing, while minimizing impacts to the biological integrity of natural mountain lakes."

[...]

"Even alternative D (91 Lakes Would Be Fishless) would provide sport-fishing opportunities in mountain lakes for a lengthy period because it would take many years to remove all reproducing fish populations from the mountain lakes. If it is not feasible to completely remove fish from larger, deeper lakes, fish densities would be reduced, and these lakes could provide sport-fishing opportunities indefinitely (refer to tables 7 and 8)." (pg 115)

These two sentences from this section represent a gross distortion of the concepts otherwise usually fairly presented in this draft EIS – apparently once again in order to justify alternative D as being acceptable. Alternative D absolutely does not meet the "sport fishing" plan/EIS objective (of a total of four objectives) as claimed here.

Anglers do not appreciate lakes with high densities of reproducing fish any more than conservationists, park employees, consultants, or anyone else. Such lakes not only lack biological integrity, and most anglers abhor that situation, but provide essentially no quality sport fishing opportunity. Such a claim is like saying to a serious golfer that miniature golf provides a sporting opportunity to play golf and improve one's game. Claiming that the removal of the quality fishery via the removal of all nonreproducing low density fish populations, while keeping the stunted lakes to "provide sport-fishing opportunities in mountain lakes" is tantamount to making a farce of this entire EIS document, and is insulting to those of us who have worked in good faith with the NPS for over two years on this process.

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Even the somewhat reasonable claim of the last sentence is misleading since to accomplish the indefinite reduction of fish populations in these "larger, deeper lakes" that contain high densities of reproducing fish would require periodic use of chemical methods on these lakes. Such an indefinite program would certainly impact the ecosystems, and even wilderness values, more than any of the additional actions required to adopt alternative B.

ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

"Provide sport fishing opportunities by stocking some of the 154 mountain lakes that have never had any fish presence."

This plan/EIS did not contemplate stocking any of the 29 currently fishless lakes because both the NPS and WDFW assumed that if the lakes have gone fishless, they are undergoing a natural recovery process that should not be interfered with." (pg 118)

Historical documents show that the WDFW never agreed to this concept. The EIS may not have considered these 29 lakes based on NPS assumptions, but the implication that the WDFW agrees with the conclusion that these lakes should not be interfered with is erroneous.

CONSISTENCY WITH SECTIONS 101(B) AND 102(1) OF THE NATIONAL ENVIRONMENTAL POLICY ACT

"Alternative B, Proposed Adaptive Management of 91 Lakes under a New Framework (42 Lakes May Have Fish), Preferred Alternative."

"However, because alternative B proposes to continue a fish stocking program in naturally fishless lakes in the North Cascades Complex, it is not totally consistent with NPS Management Policies (NPS 2001a), which seek to preserve native biota and conserve biological integrity. Alternative B may also be viewed by some as inconsistent with the Wilderness Act because it continues a practice of fish stocking and human influence in a designated wilderness area." (pg 120)

As far as I can tell, concerns of consistency with NPS Management Policies has nothing to do with the requirements of sections 101B and 102(1) of NEPA, nor does consistency with the Wilderness Act.

"Alternative D (91 Lakes Would be Fishless).

This alternative meets the stated purposes of NEPA sections 101(b) and 102(1) to a large degree." (pg 121)

The phrase "large degree" should be changed to "some degree" for reasons outlined in the "How Alternatives Meet Objectives" section above

"There would, however, still be fishing opportunities in the reservoirs and streams." (pg 121)

This is another of these disingenuous comments noted before. This EIS is on fishing in the mountain lakes of the NCNP. Opportunities in reservoirs and streams have nothing to do with mountain lakes. A statement like this would be like telling a backpacker that although backpacking would no longer be allowed, strolling on paved paths in the park would still be available.

"These lakes would continue to provide sport-fishing opportunities for the foreseeable future..." (pg 121)

This is a gross exaggeration of the situation (see the "How Alternatives Meet Objectives" section above). "However, illegal stocking may occur under this alternative." (pg 121)

This is a major issue and is not given enough exposure in this draft of the EIS. If the park were to choose alternative D and thereby essentially eliminate the historical mountain fishery which has been there for decades

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fish would increase impacts on vegetation due to increased use by campers who will no longer need to compete with anglers for presence at the lake. No, such speculation is best removed.

Wilderness Values/Alternative D
"Sport-fishing opportunities would be vastly reduced compared to alternative A because all stocking in the North Cascades Complex would cease and fish would be removed from all lakes, where feasible. This would result in long-term moderate to major beneficial impacts on opportunities for solitude in areas where fishing opportunities are eliminated." (pg 138)

The underlined phrase should say "alternatives A, B, and C".
The second sentence should be removed. There is no evidence that removing fish will lessen the number of visitors at a lake to the extent such that a typical visitor approaching a lake will see no one else (definition of solitude). Certainly such a benefit, if it occurs at all, is highly unlikely to be "major". (Such statements only serve to undermine the credibility of this draft EIS. Such consistent exaggerations of benefits under alternative D together with the consistent exaggerations of the negative impacts of the other three alternatives is unfortunate and not worthy of the people's National Park Service.)

Wilderness Values/Alternative B
"There would be a long-term major adverse cumulative impact on those who believe that the continued stocking (as proposed under alternative B) in wilderness and continued presence of reproducing populations of fish would compromise natural processes in wilderness." (pg 139)

The underlined phrase should be removed. One of the objectives of alternative B is to remove all reproducing populations. (Note that it is not relevant whether such removal is an easy or a hard task especially since any such difficulty applies equally well to alternative D.

Objectives/Alternative D

"Does not fully meet objective" (pg 143)

The sentence should be changed to:

"Does not meet the objective"

The objective is to "provide a spectrum" of opportunities for sport fishing. This entire EIS is about Mountain Lake fishing, that does not include streams and reservoirs. Even if it did, by removing all fish from all high lakes, that fishing opportunity would no longer cut across "a spectrum" of opportunity since an entire end of that spectrum will have been removed. (This is just another example of the prejudicial and preferential treatment shown by authors for alternative D. Hopefully, NPS management can find a way to insist that the final version is purged of this lingering bias.)

Affected Environment

Although I could have made many more comments in this section, I have not because there is so much repetition of issues, statements, conclusions, and all other content that I felt it was redundant to repeat comments which I have already made above in one way or another. I leave it to the EIS editors when they update this draft version to the final version to make the content of this chapter consistent with my comments found in the previous chapters. On the other hand, I have written a few comments on this chapter when I felt the time justified.

AQUATIC ORGANISMS

PLANKTONIC ORGANISMS

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(well before the creation of the park), visitors to the lands of the park who fish will certainly notice the reduction or elimination of fish from their "favorite" lake. Quite innocently, they might be tempted to "help nature along" by transporting fish fry from a stream or river in the park. This is very easy to do and one person could undo tens of thousands of dollars of work in an afternoon. This scenario ought to be taken more seriously by the NPS as they consider the implications of alternative D versus alternative B. The best way to minimize the risk of unstocked stocking by an uninformed public is to maintain a disciplined, well-managed fishery along with public outreach and education.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

"The WDFW does not agree that alternative D is the environmentally preferred alternative because it does not strike any balance between protecting biological integrity and preserving historic processes." (PG 122)

The Trail Blazers and Hi-Lakers agree with the WDFW's analysis. Additionally it should be noted in this section that the potential of illegal stocking actually may make alternative D the least environmental friendly alternative (given the ease with which it can be done, and the strong likelihood that some uninformed park angler will consider transporting fish a good idea). Lakes stocked under the guidance of professional biologists must be preferred to haphazard stocking by an ignorant general public.

One does not need to look far to see examples of illegal stocking in the state of Washington. The lowland (warm water) fishery in this state has had examples of such activity by an uninformed public. In spite of all the hard work by WDFW biologists, intensively managed warm and coldwater fisheries are under constant attack from such illegal stocking activities. It is hard to imagine how much worse it might be in a situation where a fishery has been totally removed in lakes where the public has grown accustomed to fish being present.

I submit that the NPS has been too hasty in picking alternative D as the environmentally preferred alternative. On the surface it might appear that the removal of all fish is best for the environment, but given the existence of an historical fishery, and of the scientific research that demonstrates that the stocking of non-reproducing fish in low densities does not disturb the ecological integrity of the lake, alternative B might well be the best choice under this section. The fish experts in this state, namely the WDFW biologists, clearly think so.

TABLES

TABLE 14 - 16

I have not attempted to make all the comments I might on these tables since they are so redundant with the previous sections where I have made comments above. I leave it to the EIS editors when they update this draft version to the final version to make these tables consistent with comments in other sections. (Actually, this requirement for the editors applies to all sections of the EIS.)

Mitigation/Alternative B

"Reproduction would be limited by inducing genetic sterility or selecting hatchery strains that cannot reproduce due to spawning habitat limitations and/or timing of spawning limitations (e.g., Mount Whitney rainbow trout)." (pg 129)

The use of the underlined word "limited" is misleading. "limited" gives the impression of "reduced somewhat". This word should be replaced with the word "eliminated" since sterile fish can not reproduce at all.

Vegetation/Alternative D

"Vegetation at these lakes would experience overall beneficial impacts." (pg 134)

This sentence should be removed. There is no evidence presented in the entire draft EIS that anglers cause increased damage to vegetation. One person's guess is no better than another's. For all we know the removal of

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of honest mistakes, but rather demonstrate a built-in bias of at least some of the EIS authors. The process that produces the final version of this EIS must have some sort of vetting process built-in to avoid this sort of unfortunate misrepresentation.

OTHER AMPHIBIANS

PACIFIC TREE FROG

"Recent research on the impacts of nonnative fish on Pacific tree frogs in the Sierra Nevada Mountains suggests that Pacific tree frogs have declined significantly in areas with large numbers of stocked lakes as a result of fish predation on egg and larval stages (Matthews et al. 2001b)." (pg 170)

Here is yet another example of the failure of at least some of the EIS authors to appreciate the vital distinction of fish population density when analyzing fish impacts on biological integrity. Apparently, at least one of the authors was looking for evidence to support an already formed conclusion that the presence of fish in lakes depresses the frog populations. So rather than going to the scientific literature to educate oneself on what a full body of research demonstrates, the author simply used material that supported his or her already formed views.

To make my point, allow me to tell of an opportunity I had on October 24, 2002 to hear Kathleen Matthews speak at the University of Washington on her research in the Sierra Nevada. At that time (and therefore also when the paper referenced here was written), Kathleen herself also lumped low density and high density statistics together. At a reception after her talk I spoke with her about the newly released Liss and Larson study where the importance of making this vital distinction of fish population density was demonstrated. She had not yet seen the Liss and Larson papers. She and I exchanged email for several weeks after that as she read the Liss and Larson papers using links I provided to her. She quickly came to realize the importance of factoring fish population densities into the process of analyzing predation data in high mountain lakes. She wrote me an email on November 11, 2002 when she said in part:

"I finally had a chance to read through the Liss et al. papers and agree that bringing in the range of predation into the equation is compelling."

Clearly no attempt was made by the EIS authors to become well informed on the Sierra Nevada research before jumping on the opportunity to confirm their pre-existing views on the undesirability of fish stocking of wilderness lakes. (Incidentally, she when on to say that she was in the process of re-analyzing her data set using fish population density as a key factor; however, I do not feel at liberty to release Ms. Matthews private email in its entirety without her permission, but I'm sure that can be arranged if the EIS teams so desires.)

Environmental Consequences

Although I could have spent days making comments in this important section, I have not because there is so much repetition of issues, statements, conclusions, and all other content that I felt it was redundant to repeat comments which I have already made above in one way or another. Although there are many misleading or incorrect statements in this section, I leave it to the EIS editors when they update this draft version (which can be expected to harbor errors) to the final version to make the content of this chapter consistent with my comments found in the previous chapters.

History of Public Involvement

I have no comments to make on this entire section except to say that I congratulate the NCNP employees and management who designed and implemented the public involvement process. I feel the NCNP has been open

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ZOOPLANKTON

"Lower densities of fish, more typical of stocked situations, do not have as great an effect. There is not much difference in abundance of diatomid copepods between these stocked lakes and fishless lakes (Liss et al. 1998), possibly because the densities are not as high in stocked lakes, and the zooplankton can recover between stockings." (pg 163)

These sentences should read:

"Fish stocked in low densities (for example with nonreproducing fish) have little if any measurable effect. There is not much difference in abundance of diatomid copepods between these stocked lakes and fishless lakes (Liss et al. 1998)."

The phrase "not... as great" is awkward and gives the wrong impression that the difference between high density and low density fish populations is minor when just the opposite is the case. The ending phrase starting with "possibly" is speculative and likely wrong. Measurements show that the zooplankton populations simply do not depress much at any time in the stocking cycle. The lack of effect of zooplankton is simply a matter of there being low numbers of fish at all times; there is no evidence that zooplankton populations get depressed immediately after a stocking event and then rebound over a few years as this original wording implies. Frankly, the original wording shows a significant misunderstanding by this draft EIS author of low density stocking with nonreproducing fish since low density populations using this management technique are not primarily the result of infrequent stockings (indeed they could occur every year) but rather the result of using very low numbers of fish per acre at every stocking event.

AMPHIBIANS

LONG-TOED SALAMANDER

"In general, the research indicates that there are far fewer long-toed salamanders in lakes and ponds that contain fish (especially reproducing fish), compared to lakes and ponds that are fishless, although the variation in abundance can be high even within a lake." (pg 167)

This sentence needs heavy modification. As it stands it is very misleading. The situation is far more complex than to simply consider lakes with fish and lakes without fish (see the NCNP's own Liss and Larson study for pages and pages of evidence that supports my contention). This sentence as it stands implies that there are always far fewer salamanders in a lake with fish than a lake without fish (in spite of the off hand qualifier at the end of the sentence). The research shows this is not true. The important distinction to make is not between lakes with fish and those without fish, but between lakes with reproducing populations of fish in high densities and lakes with nonreproducing populations in low densities. Fishless lakes are just the limiting case of a low density population. In fact, the Liss and Larson study has shown that indeed there is no measurable difference in salamander densities between a lake with nonreproducing fish in low densities and fishless lakes. This is expected if "fishlessness" is simply the limiting case of low densities. The draft EIS misses this vital distinction of fish density time and time again, and this is just another example.

A key point to remember whenever writing a section such as this is that the research does not show that the mere presence of fish affects the biological integrity of the lake ecosystem, but rather the biological integrity is proportionally dependent on the population density of the fish.

"In contrast, in seven lakes containing fish that were either nonreproducing stocked (2 lakes) or reproducing (5 lakes), the range was drastically lower: 0 to 8 individuals per 328 feet of shoreline surveyed." (pg 167)

I find it unbelievable that the EIS authors seem to have so little understanding of the vital conclusion of the Liss and Larson study that one can not lump reproducing and nonreproducing fish populations in the same statistic. In the context of proper mountain lake fishery management, mixing statistics from these two different data sources (reproducing and nonreproducing fish populations) is the ultimate apples and oranges story. These "slips" always seem to produce a negative image for fish stocking. This consistent pattern can not be the result

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Appendix A

JUNE 12, 1986 MEMO FROM WILLIAM MOTT TO THE REGIONAL DIRECTOR, PNW REGION

"In your January 27, 1986, memorandum and in follow-up discussions, you requested that we provide you with a clear statement regarding National Park Service policy for management of fisheries resources in the North Cascades Complex." (pg 8)

Throughout the draft EIS it is claimed that fish stocking has continued in the NCNP under a "policy waiver". I submit that this memo from the Director of the NPS clearly establishes policy for fish stocking in the NCNP as distinct from any other park in the NPS system. It can not be construed as merely a policy waiver. The word waiver never appears in this memo.

All references to "policy waiver" where ever they appear in the draft EIS need to be changed to read "policy". Other changes in content will no doubt be required to accommodate the fact that a policy was established in 1986 as opposed to a policy waiver.

"Park waters that are potential candidates for continued fish-stocking are to be reviewed to determine which waters warrant management as an enhanced recreational fishery, and for which continued fish-stocking is to be an acceptable action." (pg 9)

Furthermore, this memo establishes the policy (not policy waiver) that fish stocking is an acceptable management activity within the NCNP with proper management.

"These data will help provide an informed basis for determining whether changes in our fish-stocking management actions may be needed in the future." (pg 9)

Here the memo provides the basis of the very NEPA process underway now -- a part of which is this EIS. Mott's vision does not include any statement, or even concern, that congressional clarification is required. Mr. Mott apparently felt in 1986 that as Director of the NPS he had full authority to establish a fish stocking policy for the NCNP, and he anticipated the day when scientific research and data would bring the NCNP to the point of having being able to adopt a preferred alternative (alternative B) which would then implement those "changes in our fish-stocking management actions". His policy is not dependent on approval by Congress, and as such the provisions of this draft EIS that proclaim that alternative D must prevail until such congressional clarification is obtained are in contradiction to this NPS policy adopted at the highest NPS level in 1986.

JULY 12, 1988 SUPPLEMENTAL AGREEMENT TO MOU BETWEEN NPS AND WDFW

"This Supplemental Agreement shall first be subject to mutual review and evaluation by July 2000. The intent is to give this Agreement a 12-year life and that upon mutual review, the Agreement may be continued or modified based on information available at the time of review." (pg 11)

This agreement between the NPS and the WDFW further demonstrates the this NEPA process ought to be the complete and whole procedure to determine any changes to the fish stocking policy first established by Mott in 1986 and implemented in detail here with this MOU supplement in 1988. The deadline of July 2000 was not met due to the unavailability of the Liss and Larson data upon which Mott's vision depends. The MOU and this Supplemental Agreement have been extended to December 31, 2006 via mutual agreement between the NPS and the WDFW. Once again there is no mention of the need for congressional clarification. There is no reason why the NPS needs guidance from Congress in order to adopt the preferred alternative B.

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and fair with the public throughout this entire NEPA process. The public had superb access to information and has been given extraordinary opportunity to participate.

I'd also like to congratulate both NCNP and WDFW personnel for the remarkable degree of respect and cooperation they have shown each other during this process. In an era where federal and state agencies often battle over jurisdictional issues, it is a pleasure to see the difference a few committed individuals can make such that a constructive dialog takes place against a background of such difficult issues.

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"Additions or deletions to the list of 40 lakes may be made only by mutual agreement of the Department and the Service. Research results will be considered in future decisions." (pg 10)

Furthermore, if the NPS were to insist on defaulting to alternative D without such congressional clarification it would be in violation of this provision of the Supplement Agreement since alternative D would delete all lakes from the list of 40 referred to here. The WDFW has not agreed to such deletions, but only to the plan found in the preferred alternative B.

Appendix B

"June 12, 1986 - The director of the NPS issued a policy statement that placed all mountain lakes in the North Cascades Complex into three categories: (1) natural fish-free waters, (2) self-sustaining fish population waters, and (3) continue-to-stock waters." (pg 28)

This confirms that before 1986 there may have been the conception, or misconception that fish stocking was done under a "policy variance; however, in 1986 the Mott memo resolves any possible misunderstanding in the past by creating a NPS policy.

Appendix K

MINIMUM REQUIREMENTS DECISION GUIDE

ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

"... except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act."

- The Wilderness Act, 1964

Before I get into the specific comments on the MRA, allow me to present the results of some research I have done on the MRA procedure itself and its use.

When I first saw this MRA I was appalled. Its reasoning and conclusions were so absurd that I just could not believe that it made it into an otherwise quality document such as this draft EIS. In fact, I was so sure that this MRA was an abuse of the procedure that I some checking with various sources in an attempt to better understand the MRA process, and in particular, to better understand the circumstances under which it was designed to be used.

The first thing I did was to go the Arthur Carhart National Wilderness Training Center's website to get the forms and instructions that make up the MRA procedure. Next, I spoke with several NCPN employees to get examples of how the MRA process had been used in the past. It eventually became clear that the MRA found in this draft EIS was highly unusual since no one seemed to know if one like it had ever been done before. The MRA examples all seemed to have been done in the more traditional way of helping agencies decide primarily whether motorized equipment could be used.

Finally, I was able to speak to NPS and the National Forest Service (NFS) employees at the Arthur Carhart National Wilderness Training Center who have knowledge of how MRAs are used on a nationwide basis. I learned that four federal agencies developed the MRA process and use it. I discovered that an MRA such as the one found in this MRA is loosely called a "programmatic" MRA. (Basically a "programmatic" MRA is one that

looks at an activity rather than a tool.) With further discussion it became apparent that it is highly unusual for an MRA to be used in this programmatic fashion.

I happened to talk first to Tom Carlson who is the NFS representative at the Carhart Training Center. He stated that programmatic MRAs are not done by the NFS and it is against their policy to do so. He confirmed that to his knowledge an MRA such as the one in this draft EIS had never been done by the NFS. Furthermore, Tom was on the committee that designed the MRA procedure in the first place, and he was of the opinion that the MRA design was not appropriate to be used in this programmatic manner. He felt that the overall NEPA process itself was better able to handle such decision making since it was designed to analyze such broad issues whereas the MRA question set was designed to address the Wilderness Act 4(c) exclusions only (i.e., use of modern tools).

Next, I planned to talk to the NPS representative at the Carhart Training Center but instead ended up talking to his boss in Washington DC. It is my understanding that no one in the NPS knows more about the use of MRAs in the NPS than does Rick Potts, National Wilderness and Recreation Programs Manager for the NPS. Rick agreed that although the NPS does not have a policy forbidding the use of the MRA in programmatic situations like the NFS does, it has been highly unusual in the NPS to do programmatic MRAs. In fact, he was only aware of four such MRAs of the many MRAs the NPS has done. One is in this NCPN draft EIS on fish stocking; the other three are: one in the Rocky Mountain NP for trails; another in the Kings Canyon NP for fire management; and one in the Shenandoah NP for trails. Rick noted that the MRA procedure was relatively new having been created in 2000 and was still evolving. He mentioned that an effort was currently underway to revamp the MRA procedure such that it could be used across the four agencies in a standardized manner; in particular between the NFS and the NPS. Rick did not yet know what the outcome of that effort would be, but he thought the new standards would make it even less likely that the NPS would do programmatic MRAs in the future.

In my opinion the MRA found in this draft EIS is the most sweeping use of an MRA that has ever been done in the NPS. In none of the other three programmatic MRAs is an historic management activity disapproved across an entire park. These other three programmatic MRAs allow the management activity to continue, but simply restrict certain instances of its use where harm can be shown. Frankly, that is not unlike what preferred alternative B attempts to accomplish within the overall NEPA process; namely, the continuance of the of fish stocking, but limiting it in situations where harm can be shown. There is no justification for a separate MRA procedure to usurp the overall objective of the NEPA process by pushing the use of the MRA procedure to the most extreme use it has ever been subjected to.

This NCPN fish stocking NEPA process is filled with enough controversy without unnecessarily introducing the use of a fairly new procedure in a way that pushes its use to an extreme limit - especially just as efforts are underway within the NPS and the NFS to evolve the MRA procedure to its next incarnation which is very likely to restrict or even eliminate "programmatic" MRAs such as the one unwisely included in this draft EIS.

Here are my comments specific to the implementation of the MRA in this draft EIS:

A. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

"Fish Stocking: There is no provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that explicitly allows for fish stocking." (pg 289)

Neither is there any provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that forbids stocking. In addition there is no provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that allows for trail building, trail maintenance, bridge building, campsite conservation, or dozens of other actions the park engages in every day. This reference to these pieces of legislation is at best a red herring since such legislation is designed to leave such details to the administering agency as is proven by the total lack of such authorization for any action. Why expect these pieces of legislation to authorize fish stocking when it authorizes none of these other actions?

Beyond these considerations is the fact that the Wilderness Act permits fishing, and today's science clearly shows that the only way to provide biological integrity is to stock with nonreproducing fish in low densities.



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C. Describe Other Guidance

"Fish Stocking: Stocking of naturally fishless lakes in the National Park portion of the Stephen T. Mather Wilderness violates current NPS management policies regarding stocking of nonnative fish into national park waters." (pg 289)

This is incorrect. The Mott memo of 1986 explicitly creates a policy for fish stocking in the NCNP. Fish stocking in the NCNP today is wholly within NPS policy.

Explain: (pg 290)

NPS Management Policies (2001)

This section is incomplete. It quotes NPS policy from chapters 4 and 6 but leaves out anything from chapter 8 except a brief excerpt. Chapter 8 concerns itself with the NPS's mandate to provide recreation, whereas chapters 4 and 6 concern themselves the NPS's mandate to preserve and protect natural resources. Even the one brief excerpt from chapter 8 has a preserve and protect theme.

Once again we see the appearance of bias favoring the elimination of fish stocking by the EIS authors since it is only when you balance the preserve/protect policies of the NPS with its recreation policies that a fair analysis can be made.

"In contrast to sport fishing, the practice of stocking fish is generally prohibited in park units." (pg 290)

This is incorrect. General policy does not apply to the NCNP because the fish stocking policy for the NCNP was set by Director Mott in his 1986 memo.

Memorandum of Understanding between the NPS and WDFW

"Currently, the management of mountain lakes is performed under a temporary extension of the 1985 Memorandum of Understanding and 1988 Supplemental Agreement between the two agencies." (pg 291)

The underlined word "temporary" should be removed. All MOUs between the NPS and state agencies are intended to be renegotiated from time to time. There is nothing "temporary" about these agreements.

E. Wilderness Character**Untrammeled:**

"Stocking naturally fishless lakes, even with nonreproducing trout, would not leave the wilderness "ideally untrammelled and free from modern human control or manipulation." Stocking of fish would manipulate the native ecology of a lake and introduce a nonnative species for the purpose of enhancing recreation." (pg 292)

Even though the word "modern" is retained in this case (unlike in the main body of the draft EIS – see previous comments), the connotation of this word is totally ignored in this rationale. Fish have been stocked in lakes for centuries, including by native peoples well before the white man's arrival. There is nothing "modern" about fish stocking. This paragraph once again demonstrates how the intent of the MRA process is being subverted here to support a predetermined conclusion to eliminate fish stocking from the NCNP.

Anyone who has prior experience with the MRA procedure knows that in the vast majority of MRAs, they are used to determine whether truly modern techniques (primarily motorized equipment) must be used to accomplish a particular activity. This is the reason the word "modern" appears in this part of the MRA. How can anyone consider the packing of fish fry on the backs of people, or by horse, to be a "modern human control or manipulation". Aircraft is not necessary to stock lakes. Now, if one wanted to do an MRA to determine whether aircraft should be used to stock fish as opposed to hand methods, that would be a perfectly valid use of the MRA process. However, this MRA as it stands is a sham, perhaps even a scam.

Natural:

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"Stocking with nonreproducing trout would temporarily affect the natural character of naturally fishless lakes in wilderness by introducing a nonnative species, thus manipulating the ecological structure of the lakes." (pg 292)

The MRA procedure defines this "natural" character as:

"Natural" – Wilderness ecological and evolutionary systems are substantially free from the effects of modern civilization.

How can anyone with a straight face believe that the backpacking of fish fry into a lake, where such fish would naturally live if the stream gradients of the North Cascades were not so steep, as being an "effect of modern civilization"? It is ludicrous to make such an argument. Even the practice of fish stocking itself has no connotations of "modern civilization" since it has been practiced for thousands of years all over the world in all civilizations. One may object to the stocking of fish in the NCNP, but one can't misuse the MRA procedure in an attempt to prove your point.

Furthermore, the Liss and Larson study belies the last few words of this section. Nonreproducing fish populations in low densities do not manipulate the ecological structure of the lake in any measurable way. Their research could find no measurable difference in the ecological structure of a fishless lake and one which has been stocked with nonreproducing fish populations in low densities.

F. Describe Effects to the Public Purposes of Wilderness**Explain:**

"For example, some of the mountain lakes would no longer provide scientists with the opportunity to study the ecology of naturally fishless mountain lakes because the lakes would contain nonnative fish." (pg 293)

Here is another ridiculous claim that demonstrates the lack of integrity in the use of this MRA procedure. The EIS itself declares that there are 245 lakes in the NCNP complex. It also declares that only 91 of those lakes have ever had a history of fish stocking. Alternative B proposes to continue fish populations in only 29 of these 91 lakes with a possible addition of 13 more once there is sufficient data to determine a proper management strategy for those 13 lakes. So even if all 13 of those lakes now in limbo are added to the 29, there would only be a total of 42 of the total 245 lakes that would not be available as "fishless lakes" for research. This leaves the remaining 203 lakes available to researchers. Furthermore, many scientists might even consider it a benefit to have a few lakes that are not fishless to provide contrast and controls in the research area. In any case, research in California parks and in Idaho wilderness areas has shown that a lake returns to its natural state in about 11-20 years, even after having been subjected to the devastation of high density fish populations. The extreme position presented in this section is a far reach indeed and exposes a likely bias on the part of the MRA author.

Step 1 Decision: Is it necessary to take action?**Explain:**

"Fish Stocking: No. Stocking non reproducing trout into the high mountain lakes would continue to benefit the recreational wilderness experience for certain wilderness anglers. Stocking, however, would adversely impact the wilderness experience for other wilderness users. Fish stocking would also adversely impact, to varying degrees, the scientific, conservation and natural purposes of wilderness. If stocking were discontinued, opportunities for fishing in the high mountain lakes would be severely limited. However, various opportunities for sport fishing would remain in the rivers and streams, and other types of primitive and unconfined forms of recreation would still exist in the Steven T. Mather Wilderness. Therefore, the NPS believes that fish stocking is not required for administration of the area as wilderness." (pg 294)

This logic has nothing to do with reaching the conclusion. You could apply this same logic to essentially any management action the park takes and presumably reach the very same conclusion; namely, that the action ought to stop.

To prove this point I have substituted "trail building" for "fish stocking" and "hiking" for "fishing" into the logic expressed above. I believe this exercise clearly demonstrates that the reasoning in the MRA must have been essentially "manufactured" to reach a pre-determined conclusion.

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Trail Building: No. Building trails into the high mountain lakes would continue to benefit the recreational wilderness experience for certain wilderness hikers. Trails, however, would adversely impact the wilderness experience for other wilderness users. Trail building would also adversely impact, to varying degrees, the scientific, conservation, and natural purposes of wilderness. If trails were not built, opportunities for hiking in the high mountains would be severely limited. However, various opportunities for trail hiking would remain in the lowland areas, and other types of primitive and unconfined forms of recreation would still exist in the Seven Mather Wilderness. Therefore, the National Park Service believes that trail building is not required for administration of the area as wilderness.

Note how the reasoning still makes perfect sense. In other words, if the park were to do a similarly reasoned MRA on building or maintaining trails in the park, it presumably would once again conclude that trail building or maintenance should stop in the park.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE COMMENTS ON THE MINIMUM REQUIREMENTS ANALYSIS

The Trail Blazers and Hi-Lakers agree totally with this view of a misapplied and disingenuous MRA exercise.



Bill Paleck
09/13/2005 08:06 AM
PDT

To: Shelley Kluz/NOCANPS@NPS, Roy Zipp/NOCANPS@NPS
cc: trailblazer@nps.gov
Subject: Fw: Fishery EIS response info

Shelley/Roy,

Would you please take care of this?

Thanks,

Bill

----- Forwarded by Bill Paleck/NOCANPS on 09/13/2005 08:05 AM -----



Brian Curtis
09/09/2005 04:57 PM
MST

To: Bill Paleck <bill_paleck@nps.gov>
cc:
Subject: Fishery EIS response info

Hi Bill, I sent off my written response to the draft fishery EIS today. Included is both a hard copy and a CD. But in my haste to get it to you before leaving on a week long backpacking trip in Idaho I just realized I forgot to include my address and phone # on the response itself (My return address is on the envelope). So I'm hoping someone can, if necessary, match my address and phone # to my response.

Brian

Brian Curtis



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effects of fish stocking that showed fish stocked in low densities do not compromise native biota and a management plan was drafted that would allow fish stocking, while not impairing park resources. Because the cited law would not be violated by the management plan why was it cited?

Question C:

Describe Other Guidance

--MLFMPD Volume two P 289

Under "Fish Stocking" in this section NPS policies against stocking fish are cited. But then under "Fish Removal" the 1985 MOU between the NPS and WDFW is cited. You can't have it both ways. The MOU also applies to fish stocking, not just fish removal.

And finally, the decision: Is it necessary to take action? The MRA concludes that it is necessary to remove fish but not necessary to stock fish. Left out of conclusion is the important historical use provision of The Wilderness Act Section 4(b). An important historical use of the park would be eliminated and that fact isn't even mentioned in the conclusion. During the hearings leading up to the park's formation fish stocking was specifically asked about and it was explicitly promised that fish stocking would not cease in the park. Clearly, fish stocking and fishing are important recreational and historical uses covered under 4(b). They also do not impair park resources. For some reason park managers seem to favor some historical recreation uses that clearly impair park resources such as stock use, camping, and trails but say fish shouldn't be stocked. As a wilderness user I find trails and campsites detract from my wilderness experience while fish do not. I certainly don't mean to start a battle between hikers and anglers, but it shows how specious the conclusions reached in the MRA are. Were you to apply the exact same analysis to trails as you do to fish stocking you'd have to conclude trails should be removed and no longer maintained. That would, of course, conflict with the recreational and historical use provisions of Section 4(b) just as eliminating fish stocking conflicts with the recreational and historical use provisions of Section 4(b). According to the NPS research conducted to support this EIS fish can be stocked in low densities and they do not adversely impact native biota. Thus they do not compromise wilderness values and they fall under the pantheon of acceptable use of wilderness, just like trails.

The MLFMPD tries to make the case that the enabling legislation needs to be changed in order to implement the preferred alternative and goes so far as to default to the no stocking alternative if the enabling legislation is not "clarified." Three reasons are given for this decision:

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Having read the Mountain Lakes Fishery Management Plan Draft (MLFMPD) cover to cover I have to start out by congratulating you on producing a beautiful document that was both informative and, aside from some unavoidable repetition, was enjoyable to read. Thank you for giving me the opportunity to comment on this draft. I hope my input will help produce a sound and lasting management plan for NOCA high lakes.

The biggest misstep in the MLFMPD is the egregious misapplication of the Minimum Requirements Analysis (MRA). The Wilderness Act is quite clear and unambiguous about what activities are prohibited without considering minimum requirements:

...except as necessary to meet the minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area) there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

--The Wilderness Act: Section 4 (c)

Because fish stocking does not require any of the acts prohibited under section 4(c) it should not be subject to the MRA process. The absurdity of using the MRA process to cover fish stocking is made explicit in the MRA question A :

Are there valid existing rights or is there a special provision in wilderness legislation ... that allows consideration of action involving Section 4(c) uses.

--MLFMPD Volume two P. 288.

Fish stocking does not involve "Section 4(c) uses" therefore MRA section A should be marked not applicable. Fish removal sometimes does involve prohibited uses so the MRA should be applied to those activities. But answering a question about an "action involving 4(c) uses" when the action does not involve the prohibited uses is nonsensical.

Question B:

Describe Requirements of Other Legislation.

--MLFMPD Volume two P 289.

Laws are cited that prohibit any action that "may potentially impair park resources and values." [MLFMPD Volume two P 289] How could this law possibly apply to fish stocking? Large amounts of money and time were spent in the park studying the



if this plan/EIS resulted in the selection of an alternative that allowed for continued stocking, issuance of a policy waiver to the [NOCA] could encourage other state fish and wildlife agencies to revisit the issue of stocking in NPS units where stocking has been discontinued.

--MLFMPD Volume one P 74

The state of Washington has been stocking park waters for over twenty years under policy waivers and there has been no push by other state wildlife agencies that I am aware of to stock fish in other NPS units. What would change after this EIS has been issued to suddenly cause state agencies to push for stocking when they haven't been doing it all along?

Second, policy waivers are only temporary and do not provide a permanent solution because they can be rescinded as circumstances change. The goal of this plan/EIS is to forge a lasting solution...

--MLFMPD Volume one P 74

I would like to see a permanent solution that allows fish stocking in the park. While that is a laudable goal, it is not a reasonable justification for the automatic discontinuance of fish stocking in the absence of revised legislation. The MLFMPD will only "...guide future actions for a period of 15 years." (MLFMPD Volume one P 3) So even the plan being considered in this EIS is not permanent. The more pernicious aspect to this quote is the notion that there are "policy waivers" required to continue fish stocking. No policy waiver is required when the National Park Service Policy is to allow fish stocking in NCNP. This policy was written by William Mott in 1986:

You requested that we provide you with a clear statement regarding National Park Service policy for management of fisheries resources in the North Cascades Complex. ...fish stocking will be permitted for the purpose of enhancing recreational fishing activities.

--MLFMPD Volume two P 8

While I severely cropped Mr Mott's letter in the above quote and left out quite a bit about fishless waters and waters with reproducing fish the above quote from a Park Service Director unambiguously states that the NPS policy is to allow fish stocking in the NOCA. There has been no evidence presented that the NPS policy has changed in that regard. Why would legislation be needed when there is already a policy that allows fish stocking in place?

Finally, the [MRA] for fish stocking in the Stephen T. Mather Wilderness indicates that stocking is not necessary to meet minimum requirements for administration of

the area, and the wilderness act is unclear whether stocking is allowed in designated wilderness areas.

--MLFMPD Volume one P 74

As I showed earlier in my comments the MRA is misapplied and does not come to this conclusion. Further, for an agency that is so worried about precedent this conclusion seems especially out of line. Wilderness areas are being managed with fish stocking all over the country. If the practice was not allowed under the Wilderness Act it would have been stopped a long time ago.

The public also expressed a concern that the analysis occur on a landscape scale, so the Technical Advisory Committee took a broad look at lakes in the [NOCA] and selected a representative number of lakes to remain fishless under each alternative."

--MLFMPD Volume one P 459

This is an important statement. The MLFMPD should be looking at lakes on a landscape scale and the above statement would lead us to believe it does. But look at this:

A total of 245 mountain lakes are in the [NOCA], and at least 154 of those lakes have always been fishless and would continue to be fishless under any alternative. Because they would remain fishless and because they have never been part of the managed fishery, these 154 lakes are not analyzed in this plan/EIS.

The 91 lakes addressed in this plan/EIS...

--MLFMPD Volume one P 48

So only 91 lakes were considered in the plan/EIS. If 245 lakes are in the complex analyzing only 91 of them is **not** analyzing on a landscape scale. That leaves the final plan to understate the number of lakes that should be stocked in the future. By only considering the 91 lakes with a history of fish stocking and eliminating some lakes from consideration for stocking based on this subset the TAC was forced to eliminate some lakes that shouldn't have been eliminated had the analysis truly been landscape wide. The lake by lake analysis needs to be redone before the final plan is produced and consideration needs to be given to lakes that have never been stocked if they will serve as representative undisturbed habitat that would allow more lakes with previous management history to continue to be stocked. The wishes of the public, as expressed in the scoping meetings should be fully addressed, not swept aside with disingenuous doublespeak.



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But what about invertebrates? The impacts on invertebrates needs to be considered in the final EIS.

Cumulative impacts resulting from implementation of alternative D would be similar to those described for alternative A, but with extremely reduced effects to amphibians and native fish because of reduced fish densities and/or removal of reproducing nonnative fish in the [NOCA].

--MLFMPD Volume one P 323

...but with substantially reduced impacts...

--MLFMPD Volume one P 319

...be a reduction of impacts...

--MLFMPD Volume one P 314

This is an interesting cut and paste progression, but it isn't warranted. The elimination of highly reproducing fish is the major cause of reduced impacts and that is common to all three alternatives discussed in the quotes above. There is a reasonably large jump in impact between alternative A and alternative B but the impacts don't change nearly as much between alternatives B, C, and D. Moreover, each alternative goes on to say "...an accurate determination of the magnitude of cumulative impacts... cannot be made..." So, if an accurate determination cannot be made why use the loaded language? In each description it sure sounds like the author of the draft thinks they can make a determination of the magnitude of cumulative impacts.

Stocking activities at lakes in zones or near camps with medium to high visitation would result in short-term negligible to major adverse impacts on any special status plants

--MLFMPD Volume one P 329

This needs to be justified. How can stocking activities possibly cause major impacts?

On page 330 of the MLFMPD mitigation measures on impacts on native plants of fish removal activities are discussed. Among the mitigation measures is "wading in the lake to avoid trampling of riparian or wetland vegetation..." But nowhere are the impacts of wading on aquatic vegetation discussed. The impacts on shoreline plants are listed as negligible to minor. I'm amazed the NPS can publish this with a straight face. Even with mitigation measures in place the folks doing the removal need to camp near the lakes for multiple days and approach the water multiple times and this has to happen multiple times during the summer and probably in

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While many anglers are also conservationists, there is a distinction between those who value the stocking of lakes for their enjoyment, in contrast to those who value the conservation and protection of natural processes.

--MLFMPD Volume one P 215. Also see very similar verbiage on p 393.

I don't understand why there is the need to stereotype and divide. I find this case particularly out of line because I don't fit into either category. I am an angler who values the stocking of lakes for my, and other people's, enjoyment but at the same time I very strongly value the conservation and protection of natural processes. That is why I support low density fish stocking with non-reproducing fish in selected NOCA lakes. That allows the public the recreation and enjoyment of stocked fish while preserving natural processes. I love to see salamanders and I love watching copepods (I really do like watching them dart around). I also enjoy fishing. People can't just be sorted into convenient categories.

Many backcountry lakes that contain fish have visible patterns of human use (such as social trails...

--MLFMPD Volume one P 217

Many backcountry lakes that don't contain fish also have patterns of human use such as social trails. Why are lakes with fish singled out in this category?

In 17 of the 91 lakes, stocking would be expected to result in long term moderate, adverse impacts on macroinvertebrates.

--MLFMPD Volume one P 255

This is a misstatement. Stocking would not result in the impacts described. Stocking would not be conducted in such high densities under any alternative and such impact would only be expected in lakes with a high density of reproducing fish.

On page 313-314 of volume one the effects of eliminating the fish the Hozomeen Lake on the common loon are discussed. Impacts are said to be minor to moderate. But it also says they may stop nesting in the complex. If this were to occur the impact would fall under the category of impairment. So at best the MLFMPD should state that impacts on the loon will be moderate (forced to move to a nearby lake) to impaired (eliminated from the complex).

The use of the chemical antimycin, to remove fish is not known to have adverse impacts on amphibians.

--MLFMPD Volume one P 314



multiple years. In contrast, fish stocking activities are listed as negligible to major and fish stocking activities involved someone walking to the lakeshore once and emptying a bag of fish and then leaving. And with long stocking rotations that might happen once every 3 to 7 years. How removal activities that require repeated access to shore over time can be minor while stocking activities that require one access to the lake shore is beyond my comprehension.

Under the discussion of the impacts of alternative D on special status plants it says: *...there would be a widespread beneficial effect."*

--MLFMPD Volume one P 333

This appears to be overstated. Earlier in the draft EIS it is contended that only 10% of visitors are fishing. If only that few are using the areas it stands to reason that the benefits to riparian plants wouldn't be all that great because the majority of use, and hence, damage, is coming from non-angling users.

this theme is repeated on page 334 when activities not related to angling are said to be possibly negligible to minor even after fish are removed. So fish stockers might cause major damage while non-angers are apparently non-abusers who leave no trace of their coming.

And then comes this:

Trampling by stock (horses, mules, llamas) and visitors would likely result in negligible to minor cumulative impacts...

--MLFMPD Volume one P 334

Wow, trampling by stock is, at worst, minor, but damage by fish stockers could be major. Outrageous and ridiculous.

The ludicrousness of this whole line of thinking is brought home to roost on page 337. On that page is a photo that shows major trampling in a highly used area. But the lake in the photo is hundreds of feet below the trampled area. The photo shows excessive trampling by non-angers. The ones who are only supposed to cause negligible to minor cumulative impacts on native plants.

Evidence suggests that anglers use riparian areas more extensively than other visitors.

--MLFMPD Volume one P 338

There is no citation for this evidence. It is simply stated as supposed fact. Directly contradicting this assertion is research by Hendee, Clark, and Daily where they

found that nonanglers spent just as much time at the lakeshore as anglers [Hendee, John C; Clark, Roger N; Dailey, Thomas e. 1977. Fishing and other recreation behavior at roadless high lakes: some management implications. Res. Note PNW-304. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 27p.]

...potential impacts on vegetation would be negligible and would resemble other lakes in the park where fishing does not occur.

--MLFMPD Volume one P 338

How can this gross generalization be made? I would hazard a very educated guess that impacts on vegetation vary greatly depending on access and use even at lakes with no history of fish stocking.

Alternative C would provide substantial long-term benefits...To the extent this use is attributable to fishing and fishing-related stock use, benefits to vegetation would occur at these lakes.

--MLFMPD Volume one P 347

It is clear from the caveat that no one knows that the long term benefits on riparian vegetation would be "substantial" under alternative C. Why use the self-serving and loaded term "substantial" if you don't know if the benefits will actually be substantial?

Vegetation at the 29 lakes that are currently fishless would continue to experience negligible adverse impacts from past visitor use but would be undetectable compared to natural conditions in time.

--MLFMPD Volume one P 348

Most of the stocking in those 29 lakes was discontinued decades ago, in some cases over 70 years ago and at most of those lakes stocking never resulted in increased angler impacts. The impacts are coming from non-angers and that isn't going to change and magically result in the lakes reverting to undetectable damage. Here is a bombshell:

In those cases where ground preparation is required for helicopter landing...

--MLFMPD Volume one P 361

...helicopter use (and associated landing pads adjacent to lakes)

--MLFMPD Volume one P 362



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anglers but minor to negligible for others." (p 385) There will be 9 lakes with fish under this alternative. On page 386 it says approximately 500 anglers will be displaced outside the park. That leaves 500 anglers to fish the 9 lakes in the rec areas. That would be interesting. Concentrating those anglers into 9 lakes certainly wouldn't be a negligible to minor impact. That would be major, as would displacing the other 500 anglers to areas outside the park.

Under alternative D where there will be no lakes managed for fishing the MLFMPD says that 50% of anglers will be "displaced from fishing in the study area lakes." Where, exactly, are the other 50% of anglers that supposedly won't be displaced going to fish under alternative D when there are no high lakes to fish?

On volume one page 397 there is a typo in the first paragraph. It says "...stocking world be reduced..." but should read "...stocking would be reduced..."

Alternative D would have a moderate to major adverse impact on the social values of anglers and angler groups... Alternative D would have a moderate to major adverse cumulative impact on conservationists and conservation groups but some may support the adaptive management approach...

--MLFMPD Volume one P 398-399

That sure makes for a no-win scenario.

On the other hand, some informed wilderness users would be aware of nonnative fish in the lakes due to stocking. They would also experience the indirect effects of angling, such as social trails along lakeshores, fire rings, and lost or discarded fishing tackle and equipment. The magnitude of adverse impact would vary among individuals. Those with strong biocentric views (support protection of natural processes in wilderness areas) of wilderness would experience major long-term adverse impacts from the continued fishery management practices under alternative A.

--MLFMPD Volume one P 404 (also see page 408).

To meet the definition of a Major impact the "Human-caused impacts...on the natural environment would be readily apparent throughout the wilderness." If users have to be "informed" to be aware of the fish the management action is not "readily apparent." And, even in alternative A only 62 out of the 245 lakes in the park would have fish. That represents 25% of the lakes and that doesn't represent an impact "throughout the wilderness." There is no way to classify the effect on anybody as "major." You might be able to make the case for moderate, but even that isn't clear.

Some people would not even have to experience these impacts firsthand to be adversely affected. Without ever visiting the [NOCA], these individuals would be

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Whoa, clearing off landing pads for helicopters wasn't even considered or mentioned in other parts of the EIS. Where are the major impacts on vegetation listed that this would cause? This sort of burying and understating of impacts of fish removal while overstating the impacts of the activity of fish stocking severely undercuts the credibility of this EIS process.

This lake sustains some of the highest visitor numbers of all 91 lakes in the study area. Reducing anglers at the lake and its access trail would notably reduce risk of adverse impacts...

--MLFMPD Volume one P 363

If angler use is truly only 10% of use this statement would not appear to be justified. And of that 10% what percentage would still go even if there are no fish?

Of the lakes listed above, Hidden Thornton (Lower and Upper), and Monogram might be stocked by aircraft.

--MLFMPD Volume one P 376

That should be Middle Thornton, not Upper Thornton. Upper Thornton has no fish stocking history and will not be stocked. The middle lake is currently stocked by hand it is unlikely to be stocked by aircraft in the future.

In the discussion of visitor use and experience:

A more reasonable scenario would involve angler displacement to relatively similar terrain found on adjacent Forest Service wilderness areas...The magnitude of impact [under alternative B] would depend on individual values and expectations and would range from negligible to minor.

--MLFMPD Volume one P 380

Looking at the impact definitions it says Minor means "Other areas in the [NOCA] would remain available..." (p 370) and under Moderate it says "...some visitors who desire this experience would be required to pursue their choice in other available local or regional areas." (p 370-371). And under Major it says "Some visitors who desire this experience would be required to pursue their choice in other available local or regional areas. Other visitors may not be able to duplicate their desired experience elsewhere." (p 371). By your own definition, if B is implemented some anglers would be disbursed outside the NOCA and this would be a moderate to major impact, not negligible to minor.

In the discussion of visitor use under alternative C where nothing would be stocked in the park and a very limited number of lakes would be stocked in the rec areas the effect on some anglers has been increased to "moderate to major for some



adversely impacted by simply knowing that the naturalness of the [NOCA] was being impacted by mountain lakes fishery management actions proposed under alternative B. The magnitude of the impact is unknown.

--MLFMPD Volume one P 408

Why aren't the feelings of anglers who don't visit the park given the same treatment? Wouldn't some anglers bemoan the loss of opportunity even if they never plan to visit the park? Why aren't their feelings acknowledged?

The theme of not paying attention to the actual impact threshold definitions continues:

Anglers who choose to fish elsewhere due to the reduced fishing opportunities would experience long-term minor adverse impacts.

--MLFMPD Volume one P 413

But according to the definition "Opportunities for primitive and unconfined forms of recreation would be slightly improved or reduced in limited areas of the wilderness." (P 401) How does forcing the users completely out of the wilderness fit the definition of "...slightly...reduced in limited areas of the wilderness?"

Later on the same page:

All stocking in the [NOCA] would cease. Compared to alternative A, this would cause moderate to major beneficial impacts on opportunities for solitude over the long term due to the decreased use of high mountain lakes for fishing.

--MLFMPD Volume one P 413

Again, we have to turn to the actual definition of a major impact: "...actions would have to have a readily apparent beneficial or adverse impact on opportunities for solitude throughout the wilderness area." (P 402) In alternative A only 25% of the lakes in the park complex would have fish. Twenty five percent of lakes ignores the fact that non-anglers have all the non-lake parts of the park to avoid anglers and the other 75 % of lakes where anglers can be avoided. Because such a small part of the park is impacted the benefit for solitude can't meet the definition of major.

Some of those with an anthropocentric perspective would view the application of a science-based adaptive management plan to remove fish as a negligible impact and some would view this as beneficial.

--MLFMPD Volume one P 415 (see also similar verbiage in the next paragraph)

*The above sentence occurs in the discussion of alternative D where all fish would be removed. This is **not** an adaptive management plan and this sentence needs to be stricken.*

Compared to alternative A, there would be long-term major beneficial cumulative impacts on those who believe that continued stocking in wilderness ... would compromise natural processes.

--MLFMPD Volume one P 415

Elsewhere in this document we learned this isn't true. Low-density non-reproducing fish do not compromise natural processes. So why do we have to cater to certain people's uninformed viewpoints? Wouldn't education make more sense?

The displacement of anglers to other wilderness areas would result in long-term negligible adverse cumulative impacts even if all anglers decided to fish elsewhere.

--MLFMPD Volume one P 417

Negligible? Moving anglers generates major benefits for solitude in the park, but only negligible impacts on solitude outside the park? That makes no sense. The impact has to be commensurate.

Helicopters hovering overhead are known to generate noise levels of about 70 to 90 decibels, compared to background levels of 20 to 40 decibels.

--MLFMPD Volume one P 287

*According to table 33 on page 283 helicopters generate 70 to 90 decibels at 1000 feet. For fish removal the choppers are not going to hover at 1000 feet. They are going to land. Calculating the noise level, based on 90 dba at 1000 feet to a more realistic 31 feet I arrive at 120 decibels. That is a **huge** difference. 120 dba is extremely loud. Loud enough to cause damage to human hearing. This is illustrative of how impacts of fish removal are consistently soft peddled in the draft plan/EIS while impacts of fish stocking are consistently over stated. Here's another one:*

Impacts of fish removal using the chemical antimycin would be negligible to minor. The use of small motorized boats to apply antimycin would cause short term noise disturbances to waterfowl on the lake or other species (such as beavers or otters) around the immediate lake shore; however these disturbances would be short term and negligible for these species.

--MLFMPD Volume one P 288

The use of motors would cause negligible impacts???



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September 11, 2005
Superintendent
North Cascades National Park
810 State Route 20
Sedro-Woolley, WA 98284

Dear Superintendent Palect:

With regard to the issue of the Mountain Lakes Fishery Management Plan/EIS, I support Alternative D. The National Park Service has given no reason that I can find in the Executive Summary or my brief skim of Vol. I for choosing a management action that it acknowledges is against NPS policies (p. 4th Exec. Summ.). The NPS also acknowledges that only a small number (of obviously vocal and influential) park visitors participate

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...wildlife at lakes would incur short-term negligible to minor adverse impacts from periodic fixed-wing aircraft stocking (noise disturbance)...

--MLEMPD Volume one P 288

So an aircraft flying over for a few seconds that generates 70 to 80 decibels could cause a minor impact while a helicopter landing and motorboats on the lake would cause negligible impacts? There should at least be the appearance of balance. Such blatant under evaluating fish removal impacts while over evaluating fish stocking impacts severely undermines the credibility of the whole process.

Removal of fish would result in the loss of a food source for fish-dependent species, requiring them to disperse to other areas in search resources; because of this, piscivorous wildlife would incur long-term negligible to minor adverse impacts when lakes are returned to fishless conditions.

--MLEMPD Volume one P 288

So moving fish eating wildlife out of the wilderness is negligible to minor while forcing amphibians to move from some lakes results in an entire EIS?

There is no discussion of the impacts of chemical fish removal on invertebrates. This is a major omission.

Although the impacts on individuals, family units, or localized populations of any associated loss would be serious, populations of these animals in the [NOCA] would only experience minor impacts.

--MLEMPD Volume one P 290

This is also true for salamanders with respect to introduced fish when you look at the situation on a landscape wide basis. Why is that never mentioned in the entire document?

I am very supportive of adaptively managing the lakes in the park complex. But it is very important that the technical committee be allowed to take a truly landscape wide view to determine which lakes should be stocked instead of the limited approach taken to prepare the draft plan/EIS.

Thank you for allowing me to comment.

Brian Curtis



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in fishing (although a theoretically large number should not alter the decision if it protects resources for future generations). The NPS also states that opportunities for high lake/wild country fishing exist nearby outside the park in Washington state.

I cannot imagine why NPS officials would want to invite the current Congress to deliberate the legal authority of fish stocking in Wilderness at North Cascades N.P. for its own sake or for the sake of other NPS wilderness areas that could be affected. To invite change to North Cascades N.P.'s enabling legislation and possibly to the Wilderness Act as well at this time in history,

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particularly, seems the height of folly.

Allowing reintroduction of non-native fish "only where biological integrity is conserved" seems like a highly questionable decision. While some parameters may be measurable, overall how does one decide — with inevitable outside pressure — what is sufficient biological integrity when numerous parameters are involved, interact, are interdependent? How will you know?

To base a major ecosystem decision on the fear that a few anglers will secretly stock more non-native fish is quite astonishing to me. To operate under such fear as a determining factor is to admit to blackmail.



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can the NPS dare to take such a management decision that permanently alters the ecosystem for present and for future generations of all species, including humans?

Sincerely,
Patricia A. Millner

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I do not understand why sport fishing would be considered an essential recreational opportunity in a national park, in designated wilderness, in lakes that are known to be naturally fishless.

It will surely take decades, if not centuries, to complete the actions of Alternative D. Refining methods will itself take years. This should give anglers time to fish out some lakes that do have fish and to explore others nearby but outside the park with fish.

North Cascades National Park Service Complex has one of the premier wilderness areas in the lower 48 states. How





Bill Paleck
09/15/2005 08:05 AM
PDT

To: Shelley Kluz@NOCA/NPS@NPS, Roy Zipp@NOCA/NPS@NPS
cc: For: No Cascades Mountain Lakes Fishery Mgmt Plan/EIS - Dyer
Subject: comments 9-14-05

----- Forwarded by Bill Paleck@NOCA/NPS on 09/15/2005 08:05 AM -----



"Polly (Pauline) T Dyer"
09/15/2005 03:58 AM
MST

To: bill_paleck@nps.gov
cc:
Subject: No Cascades Mountain Lakes Fishery Mgmt Plan/EIS - Dyer comments
9-14-05

To: Supt. Bill Paleck, No. Cascades NP Complex
This is being addressed to the Superintendent
(guessing at the email address) since our computer's
address book did not have the web page address of
<http://parkplanning.nps.gov/noca>

Attached are the 3 pages of comments on the
North Cascades Mountain Lakes Fishery
Management Plan/EIS.

Polly and John A. Dyer



No Casc NP - M. Lakes Fishery EIS comments 9-14-05.doc



September 14, 2005

Bill Paleck, Superintendent
Mountain Lakes Fishery Management Plan/EIS
810 State Route 20
Sedro Woolley, WA 98284-1239

<http://parkplanning.nps.gov/noca>

Subject: North Cascades Mountain Lakes Fishery Management Plan
and Environmental Impact Statement

Dear Superintendent Paleck:

Thank you for the extension to September 15, 2005, for submitting comments in connection with the subject document. As much as I would like to respond specifically to the many and varying topics and recommendations presented for the Alternatives, I will limit my comments to a few observations.

Overall, this Management Plan/EIS comes across as doing its utmost to reach what nearly appears to have been a pre-determined outcome, as developed for your Preferred Alternative B, Proposed Adaptive Management of 91 Lakes under a new Framework (42 Lakes May Have Fish).

To fully implement the original, basic national park purpose to allow natural systems to remain "unimpaired", evolving naturally, Alternative D, Lakes Would be Fishless, is the only one that recognizes and responds to this major underlying premise.

RESEARCH (Vol. One, pg. ix): It was heartening to see The Technical Advisory Committee's assumption that "mountain lakes that had never been stocked represented the highest degree of biological integrity." But, then, it goes on "to craft management alternatives B and C...for nonreproducing trout...in some lakes and managing fishless conditions in other lakes." Again, This quite apparently led to a nearly predetermined outcome resulting in Alternatives B and C.

LEOPOLD REPORT (Vol. One, pg. 11): It is interesting to note, first, the Leopold Report; second, the 1972 NPS policy prohibiting "artificial stocking of fish species exotic to a park", and, third, NPS working with the state [California] eventually resulted in returning "naturally barren waters" to their natural condition in Sequoia Kings Canyon and Yosemite National Parks.

It is logical that the North Cascades National Park could have followed this same scenario, instead of perpetuating fish stocking in many of its originally naturally barren, fishless mountain lakes -- as outlined in the successive Memorandums of Understanding with the Washington Department of Fish and Wildlife [formerly Dept. of Game].

LOUTER (2003) REPORT (Vol. One, pg. 12): This report is disturbing -- in his assessment that the WDFW interpreted the establishment of the Lake Chelan National Recreation Area, specifically



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"A change in the enabling legislation for the North Cascades Complex to allow for continued fish stocking would set a precedent for this NPS unit, and possibly others that have, or may have in the future, fish-stocking issues. If Congress should choose to allow stocking through a change in the enabling legislation, it will have clarified that fish stocking is an appropriate activity in the North Cascades Complex. That unambiguous clarification would allow the NPS to implement any of the management alternatives that include the practice of verbal commitments in support of stocking that proponents believe were made by federal officials prior to establishing the North Cascades Complex but never codified in law.

"Congressional action to clarify enabling legislation is an intricate process that could take several years. If the NPS does not receive clarification from Congress by the time a record of decision for this plan/EIS is issued, alternative D (91 Lakes Would Be Fishless) would be implemented until clarification is received."

We note on page 14, Vol. One, that fish stocking activists and proponents interpreted then-NPS Director George Hartzog as having "promised" in a May 1967 statement that "[we] have an active fish-[stocking] program in every single major park.....we [stock] fish in every area that I can think of off the top of my head now, including all of our major parks."

The paragraph goes on to say, "Proponents of stocking believe they were promised that stocking would continue after the park was established (Trail Blazers and Hi-Lakers....)"

We beg to disagree. First, a statement such as Hartzog's was not a "promise"; it was an observation. It would also appear that Director Hartzog had forgotten, or he was not up on, the Leopold Report, together with follow-up and subsequent action by two "major national parks".

To reiterate from our previous comments (page 2 above), please note, again, that other national parks (Sequoia and Yosemite) "began phasing out trout stocking in the late 1960s." And, to again reiterate - "In 1972 the NPS released its policy stating, 'No artificial stocking of fish species exotic to a park will occur....'"

Quite obviously, the North Cascades National Park Complex decided not to follow the same honorable path of its colleagues of the older major national parks.

However, there is still time to implement that NPS 1972 policy.

Sincerely,

POLLY and JOHN A. DYER

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in order to allow hunting and fishing, that those provisions also extended into the National Park. The WDFW then erroneously decided it was also permitted to continue its exotic fish planting in the naturally fishless lakes in the North Cascades National Park. It was and is a real "stretch" for the WDFW to assert it could extend the privilege of stocking and fishing of exotic species in the National Recreation Area also in the National Park. It is disturbing to see that NPS Director William Penn Mott, Jr., went along with this. (Vol. Two, pg 8,9).

WILDERNESS: (Vol.Two, pg. 292). The best understanding in the two volumes of the Fishery Management Plan/EIS, is that related to the "Untrammeled" requirement for designated Wilderness. These need to be your basic goals, with concomitant results, for the North Cascades National Park and its Stephen Mather Wilderness. Untrammeled requirements should be the ultimate actions, recognizing that this could be a gradual process -- eventually resulting in Alternative D.

Quoting:

"Stocking naturally fishless lakes, even with nonreproducing trout, would not leave the wilderness 'ideally unhampered and free from modern human control or manipulation.' Stocking of fish would manipulate the native ecology of a lake and introduce a nonnative species...."

"Fish removal would also entail short-term human control or manipulation, with the objective of reestablishing sustainable native ecological conditions. *Over the long term, removal of self-sustaining populations of trout would reestablish the untrammeled nature of the wilderness character by reducing evidence of human manipulation (e.g., nonnative fish) in lakes.*" [Emphasis added]

Other Comments: We would like to have made a number of other observations/comments on proposals, descriptions, etc. in this Mountain Lakes Fishery Management Plan/EIS.

However, we limit ourselves to one specifically -- an extremely onerous, and dangerous, proposal. Should this proposal be undertaken by the NPS, we intend to make every effort we can to assure that this does not go forward and compromise the designated Wilderness of the North Cascades National Park -- and, potentially, other national parks, as well.

Quoting from Vol. One, pg. vii:

"The NPS has determined that fish stocking in the Stephen T. Mather Wilderness would only be implemented if Congress granted the NPS the unambiguous legal authority to do so. Therefore, should a management alternative that allows for continued stocking be selected through this plan/EIS decision-making process, the NPS intends to ask Congress for a change to the North Cascades Complex enabling legislation to clarify how the mountain lakes should be managed. The following is an example of clarifying legislation that would allow stocking to continue in the North Cascades Complex:

"Notwithstanding any other provision of law, a fisheries management program that includes the stocking of fish in select lakes within the North Cascades National Park Service Complex is authorized so long as both the National Park Service and the State of Washington agree on the lakes, species of fish, and number of fish to be stocked.



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Faxed to 360-856-1934
9-15-05

Bill Paleck, Superintendent
Fishery Management EIS
North Cascades National Park

Dear Bill,

The primary (and only) reason I go to the North Cascades National Park area is to hike up to a beautiful mountain lake and go fishing.

In order for me to enjoy a wilderness experience it is necessary for my family, friends and I to drive up to the area on man made roads, hike into the mountains on man made trails and fish in the lakes stocked by man. (and women)

A properly managed lake stocked with fish does not take away from anyone's wilderness experience any more than a trail through the forest would. Both enhance the experience while making it possible and worthwhile.

I tend not to get too much into legalities or extremism in any direction. The human experience is usually optimized simply using logic and reasonable common sense. In that vein: **Please continue properly managed fish stocking in the NCNP.**

Thank you for your attention.

Don Wicklund

Don Wicklund Current Vice President of the Hi-Lakers Club of W.A.
Belinda Wicklund

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September 15, 2005

Superintendent
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239

Subject: Mountain Lakes Fishery Management Plan and EIS

Dear Mr. Paleck:

I favor Alternative D, the environmentally preferred alternative, in principle because it potentially restores naturally fishless lakes to their original biological integrity.

However, this alternative needs a specific implementation plan to remove fish within a specific timeframe (perhaps, 20 years) with the financial and personnel assistance of the Washington Department of Fish and Wildlife and others responsible for past fish stocking. Without a specific plan and funding, reproducing populations of stocked fish could remain in these lakes for years as well as recreational fishing such as has occurred in Sequoia-Kings Canyon National Parks and other NPS areas. Without committed and diligent park management, this could easily become the No Action Alternative.

While Alternative B, the adaptive management alternative, has aspects that are certainly invite support, asking Congress to grant North Cascades Complex an exception to NPS Management Policies with the "unambiguous legal authority" to stock non-native fish in fishless lakes could set a dangerous national precedent. In addition, the NPS has not demonstrated that it can implement adaptive management or any long-term management policy, and there are no managerial or fiscal assurances that it could be successful in this instance.

While it is tempting to take professional exception to some of the details in the Management Plan and EIS, the fact remains that this was a very difficult planning project and process. Please extend my compliments and appreciation to the North Cascades Complex staff and partners for a job well done. Thank you for the opportunity to comment.

I request that you withhold my address from the decision-making record.

Sincerely,

Bruce L. Freet

Bruce L. Freet
Environmental Agreements, Inc.



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Mr. Bill Paleck, Superintendent
Mountain Lakes Fishery Management Plan/EIS
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239

Bill,

I strongly urge North Cascades National Park Management to support "Alternative D: All 91 Lakes would be fishless" as stated in the Mountain Lakes Fishery Management Plan/EIS as the "environmentally preferred alternative" in order to end the debate. I have been using the North Cascades National Park as an avid angler and backpacker for the last 20 years. I spend thousands of dollars annually in the surrounding communities of the park. I also give financial support to several groups who focus on park conservation and the protection of our wild lands. When I travel into the back country of North Cascades NP, I go there for solitude, to get away from humans and human influences. I hold North Cascades Complex to the highest standard when managing the natural resources NOCA. This is also states in the NPS Management Policies (see 1.2 NPS Management Policies: "[park units] warrant the highest standard of protection."). This is especially true since all but one of the 91 lakes considered in the EIS are within a specially designated area (wilderness), which means there are additional management requirements. These requirements include keeping wilderness untrammeled, or unhindered and free from intentional modern human control or manipulation; and natural, or substantially free from the effects of modern civilization. Continued fish stocking impacts both of these qualities and wilderness character is deeply impacted as a result. NOCA preferred alternative to continue stocking these historically fishless lakes is contrary to the intent of NPS Management Policies as well as the Wilderness Act. Doesn't requesting a change in the enabling legislation in order to avoid being in violation of NPS Policies and the Wilderness Act defeats the purpose of having these laws and guidelines?

When I fish the lakes and streams in Washington, I choose ones that have native fish populations that are healthy and where they're a natural part of the ecosystem. I do not need to fish in high alpine lakes in the park which was set aside to protect Wilderness values. Historically the lakes outlined in this plan have been naturally fishless; it is just in our more recent history that humans have managed to manipulate even the farthest reaching of natural systems. Most lakes that are stocked or have a history of stocking have unique characteristics that unstocked lakes do not have. Therefore to compare a lake that has been stocked to a lake that has not been stocked in the North Cascades Complex, and based on those comparisons to then conclude that there are no major impacts, this is basically shoving the scientific evidence under the carpet. You need to support good science. It is impossible to determine the species composition and abundance in those lakes prior to being stocked, along with what kind of complex

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FAX COVER SHEET

FROM Anna Schrenk
DATE 2005-09-16 04:57:19 GMT
RE Mountain Lakes Fishery Management Plan/EIS

COVER MESSAGE

Alternative D, Lakes Would be Fishless



interactions took place prior to human manipulation. We simply cannot identify what has been lost in these stocked lakes. Washington State has hundreds upon hundreds of fishable lakes, many of which are in alpine areas near NOCA Complex. The public will still be able to enjoy Washington's lakes. Just because fish stocking has been conducted in the past, does not mean that it is right to continue to stock in the future. Nobodies Recreation rights are being taken away.

I believe that the decision should not be based on science alone, although science should inform the decision. There is a host of other things to consider, most importantly the Organic Act of 1916 and NPS Management Policies, which gives the NPS clear guidance on how to manage natural resources (4.4.3 "The Service will not stock waters that are naturally barren of harvested aquatic species."). The scientist that worked on this project were hired in part to guide you in the decision management should support. Instead of following this guidance, management instead is trying to change its enabling legislation in order to avoid following what it is directed to do.

NPS Management Policies 4.1.4 states: "... the Service will develop agreements with federal, tribal, state, and local governments and organizations, and private landowners, when appropriate, to coordinate plant, animal, water, and other natural resource management activities in ways that ***maintain and protect, not compromise, park resources and values***. If fish stocking continues, North Cascades Complex will fail to maintain and protect its resources and values. The North Cascades Complex can continue its commitment to coordination with the WDFW by following the guidance provided by NPS Management Policies (4.4.1): "To meet its commitments for maintaining native species in parks, the Service will cooperate with states, ... to prevent the introduction of exotic species into units of the National Park System, and remove populations of these species that have already become established in parks."

As the Superintendent you should be showing your leadership as was intended by NPS Management Policies 1.6 Environmental Leadership which states: "Given the scope of its responsibility for the resources and values entrusted to its care, the Service has an obligation, as well as a unique opportunity, to demonstrate leadership in environmental stewardship." Later, it directs the Service to, "... tangibly demonstrate the highest levels of environmental ethic." Do not abandon your responsibility of environmental leadership. As a leader within the NPS, you are directed to lead by example, make the example be to promote biodiversity and remove the fish from the historically fishless lakes. This is the only environmentally sound and ethical example that you should be following as a leader of the National Park Service.

This could be your chance to take a stand for biodiversity in one of the richest parks in our nation for a change. This is your opportunity to support to restore the historically and natural fishes lakes to there pre-human state in order to promote the biodiversity of these precious gems in the North Cascades. North

Cascades National Park deserves the absolute highest level of protection of any of our public lands in Washington. Good luck in making this very important decision.

Thank you,

Anna Schrenk



<p>Mr. Bill Paleck, Superintendent Mountain Lakes Fishery Management Plan/EIS North Cascades National Park Service Complex 810 State Route 20 Sedro-Woolley, WA 98284-1239</p> <p>After review of the Draft Environmental Impact Statement for the North Cascades National Park Complex's Mountain Lakes Management Plan, I would like to register my rejection of Alternative B (the Preferred Alternative) chosen by the Park Managers, and to affirm my support for Alternative D (the Environmental Alternative).</p> <p>The North Cascades National Park Complex (NCNPC) contains some of the most undisturbed and pristine wild lands left in the entire lower 48 States. This majestic and irreplaceable wilderness deserves the highest level of protection we can possibly afford it. Our National Parks and Park Wilderness Areas are and must remain - our most natural, biologically diverse, and important national treasures.</p> <p>Although science should inform the decision on how to manage the high elevation lakes in the CNNPC, the decision should not be based on science alone. There is a host of Federal and National Park Service Management Policies and Acts, which must be followed:</p> <ul style="list-style-type: none"> NPS Management Policy 1.6(2001) Environmental Leadership states: "Given the scope of its responsibility for the resources and values entrusted to its care, the Service has an obligation, as well as a unique opportunity, to demonstrate leadership in environmental stewardship." Later, it directs the Service to, "... tangibly demonstrate the highest levels of environmental ethic." In choosing Alternative B the North Cascades Complex is abandoning its responsibility of environmental leadership. The NPS is directed to lead by example; the example the CNNPC is creating by choosing to allow fish stocking is that of a misguided environmental ethic. Through continued fish stocking, CNNPC sets a precedent for neighboring land managers to perpetuate the practice of stocking exotic species into designated wilderness areas. The CNNPC should explain to the public why it is willing to abandon this policy. NPS Management Policy 1.2(2001) "[Park Units] warrant the highest standard of protection." Why is the Park Service choosing to ignore this Policy by not choosing the alternative which holds our high elevation lakes to the highest standard of protection? NPS Management Policy 4.4.3(2001) states, "The Service will not stock waters that are naturally barren of harvested aquatic species." This policy statement appears to be very clear. Why is this Policy not being considered? 	
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<p>FAX</p> <p>COVER PAGE</p> <p>TO: MOUNTAIN LAKES FISHERY MANAGEMENT PLAN / EIS</p> <p>9-15-05</p> <p>12 of pages - 0 including this page</p> <p>FROM: STEVEN B. HATHN</p>	
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- NPS Management Policy 4.1.4(2001) states: "...the Service will develop agreements with federal, tribal, state, and local governments and organizations, and private landowners, when appropriate, to coordinate plant, animal, water, and other natural resource management activities in ways that maintain and protect park resources and values". If fish stocking continues the NCNPC will fail in its mission to protect park resources and values. The NCNPC appears to put a lot of importance on the relationship that they have had with the WDFW over the years. Under the Environmental Alternative, the Park can continue its commitment to coordination with the WDFW by following the guidance provided by current NPS Management Policy 4.1.1.(2001): "To meet its commitments for maintaining native species in parks, the Service will cooperate with states...to prevent the introduction of exotic species into units of the National Park System, and remove populations of these species that have already become established in parks."
- Wilderness Act of 1964: The Wilderness Act requires that the Stephen Mather Wilderness be kept "untrammeled, or unhindered and free from intentional modern human control or manipulation; and natural, or substantially free from the effects of modern civilization". The continuation of stocking under Alternative B disregards all of these qualities and the Parks wilderness character is deeply impacted as a result. The Park Service needs to explain how fish stocking can be considered "free from intentional human control or manipulation?"
- NPS Management Policy 6.4.3(2001) states "Recreational uses in NPS wilderness areas will...protect and preserve natural conditions...and preserve wilderness in unimpaired conditions". How does fish stocking achieve the goal of preserving wilderness in unimpaired conditions when best available science documents loss of biodiversity?
- NPS Organic Act of 1916: This law directs the NPS to manage NCNPC "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of future generations". Although the NPS may have some latitude when making resource decisions, the courts have consistently favored conservation over recreation. The NPS cannot allow adverse impacts that result in resource impairment. The continued stocking of fish impairs the biological integrity and diversity of a native ecosystem, destroys wilderness values through human manipulation and degrades native insect and amphibian populations. Why is the Park Service willing to ignore court precedent?

Even though all of the Policies and Acts stated above clearly direct the Park Service to discontinue stocking and eliminate fish from our high mountain lakes, the NCNPC has decided to attempt to circumvent them. The NCNPC proposal to change the enabling legislation for the creation of the park, to explicitly allow for the stocking of fish should be reconsidered. As stated in the EIS, changing the enabling legislation may endanger current policy in several other National Parks where fish stocking has been eliminated. If this is true, this strategy is selfish and very risky. The Park Service must explain why it

would be willing to endanger not only the biological diversity and integrity of the NCNPC through the continuation of stocking, but other Parks as well. Changing the enabling legislation to suit the needs of a small minority of fisher-people detracts the purpose of having all of these Policies and Acts in the first place. We have the laws already; we just need to start following them.

I do believe there is a case to be made for changing the Enabling Legislation of the Park. The Trail Blazers have argued that "the only way to deter the illegal stocking of fish in the NCNPC may be to provide a scientifically managed fishery" (Trail Blazers' comments on MLP, 4-16-03). This logic is irrational and defeatist and I urge the NCNPC to disregard it. I support the changing of the Enabling Legislation to provide for the punishment of individuals caught stocking fish illegally in the high elevation lakes of NCNPC. A strong deterrent must be set in place to discourage fisher-people who stock lakes without consent.

The impacts of fish stocking on metapopulations of amphibians is poorly understood and lacks sufficient data to make a confident decision one way or the other. I believe that the Park Service should error on the side of caution and choose Alternative D, to ensure that at least one small area of the entire Cascade Mountain Range can have a metapopulation of amphibians that is intact as possible. Our National Parks are supposed to be living laboratories where researchers can study amphibians and aquatic organisms in their original and natural state; it is our responsibility to restore the balance.

The EIS fails to consider the cumulative impacts of global climatic change on mountain lake ecosystems. These high lake ecosystems are some of the most fragile in the Complex and will be the first to experience noticeable change at this latitude. The presence of fish in naturally fish-free lakes presents a totally unnecessary and additional threat to the health and survival of mountain lake ecosystems during the onset of climatic change. The Park Service needs to include a section, which addresses this important issue.

Vegetation Section: The following comments are based on my 12 years experience conducting rare plant surveys and vegetation research as a Botanist in Washington State.

- The Park Service states that surveys have not been completed for plant species of special concern within the project area (p.195). Although there are unknown federally listed species within the NCNPC, there are numerous S-1 Sided listed species which could occur within these high lake habitats (Personal knowledge). S-1 populations are those which have less than five known occurrences in the State and are considered very rare. If the Park Managers are to make a decision based on the Cumulative Impacts posed by allowing the high lakes fishery to continue, how can they make this decision without knowing first if there are any rare plants found at the 91 lakes? Simply providing a list of the potential rare plants for the project area serves no purpose. The presence or absence of these



The methods used to analyze impacts to vegetation are based on assumptions and anecdotal evidence. I feel these issues need to be clarified in order for the Park Service to make an informed and responsible decision. Why did the NCNPC find it necessary to conduct long term studies on aquatic organisms, amphibians and fish, but did not find it necessary to conduct any studies on the impacts to shoreline vegetation or rare plants? The methods used to analyze impacts to vegetation are based on assumptions and anecdotal evidence. No final decision should be given until these important issues are clarified and a more complete analysis of the 'true' cumulative impacts can be assessed.

The only place in the EIS where I could find reference to who the members of the Technical Advisory Committee were was on page 458, which showed a very general list of the Agencies involved. If I have not overlooked the complete list of committee members somewhere else in the EIS, why did the Park Service not find it necessary to list the names and qualifications of each member? Wouldn't the Park Service want to be as transparent as possible in this process? I feel that a possible conflict of interest must be pointed out to the public in regards to the composition of the Technical Advisory Committee. My conflict of interest concern rests with the inclusion of Mr. Bob Pfeifer on the Advisory committee. I am not challenging Mr. Pfeifer's extensive experience as a fish biologist working for the WDFW. I am challenging his ability to be unbiased in the decision making process. A quick search on the internet revealed that Mr. Pfeifer was President of the Washington State High Lakers for two years and Treasurer of the Trail Blazers Inc. These two organizations exist for the sole purpose of promoting and facilitating the stocking of non-native fish into naturally fish free lakes throughout the Cascade Range. The presence of a pro-stocking activist such as Mr. Pfeifer on the Advisory Committee has led me to be suspicious of the findings of the Technical Committee. I am concerned about the amount of influence Mr. Pfeifer may have had on the other members of the Advisory committee through professional and personal interactions. I am also concerned about the amount of influence he may have had on the portions of the EIS which he wrote. The Park Service should disclose for the public record which sections were written by which subject experts. Mr. Pfeifer's position on the committee may not be illegal but it surely does not give the public the confidence that an unbiased review has been conducted. If the Park Service wanted to include a pro-stocking activist on the Technical Committee they should have included a member of the environmental community to represent biological integrity.

To argue that the fishing opportunities within the boundaries of NCNPC are irreplaceable and irreproducible elsewhere is an exaggeration. There are 1793 high lake fisheries Managed by the WDFW up and down the Cascade Mountain Range. Similar opportunities exist in the immediately adjacent Pasayten, Glacier Peak and Nelsy Doodus Wilderness Areas. The terrain of these Wilderness Areas is identical in their geologic and glacial formations. To remove the opportunity to fish in 91 out of 1793 of these lakes is not unreasonable and it is not anti fisherman. Just because fish

species is critical to making an informed and responsible decision. No final decision should be made until comprehensive rare plant surveys are completed at all 91 lakes. Why did the Park Service decide that plant surveys were unimportant?

The description of shoreline vegetation was done using aerial photos with no ground truthing. Why was no ground truthing conducted?

If there is no data on the levels of indirect impacts anglers may have on lakeshore environments; why did the NCNPC not conduct or contract out research to answer this question?

The study quoted by Hendee et al. concluded that "manipulating the fishery to modify visitation at high lakes is, at best, a partial solution, because other users would continue to affect the resources" (EIS p336). The issue being addressed by the EIS is the impacts of fishing at high elevation lakes on riparian vegetation. The EIS goes on to state that "many anglers observed and interviewed during the course of the study cited reasons other than fishing as their primary motivation for visiting the lakes, which suggests that their use patterns may not change". The question is how do different user groups utilize the riparian areas when they visit a lake, not whether people will continue to visit the lake. Who suggests that their use patterns would not change? Did Hendee et al. suggest this in their paper or did the writer of this section suggest this statement? I believe a reasonable person can intuitively conclude that fisher-people create more impacts due to their needing to stand and walk around the lakeshore vegetation in order to fish. More studies should be conducted or contracted out by the NPS in order to make an informed decision on the affects of fishing on riparian vegetation, which is free from assumptions.

The research cited by Hospadarsky and Brown hypothesized "that if time spent in the riparian zone were proportionate to impacts, then anglers would have up to three times as great an impact as hikers". Immediately after this statement the sentence "This hypothesis has yet to be tested" is inserted. Why was this sentence inserted? The writer of this section did not find it necessary to say "this hypothesis has not been tested", after the Hendee et al. statement saying "which suggests that their use patterns may not change". It seems to be an attempt to legitimize the 'less shoreline impact by fisher-people' statement by Hendee and discredit the 'more shoreline impact by fisher-people' statement by Hospadarsky.

The EIS states "It is also important to note that many anglers fish with rafts, which limits trampling of riparian vegetation" (Page 336). What does "many" anglers mean, one, two, a thousand? Was this study actually conducted on the NCNPC high lakes fishery? If not, what would its relevance be to this EIS? It would be intuitive to conclude that very few fisher-people are carrying rafts into such remote high lake locations such as Bear, Skymo, No-name, Bendlen or Green Lakes, to name a few.



stocking has been conducted in the past in the park, does not mean that it is right to continue to stock in the future.

The Trail Blazers have argued that "the benefit/impact of non-reproducing fish in lakes is even better than that of hiking, climbing, and other wilderness uses. Surely most visitors would see fish jumping in a lake as less damaging than the ugly scar of a trail." (Trail Blazers, comments on MLEP, 4-16-03) This argument should be disregarded by the Park Service as irrational. The Park Service should not be basing their decision on which impact is worse. Both of these impacts are bad and need to be addressed separately. The purpose of this EIS is to address the stocking of fish in high lakes.

I find it confusing that the same Park Managers, who support the continued human manipulation of our high elevation lakes through the selection of the Preferred Alternative, also support the reintroduction of the Grizzly Bear back into the NCNPC. How does one support returning the North Cascades Ecosystem back to its original balance in one respect and then turn around and condemn 42 of the Parks mountain lakes to continued degradation and loss of diversity? The Park Service should explain to the public this discrepancy in logic.

After careful review of the EIS I was unable to find a statement that explained why the Park Service has chosen Alternative B. The only explanation was found in the "Frequently Asked Questions" insert included with the EIS. This explanation is unsatisfactory and lacks detail or clarity. The Park Service must explain in detail why the recreational fishing opportunities of a handful of people are more important than preserving the biological integrity of our high elevation lakes. Why is fostering "a continued cooperation and collaboration in fish management between the WDFW and the NPS" important? Why would this relationship trump the protection of biological resources? Why does the "NPS believe that cooperative management between the NPS and WDFW is essential for the successful management of the mountain lakes fishery", if all available science and current NPS policies concludes that fish stocking should not occur? I am honestly baffled to why the NCNPC has chosen Alternative B, and it seems that there may be a lot more going on behind the scenes. Does the Park Service feel pressured by the WDFW? Does the Park Service fear a lawsuit by WDFW? Does the Park Service believe that we need to continue to stock half of the lakes, because if we don't, renegade fisher-people will illegally stock them anyway? In order for the park service to facilitate a comprehensive understanding by the public of why the Preferred Alternative was chosen, perhaps a section should be added to the EIS entitled "Politics". This is not an attempt at sarcasm; the public deserves full disclosure into why the Preferred Alternative was chosen, and I believe a discussion of this nature would help with that understanding.

The Preferred Alternative is unnecessary, expensive, counter to best available science, counter to current management policies, and would set a dangerous and embarrassing precedent. Our beloved North Cascades deserve much better than the Compromise proposed in Alternative B. We must seize this opportunity to restore the balance to the high mountain lakes of NCNPC. The biological consequences of allowing non-native fish in our high elevation lakes far outweighs the selfish desires of a small handful of fisher-people. Choosing the Environmental Alternative is not 'anti-fisherperson', it is not 'anti-recreation'.....it is simply the 'right thing' to do. Good luck in making this very important decision.

Sincerely

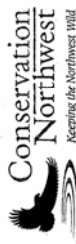
Steven Hahn

Mailing Address:

Physical Address:



Officers
 Board President
 Board Secretary
 Executive Director
 Alexander Lash
 Bill Doreilly
 Jeffrey J. Bode
 Mitch Friedman



September 15, 2005
 Bill Paleck, Superintendent
 North Cascades National Park Service Complex
 810 State Route 20
 Sedro-Woolley, WA 98284-1239

RE: Mountain Lakes Fishery Management Plan/EIS

Dear Superintendent Paleck:

I submit these comments on behalf of Conservation Northwest and our 7,000 members. In summary, we urge the National Park Service to solve the fish stocking problem with actions most similar to Alternative D as outlined in the May 2005 "Draft Mountain Lakes Fishery Management Plan". In summary, all stocking in the North Cascades National Park Complex should be discontinued: it is not in keeping with the enabling legislation, nor National Park Service management guidelines; it is scientifically unsound; and most importantly, it is an environmentally-destructive program which will degrade rare natural areas that are intended to be left pristine for future generations. We do not support Congressional action to alter the enabling legislation for the North Cascades Complex for many reasons, but mainly because fish stocking is environmentally destructive. A Instead, we support adaptive management to restore the lakes and streams that are an essential part of this national treasure.

Stocking is illegal, and out of character in the North Cascades National Park Complex

The Organic Act of 1916 authorized the creation of National Parks, it states: "the fundamental purposes of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The enabling legislation of the North Cascades Complex follows the spirit of Organic Act. Fishing is identified as an appropriate recreational use, and the legislation does not distinctly authorize policy variation from the norm with regard to the issue of fish stocking. To be clear: the enabling legislation does not identify fish stocking as a legal, or appropriate means of fish management.

Bill Paleck
 09/16/2005 07:50 AM
 PDT
 To: Shelley Kluz/NCA/NPS@NPS
 cc: [redacted]
 Subject: Fw: Mountain Lakes Fishery Management Plan/EIS

----- Forwarded by Bill Paleck/NCA/NPS on 09/16/2005 07:50 AM -----

Seth Cool
 09/15/2005 04:32 PM
 MST
 To: bill_paleck@nps.gov, roy_zipp@nps.gov
 cc: [redacted]
 Subject: Mountain Lakes Fishery Management Plan/EIS

Mr Paleck and Mr Roy,
 Please find my comments regarding the Mountain Lakes Fishery Management Plan/EIS attached below. I will mail a hard copy as well.

Thank you,
 -Seth

Seth Cool
 Conservation Northwest
 WWW.CONSERVATIONNW.ORG

Formerly Northwest Ecosystem Alliance. We've changed our name, but not our mission or means! We still work hard to "Keep the Northwest wild." Comments Final.doc



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SUBSTANTIVE NORTH CASCADES EIS COMMENT
DALE RIVELAND, HI-LAKER
September 14, 2005

Issue Discussed

This comment challenges the draft EIS conclusions that fish stocking under Alternatives A, B and C require congressional clarification and that Alternative D will be implemented until clarification is received. This comment further submits that the National Park Service (NPS) has instituted policies and executed agreements that require it to make fish stocking decisions based upon the local facts and scientific findings and not contingent upon a change in the law.

Specifically, this comment requests deletion of the following from the draft EIS:

- (1) The section of the Executive Summary at pages vii and viii under the heading **Implementing the Fishery Management Plan Through Congressional Action** and the statements at pages 14, 74 and 100 of Volume One and elsewhere that NPS has determined that fish stocking in the North Cascades Complex will only be implemented if Congress grants that authority to NPS
- (2) Characterization of the 1986 NPS Memorandum throughout the draft EIS as a "policy waiver."

Comment

- A. NPS has the Authority and Duty to Decide Fish Stocking Issues

The applicable Wilderness Acts of 1964 and 1988 set broad standards for the management and administration of the wilderness areas, and direct the Secretary and NPS to apply those standards and to make and implement local decisions. NPS is directed by statute to bring to this process "the highest quality science and information." 16 USC Sec 5932. NPS is further directed to "assure the full and proper utilization of the results of scientific studies for park management decisions." 16 USC Sec 5936. There is nothing ambiguous about the Wilderness Acts. They are not written to provide bright line decisions to specific local issues. 16 USC Sec 1133 provides:

- (b) Agency responsibility for preservation and administration to preserve wilderness character; public purposes of wilderness areas. Except as otherwise provided in this Act each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historic use.

This responsibility is specifically acknowledged in NPS Management Policy 6.1. It is the agency's authority and duty to find the local facts and science and to weigh those in light of the public purposes specified in the Act, here they are primarily recreation, conservation and historical use. That is exactly what NPS is doing though the NEPA process. NPS Management Policy 6.3.4.3 outlines the NEPA processes to use, including

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the EIS. Would NPS go to Congress to approve a plan for a new trail system or an area of educational or safety signage?

Congress does not act upon all issues referred to it. Congress has broader, more important decisions demanding its attention. Specific local decisions were delegated to NPS for a reason. Hi-Lakers have no objection to an amendment to the law specifically authorizing scientifically controlled fish stocking in the North Cascades Complex; the organization supports that effort. We do object to the plan's conclusion that lack of congressional action means the best solution is barred.

Before I comment on the three specific reasons for requiring "congressional clarification" I note a reliance throughout the reasons and in the draft EIS as a whole upon the characterization of the 1986 NPS Memorandum as a "Policy Waiver." The draft EIS identifies this Memorandum as a "Policy Waiver" every time it is mentioned, even in the table of contents to volume two, and in Appendix A Contents page 1 and again at page 3. In fact, the 1986 NPS Memorandum is the statement of specific North Cascades Complex fish management and stocking policy, and it says nothing about waiving any policy. This Memorandum recites local history and conditions and it states:

"...you requested that we provide you with a clear statement regarding National Park Service Policy for management of fisheries resources in the North Cascades Complex."

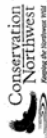
That policy has been applied now for 19 years, and it has been implemented through agreements with WDFW which also has fish management jurisdiction there.

The Executive Summary at page vii states that the 1988 Wilderness Act directed NPS to manage this wilderness in accordance with the 1964 Act, and "At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters..." Which policies are those? Do they apply to stocking fish native to the drainage and ecosystem involved, if not to the lake? If such policies existed in 1988 they should be added to Appendix D. The Background summary at page 11 refers to a 1972 policy that prohibited artificial stocking of fish species exotic to a park and prohibited stocking "naturally barren waters." The draft quotes and cites Louter 2003 for this statement rather than the policy itself. What is the complete policy, to which parks did it apply, and over what time period was it in force? Both Management Policies 4.4.3 and 4.4.1 provide for stocking of native or exotic species under specific situations that can apply here, i.e. historic stocking in a recreation area or preserve, or stocking in wilderness needed to meet the desired condition of a historic resource, but only where it is prevented from being invasive. At the bottom of page 32 of Volume One the draft EIS summarizes policy 4.4.4.1 and follows that summary with an unsupported conclusion. The conclusion is that because not all of the 4.4.1 conditions have been met a "policy waiver" has been required. This conclusion is plainly contrary to the language of the 1986 NPS Memorandum. How was it determined that the conditions of 4.4.1 were not met? This conclusion is not correct.

However, let us assume for analysis purposes that the Executive Summary statement is literally correct; "At the time the WPWA was passed, NPS policies prohibited fish



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this alteration is one of the many adverse impacts that fish stocking has the natural environment; the behaviors of river otters, birds such as kingfisher, mergansers and osprey have been altered. Alternative D will help correct this disturbance on page 292, the Draft Management Plan states, "piscivorous wildlife inhabiting high mountain lakes are not naturally occurring in the North Cascades Complex, and removal of fish would eventually return habitat to its condition prior to human manipulation." This latter point is correct and should be the focus of this entire section. Unfortunately it was not included in the conclusion, an oversight which resulted in this section erroneously concluding that Alternative D "would be expected to result in long-term minor adverse cumulative impacts on wildlife populations and communities in the region." (p293) Please update the entire Wildlife Section to further explore the various ways in which human manipulation of fish populations is detrimental to the natural ecosystem, including its natural wildlife, and to the Wilderness and National Park experience.

Our organization supports restoration of high mountain lakes within the North Cascades National Park Complex.

We support the spirit of Alternative D, mainly because it includes no additional fish stocking. However, we are not completely supportive of the use of antimycin or other piscicides in high mountain lakes. We are troubled by the proposed use of antimycin, because the piscicides may impact rare species such as the salamander of bull trout.

The EIS states "toxicity of antimycin to aquatic invertebrates has been found to be similar to that of fish at concentrations comparable to those that would be used in the North Cascades Complex..." (265). The EIS goes on to claim that "Field tests of antimycin effects have shown no observable impacts on various amphibian species at typical fish-control treatment levels." (p 265). We do not believe the case is this clear. According to a report by the Montana Chapter of The Wildlife Society, "The nontarget effects of another piscicide, antimycin, have apparently not been formally studied, but preliminary observations seem to indicate that antimycin is also toxic to turtles and amphibian larvae (Paola 1998)." Also, since amphibians rely on invertebrates for food, any reduction in insect numbers may have adverse impacts on amphibians.

We urge the Service to try less invasive eradication methods first – such as gill netting, etc, and to follow these efforts with research to determine efficacy. Such eradication efforts should be adapted in light of any findings. Then, if several attempts at eradication are not successful, it may be beneficial to move to piscicides. It should be noted that fish have been present for some time, so any remaining amphibians or other rare species are unlikely to be extirpated simply because complete eradication of fish is not achieved in the next few years.

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stream is a human-induced disruption of a natural ecosystem, and is to be avoided in areas managed as natural zones.⁶⁶ Yet, legislators did not include a provision which explicitly allowed fish stocking.

Fish Stocking is damaging to the ecosystem

The presence of fish in formerly fish-free high mountain lakes is detrimental to natural aquatic ecosystems. Native amphibians and amphibods are likely the most severely affected species in the high mountain lakes. These species had lived and evolved in a predator-free environment, so the introduction of predatory fish has been particularly destructive to them. This Management Plan outlines many of these impacts, and we applaud official recognition of this problem. Unfortunately, many species are now in serious decline, worldwide. The long-toed salamander densities have been reduced because of the presence of introduced trout.⁶⁷ A new discovery of an amphipod only found in one other lake in the Western United States is at risk of never being described and studied because the non-native fish populations.⁶⁸

The impacts of fish presence make Alternative D the best alternative for the health of the ecosystem. Under alternative B, "aquatic organisms (including plankton, macroinvertebrates, and amphibians) would continue to experience long-term negligible to minor adverse impacts from fish predation and competition in lakes that would continue to be stocked with low densities of nonreproducing fish. These impacts would decline further as stocking is curtailed or eliminated in lakes based on adaptive management decisions pertaining to stocking." (P 266-267)

Under Alternative D, "Aquatic organisms (including plankton, macroinvertebrates, and amphibians) would continue to experience long-term negligible to minor adverse impacts from fish predation and competition until stocked populations of fish gradually die out or were removed through treatment. Once these stocked fish are gone, native aquatic communities would eventually revert to predisturbance (that is, prestocking) conditions, and this would result in long-term beneficial impacts on native aquatic organisms." (p. 276)

The presence of fish has also altered and likely damaged to terrestrial ecosystems. The Draft Plan states on page 282, that, "Many wildlife species that historically did not inhabit the high mountain lakes have expanded their range to include new areas where fish have become abundant." We feel

⁶⁶ National Park Service Director, William Penn Mott Jr. Memorandum, June 12, 1986.

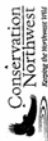
⁶⁷ Liss, William, Larson, Gary L., and Hoffman, Robert L. Ecological Impact of Introduced Trout on Native Aquatic Communities in Mountain Lakes. *Ecosystems*. July 2002.

⁶⁸ Zipp, Roy. Fish Removal NRPP Resource Management Proposal, Dec. 17, 2004



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We understand that antimycin degrades relatively quickly, and that many management precautions will be taken in its application. However, we are concerned that amphibians and arthropods will be impacted, and possibly extirpated by antimycin as well.

We urge the Service to seek more information regarding the impacts of antimycin on amphibian populations, the recolonization of amphibians, and to analyze the use of piscicides with a strategy that aims to recover specific species in trouble in specific geographic areas.

Lead Tackle

On a final note, fishing tackle that contains lead should be banned from the entire North Cascades National Park (including Ross Lake) as soon as possible. Steel alternatives are available. Fines could be used to help cover native restoration costs. All national parks in Canada have implemented lead-free fishing to eliminate the threat that lead poses to wildlife and the environment. All fishing tackle under 50 grams containing lead, such as leaded sinkers, lead split shot, lead weighted jigs and soft lead putty wire are not allowed.

Thank you for the opportunity to comment on this proposal. Please feel free to contact me if you have any questions at [REDACTED]

Sincerely,

Seth Cool

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Bill Paleck
09/16/2005 07:51 AM
PDT
To: Shelley Kluz/NOC/NPS
cc:
Subject: Fw: Mountain Lakes Fishery Management Plan/EIS

----- Forwarded by Bill Paleck/NOC/NPS on 09/16/2005 07:51 AM -----



"Josh Walter"
09/15/2005 09:50 PM
AST
To: <bill_paleck@nps.gov>, <roy_zipp@nps.gov>
cc:
Subject: Mountain Lakes Fishery Management Plan/EIS

Superintendent Paleck and Mr. Roy Zipp:

Please accept the attached document as the National Parks Conservation Association's comments on the Mountain Lakes Fishery Management Plan/EIS. A hard copy has also been mailed. Thank you for your time in reviewing our comments.

Sincerely,

Josh Walter

Josh Walter
NW Rivers Program Coordinator
National Parks Conservation Association



NPCA Comments on High Lakes EIS.doc



life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.²

The National Park Service's Management Policies specifically state that a park unit is to "warrant the highest standard of protection."³ The 2001 edition of National Park Service Management Policies is the most recent articulation of this mission. The Management Policies General Management Concepts section states the Service, "will try to maintain all the components and process of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems."⁴

The National Park Service Management Policies are clear on the issue of fish stocking, they state, "The Service will not stock waters that are naturally barren of harvested aquatic species."⁵ In an article commissioned by the Aldo Leopold Wilderness Research Institute, the authors' state, "Stocking of fish in NPS wilderness must be for the purpose of preserving or restoring 'natural aquatic habitats and the natural abundance and distribution of native aquatic species'.⁶

In addition, as a major directive of the Park Service, the agency has spearheaded the fight against the spread of non-native species within park boundaries. Executive Order #13112, regarding invasive species, states that park units will,

...(f) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them....

Under the National Park Service's 1999 Natural Resource Challenge, the NPS is directed to combat the spread of non-native species. NPS Director Fran Mainella states

The presence of non-native plants, animals, and other [pest] organisms pose a major and nearly universal threat to the preservation and restoration

² National Park Service Organic Act, (16 USC 1)

³ National Park Service Management Policy, Chapter 1, Article 2

⁴ National Park Service Management Policy, 2001a ed, Chapter 4, Article 1

⁵ National Park Service Management Policy, 2001a ed, Chapter 4, article 4, sec 3

⁶ Landres, Peter; Meyer, Shannon; and Matthews, Sue. 2001. The Wilderness Act and Fish Stocking: An overview of Legislation, Judicial Interpretation, and Agency Implementation. p. 292. As referenced in *Administrative Policies for National Areas of the National Park System* (Washington, D.C: Department of the Interior, National Park Service, 1970) 97-112.

⁷ Executive Order #13112, Feb 3, 1999

September 15, 2005

Bill Paleck, Superintendent
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239

RE: May 27th, 2005 Release of the Mountain Lakes Fishery Management Plan/EIS

Dear Superintendent Paleck:

On behalf of the National Parks Conservation Association (NPCA), its 300,000 members nationwide and its 9,000 members in Washington State, please consider these comments on the Mountain Lakes Fishery Management Plan Draft EIS.

Overall, the leadership and staff from the North Cascades Complex should be commended for their role in producing this Draft EIS. The fish stocking controversy has been an issue of contention for many years, with little resolution or ecological restoration. The Draft EIS reveals the complexities of this issue.

NPCA's comments are broken down into the following categories: the National Park Service's authority and decision making discretion, the ecological impacts of fish stocking, the practice of fish stocking in designated wilderness areas, and the proposed actions NPCA supports.

1. The National Park Service has the sole authority to manage fish stocking in North Cascades Complex, and the park's responsibility is informed by NPS policies, executive orders, and statutes.

The North Cascades Complex has the responsibility and clear authority to make the final management decisions regarding park resources. The North Cascades enabling legislation specifically states that, "property within the boundaries of the park and recreation areas (are) hereby transferred to the administrative jurisdiction of the Secretary for administration by him as part of the park and recreation areas."¹ The park's partnership with the Washington Department of Fish and Wildlife (WDFW) should be maintained and the park should utilize WDFW's expertise in removing non-native reproducing fish species. A partnership between these two agencies is vital to determining the best use practice for wilderness removal. However, the final authority and decision on management of park resources resides solely with National Park Service.

That decision is controlled by the 1916 Organic Act of the National Park Service, which states that the purpose of the national parks is to

...conserve the scenery and the natural and historic objects and the wild

¹ North Cascades Complex Enabling Legislation. (82 Stat. 926)



of natural habitats. Identifying, mapping, and evaluating non-native species is critical to an effective and well targeted effort to control their negative effects. The National Park Service must aggressively target these invaders where they threaten park resources.⁸

These examples illustrate the responsibility of the Park Service to lead the way in returning the mountain high lakes back to their natural, fishless ecosystems.

2. Non-native fish stocking threatens fragile ecosystems in North Cascades and native species of trout and salmon.

Fish stocking including the introduction of fish in historically fishless lakes, and stocking other lakes with non-native fish. The native ecosystems of these mountain high lakes are affected by the introduction of non-native fish populations.

Specifically, populations of bull trout, a threatened species, are at risk of hybridizing with brook trout. The hybrid population further damages the native bull trout population by competing in and changing the fish's already fragile ecosystem. Westslope cutthroat trout also are at risk of hybridization with rainbow trout through non-native rainbows dispersing from mountain lakes. Chinook and Coho salmon are at risk of declining breeding and rearing habitat due to the presence of non-native trout dispersion from mountain lakes.

The native populations of amphibians and amphipods could be the most severely affected species in the mountain high lakes. These species had lived in the mountain lakes predator free for thousands of years prior to fish stocking. Many species are now in serious decline. The long-toed salamander densities have been reduced because of the presence of introduced trout⁹. A new discovery of an amphipod species in one of the mountain high lakes only found in one other lake in the Western United States is at risk of never being described and studied because the non-native fish populations.¹⁰ This new amphipod is specifically threatened due to the non-native trout populations using amphipods as a food source. These examples show the severe effects of non-native fish on the native biota. The end of fish stocking and the beginning of restoring these lakes is imperative to the health and restoration of these native ecosystems.

3. Fish Stocking and its Effect on Wilderness Areas

Most of the North Cascades Complex is designated wilderness. All but one of the 91 mountain high lakes involved in the Draft EIS falls outside of wilderness boundaries.

⁸ Exotic Plant Management Team, Safeguarding native plants and animals. March 2003, newsletter.

⁹ Liss, William; Larson, Gary L.; and Hoffman, Robert L. Ecological Impact of Introduced Trout on Native Aquatic Communities in Mountain Lakes. *Ecosystems*. July 2002.

¹⁰ Zipp, Roy. Fish Removal NRPP Resource Management Proposal, Dec. 17, 2004

Wilderness designation protects certain, "area(s) where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain..."¹¹ and "retains its primeval character and influence without permanent improvements..."¹²

The practice of stocking and maintaining historically fishless high mountain lakes is out of character with the purpose of wilderness areas. Introducing and maintaining non-native fish alter the ecosystem and character of the lakes and streams, and alters the behavior of the native biota. Continuing to stock these mountain high lakes violates the principle tenant of the Wilderness Act, the provision stating areas will be *untrammeled* by humans, and *retain their primeval character* and influence.¹³ (emphasis added) Again, returning the mountain lakes back to their natural state will help in the North Cascades Complex's commitment to wilderness and wilderness protection.

Due to the remote nature of many of the mountain high lakes in question, the visitors to the high lakes areas are a very small percentage of the yearly visitors to the North Cascades Complex. After looking further into the use of mountain high lakes for fishing purposes, the proportion of fishermen to backcountry visitors again is very small. The opportunity for recreation in the North Cascades Complex is vast. Recreational Fishing opportunities are available in many sites within the park units without having to use the historically fishless mountain lakes.

Requesting a change in the park's enabling legislation in order to avoid being in violation of NPS policies and the Wilderness Act undermines the public's spirit and the overarching purpose of having these laws and guidelines, and NPCA strongly opposes that proposal. Wilderness speaks directly to "wildness" and continuing to respect the "wildness" of the North Cascade Complex is imperative. To continue stocking historically fishless lakes is to take away from the character of wilderness.

4. NPCA supports Alternative D, the environmentally preferred alternative as the best option to protect the integrity of North Cascades for future generations.

After considerable review of the management plan, NPCA supports Alternative D, the environmentally preferred alternative. The elimination of fish stocking practices in North Cascades National Park is the most practical way to uphold the integrity of the Park Wilderness, its native biota, and the park's directives. NPCA understands the long and contentious issue of fish stocking in North Cascades National Park but strongly recommends, in light of management policies and park service directives, that the Park stop allowing the practice of fish stocking.


NPCA also believes the cessation of fish stocking in the North Cascades Complex brings a new and exciting opportunity to increase scientific knowledge of the effects of non-native fish species introduction on high lake ecosystems. Using the removal of non-native fish populations as a case study on the best practices of restoring the mountain high lakes could be used as valuable information for other non-native removal projects.

¹¹ Wilderness Act, 16 USC 1131-1136, 78 Stat. 890

¹² Wilderness Act



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 **DAVID FLUHARTY**
09/15/2005 09:54 PM MST
To: "NCCBoard" <n3c-board@northcascades.org>
<NOCA_Superintendent@nps.gov>
cc: NCCC Comments on Mountain Lakes Fisheries Management Plan/EIS

Dear NCCC and Supt. Paleck

Attached are the NCCC comments on the above noticed DMP/EIS. This has been a long haul for NCCC with the original challenge delivered by Board members meeting up with fish stocking backpackers and asking what the H--- they were doing. That led to other questions.... etc. Finally NCCC officially challenged the policy in its suit over the GMP which led to a settlement in nineteen ninety one! Now 14 years later we are reviewing the results of concerted scientific research, changes in perception by NOCA, different perspectives from WA DFW and new understandings and sophistication from High Lakers and Trailblazers [no longer are they simply repeating the mantra that fish in lakes keep the mosquitoes down].

Still, NCCC has strongly urged the NPS to take the long run viable solution to invasive species -- eradicate them in the effort to protect native amphibians and to restore the ecological integrity of the NOCA.

I hope that I am clear in communicating NCCC refusal to accept continued stocking. The NPS made a valiant but desperate attempt to preserve a balance between lake restoration and continued fish stocking by introducing a new wrinkle. The new wrinkle is "active adaptive ecosystem management". This is a concept very near and dear to my heart conceptually but which has a deplorable track record in terms of empirical results. The problem is not with the concept but with the limited abilities of public [and private] management institutions to produce the process and results promised. A fully adaptive management program as described by the NPS for NOCA would cost, in my estimation, at least half as much as the total NOCA operations budget. Thus, I [on behalf of NCCC] respectfully challenged the ability of the NPS to produce the planned elements of the preferred Alternative or its close second, Alt. C. NCCC supported Alternative D which is to cease fish stocking. NCCC added a request to Alt. D [which was terribly inadequately described in the EIS] that a strategic implementation plan be developed to state the objective as eliminating non-native fish and restoring aquatic habitats to the extent possible [Actually this statement may be more coherent than what is in the appended NCCC statement so we hope that it will be included in the official comments -- Bill, are you listening?].

This was a tough call as the NPS is attempting to start a new approach to scientifically identifying levels of impairment and to define thresholds in resource management. These are valuable and innovative concepts but extremely difficult in light of ecosystem variability and the monitoring required to assess cause and effect. I have spent a fair amount of my academic career investigating such questions. From my perspective and what I understand from our NCCC Board discussions the bottom line for this set of issues is that perpetuation of stocking of non-native species in NOCA is unacceptable and that our goal is to encourage the NPS to be true to its mandate to eradicate invasive species and to restore ecosystems degraded by fish stocking [to the extent feasible]/ NCCC and the NPS and other folks interested in this question may need to get comfortable with the fact that where reproducing populations of fish have been established in mountain lakes that these effects may be irreversible given cost and technology and environmental impacts of restoration. Alternatively, many of the lakes without reproducing populations can be expected to become fish free through superannuation of the stocked populations once stocking ceases. We are talking 10-20 years for trout species. This "passive" adaptive management approach is slow

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We also recommend that the North Cascades Complex continue to work with the Washington Department of Fish and Wildlife to return the mountain high lakes back to their natural state. This is an exciting opportunity to foster the cooperative spirit between two different agencies.

We have come to this decision by reviewing the Draft EIS, scientific research, park management documents, the Organic Act, the Wilderness Act, and the National Park Service's Management Policies, and a number of other related materials. NPCA's members feel strongly about the protection of our National Parks, the Wilderness areas they encompass, and the species that inhabit these areas. NPCA will be tracking the progress of this issue closely.

Thank you for the opportunity to submit comments on this issue.

Sincerely,

Josh Walter
Program Coordinator
NPCA-Northwest Regional Office





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but secure and relatively cost-free except for long term monitoring.

With that, I turn things over to the Board.

Dave

  NCCOInetfish.doc NCCOInetfish.doc

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(32) Done 9/16
Per Dept Oct Nov 9/16
File

To Bill Palack

From NCCO

Re Draft Mt Lakes Fishing Mgt Plan
Comments

9/15/05

7 pp. including this

call

is faulty



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practice by the NPS nation-wide to prohibit fish stocking. All this was done without adequate environmental assessment.

As NOCA is aware, the extant document is a result of the challenge from North Cascades Conservation Council to the General Management Plan for NOCA over continued fish stocking after the designation of NOCA (Appendix D Vol.2). At that time of challenge, NCCC argued and NOCA agreed in the 1991 Settlement Agreement, that impacts of stocking of fish in lakes of NOCA were not adequately analyzed. This Settlement Agreement led to some highly productive and informative scientific research although the research was performed over a period longer than anticipated. Now we have completed that environmental assessment and it clearly shows adverse impacts -- in some cases small and in some cases large.

NCCC has learned from the research performed regarding phytoplankton, zooplankton, macro invertebrates, amphibians and fish and stocked and unstocked lakes and aquatic ecosystems in the North Cascades. While still an incomplete inventory of these systems, there is now a much more secure scientific basis for understanding the roles of introduced species of fish in the region. NCCC finds support from the research performed that introduction of fish to many aquatic ecosystems has had demonstrable adverse effects on them and that this violates the intent of Congress for management of NOCA. Admittedly many of the impacts pre-dated the NOCA designation. The fundamental argument that NCCC makes in this regard is that in the United States the NPS has a national and local policy of eradicating invasive species to the extent feasible. The stocked trout species represent an introduction of a non-native invasive species to the ecosystem in NOCA. There is little doubt that the presence of fish in these mountain lake and stream aquatic systems is virtually entirely attributable to human intervention.

NCCC understands that the current policy as described under Alternative A is based on a perceived conflict between the responsibility of the NPS and existing practices prior to 1968 and modified, but unresolved, management disputes following that time. NCCC is convinced that Congress through its designation of NOCA in 1968 intended to change management directions in many ways, i.e., cessation of timber harvest, protection of wildlife, and setting a preservation mandate. The designation language in the 1968 promulgation of NOCA is definitive and not compromised by statements in hearings and the administrative record of what individuals or officials may have thought prudent or advisable prior to the date of Congressional action or how such wording is interpreted. Further, as understanding of ecosystems has evolved and the unique role of the NPS in preserving or attempting to restore ecosystem processes, revisions have taken place in NPS legislative mandates and in management policies.

A Test of Concept or a Pragmatic Approach -- What is the Future?

NPS implementation of ecosystem-based policies that transform past practices has not been easy and will probably become even harder in the future than today. As we more and more realize that humans have impacts on even remote and protected land and sea areas the question of what we manage for and how we manage is critical. It is useful to

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Bill Paleck, Superintendent
Mountain Lakes Fishery Management Plan/EIS
North Cascades National Park Service Complex
810 State Route 20
Sedro Woolley, WA 98284-1239

September 15, 2005

Dear Supt. Paleck:

North Cascades Conservation Council (NCCC) appreciates this opportunity to comment on the Draft Mountain Lakes Fishery Management Plan and EIS and its proposed measures to manage the aquatic ecosystems in North Cascades National Park Service Complex (NOCA). These comments reflect official comments on the above mentioned EIS on behalf of the Board of NCCC in its support for a modified Alternative D (the Environmentally Preferred Alternative) as the policy the NOCA should pursue. NCCC recognizes that this Alternative D may be difficult to achieve but it is an easier to implement and more straightforward and cheaper alternative than either Alternative B or C. Alternative A is clearly not acceptable is based on the continuing adverse impacts to aquatic ecosystems documented by the research performed and the concerns expressed about further invasion of outlet/inlet streams and introgression with native species. NCCC continues to insist that the NOCA goal is to restore ecosystems to their natural condition. We would sincerely hope that NOCA would reassess its choice of Alternative B as the preferred alternative. NCCC offers its rationale for support for Alternative D as outlined below.

Some History -- Not Sour Grapes

NCCC would like to point out, as a matter of public record that until NCCC started raising questions about the continued fish stocking in NOCA around 1984 there was no MOU between the State of Washington and NOCA. Further, the negotiation of this MOU in 1985, lamentably, included no other parties than the State, NOCA and the proponents of fish stocking. In fact, the general public was not privileged to know what lakes were being stocked because this was seen as possibly attracting unwanted fishing pressure. Please note as well, that the NPS Variance granted in 1988 was in deference to the State of Washington and two fish stocking groups but there is no mention of opposition from at least one conservation group. Most unfortunate, from the perspective of NCCC is that the NOCA requested the variance to continue to allow grant permission stock fish in some lakes. Need it be said that a "variance" is an exception to a standard

Founded in 1967 ... To protect and preserve the North Cascades' scenic, scientific, recreational, educational, wildlife, and wilderness values



reflect as we start this discussion on the words of Aubrey Haines in his two volume *The Yellowstone Story* published in 1977 [Boulder: CAUP and the Yellowstone Library and American Museum].

"It is indeed ironic that a great Park which has pioneered so much that is associated with the national park movement and has triumphed over so many perils during a hundred years of lusty growth should stand stalled upon the threshold of its second century, faced with the grave decision whether to continue in a traditional but outmoded course or to change to another course more likely to serve and preserve [emphasis in original text]."

NCCA is poised on a pathway to change management approaches. NCCA is not an old park like Yellowstone National Park but it is a potential leader with respect to long term ecosystem-based management as evidenced by its long term ecosystem monitoring efforts. However, at this juncture NCCA seems to be embarking on a new experiment in management using objective functions like defining "thresholds" and levels of "impairment" rather than focusing on the fundamental preservation mandate. This is a very slippery slope. As long as any non-conforming activity does not result in "impairment" is it to be allowed? Alternatively, are we being asked to recognize that a threshold has been irreversibly transgressed with respect to fish stocking so we should focus on managing impacts [level of impairment] rather than seeking to eliminate the practice and restore ecosystem composition, process and function? These are tough questions and they are at the heart of management choices.

The active adaptive management approach laid out in this MLMP [Alts, B and C] has yet to be demonstrated and sustained anywhere despite its conceptual elegance and intuitive appeal. Indeed, Carl Walters, one of the fisheries scientists who developed [along with Hollings and Hilborn] the concepts for adaptive management and once a leading proponent of the use of adaptive management has become convinced that our current management institutions are incapable of supporting such an approach [Walters comments in two public discussions, first at National Center for Ecosystem Analysis and Synthesis, Santa Barbara, CA, May 2004 and second at Workshop on Ecosystem-Based Management for Archipelagic Systems, Honolulu, Hawaii May 2005]. It is hard to disagree with Walter's perspective based on empirical studies of intended adaptive management processes.

There needs to be a substantial dose of reality applied here. The management and monitoring processes for adaptive management are commonly much more expensive than conventional management and have not been sustained over the period required in publicly funded efforts [15 years in this instance]. NCCC has great concern that even limited set of costs identified for the first round of fish removals under various scenarios Tables 33, 34, and 35 are only a small indication of the funding needed for a full adaptive approach [especially the monitoring component] as outlined in the Mountain Lakes Management Plan. NCCC concern is increased when these levels of funding are compared with the whole NCCA operational budget Table 30. What is the likelihood that the proposed fish ecosystem management program can receive adequate incremental funding to do what is outlined? What is not going to get done if no new resources are

available to implement the adaptive management plan? Or do we simply default to Alternative A because we cannot afford to live up to the implementation of Alternatives B and C.

Alternatives B and C represent considerable improvements over Alternative A but they involve even more management difficulties than those associated with Alternative D. Perhaps NCCC is overestimating the task and cost of implementing these alternatives or underestimating the ability of the NPS to do this job as proposed. NCCC needs far greater assurance that this adaptive management approach can work as proposed and that the resources are guaranteed to ensure success than is presented in this document.

NCCC reading of the research results of the above mentioned studies and other fish stocking literature from California, and western Canada indicates that in places where the introduced species of trout have been successful in establishing reproducing populations, the impacts tend to be greater than in areas that are stocked. However, because impacts are detectable from both the successful invaders and the stocked non-reproducing populations they are therefore unacceptable as they impair the functioning of aquatic ecosystems in NOCA. If the NOCA questions were the complex type of question of balancing the native fish stocks against introduced species and controlling the levels of introductions as faced Yellowstone National Park, that would be one matter. [See Varley, J.D. and P. Schullery 1998. *Yellowstone Fishes: Ecology, History and Angling in the Park*. Stackpole Books, Mechanicsburg, PA]. That is not the case, however, all parties to this discussion seem to agree that the mountain lakes and aquatic ecosystems in the NOCA region were devoid of fish before unregulated fish stocking commenced.

In a very pragmatic way Alternative D makes compelling sense managerially, strategically and financially. Decision to cease fish stocking as outlined in Alternative D coupled with a prioritization of actions to be taken over time to restore aquatic ecosystems after removal of invasive fish species, in no longer than 15 years, is still an ambitious program to reverse the decades of impact from fish stocking. It is very unfortunate, in the view of NCCC that Alternative D implementation did not receive the same level of attention as Alternative B. Still, the Draft Management Plan and EIS presents the kinds of analyses and assessments of where the greatest adverse impacts are occurring and where management interventions can be most effective [Appendices E-M]. These can be used to prioritize management actions. Most importantly, NPS resources will be consistent with the national policy and can be spent towards the goal of restoring mountain aquatic systems rather than titrating lakes with fish to continue low demand fishery subject to a very difficult and expensive assessment of thresholds and levels of impairment.

NCCC argues that, it is important from an ecosystem perspective, to start from ground zero and not the shifting baselines for fish management in the latter half of the 20th Century. From the perspective of NCCC the NPS has no responsibility to the 21st Century to maintain an outmoded management policy toward fish stocking in order to maintain a fishing "opportunity." There is no such responsibility for the NPS with regard to any non-native species. NCCC is not anti-fishing. We fully support a NOCA fisheries



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Summary and Conclusion

Why does NCCC advocate cessation of fish stocking in the aquatic ecosystems of the NPA units of the North Cascades?

1. The National Park Service has a nation-wide policy to eliminate invasive species in the National Parks. The NOCA Mountain Lakes stocking program is directly contradictory to the national program [see p. 30 DEIS Vol. 2 "The Service will not stock waters that are barren of the harvested aquatic species." If we cannot rely on the NPS preservation mandate in the management of our most protected national ecosystems, whom can we trust to produce the results of ecosystem protection? The NPS is not the National Marine Fisheries Service which is called upon to balance resource harvest needs with protection of the marine ecosystems from which they are produced [See, Sustainable Fisheries Act 1996]. Nor is it the National Forest Service. The NPS is distinct in its mission to protect ecosystems to the extent that it is able within its own system boundaries.
2. NOCA stocking of the Mountain Lakes even under strictly modified conditions, e.g., stocking not reproducing fish, is an artificial practice and is founded on an "invasive" species mentality in its approach to management of these otherwise fish-free ["barren" areas. Of course, these are not barren areas as they support a rich flora and fauna of high lake ecosystems and, left alone, could serve over time as ecological reference points for much of the Anthropocene.
3. The NPS has not demonstrated a compelling need why it should continue a fish stocking program when there are significant environmental effects and when there are significant areas outside of NPS management that are presently used for this same purpose.
4. The NPS must commit itself to managing for ecological integrity in NOCA.

If further information and clarification of NCCC position in support of Alternative D is needed, please contact us as indicated below.

Sincerely

David Fluharty

David Fluharty [on behalf of the NCCC Board of Directors]

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management engagement with the State of Washington and NGOs to manage native fish fisheries as appropriate to North Cascades aquatic ecosystems. We do not support an artificial program based on fish stocking or on continuation of reproducing populations of invasive species.

Research Results Support Alt. D as Management Direction

Given the nearly 10 years of research performed by OSU and USGS researchers as well as dedicated NOCA fisheries professionals, we are now in a much better position to assess the continuing impacts of the mistaken, in the view of NCCC, policy of continuing fish stocking in lakes in NOCA after the designation of NOCA in 1968. While NCCC is sympathetic to and respectful of the State of Washington's position on fish stocking and has high regard for the individuals in the High Lakers and Trailblazers non governmental organizations for their personal commitments and contribution of expertise to fish stocking in this area, we remain insistent that NOCA adopt the approach indicated in Alternative D to phase out fish stocking, to restore to the extent feasible the impacted aquatic environments and to commit itself to monitoring the effects of these measures on the aquatic ecosystems of NOCA.

The basis for NCCC's insistence in this regard stems from what we understand to be the fundamental charge of Congress to the NPS in its 1916 Organic Act [which was not cited in Appendix D "Related Regulations, Policies and Laws and [sic] Legislation"] i.e., to "conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Please note, that it was the original ecosystem and not a human transformed ecosystem, that the NPS was to preserve. Because the mountain lake and aquatic systems have been impaired, it is necessary to restore them.



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Washington State Hi-Lakers

September 14, 2005

Bill Paleck, Superintendent
Mountain Lakes Fishery Management Plan/EIS
North Cascades National Park Service Complex
810 State Route 20
Sedro-Walley, WA 98284-1239

Dear Mr. Paleck:

Re: Draft North Cascades EIS Comments

The Washington State Hi-Lakers thank you for your courtesies throughout this EIS process and for your facilitation of comments in this response stage. Enclosed in both printed and CD form are the following comment submissions:

1. September 14, 2005 Washington State Hi-Lakers North Cascades Draft EIS comment.
2. September 14, 2005 Substantive North Cascades EIS Comment of Dale Riveland. This comment is a revision of, and substitution for, the comment of Dale Riveland dated August 23, 2005 previously submitted. Please disregard and discard the August 23 submission.
3. July 27, 2005 Substantive North Cascades EIS Comment of Dale Riveland. This is an exact duplicate of earlier submissions of this comment. It is included here because it is referenced in item 2 above.

Sincerely,

Dale Riveland, President

cc: Sandy McKean

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NORTH CASCADES DRAFT EIS COMMENT WASHINGTON STATE HI-LAKERS September 14, 2005

Since white men arrived in the area high lake fishermen have backpacked and fished and studied the lakes of the North Cascades. As an organization, the Washington State Hi-Lakers has for nearly fifty years provided survey information and organized data for the state management of these lakes and their fish. We have a sweat and awe based cultural commitment to respect the wilderness and to support management of its lakes and the biota that live there.

Individual Trail Blazers and Hi-Lakers have submitted oral and written comments on the draft EIS. The Hi-Lakers, as an organization, adopts and submits all of these comments from the members of both organization as the Hi-Lakers response to the draft EIS. The Hi-Lakers organization specifically adopts the written comments of the following persons:

Brian Curtis
Sandy McKean
Mike Swayne
Dale Riveland

The Hi-Lakers submit that the only alternative in the draft EIS that is reasonably consistent with Wilderness Act standards is Alternative B. However, most Hi-Lakers that frequent this wilderness are concerned about the goal that appears in all alternatives for 100% eradication of reproducing fish. Note the comments of Mike Swayne and Pete Smith. Hi-Lakers support removing reproducing fish populations that harm the ecosystem where such eradication is practical. However, some of the EIS conclusions regarding huge overpopulation of fish are only assumptions made because of lack of complete data. An additional problem is that 100% eradication may not be possible by current methods in all these lakes, and the eradication effort at a few lakes may cause more harm than benefit to the wilderness.

Hi-Lakers further submit that the draft EIS requirement of "congressional clarification" is improper. They also submit that the EIS overstates and overemphasizes the preservationist view of "wilderness values." Hi-Lakers argue for a stronger emphasis of the research conclusion that properly managed fish stocking has no measurable impact on the North Cascades Complex ecology. Finally, Hi-Lakers submit that the draft EIS use of the minimum requirement analysis is seriously flawed.

Respectfully Submitted:
Washington State Hi-Lakers
By Dale Riveland, President



the EIS. Would NPS go to Congress to approve a plan for a new trail system or an area of educational or safety signage?

Congress does not act upon all issues referred to it. Congress has broader, more important decisions demanding its attention. Specific local decisions were delegated to NPS for a reason. Hi-Lakers have no objection to an amendment to the law specifically authorizing scientifically controlled fish stocking in the North Cascades Complex; the organization supports that effort. We do object to the plan's conclusion that lack of congressional action means the best solution is barred.

Before I comment on the three specific reasons for requiring "congressional clarification" I note a reliance throughout the reasons and in the draft EIS as a whole upon the characterization of the 1986 NPS Memorandum as a "Policy Waiver." The draft EIS identifies this Memorandum as a "Policy Waiver" every time it is mentioned, even in the table of contents to volume two, and in Appendix A Contents page 1 and again at page 3. In fact, the 1986 NPS Memorandum is the statement of specific North Cascades Complex fish management and stocking policy, and it says nothing about waiving any policy. This Memorandum recites local history and conditions and it states:

"...you requested that we provide you with a clear statement regarding National Park Service Policy for management of fisheries resources in the North Cascades Complex."

That policy has been applied now for 19 years, and it has been implemented through agreements with WDFW which also has fish management jurisdiction there.

The Executive Summary at page vii states that the 1988 Wilderness Act directed NPS to manage this wilderness in accordance with the 1964 Act, and "At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters..." Which policies are those? Do they apply to stocking fish native to the drainage and ecosystem involved, if not to the lake? If such policies existed in 1988 they should be added to Appendix D. The Background summary at page 11 refers to a 1972 policy that prohibited artificial stocking of fish species exotic to a park and prohibited stocking "naturally barren waters." The draft quotes and cites Louter 2003 for this statement rather than the policy itself. What is the complete policy, to which parks did it apply, and over what time period was it in force? Both Management Policies 4.4.3 and 4.4.1 provide for stocking of native or exotic species under specific situations that can apply here, i.e. historic stocking in a recreation area or preserve, or stocking in wilderness needed to meet the desired condition of a historic resource, but only where it is prevented from being invasive. At the bottom of page 32 of Volume One the draft EIS summarizes policy 4.4.4.1 and follows that summary with an unsupported conclusion. The conclusion is that because not all of the 4.4.1 conditions have been met a "policy waiver" has been required. This conclusion is plainly contrary to the language of the 1986 NPS Memorandum. How was it determined that the conditions of 4.4.1 were not met? This conclusion is not correct.

However, let us assume for analysis purposes that the Executive Summary statement is literally correct; "At the time the WPWA was passed, NPS policies prohibited fish

SUBSTANTIVE NORTH CASCADES EIS COMMENT
DALE RIVELAND, HI-LAKER
September 14, 2005

Issue Discussed

This comment challenges the draft EIS conclusions that fish stocking under Alternatives A, B and C require congressional clarification and that Alternative D will be implemented until clarification is received. This comment further submits that the National Park Service (NPS) has instituted policies and executed agreements that require it to make fish stocking decisions based upon the local facts and scientific findings and not contingent upon a change in the law.

Specifically, this comment requests deletion of the following from the draft EIS:

- (1) The section of the Executive Summary at pages vii and viii under the heading **Implementing the Fishery Management Plan Through Congressional Action** and the statements at pages 14, 74 and 100 of Volume One and elsewhere that NPS has determined that fish stocking in the North Cascades Complex will only be implemented if Congress grants that authority to NPS
- (2) Characterization of the 1986 NPS Memorandum throughout the draft EIS as a "policy waiver."

Comment

- A. NPS has the Authority and Duty to Decide Fish Stocking Issues

The applicable Wilderness Acts of 1964 and 1988 set broad standards for the management and administration of the wilderness areas, and direct the Secretary and NPS to apply those standards and to make and implement local decisions. NPS is directed by statute to bring to this process "the highest quality science and information." 16 USC Sec 5932. NPS is further directed to "assure the full and proper utilization of the results of scientific studies for park management decisions." 16 USC Sec 5936. There is nothing ambiguous about the Wilderness Acts. They are not written to provide bright line decisions to specific local issues. 16 USC Sec 1133 provides:

- (b) Agency responsibility for preservation and administration to preserve wilderness character; public purposes of wilderness areas. Except as otherwise provided in this act each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historic use.

This responsibility is specifically acknowledged in NPS Management Policy 6.1. It is the agency's authority and duty to find the local facts and science and to weigh those in light of the public purposes specified in the Act, here they are primarily recreation, conservation and historical use. That is exactly what NPS is doing though the NEPA process. NPS Management Policy 6.3.4.3 outlines the NEPA processes to use, including



stocking in naturally fishless waters..." The clear inference of the statement is that in enacting the 1988 Washington Wilderness Act that applied specifically to the North Cascades Complex, Congress ignored the local facts, particularly a century of fish stocking throughout the Complex and the fact that WDFW alone was then managing the fisheries in the two recreation areas of the Complex. It also apparently implies that Congress ignored the reality that stocking was done under a local policy that was in force and cemented by written agreements with the WDFW. Are we to believe that Congress somehow ignored the true history and other facts in formulating the legislation because the specific local policy was only a "policy waiver," and official "policy" prohibited fish stocking there?

The first reason stated for requiring "congressional clarification" is that fish stocking has been discontinued in some parks and a policy waiver here may encourage other state agencies to revisit the issue. This is indeed an opportunity to erect a "congressional clarification" precedent to discourage controversy in other parks. Though such a precedent may be comforting for the centralized way of managing, it is not a valid reason to avoid timely implementation of an EIS processed decision here. Surely, NPS is prepared to deal with fish stocking issues for each park based on that park's history, data and science. NPS Management Policy 8.2.2 Recreational Activities provides that specific recreational activities will be encouraged, allowed or not allowed according to the criteria. "However, not all of these activities will be appropriate or allowable in all parks; that determination must be made on the basis of park-specific planning." We respectfully submit that NPS is inappropriately interjecting into a park-specific NEPA process a requirement that has no purpose other than enhancing nationwide decision making.

The second reason stated for a "congressional clarification" is that policy waivers can be changed and that a lasting solution is sought under the EIS. Our response is that NPS under Alternate B will formulate a local plan and policy just as it did through the 1986 NPS Memorandum. I am not sure that is a "lasting solution." Note that the Executive Summary at page iii states:

Upon conclusion of the plan/EIS and decision-making process, one of the four alternatives would become the "Mountain Lakes Fishery Management Plan" and guide future fishery management actions for a period of 15 years. Whatever the period of the plan we are confident NPS can formulate the policy to implement it.

The final reason stated for requiring "congressional approval" is that the minimum requirement analysis indicates that fish stocking is not necessary to meet the minimum requirements of the area and the Wilderness Act is unclear whether stocking is allowed. The lack of Wilderness Act clarity is dealt with above. The Act provides the standards; it is NPS job to formulate local policy.

The minimum requirements analysis was misapplied to fish stocking. If a MRA is required it must be based upon the policy that requires it; and if that policy is applied then low density stocking of nonreproducing fish will be determined to be appropriate or

necessary to the administration of the areas. This latter issue is the subject of extensive comment in my July 27, 2005 submission, a copy of which is resubmitted herewith.

B. NPS has committed itself to make North Cascades fish stocking decisions based upon information (facts and science), not based upon law change.

In the 1985 Memorandum of Understanding the NPS and WDFW agreed to consult with each other regarding research and regulation and transplanting of fish, and they agreed to establish Technical Study Task Forces. The 1986 NPS Memorandum directs that some of the North Cascade Park lakes be stocked with species native to the Park or ecological region for recreational purposes and directed that some be left fish free; and it encouraged a research effort to monitor impacts and determine changes over time. The intent of the research was to provide an informed basis for fish stocking management in the future.

The 1988 twelve year Supplemental Agreement allowed fish stocking in 17 Park lakes and allowed self sustaining populations to continue in 23 more while the NPS conducted research. It also stipulated that the list of lakes could be changed only by mutual agreement between NPS and WDFW and added that research results would be considered in future decisions. This 1988 agreement also stated:

This Supplemental Agreement shall remain in full force and effect unless terminated by mutual consent of the Department and The Service.

The 1991 Consent Decree provides that NPS will complete its research and conduct a NEPA review of fish stocking. The 2002 Reaffirmation extends the 1988 Supplemental Agreement to December 2006.

By the memorandum, agreements and Consent Decree NPS has committed itself to a process that includes scientific research, consultation with WDFW and agreement not to revise the stocking list without WDFW agreement, and ultimate review and resolution of fish stocking issues by the NEPA process. The letter and spirit of all of the agreements dictate that the final decisions be based upon information, not legislation. The late date insistence upon legislation prior to scientifically conducted fish stocking violates these agreements.

Conclusion

The draft EIS is a mostly objective document of considerable depth. The whole of the document is tarnished by imposing upon it a web of strained facts and logic in order to support a conclusion the no fish stocking will be allowed without "congressional clarification." We request that this conclusion and its supporting arguments be removed from the draft EIS along with the characterizations of the 1986 NPS Memorandum as a "policy waiver" throughout.

Submitted:

Dale Riveland, HI-Laker



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only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

It is indeed logical that a lesser standard be applied in the general decision process affecting wilderness than in decisions to overcome statutory prohibitions. There is no logic in using a strict "necessity" standard when deciding whether to go left or right in general management decisions. For the fish stocking issue the proper Step 1 is:

Is the proposed management action "appropriate or necessary for administration of the area as wilderness," and does it "not pose a significant impact the wilderness resources and character?"

That is the language of the policy. This corrected question elicits a different answer that already appears in the MRA. The correct answer is the paragraph that appears immediately before the Step 1 question as follows:

Following removal of reproducing, self-sustaining populations of trout, restocking of some lakes with nonreproducing populations of trout, as proposed in two alternatives, would support recreational and historical use purposes of the wilderness area while minimizing impacts to biological integrity. (Appendix K, p.293).

It would be violation of NPS policy to apply a decision standard far more stringent than the policy requires.

The minimal tool for fish stocking is hand stocking by backpack access.

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SUBSTANTIVE NORTH CASCADES EIS COMMENT
DALE RIVELAND, HI-LAKER
July 27, 2005

Issue Discussed

This comment questions the application in Appendix K of the Minimum Requirements Decision Guide (MRDG) to the fish stocking decisions. The Step 1 of the MRDG provides: "Is it necessary to take action?" This is not a proper question regarding fish stocking. The MRDG questions were designed for decisions to overcome one of the ten statutory prohibitions, not for general management decisions. The result of answering a misleading question is that the minimum requirements analysis provides a misleading answer.

Comment

The Washington Department of Fish and Wildlife (WDFW) Comments on the Minimum Requirements Analysis (Appendix K, p.299-300) are correct in concluding that no MRA is required for continuation of century old fish stocking in limited lakes selected by biologists in order to maintain biological integrity. If it is determined that an MRA is required, then the correct standards are those specified in National Park Service (NPS) management policy 6.3.5. Apparently when the WDFW comments were authored the WDFW did not have before it the language of NPS management policy 6.3.5.1 submit these comments as my supplement to those of the WDFW.

The MRDG states that it is derived from Section 4(c) of the Wilderness Act. Instructions-p.1. If an MRA is required at all for fish stocking, it is not because fish stocking is one of the ten prohibited activities in Section 4(c), but because NPS has issued policy 6.3.5 which provides:

All management decisions affecting wilderness must be consistent with the minimum requirement concept.

Policy 6.3.5 describes a two step process that is significantly different than the MRDG process. The two step process under this policy is:

Whether the proposed management action is appropriate or necessary for administration of the area as wilderness and does not pose a significant impact to wilderness resources and character, and the techniques and types of equipment needed to ensure that impact to wilderness resources and character is minimized. Emphasis supplied.

In accordance with this policy, superintendents will apply the minimum requirement concept to the context of wilderness management planning, as well as to all other administrative practices, proposed special uses, scientific activities, and equipment use in wilderness. When determining minimum requirement, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness resources or character is unavoidable,



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NATIONAL PARKS CONSERVATION ASSOCIATION*

*Protecting Parks for Future Generations**

September 13, 2005

Bill Paleck, Superintendent
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239

RE: Mountain Lakes Fishery Management Plan/EIS,

Dear Superintendent Paleck:

On behalf of the National Parks Conservation Association (NPCA), its 300,000 members nationwide and its 9,000 members in Washington State, please consider these comments on the Mountain Lakes Fishery Management Plan Draft EIS.

Overall, the leadership and staff from the North Cascades Complex should be commended for their role in producing this Draft EIS. The fish stocking controversy has been an issue of contention for many years, with little resolution or ecological restoration. The Draft EIS reveals the complexities of this issue.

NPCA's comments are broken down into the following categories: the National Park Service's authority and decision making discretion; the ecological impacts of fish stocking; the practice of fish stocking in designated wilderness areas, and the proposed actions NPCA supports.

1. The National Park Service has the sole authority to manage fish stocking in North Cascades Complex, and the park's responsibility is informed by NPS policies, executive orders, and statutes.

The North Cascades Complex has the responsibility and clear authority to make the final management decisions regarding park resources. The North Cascades enabling legislation specifically states that, "property within the boundaries of the park and recreation areas (are) hereby transferred to the administrative jurisdiction of the Secretary for administration by him as part of the park and recreation areas."¹ The park's partnership with the Washington Department of Fish and Wildlife (WDFW) should be maintained and the park should utilize WDFW's expertise in removing non-native reproducing fish species. A partnership between these two agencies is vital to determining the best use practice for wilderness removal. However, the final authority and decision on management of park resources resides solely with National Park Service.



*North Cascades Complex Enabling Legislation

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That decision is controlled by the 1916 Organic Act of the National Park Service, which states that the purpose of the national parks is to

...conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.²

The National Park Service's Management Policies specifically state that a park unit is to "warrant the highest standard of protection."³ The 2001 edition of National Park Service Management Policies is the most recent articulation of this mission. The Management Policies General Management Concepts section states the Service, "will try to maintain all the components and process of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems."⁴

The National Park Service Management Policies are clear on the issue of fish stocking; they state, "The Service will not stock waters that are naturally barren of harvested aquatic species."⁵ In an article commissioned by the Aldo Leopold Wilderness Research Institute, the authors' state, "Stocking of fish in NPS wilderness must be for the purpose of preserving or restoring 'natural aquatic habitats and the natural abundance and distribution of native aquatic species'."⁶

In addition, as a major directive of the Park Service, the agency has spearheaded the fight against the spread of non-native species within park boundaries. Executive Order #13112, regarding invasive species, states that park units will,

... (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them...

² National Park Service Organic Act, (16 USC 1)

³ National Park Service Management Policy, Chapter 1, Article 2

⁴ National Park Service Management Policy, 2001a ed, Chapter 4, Article 1

⁵ National Park Service Management Policy, 2001a ed, Chapter 4, article 4, sec. 3

⁶ Landres, Peter, Meyer, Shannon, and Matthews, Sue. 2001. The Wilderness Act and Fish Stocking: An overview of Legislation, Judicial Interpretation, and Agency Implementation. p. 292. As referenced in *Administrative Policies for National Areas of the National Park System* (Washington D.C: Department of the Interior, National Park Service, 1970) 97-112.

⁷ Executive Order #13112, Feb 3, 1999



Wilderness designation protects certain, "area(s) where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain..."¹¹ and "retains its primeval character and influence without permanent improvements..."¹²

The practice of stocking and maintaining historically fishless high mountain lakes is out of character with the purpose of wilderness areas. Introducing and maintaining non-native fish alter the ecosystem and character of the lakes and streams, and alters the behavior of the native biota. Continuing to stock these mountain high lakes violates the principle tenant of the Wilderness Act, the provision stating areas will be *untrammeled* by humans, and *retain their primeval character* and influence.¹³ (emphasis added) Again, returning the mountain lakes back to their natural state will help in the North Cascades Complex's commitment to wilderness and wilderness protection.

Due to the remote nature of many of the mountain high lakes in question, the visitors to the lakes, to begin with, is a very small portion of the yearly visitors to the North Cascades Complex. After looking further into the use of mountain high lakes for fishing purposes, the proportion of fishermen to backcountry visitors again is very small. The opportunity for recreation in the North Cascades Complex is vast. Recreational Fishing opportunities are available in many sites within the park units without having to use the historically fishless mountain lakes.

Requesting a change in the park's enabling legislation in order to avoid being in violation of NPS policies and the Wilderness Act undermines the public's spirit and the overarching purpose of having these laws and guidelines, and NPCA strongly opposes that proposal. Wilderness speaks directly to "wildness" and continuing to respect the "wildness" of the North Cascade Complex is imperative. To continue stocking historically fishless lakes is to take away from the character of wilderness.

4. NPCA supports Alternative D, the environmentally preferred alternative as the best option to protect the integrity of North Cascades for future generations.

After considerable review of the management plan, NPCA supports Alternative D, the environmentally preferred alternative. The elimination of fish stocking practices in North Cascades National Park is the most practical way to uphold the integrity of the Park Wilderness, its native biota, and the park's directives. NPCA understands the long and contentious issue of fish stocking in North Cascades National Park but strongly recommends, in light of management policies and park service directives that the Park stop allowing the practice of fish stocking.

NPCA also believes the cessation of fish stocking in the North Cascades Complex brings a new and exciting opportunity to increase scientific knowledge of the effects of non-native fish species introduction on high lake ecosystems. Using the removal of non-

¹¹ Wilderness Act, 16 USC 1131-1136, 78 Stat. 890

¹² Wilderness Act

Under the National Park Services' 1999 Natural Resource Challenge, the NPS is directed to combat the spread of non-native species. NPS Director Fran Mainella states, "The presence of non-native plants, animals, and other [pest] organisms pose a major and nearly universal threat to the preservation and restoration of natural habitats. Identifying, mapping, and evaluating non-native species is critical to an effective and well targeted effort to control their negative effects. The National Park Service must aggressively target these invaders where they threaten park resources."⁸

These examples illustrate the responsibility of the Park Service to lead the way in returning the mountain high lakes back to their natural, fishless ecosystems.

2. Non-native fish stocking threatens fragile ecosystems in North Cascades and native species of trout and salmon.

Fish stocking including the introduction of fish in historically fishless lakes, and stocking other lakes with non-native fish. The native ecosystems of these mountain high lakes are affected by the introduction of non-native fish populations.

Specifically, populations of bull trout, a threatened species, are at risk of hybridizing with brook trout. The hybrid population further damages the native bull trout population by competing in and changing the fish's already fragile ecosystem. Westslope cutthroat trout also are at risk of hybridization with rainbow trout through non-native rainbows dispersing from mountain lakes. Chinook and Coho Salmon are at risk of declining breeding and rearing habitat due to the presence of non-native trout dispersion from mountain lakes.

The native populations of amphibians and amphipods could be the most severely affected species in the mountain high lakes. These species had lived in the mountain lakes predator free for thousands of years prior to fish stocking. Many species are now in serious decline. The long-toed salamander densities have been reduced because of the presence of introduced trout.⁹ A new discovery of an amphipod only found in one other lake in the Western United States is at risk of never being described and studied because the non-native fish populations.¹⁰ This new amphipod is specifically threatened due to the non-native trout populations using amphipods as a food source. These examples show the severe effects of non-native fish on the native biota. The end of fish stocking and the beginning of restoring these lakes is imperative to the health and restoration of these native ecosystems.

3. Fish Stocking and its Effect on Wilderness Areas

Most of the North Cascades Complex is designated wilderness. All but one of the 91 mountain high lakes involved in the Draft EIS falls outside of wilderness boundaries.

⁸ Exotic Plant Management Team, Safeguarding native plants and animals, March 2003, newsletter.

⁹ Lisa Williams, Larson, Gary L., and Hoffman, Robert L., Ecological Impact of Introduced Trout on Native Aquatic Communities in Mountain Lakes, *Ecosystems*, July 2002.

¹⁰ Zipp, Roy, Fish Removal NRP Resource Management Proposal, Dec. 17, 2004



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native fish populations as a case study on the best use practices of restoring the mountain high lakes could be used as valuable information for other non-native removal projects.

We also recommend that the North Cascades Complex continue to work with the Washington Department of Fish and Wildlife to return the mountain high lakes back to their natural state. This is an exciting opportunity to foster the cooperative spirit between two different agencies.

We have come to this decision by reviewing the Draft EIS, scientific research, park management documents, the Organic Act, the Wilderness Act, and the National Park Service's Management Policies, and a number of other related materials. NPCA's members feel strongly about the protection of our National Parks, the Wilderness areas they encompass, and the species that inhabit these areas. NPCA will be tracking the progress of this issue closely.

Thank you for the opportunity to submit comments on this issue.

Sincerely,

Josh Walter
Program Coordinator
NPCA-Northwest Regional Office

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Cascades National Park is the most practical way to uphold the integrity of the Park Wilderness, its native biota, and the park's directives. NPCA understands the long and contentious issue of fish stocking in North Cascades National Park but strongly recommends, in light of management policies and park service directives that the Park stop allowing the practice of fish stocking.


NPCA also believes the cessation of fish stocking in the North Cascades Complex brings a new and exciting opportunity to increase scientific knowledge of the effects of non-native fish species introduction on high lake ecosystems. Using the removal of non-native fish populations as a case study on the best use practices of restoring the mountain high lakes could be used as valuable information for other non-native removal projects.

We also recommend that the North Cascades Complex continue to work with the Washington Department of Fish and Wildlife to return the mountain high lakes back to their natural state. This is an exciting opportunity to foster the cooperative spirit between two different agencies.

We have come to this decision by reviewing the Draft EIS, scientific research, park management documents, the Organic Act, the Wilderness Act, and the National Park Service's Management Policies, and a number of other related materials. NPCA's members feel strongly about the protection of our National Parks, the Wilderness areas they encompass, and the species that inhabit these areas. NPCA will be tracking the progress of this issue closely.

Thank you for the opportunity to submit comments on this issue.

Sincerely,


Josh Walter
Program Coordinator
NPCA-Northwest Regional Office



- 5) In Table 6: Willow and MR-11, both 4C lakes, do not have a planned species under Alt B.
- In Table 6: Upper Diodoud No. 3, Lower Dee Deer/Tamarack, and Kwahne sum are 4A lakes under Alt. B but have Mount Whitney Rainbow listed as planned species.
- 6) In Table ES-2, Stout, lower Stout and Trapper lakes are listed as having Low-density reproducing fish under the Current Condition of Lake (as represented under alternative A). Yet in Table H-1 these lakes are tagged with the estimation of 222 fish per acre (for overproducing fish populations). This is a contradiction. If one of these is in error it should be corrected.
- 7) Regarding 4B lakes, I disagree with the phrase "Discontinue stocking and monitor lake conditions" regarding the management of these lakes under Alternative B. The 5 lakes in this category are currently stocked with low densities of non-reproducing fish and have well managed populations according to Table H-1. Since the densities are low and the EIS Draft utilizes "scientific information and data that are provisional and possibly incorrect" (pg. X, exec. summary), I would like to see the continued stocking of these lakes while a management decision is being made or a scientific reason why they should not be stocked is found. Another option may be to cut the stocking densities.
- 8) I am in complete agreement of the goal of the 2C management action as indicated under Alternative B. I am concerned that Bear, Berdeen and Monogram lakes appear here because of my second comment regarding planned, repeated chemical fish removal from Wilderness lakes.
- 9) I am pleased that science has proven that low densities of non-reproducing fish have a negligible impact on the biota of the 3C and 4C lakes. These lakes are well managed with non-reproducing fish and have low densities according to Table H-1. These lakes are proof that high lake sport fisheries can coexist with responsible eco-management.
- 10) On page 114 of Volume 2 there appears to be a typo in the Species/strains historically present section. "IC" is listed as a species.
- 11) Regarding 2A lake Lower Berdeen where fish will be permanently removed: Is it possible that the over reproducing fish that may not be feasible to remove in Berdeen will eventually spill into Lower Berdeen recreating the problem? If there is any chance of this I ask that Lower Berdeen be treated similarly to Berdeen.
- 12) The Draft should note in clear language that most of the 561 bodies of water in the Complex have not been surveyed and the range and density of existing habitat for sensitive species is uncertain. Also, that the geography covered by the 22 well-managed lakes with continued stocking under Alternative B is insignificant compared to the probable overall habitat for most of the amphibian, zooplankton and macroinvertebrate species in the Complex. I believe the EIS draft casually dismisses the fact that only 91 lakes out of 245 were studied. This gives a false inflated impression of the extent of impacts documented from fish densities in lakes.

- Dave Harwell
Trail Blazer member
High Laker member
- High Mountain Lakes Fishery Management Plan/EIS Comments
- 1) I am in favor of Alternative B because it is the only alternative based on science with an emphasis on protecting sensitive species while providing an historical sport fishery in the Complex. I have following comments and suggestions regarding Alternative B.
- 2) "Feasibility of fish removal was assumed to be low if lake surface area exceeds 50 acres or lake volume exceeds 1,000 acre-feet. Table 7 identifies the nine lakes having characteristics that could make complete fish removal in feasible." (Vol. 1, Pg. 95)
- Bear, Berdeen, Green, Hanging, Hozomeen, Monogram, Stout, Hidden and Trapper lakes**
- According to Table 7, Bear, Berdeen, Green, Hanging, Hozomeen and Monogram are slated for chemical fish removal under Alternative B even though it is plainly stated it may not be successful. I believe the surviving fish population will rebound to high densities after a few generations. This management action appears to be temporary and necessitate repeated fish removal in the future. I think this decision should be reconsidered. I do not agree with planned, repeated chemical fish removal in these Wilderness lakes. I ask that these lakes be left in their current state until a method of complete fish removal is found.
- 3) "Upon conclusion of the plan/EIS and decision-making process, one of the four alternatives would become the "Mountain Lakes Fishery Management Plan" and guide future fishery management actions for a period of 15 years."
- I think 15 years is too short a time span. 11 million dollars of research and this EIS process is a lot of public money and effort for such a short time period. This is the lifespan of 2-3 generations of fish and not enough time to adaptively manage the lakes. I would like to see science and monitoring determine the long-term management of these lakes and not an arbitrary time period.
- 4) The window explaining the numbers of lakes under Alternative B on the margin of page xiii is confusing. The Alternative B window states, "29 lakes would have fish, 49 lakes would be fishless, 13 lakes would be evaluated". It seems that there are actually 22 lakes that would have fish (2C, 3C, 4C). Assuming that the seven additional lakes come from action 3B, it is not clear that from Table ES-1 that these lakes will be planted.



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13) I would like to thank the people and agencies involved with producing the High Mountain Lakes Fishery Management Plan/EIS and the public clubs and individuals that are commenting on its findings.

Dave Harwell
Dave Harwell
9/15/05

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page 1 of 1

September 15, 2005

Superintendent
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239

Subject: Mountain Lakes Fishery Management Plan and EIS

Dear Mr. Paleck:

I favor Alternative D, the environmentally preferred alternative, in principle because it potentially restores naturally fishless lakes to their original biological integrity. However, this alternative needs a specific implementation plan to remove fish within a specific timeframe (perhaps, 20 years) with the financial and personnel assistance of the Washington Department of Fish and Wildlife and others responsible for past fish stocking. Without a specific plan and funding, reproducing populations of stocked fish could remain in these lakes for years as well as recreational fishing such as has occurred in Sequoia-Kings Canyon National Parks and other NPS areas. Without committed and diligent park management, this could easily become the No Action Alternative.

While Alternative B, the adaptive management alternative, has aspects that are certainly invite support, asking Congress to grant North Cascades Complex an exception to NPS Management Policies with the "unambiguous legal authority" to stock non-native fish in fishless lakes could set a dangerous national precedent. In addition, the NPS has not demonstrated that it can implement adaptive management or any long-term management policy, and there are no managerial or fiscal assurances that it could be successful in this instance.

While it is tempting to take professional exception to some of the details in the Management Plan and EIS, the fact remains that this was a very difficult planning project and process. Please extend my compliments and appreciation to the North Cascades Complex staff and partners for a job well done. Thank you for the opportunity to comment.

I request that you withhold my address from the decision-making record.

Sincerely,

Bruce L. Freet
Bruce L. Freet
Environmental Agreements, Inc.

This letter was faxed at 1:30 pm on Sept. 15th.



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September 15th, 2005

Dear Bill,

This is my response to the High Mountain Lakes Fishing EIS.

Within the North Cascades National Park (not including the recreation areas), fish stocking should no longer be allowed. Existing non-native fish stocks should be removed using methods that cause the least ecosystem damage. This is the only action that is consistent with the National Park Organic Act which mandates that park resources are to be preserved unimpaired for future generations.

In the Ross Lake and Lake Chelan Recreation areas my personal feeling is to treat the lakes in the same way as in the park. However, I understand there is a more delicate balance to be achieved between recreation and environmental preservation. I trust that you will attempt to achieve this balance without sacrificing high lakes ecosystem concerns and that any lakes that continue to be stocked will be monitored.

Sincerely

Mark Scherer

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September 15, 2005

Bill Paleck, Superintendent
Mountain Lakes Fishery Management Plan/EIS
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239

Dear Mr. Bill Paleck

I commend the North Cascades National Park for managing towards a more natural condition with emphasis on amphibians. However the NCPNS cannot manage for one group of species at the peril of another. After reviewing the draft North Cascades National Park Service Complex Mountain Lakes Fishery Management Plan/EIS I am concerned about the analysis, determination, and effects to the nesting loons on Hozomeen Lake.

I disagree with the analysis in alternatives B, C, and D that found: "While the loss of habitat at Hozomeen Lake is unlikely to affect the overall population of common loons, at the local level, the breeding pair of loons would be displaced from Hozomeen Lake and either would choose an adjacent area to nest or would stop nesting in the North Cascades Complex."

Between 1979 and 1999 only 20 Common Loon nests have been identified in the state of Washington. Of those 20, 10 (50%) were the maximum number known to be occupied during a single breeding season (WDFW 2000 Loon Status Report). The potential loss of the breeding pair at Hozomeen Lake will certainly have an affect on the overall breeding population of Common Loons within the state of Washington.

It also states that "the breeding pair of loons would be displaced from Hozomeen Lake" in alternatives B, C, and D. I also disagree with this analysis. Where would the breeding pair go? The analysis states that "Adequate fish resources to support a family of loons may exist in nearby Ross, Ridley, and Willow Lakes." WDFW (2000 Loon Status Report) states that unsuccessful territorial or non-territorial adults may comprise up to 49% of summer loon populations on breeding lakes. With many single loons present on the landscape how come they have not occupied any available nesting habitat? Ross Lake also has the potential disturbance from boat wakes, reducing its ability to provide suitable nesting habitat. Ridley and Willow Lakes are also much smaller than Hozomeen and may not be large enough to support a nesting pair of loons. Additionally, Ridley and Willow Lakes are proposed to become fishless in alternative D. How does this provide "adequate fish resources to support a family of loons"?

I also disagree with the impact assessments listed for the Common Loon in Alternatives B, C, and D based on the definition of these impacts on page 297, volume one of the draft EIS. All alternatives state that allowing Hozomeen Lake to go to a fishless condition would "incur minor to moderate impacts".

The definition of "minor" impacts states: *An action would result in detectable impacts, but they would not be expected to result in substantial population fluctuations and would not be expected to have any measurable long-term effects on native species, their habitats, or the natural processes sustaining them.* Occasional responses to disturbance by some individuals would be

Jeff Heinlen





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1675 Montross Avenue, N.E., Bldg. 1
Seattle, WA 98115

NMFS Tracking No:
200504525

September 16, 2005

William F. Paleck
National Park Service
North Cascades National Park
Lake Chelan National Recreation Area
Ross Lake National Recreation Area
810 State Route 20
Sedro-Wooley, Washington 98284-9394

Re: Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens
Fishery Conservation and Management Act Essential Fish Habitat Consultation
for the Mountain Lakes Fishery Management Plan. (HUC 1711000401 Upper
North Fork Nooksack, 17110005 Upper Skagit).

Dear Mr. Paleck:

This correspondence is in response to your request for consultation under the Endangered Species Act (ESA). The National Park Service (NPS) submitted a Biological Assessment (BA) for the above referenced project to the National Marine Fisheries Service (NMFS) on August 8, 2005. The NPS requested NMFS' concurrence with an effects determination "not likely to adversely affect" for Puget Sound (PS) Chinook salmon (*Oncorhynchus tshawytscha*) as provided under section 7(a)(2) of the ESA and its implementing regulations (50 CFR 402) for the action. PS Chinook salmon were listed as threatened under the ESA on March 24, 1999 (50 CFR 223 and 224). NMFS reviewed the BA and concurs with the effects determination for this project.

The NPS proposes to adopt a Mountain Lakes Fisheries Management Plan to manage fisheries in 91 lakes throughout the North Cascades National Park Service Complex (Complex). The purpose is to manage the lakes to minimize impacts to native species, including native fish populations downstream. An adaptive management program with extensive monitoring will be implemented to aid future management decisions. No future activities in the action area are dependent on this action.

Exotic (non-native) species have been introduced into Cascade mountain lakes for more than a century. Since 1933, the Washington State Department of Fisheries and Wildlife (WDFW) has stocked selective lakes in the Complex with non-native trout species for recreational fishing. Continued stocking has been a contentious issue since the creation of the Complex in 1968. The development of a management plan is intended to resolve the long standing controversy and establish a plan to minimize the impacts of non-native trout species on native biota.



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As requested in the BA, NMFS analysis considered the preferred alternative presented in the Environmental Impact Statement. That alternative proposes to eliminate high densities of reproducing non-native populations from lakes in the Complex while allowing low densities of reproducing and stocked fish populations to remain in select lakes. All lakes would be managed to minimize impacts on biological resources in the lakes and native fish populations downstream. An extensive monitoring program will be implemented to adjust future management and avoid unacceptable effects to native biota. Restocking of non-reproducing fish may occur in some lakes if available information indicates that impacts to native species will be minimized. Specific conservation measures proposed by WDFW include: (1) adjusting stocking densities and frequencies to avoid overstocking and minimize the potential for downstream dispersal, (2) developing hatchery strains that are genetically triploid and incapable of reproducing or hybridizing with native species, (3) removing populations of reproducing fish to reduce the potential for downstream dispersal, and (4) utilizing piscicides that degrade rapidly and will not disperse downstream.

NMFS expects the effects from the proposed project to have discountable effects because PS Chinook do not occur near any of the lakes. PS Chinook inhabit areas far downstream from the lakes and are unlikely to interact with the stocked fish. If some non-native fish disperse from the lakes to downstream areas, implementation of the proposed management plan will reduce the likelihood of interactions because: (1) the reduced population density of stocked fish will reduce the likelihood of downstream dispersal and (2) the increased use of non-reproducing fish will reduce the likelihood that self-sustaining populations of non-native fish species will become established.

If some non-native trout disperse downstream and interact with PS Chinook, the effects of that interaction are expected to be insignificant for PS Chinook. The potential effects identified by NPS are hybridization and predation. However, NMFS does not expect hybridization with PS Chinook to occur because there are no known instances of hybridization between PS Chinook and any of the introduced trout species. In the downstream areas occupied by PS Chinook, there are large populations of native trout. The few non-native trout that might disperse from the lakes are not expected to significantly alter the predation effects to PS Chinook juveniles.

NMFS concurs with the effect determination of "may affect, not likely to adversely affect," for PS Chinook. Concurrence is based on information in the BA and is contingent upon full implementation of the conservation measures described by the applicant and included in the administrative record.

This concludes informal consultation on these actions in accordance with 50 CFR 402.14(b)(1). The NPS must re-analyze these ESA consultations if: (1) new information reveals effects of the action(s) that may affect listed species in a way not previously considered; (2) the action(s) is modified in a manner that causes an effect to the listed species that was not previously considered; or (3) a new species is listed, or critical habitat designated, that may be affected by the identified actions(s).



Historical Case for Fish Stocking the High Lakes in the North Cascades (including recent scientific conclusions)

Preface

Much of this "tour" through the history of fish stocking in the North Cascades was gleaned and guided by the excellent book *"Contested Terrain: Administrative History"*,¹ written in 1998 by David Louter. Louter was employed at the time by the National Park Service (NPS) as a professional historian. In spite of the excellence of Louter's book, it was so broad in scope that it excluded much of the detailed history critical to a full understanding of fish stocking in the area now known as the North Cascades National Park Complex (NOCA).²

As part of the NOCA Environmental Impact Statement (EIS) on fish stocking begun in March of 2003, Louter wrote a white paper entitled *"The Fish-Stocking Controversy"* to add the missing detail. Although Louter's white paper was a welcome contribution, several important events were either skipped or characterized in a way that favors the NPS's general preference for removing already introduced fish species from national parks on the ideological grounds of wilderness values. Specifically the white paper spends little time discussing either the historical rationale for the continuation of fish stocking in the NOCA, or the remarkable scientific evidence that has accumulated showing no measurable impact on park ecosystems when fish stocking is properly managed.

This *"Historical Case for Fish Stocking the High Lakes in the North Cascades"* document is meant to remedy these aspects of Louter's white paper by presenting the historical case for fish stocking in the NOCA from actual documents and records – including the documented written or spoken words of notable figures who directly participated in this history (e.g., members of Congress, officials of the NPS). It also draws heavily from Louter's *"Contested Terrain"* book (given its neutral character) to chronicle the various events that occurred during this fascinating 40-year history.

Woven throughout this history is an example of the equally fascinating corollary issue of conflict between federal and state rights in the management of wildlife on federal lands.

The scientific evidence pertaining to fish stocking in the North Cascades comes primarily from the Liss & Larson report: a comprehensive, 15-year, million dollar study of the north Cascades alpine lake ecosystems conducted by Oregon State University and completed in 1999.³

Early History

This paper will not attempt to review the history of fishing and the park before 1963. It was in 1963 that the *"Study Team Report"*⁴ effort was launched by the then new Kennedy administration. The history of the fish stocking controversy essentially dates from the initiation of this study. As far as earlier history,

¹ Louter, David. *Contested Terrain: North Cascades National Park Service Complex An Administrative History*. Seattle: National Park Service, 1998[Hereafter cited As "Contested"]


² The North Cascades National Park Complex (NOCA) includes the North Cascades National Park (NCNP) and the surrounding Ross Lake and Lake Cleelan National Recreation Areas. Although not technically correct, the names NOCA and NCNP are sometimes used interchangeably in the literature.

³ *Ecological Effects Of Stocked Trout In Naturally Fishless High-Elevation Lakes, North Cascades National Park Service Complex, WA, USA. Phases I, II, III*. April 1999.

⁴ Dept of Interior and Dept of Agriculture. *The North Cascades: A Report to the Secretary of Interior and the Secretary of Agriculture*. October 1965.

Should you have any questions concerning this informal consultation for ESA or EFH, please contact Joel Moribe of the Washington State Habitat Office at (206) 526-4359 or at joel.moribe@noaa.gov.

Sincerely,


D. Robert Lohin
Regional Administrator

cc: Roy Zipp, Natural Resources Specialist, NPS



suffice it to say that the area now occupied by the NOCA was always admired for its exquisite beauty and many people did many things to focus attention on its preservation and proper use. During this early period the federal lands which eventually became the park were administered by the Forest Service (FS) under its "many uses" mandate.

Study Team Report of 1965

The Study Team Report almost never happened. There was a call to do a study of the North Cascades area as early as 1959 by Congressman Telly, but the effort became bogged down in jurisdictional disputes between the FS and the NPS.

This theme of jurisdictional disputes arose time and time again over the next decade. Which agency and which land and wildlife management policy/culture was to prevail? Those who preferred using land and wildlife for the benefit of the surrounding people favored the Forest Service structure; whereas those who were concerned with preserving the land and wildlife looked to the NPS structure.⁶

The debate over how to balance these two competing views, policy sets, and cultures was intense. The logjam at this time was finally broken with what became known as the "Treaty of the Potomac." This "treaty" between the two agencies paved the way for the study team to do its work. The study was completed in October 1965 and released to the public on January 6, 1966.

Ed Craft, Chairman of the study team, termed the study a "compromise proposal" since the team members remained heavily split, and said "undoubtedly the most controversial" aspect of the study was whether there would be a park at all. (The alternative being to allow the land to continue to be managed by the FS.) Craft's compromise proposal claimed that a park should be established for the purposes of "mass recreation use." It was clear to all involved on the study team that however a park was established, traditional uses of the land such as fishing and camping could not be excluded in a major way. These concerns would become one of the primary reasons for the eventual creation of a park complex consisting of a national park and national recreation areas. Compromise on public use versus preservation was evident from the very beginning and all through the remaining history of the NOCA.⁸

The Creation of the North Cascades Park Complex

US Senator Henry Jackson held committee hearings in Seattle on February 11-12, 1966 to get public input on the Study Team Report. Hundreds of statements and communications were heard or received. Fishing was one of the areas addressed by the committee members and the public as they considered this statement made in the Study Team Report in the Resources section:

*"Fishing would not be affected because fishing, habitat development, and stocking are allowed in a National Park."*⁹

⁶ Contested, pp 37-43

⁷ Jurisdictional disputes continue into the present; although the players tend to be the NPS and state wildlife agencies.

⁸ Contested, pp 37-43

⁹ Contested, pp 37-43

¹⁰ U.S. Congress, Senate, Committee On Interior And Insular Affairs, North Cascades (Olympic National Park, Hearings On The Study Team Report Of The Recreation Opportunities In The State Of Washington, February 11 And 12, 1966, 89th Cong., 2d Sess., 1966, pp 26. [Hereafter cited as "Hearings #1"]

As well as Recommendation XX in the Other Recommendations section:

*"The State of Washington and concerned Federal agencies should take all reasonable measures to protect and manage the fisheries resource, to improve habitat, and to increase levels of fishing use."*¹⁰

Senator Jackson introduced Senate Bill 1321 on March 20, 1967¹¹ and scheduled hearings in various cities during April and May of 1967 to get further public reaction to the Senate bill, which had been based on the recommendations of the Study Team Report.¹² The desire to continue the fishery and hence fish stocking was expressed by several dignitaries:

"Fishing, of course, would be a permitted use in both the national recreation area and the national park." Stewart Udall, Secretary of the Interior.¹³

"I further recommend that in the Wilderness Areas fishing and hunting be administered by the State of Washington...I recommend that the North Cascades National Park be managed according to traditional National Park criteria. Fishing would be permitted, but hunting would be prohibited." Statement of Daniel Evans, Governor of the State of Washington as read by John Biggs.¹⁴

An exchange between Senator Jackson and John Biggs, Director of the Washington State Department of Game:¹⁵

Biggs: "...the necessity for active restocking programs has clearly been proven...Such a program of stocking is essential for the reason these waters offer little or no potential for natural restocking."

Jackson: "What you are saying is that the Park Service has a tendency to limit the stocking of fish within the lakes of the national parks?"

Biggs: "I would feel so, Mr. Chairman"

Jackson: "What is the situation in this area at the present time with reference to the stocking of fish?"

Biggs: "It is handled by the State of Washington through its Department of Game."

On April 20, 1968 Congressman Meets introduced House bill HR 8970. There were competing bills at the time but HR 8970, almost identical to Senate bill 1321, was the one eventually passed by the House. Hearings were held on these House bills in April and July of 1968.

The following very telling exchange occurred between Congressman Lloyd Meeds, Congressman Morris Udall, and National Park Service Director George Hartzog during a hearing on these House bills. The exchange seems to make clear to the Committee members that fishing and fish stocking would be permitted in the proposed park. This exchange was later referred to by State of Washington officials and

¹⁰ Hearings #1, pp 34

¹¹ Contested, pp 47

¹² U.S. Congress, Senate, Committee On Interior And Insular Affairs, Subcommittee On Parks And Recreation, Hearings On S. 1321, A Bill To Establish North Cascades National Park, 90th Cong., 1st Sess. 1967, pp 1-2. [Hereafter cited as "Hearings #2"]

¹³ Hearings #2, pp 12

¹⁴ Hearings #2, pp 48

¹⁵ Hearings #2, pp 51-53



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"Popular places have been littered and denuded, the trees hacked up, the flower meadows trampled or laced with trails and the few level spots strewn with fireplace scars." 1970, Roger Contor, first Superintendent of the NCNP.¹⁸

As seen in the next quote, these abuses were addressed in a management plan that corrected the abuses and insured that abuse would not occur again. Note however that these management plans did **not** eliminate these traditional uses.

"This backcountry and its fragile alpine ecosystems must be managed carefully to prevent damage by visitors and livestock. Corrective measures will involve revegetation of the denuded areas; improvement of the surface, grade, and drainage of trails; elimination of fires and overnight camping in the more fragile locations....." 1970, Roger Contor, Superintendent NCNP.¹⁹

Similarly, and given the promises made by congressional representatives and Park Service administrators, fishing and fish stocking might well have been expected to follow a like program of corrective measures. In other words, one might have expected Park Service administrators to implement management plans that healed past abuses while allowing the continued use of NCNP lands for the recreational purpose of fishing – just as was done for the hiking, backpacking, and camping.

However, after the Leopold Report and the coming of biologist Robert Wasson to the park in the early 1970's, a full scale effort was made to manage high lake fishing, but rather to eliminate it. Louter says that in 1975 Superintendent Lovell White, "instituted a new policy for the park's high mountain lakes stating, in essence, that the agency would no longer stock naturally barren lakes and would not restock those lakes into which native trout had been introduced...."²⁰

The Washington State Game Department (WDG) certainly did not accept this unilateral abandonment of the use of fishing by the NPS. After loud complaints of foul by the state, NPS Regional Director Russell Dickenson decided to use a NPS variance "to affirm our commitment to fish stocking." in July 1975.²¹

But according to Louter, "the fish-stocking issue was not fully resolved in the 1970's....and would flare up again...in the 1980's."²² Superintendent John Reynolds in 1985 once again attempted to eliminate the stocking of fish in the high lakes to be in keeping with the NPS policy of no fish stocking, inspired by the Leopold Report. According to Louter, Reynolds was intent on bringing the NCNP in line with the other, older parks in the National Parks system, and he was concerned about how fish stocking in the NCNP would set precedent for other parks.^{23,24} This conflict between the NPS and the WDG was at least temporarily resolved by a policy set forth by NPS Director William Mott in a memorandum dated June 12, 1986 to the Acting Director of the Pacific Northwest Region.

"In developing our reply to your request, we have considered both information regarding the impact of introducing fish into naturally fish-free lakes and also the record of the testimony concerning the establishment of the North Cascades Complex."

- ¹⁸ Contested, pp 102
- ¹⁹ Contested, pp 110-112
- ²⁰ Contested, pp 116
- ²¹ Contested, pp 119
- ²² Contested, pp 120
- ²³ Contested, pp 240-242
- ²⁴ Apparently, the unique conditions and commitments surrounding the establishment of the park as documented here were not taken into account by Reynolds.

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citizens as part of the basis for their belief that the establishment of a National Park would not interfere with the state's highly successful stocking program for the high lakes in the area.¹⁶

Meeds: "Mr. Campbell, this is the second time I have heard this statement today and if I may, Mr. Chairman, I would like to ask Mr. Hartzog, Director of the Parks, a question which I do not know the answer to, through Mr. Campbell."

Udall: "If you are willing to run the risk of the answer, I will let you ask Mr. Hartzog."

Meeds: "Mr. Hartzog, I see in this testimony a statement that the Park Service 'limits planting of fish in lakes with no native fish populations that are now planted by the Forest Service and the State game department working together.' Is that a true statement?"

Hartzog: "It is not, and I do not know how on earth this information goes around. Mr. Meeds. We have an active fish-planting program in every single major park and for many years we had a Fish and Wildlife Service hatchery operated in Yellowstone National Park. Now, if the stream already has its limit of fish comparable with its food-carrying capacity, then obviously, we do not engage in put-and-take fishing program. But, we plant fish in practically every area that I can think of off the top of my head now, including all of our major national parks."

Meeds: "Thank you, Mr. Chairman, I really did not know the answer. I heard that twice this morning and it was my understanding the Forest Service did allow planting of fish. I am glad to get that cleared up."

David Louter summarized the establishment of the North Cascades National Park (NCNP) in his history as uniquely contentious, indicating it came about only because of compromise; and that this did not bode well for future parks: "as the bitter fight to create a park in the North Cascades demonstrates, those areas that remained outside of the park system faced great political odds against their conversion into national parks."¹⁷ Unlike other previous parks, the NCNP was possible in large measure because of the compromises that were made and committed to by all sides that formed the basis of consensus. As Chairman Dr. Craft indicated when the Study Team did its initial work, concessions were made by the NPS in order that there would be a park at all.

Park Administration

Park administrators have sought to implement procedures to manage the lands and wildlife of the NOCA since its creation. These efforts have usually taken the form of repairing previous damage, and then instituting policies and management plans which allow for the continued recreational use of the park by the public. These policies and plans allow managers to minimize the impact of public use while permitting the use to continue.

These efforts are most clearly demonstrated in relation to trails and camping. The following are a series of quotes from Louter's history that demonstrate how this process unfolded.

- ¹⁶ *Hearings Before The Subcommittee On National Parks And Recreation Of The Committee On Interior And Insular Affairs House (11 Representative 90th Congress, 2nd Session On H. R. 8970 And Related Bills, July 13, 1968, pp 854, [hereafter cited as "Hearings #3"]*
- ¹⁷ Contested, pp 60

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"In summary, with the three above classes of waters (fish-free waters, self-sustaining fish populations and fish-stocked waters) we will provide for an enhanced recreational fishing experience in the park while at the same time assuring that we provide the opportunity for aquatic research under natural conditions. In this regard, it would be desirable for your office to develop and implement a research effort that (a) establishes current fish and aquatic habitat baseline conditions in park waters; (b) monitors carefully the impacts of fish stocking on fish and other wildlife; and (c) determines changes over time referenced against current baseline conditions or against undisturbed natural conditions where they are known. These data will help provide an informed basis for determining whether changes in our fish-stocking management actions may be needed in the future."²⁵

Furthermore, in a remarkable demonstration of political unity, a letter was written by four influential national politicians from the State of Washington (Senators Gorton and Evans, and Congressmen Dicks and Swift) urging that the NPS take into account the commitments regarding historic uses made when the park was created.

"We understand that the Superintendent of the North Cascades National Park recently decided to prohibit the longstanding practice of planting fish in high alpine lakes in the Park. We also understand that you are reviewing this decision, and we urge you to reconsider it."

We are aware of the present policy of the National Park Service to manage ecosystems in their natural state. As a matter of general policy, we agree that it is an important role of the national parks to preserve natural ecosystems. The North Cascades National Park complex, however, presents a unique situation. The Park and the Recreation Areas were created with a specific recognition for the historic uses to which the area had been put.²⁶

This memorandum and letter set the stage for a dialog between the NPS and the Washington Department of Wildlife (WDW), formerly the WDG, for the development of a management plan in 1987 for these high lake waters which provided the "historic use" of fishing the state considered promised when the park was created. However, the devil being in the details, the NCNP and the WDW came to disagree strongly on which lakes fell into which categories as laid out in the Mott memorandum of 1986. As described by Loutser, WDW Director Wayland and NCNP Superintendent Reynolds were each backed in a corner with threats of unilateral action made by both sides. The negotiations were at loggerheads and seemed destined for court action until William Horn, Assistant Secretary for Fish, Wildlife, and Parks intervened and asked the agencies to work out their differences.²⁷

With this intervention by Horn, the NCNP and the WDW signed a Memorandum of Understanding (MOU) on July 12, 1988 listing the lakes to be planted. That MOU is still in effect as of this writing having been reaffirmed and extended several times.

In a letter from William Horn to the WDW, Horn not only encouraged cooperation between the state and federal agencies, but he also promised that the NPS would undertake development of a high lake fishery management plan based on a scientific data collection and analysis.

"The National Park Service is undertaking an intensive research project to develop a proper data base to support decision-making about the future role of fish stocking in the management of recreational fishing in the park."

²⁵ NPS Director William Mott to the Acting Director of the Pacific Northwest Region, June 12, 1986. File N1423, NOCA.

²⁶ Senator Shale Gorton, Senator Dan Evans, Congressman Al Swift, and Congressman Norm Dicks to Letter to William Mott, Director, NPS, June 25, 1986.

²⁷ Contested, pp 244

"The results of the research will be used to support development of a publicly reviewed recreational fishery management plan."²⁸

This recomplained essentially the same commitment made a year earlier by Charles Odegaard, Regional Director NPS, in a letter to Jack Wayland, Director WDW:

"Some naturally, fish-free waters may be stocked contingent on the design concept of a research project."²⁹

The door was thus left open not only for a fully managed fishery, but also interestingly enough for a fishery not necessarily limited to the lakes previously included in the MOU.³⁰ The scientific study promised by Horn began soon thereafter in 1988 and continued for nearly 15 years. The study included researchers from Oregon State University and is commonly known today as the Liss & Larson study. A key conclusion resulted from the Liss & Larson study: non-reproducing, low density fish populations have little or no impact on lake ecosystems. Only reproducing, high density fish populations result in ecological damage to high lakes.

"There were no significant differences in large diatomid³¹ densities between fishless lakes and lakes with non-reproducing trout populations."³²

"Lakes with non-reproducing trout will be a crucial component of NOCA's high lakes management plan because the lakes are common within NOCA. Furthermore, many anglers prefer to fish in lakes with non-reproducing trout because trout densities are low and fish often reach a large size. Lakes where trout are incapable of reproducing because they lack adequate spawning areas may offer the most options for future management. In these lakes fish densities can be regulated by controlling both stocking densities and the interval between stocking."³³

In other words, this multi-year, multi-million dollar study concluded that if fish populations are properly managed so that those populations are maintained at low densities, there is no statistical difference between lakes with such fish populations and those lakes that are fishless. Now that this research has been done, the results clearly indicate that periodic stocking of non-reproducing fish in low densities can indeed provide a high mountain fishing recreational opportunity without negative impact on the park ecosystem, just as was offered by Odegaard, Mott, and Horn.

Note that this result of the Liss & Larson scientific research is somewhat counter-intuitive and was not well appreciated by most of the players in this history. One might think (and some figures in this history did think) that the best solution to providing lakes with fish would be to allow the fish to reproduce and thereby alleviate the need to periodically stock them. In fact the opposite is true. Periodic stocking is the best way to provide fishing opportunity without ecological damage since non-reproducing populations can be maintained with such stocking.

²⁸ William Horn to Jerry Neal, April 28, 1988. File N1619, NOCA.

²⁹ Charles Odegaard, Regional Director NPS to Jack Wayland, Director WDW, August 1987.

³⁰ Assuming such inclusion was compatible with the research results.

³¹ The most common crustacean zooplankton.

³² Ecological Impact Of Introduced Trout On Native Aquatic Communities In Mountain Lakes, North Cascades National Park Service Complex, WA, USA: Phase III Final Report, July 2002. See Summary of chapter 3.

³³ Ecological Effects Of Stocked Trout In Naturally Fishless High-Elevation Lakes, North Cascades National Park Service Complex, WA, USA: Phase II, April 1999. See Global Conclusions Related To Effects Of Introduced Trout On Native Biota section of chapter 7.



The Future

It would seem logical to resolve these long standing disputes, between the state's right to manage wildlife and the federal government's right to manage its lands, by cooperatively analyzing a proposed use of park resources that weighs the recreational benefits of the use against the impacts (in a sort of cost/benefit analysis). There is little question as to the recreational benefits of a high lake fishery to park visitors. Additionally there are financial benefits to the State of Washington with license sales, and economic benefits to local businesses. As for impact, the recent scientific evidence strikingly concludes that low density stocking has little, if any, impact on the ecosystems involved.

The historical record presented above makes it clear that the fishery managed by the state for so many years was to continue in conjunction with NPS management after the Park's creation. This is apparent in the historical record, and reinforced in the subsequent Memorandum of Understanding signed in 1988. Given these considerations, it should be clear that both the state and federal government have an opportunity to continue to provide significant high lake fishery recreational benefits to citizens with extremely low environmental risk.

Prepared by Sandy McKean
Member of WDFW Inland Fish Policy Advisory Group
NCNP Chair for Trail Blazers and Hi-Lakers

August 25, 2004 (revised May 12, 2005)



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Kept Private

I have read the executive summary of this plan and am not convinced that the lakes currently being stocked are biologically depressed as a result of the stocking. I support Alternative A. I believe that fishing in the high country is as healthy of a hobby as one can find anywhere and I would hate to see this activity limited by a biological zeal for purity.

If the NPS could clearly show that fish and/or human access were causing serious damage to the ecosystem surrounding these lakes then I would support the elimination of stocking. Lacking evidence of such an impact, I ask that you continue to allow fishing in the high country.

By the way, great job on the executive summary. It is well organized, concise, and actually a pleasure to read.

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Catherine S. Austin

I am submitting my support for Alternative D of the North Cascades National Park High Mountain Lakes Fishery Management Plan. Given that the 91 lakes under consideration were naturally fishless and that human interference in these fragile, alpine, aquatic ecosystems began one hundred years ago or less, it seems reasonable to use the insight provided by recent studies to prompt the removal of exotic fish species now. From an ecological standpoint, I am concerned about the impacts of both reproducing and continually-stocked high lake fisheries on densities of copepod, caddisfly, and amphibian species of concern. The ecosystem roles and interactions of these native organisms, perhaps most importantly the long-toed salamander, seem to merit the protection of the Wilderness Act, which - while not expressly prohibiting fish stocking - offers in spirit a strong valuation of unhindered natural processes. Since a majority of North Cascades National Park is designated wilderness, I invoke the Wilderness Acts applicable to the high lakes therein, as well as to the spirit of conservation within the whole of the North Cascades National Park Complex, which I take to extend to the land designated Recreation Area. It is, clearly, the stated Park Management Policy to avoid the introduction of exotic species into parks. As for concern over fish removal techniques, I am satisfied that the impacts of mechanical removal techniques and the chemical antimycin, as explained and mitigated in the plan proposed, are sufficiently low as to be offset by the benefits to the native ecosystems of fish exotic removal.

In keeping with the opinion expressed above, I would secondarily support Alternative C, which admittedly has the advantage of providing recreation for a group of people (those who fish) who hopefully may, in other ways, support the park mission of preserving resources unimpaired for future generations, and which would continue to allow the impacts of fish stocking in only Recreation Area lakes. As a third choice, I would support Alternative B, which I can see offers the lowest cost of the non no-action alternatives, and which is still preferable to continuing to stock high lakes as per current management.

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David Berger

My name is David Berger. I first want to say I've been around families and watched father and sons fishing in the high lakes, and I can't quite explain why it's such a magical experience to see that handing down and offering from one generation to another, but it's real. And I encourage the preferred option B for that reason.

I wanted to speak a little more about B, just my own concern looking, I guess, down at the future and the adaptive management plan and some of the ideas that are contained there. My worry would be that there's enough ambiguity and wiggle room and budgetary excuses that we'll run into the same problems in the future that we have right now because of the confusions with the Memorandum of Understanding in the past, and my worry as a high laker and a high-lake fisherman is that we will remove fish from some lakes and maybe remove fish from lakes that are overstocked, which is good, but the other side of the coin to the adaptive management plan and thought to restock some of the lakes, that will not happen, and so I would encourage the Park Service to consider an informal linkage among the various components of Plan B, in other words, not necessarily a one-to-one quid pro quo, but some sort of linkage that if and before we remove stocking from certain lakes, we proceed with the -- or you proceed with the other components of the plan.

If we're going to remove stocking from certain lakes by whatever means and then reconsider whether those lakes will have fish again, that some of those lakes be considered and decisions made before the fish are removed from some lakes.

And if it doesn't quite happen in that order, at least have some sort of written understanding that there's a component of linkage informally between them so that 5 years from now or 10 years from now or 15 years from now when there's no budgetary money for the monitoring because it's so expensive, or for the expense of detailed adaptive management analysis we don't get the shaft of all the lakes being taken out of circulation for fish and none put back in.

And additionally, just briefly, I'd like to have the flow chart looked at with a little more of a selective eye, a little less conservative eye, such decisions as -- not to get too complex -- but lakes and single basins or single lakes and basins being removed for the possible danger to amphibians. I would just like to say -- I forget what the legal term is, but generally speaking, you don't put someone in jail for something they intend to do; you let it happen first and then you examine the circumstances. So if we do have problems with the amphibians in the lake, I am quite sure that everybody in this room would be supportive of the appropriate action to address that, but until it's real, I don't see prophylactic action being taken. Thank you.

5

Joanna R. Bould
The Wilderness Society

Bill Paleck, Superintendent
North Cascades National Park Service Complex
810 State Route 20
Sedro-Woolley, WA 98284-1239

26-Aug-05

Re: Mountain Lakes Fishery Management Plan/EIS

Dear Superintendent Paleck:

The Wilderness Society appreciates the opportunity to comment on the North Cascades National Park Service Complex Mountain Lakes Fishery Management Plan. The Wilderness Act clearly recognizes recreation as an important value of wilderness. The Wilderness Society has long supported and will continue to advocate for



appropriate wilderness recreational opportunities, including fishing. However, recreation is not the only recognized use of wilderness, and the protection of wilderness character must be paramount in a land managers' decision-making process.

The presence of native fish and wildlife at naturally fluctuating population levels is an important component of wilderness character. However, the continued stocking of non-native fish populations into naturally fishless lakes is an action we consider incompatible with the purpose and value of designated Wilderness. We express further concern with some of the mechanical and chemical methods proposed to remove non-native reproducing fish populations under Alternatives B, C, and D. Moreover, stocking of non-native fish populations directly contradicts the Park Service's own Management Policies directing the restoration of natural systems. See Management Policies, Chapter 4.

Further, The Wilderness Society is strongly opposed to any effort to amend the enabling legislation for the North Cascades Complex to allow for continued stocking of non-native fish in Wilderness areas. We feel that such legislation is unnecessary and could set a bad precedent for other areas in which this practice has been banned.

We intend to track this proposal closely. Please continue to send information to the address below.

Thank you for your time and consideration.

Sincerely,

Joanna Bould
Washington Campaign Coordinator
The Wilderness Society
1424 Fourth Avenue, Suite 816
Seattle, WA 98101

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Norm Burke

Well, after that, mine's going to be real short. I'm primarily a private citizen living in Manson at the moment. And I've read the Environmental Impact Statement, and a couple of things concern me. First of all, I would like to give my congratulations to the team that prepared that document. That's something else, 599 pages, and I think that's just the first volume. It dawned on me that I just wondered how much that thing cost. In any case, if I knew of the man-hour number, I could calculate it, I suppose.

But I support the continued fish stocking within the National Park. And Alternate B is probably as good as any. The other two alternates that also support fish stocking are also acceptable. But what disturbs me the most is I read in the summary that regardless of what alternative is brought forward or is arrived at through this process, if there is no congressional legislation that is accomplished by our congressmen, then this whole thing goes out the door. All the alternatives are meaningless because we automatically revert to Alternative 4 which presumably has a time line for removing all fish and discontinuing stocking completely. That disturbs me. That's about it.

17

Kept Private

After visiting the North Cascades National Park and all its beauty I would like to express my concern regarding the introduction of non-native fish into wild mountain lakes. Doing this would disrupt the balance of nature. The North Cascades National Park deserves superior protection!

Please think about the future of OUR park!

27

Vern Cohrs

Vern Cohrs, and I'll be brief. Prior to formation of the park in the late '60s, fish stocking was allowed. In the formation of the park, not only the historical stocking but the promises were made by the people trying to form the park to sportsmen, that fishing would continue in the park complex, and I'm in favor of continued fish stocking in the NCNP.

25

**Don Collen
Wildcat Steelhead Club**

My name is Don Collen, and I'm president of the Wildcat Steelhead Club, and I have to apologize here because the fact is that I wasn't informed of this meeting until this morning, so I haven't really had a chance to digest the thing, but if we have to choose between Alternative A, B, C or D, our club would go for A. There's no question about it, no action.

I feel strongly that we are trying to microanalyze Mother Nature, and for individual purposes or clubs or ethnic groups, whatever you can call it, and I think all we're doing is making more problems for ourselves. I strongly feel that in a lot of cases where the ZISs are set up, we should just leave Mother Nature alone and let it handle it. That's all I have tonight. I'll send more in later.

8

David and Charlotte Corkran

We urge adoption of Alternative D, "The Environmentally Preferred Alternative." We have been visiting the North Cascades since 1957, and Char has been studying its wildlife since 1967. As an co-author of a book on how to identify all life stages of Pacific Northwest amphibians and as a researcher surveying the occurrence of amphibians in remote areas of Yellowstone National Park, Char has been observing amphibians in some of the most pristine wilderness in the lower 48 states. Yet even in these remote areas she is finding amphibians threatened by man's activities. In the North Cascades NP., the Glacier Peak Wilderness and the Pasaytan Wilderness she has seen amphibians impacted by fish introduced into hitherto fishless lakes. In Yellowstone park fish introduced into some lakes have had similiar impacts, as have roads, tourist facilities and administrative sites. Even in the most remote portions of Yellowstone amphibians are being attacked by Kittridge's disease, a world wide epidemic thought to be associated with global warming, acid rain, or some other human activity. Her experience suggests to us that amphibians need every refugia they can find. Alternative D. would maximize the refugia available to salamanders, toads and frogs, and is therefor the most appropriate alternative for protecting this important genra of animals. Alternative D. is also the most appropriate alternative in light of the Park Service mission and existing Park Service policy. It needs no action by Congress, which alone makes it far preferable to the other actions. There is no telling what Congress will do once the issue is on its doorstep. Please adopt Alternative D.



65

Brian Curtis

First, let me just say that I've actually enjoyed reading the EIS. It's a beautiful piece of work. For the most part it was actually very enjoyable reading, but there are a few things in it that I'd like to point out that concern me.

One is it says -- it talks about until the public scoping meetings, it says on Page 459, "The public also expressed a concern that the analysis occurred on a landscape scale, so the technical advisor committee took a broad look at lakes in the North Cascades Complex and selected a representative number of lakes to remain fishless under each alternative," but it also says in the study area definition on Page 48 that a total of 245 mountain lakes in the North Cascades Complex and at least 154 of these lakes which have always been fishless and because they would remain fishless and because they've never been part of the managed fisheries, these 154 lakes were not analyzed in the EIS.

So, in other words, it's not a landscape-wide document; it's actually only taking a certain subset of the park. And so a lot of the decisions were made on an individual lake basis. The decisions to leave unique waters fishless, for instance, were not made taking into consideration there might be other fishless lakes in that those 154 lakes that would also apply. Then my next concern was over the MRA, and I think that Jeff's comments really covered pretty much mostly what I had planned to say on that very nicely. It says -- the one sentence that really says it, it says on Page 75 that "stocking is not expressly prohibited in the Act," and then it goes on to say that according to Section 4(c) of the Wilderness Act agencies may engage in management actions that may otherwise be prohibited in the wilderness provided they are necessary," and I think that sentence is incorrect. It should read "that are otherwise prohibited in the Act" because it lists the express -- it expressly lists the items that are prohibited for which an MRA is required.

And those acts, of course, include helicopters and outboard motors that are proposed to be used for elimination of fish in some of these lakes, so those are the tools that the MRA needs to be applied to.

The other issue I have is adopting Alternative D if there's no -- if Congress doesn't take action. There seems to be a three-pronged reason on Page 74, the first of which is the precedent -- they say you don't want a precedent set so that other states would want to start putting pressure on their parks to allow fish stocking.

That -- for years we've been having temp -- we've been having fish stocking in the park and I haven't seen that pressure from the other states, so I'm not sure that really applies once the EIS is passed. Additionally, the second reason was that the waivers are only temporary, and I agree it would be nice to have a longer term solution, so I'm not against clarification from Congress, but I don't think that's a reason to drop it into Alternative D.

It doesn't make a difference. There's no justification that follows from that, and the third reason was the MRA, but since the MRA is misapplied, I don't see how that applies either, so I just don't see any justification for applying Alternative D without any legislation. So that's all I've got.

11

Doug H. England

It is important to not change the current policy of allowing fish stocking in high country lakes in the North Cascade National Park as was promised when the park was formed. The volunteer program requires no federal funds to administer and greatly enhances the use and enjoyment of this national treasure. Regardless of how the fish population began, a delicate balance now exists in the area around the lakes that includes the fish as a vital element. This balance has only improved and strengthened many other systems within our environment. To remove this important factor will only degrade our heritage.



13

Kept Private

I would like to let you know of my support of Alternative D as described in the (EIS) for the North Cascades National Park Service Complex Mtn. Lakes Fishery Management Plan Environmental Impact Statement.

We need to keep non native fish out of our state lakes. Fishless lakes need to be kept fishless. The biodiversity of these lakes as nature meant them to be is a very important balance to natures life and ours. As a sportsperson and the spouse of an avid fisherman.....leave our lakes alone. Keep them as native fishing lakes or fishless lakes.

26

Virgil Harder

You want proof? I have two basic comments and a conclusion. The minimum requirement analysis or MRA has been misapplied. Fishing needs to be viewed as an accepted recreational activity, just as hiking and camping and mountain climbing are. The NCNP routinely does various management actions to provide trail building, trail maintenance, campsite construction with minimum impact.

Fish stocking is an equivalent management action to provide an ecologically sound mountain lake fishery. MRA cannot sensibly conclude that low-density fish stocking is inappropriate, and it could conclude that properly constructed trails are inappropriate. When the park was created, it committed to provide hiking, camping and fishing, and I will not get into the hearings. MRA can no longer conclude that properly managed fishing should be eliminated, and it can't conclude that properly managed hiking should be eliminated. The EIS claims it can press no clarification as required to give NCNP authority to continue fish stocking because nothing is complained in the legislation authorizing fish stocking.

Many management actions were not spelled out in 1968 enabling legislation. Is legislation needed to build a bridge on a trail, or even build a trail itself? Is legislation needed to repair a trail? Does the legislation authorize campfires to be allowed? Congress intended hiking and trail building to be continued once the park complex was established. In the same way the Congressional record shows that fishing along with proper fish stocking also was intended.

The EIS statement that fish stocking cannot continue without legislative clarification is unjustified giving MP's history as evidenced in the Congressional hearings and by NCNP's management actions to now.

My conclusion is that the MRA draft/EIS is flawed because its reasoning were impartially applied to hiking trails maintenance and mountain climbing as it does to fishing and fish stocking. It would have to conclude a trail should be eliminated, bridges should be eliminated, campsites should be eliminated. The EIS claim that congressional clarification is required is flawed for the same reasons. Auf Wiedersehen!

76

Virgil Harder

I'm writing "B" down before I come up.

"Wilderness" is in EIS Volume I 333 times. It is in the EIS Appendix Volume II 199 times. The EIS leans rather strongly toward blaming fishers for damaging the "wilderness value" of lakes. Are fishers the only ones at lakes?

Since I haven't been to a lake in the North Cascades National Park with a well-trafficked trail to it -- In fact, I have been to no lakes in the North Cascades Park with a trail. I do have one example, and non-fishers account for probably 95 percent of the traffic to Summit Lake, a beautiful lake north of Mount Rainier. You get up in the morning, and Mount Rainier is practically blocking your view outside the tent flap. Who gets blamed for destroying the lake surroundings and for tossing garbage? The method used for counting fishers at various lakes generates fictitious, inaccurate numbers. Besides, most NCNP Complex fishers go to lakes with no trails to them, and the



fishers' credo is "Leave no trace." Of course, there are always a few exceptions, just like there are a few exceptions at campsites and on mountains.

In other words, for the EIS to claim that fishing detracts from wilderness values is preposterous. It adds to wilderness values just like hiking, mountain climbing and camping do.

The EIS implies -- probably states, but I missed it -- there were or are no native fish in NCNP Complex; ipso facto, no native fish equals no authority to stock fish to some. NCNP staff archeologist, in a paper published March, 1997, titled, "An Updated Summary Statement of the Archeology of the North Cascades National Park Service Complex," has several references to fish being in NOCA centuries ago. Here is one quote: "The lands in today's park complex were occupied by human groups for at least the last 8,400 years." That's a quotation. And continue, "Most of the archeological sites in NOCA consist of below-ground remains of camps and resource areas where Indian people processed and cooked food, collected specific kinds of rocks and minerals for tools and hunted, fished and collected plants," end of quote. Could Ross Lake fish be descendants from 8,400 years ago? Could fish have come up Skagit River before the Ross Lake dam was built and moved into connecting streams and lakes? Actually, could Ravens and/or Loons have dropped fry into lakes?

I was at a lake in British Columbia, and an eagle came down and took a fish away from my partner.

The EIS needs to quit its bias and be objective. It needs to use science, not domineering or unsupportable declarations.

Thank you.

59

Hans Helm

Good evening. My name is Hans Helm. I'll be talking about balance and diversity of lakes for overnight backpacking and fishing availability to our families. When I was a young boy, about ten, my parents would take me hiking to beautiful remote high mountain lakes in the parks of the states of Wyoming and Colorado. With a considerable amount of effort and elevation gain, we would finally reach the shore of some pristine, clear water lakes and have a well-deserved rest and a nice picnic lunch my mom would prepare.

Then we would fish, and if we were lucky, catch the most colorful and feisty trout I ever saw. We would take a few back to camp and eat them for dinner. Better than Salty's.

These memories are the reason I'm so passionate about saving a few lakes in the North Cascades National Park for the purpose of continued fish stocking, which, of course, is being carried out in a manner sensitive to the other organisms living in these lakes based on very extensive scientific research previously done.

The North Cascades National Park is one of the most beautiful parks in the nation, including the high mountain lakes within its boundaries, and there is nothing like the memories of taking your son or daughter for a quality fishing experience and a nice picnic lunch, I might add, to one of these picturesque lakes that are like none other in our beloved state. I feel the diversification of high lakes and all types of environments, including the uniqueness of those in the park, should be enjoyed by fishing families as well as hikers, mountain climbers, and other recreational enthusiasts.

In conclusion, I would like to say as Bill Paleck has stated in prior North Cascades National Park presentations, we have to achieve a balance for all the recreational user groups. I feel this balance includes a continued fishery as being one aspect of preserving a quality wilderness experience in the North Cascades National Park. Thank you.

61

Bill Henkel

My name is Bill Henkel; I'm 71 years old; I'm an outdoorsman. I've hiked the high country from the Georgia Appalachians through the Adirondacks up through the Ungava Peninsula. It's amazing the amount of life in the wilderness out in the mountains.

I seen white-tailed deer and black bear and canoeing in the Penobscot River in Maine. I've hiked in the west from the Sierras all the way up to the north slope. I'm amazed at the white doll sheep in the Wrangle and Saint Elias Mountains. I've seen unindigenous mountain goats in Colorado in the Montana Spanish Peaks Wilderness. I watched the huge herds of caribou come across the Noatak in Alaska.

What's most amazed me about these experiences is life. Life. The great abundance of life. In all these places there's been waters that I've been, the waters have always teamed with life. To me, the rise of a trout in the mountain lake says this lake is full of life. Everything is right with the world. This is good.

The whole concept that the National Park Service is going to make barren the lakes of the North Cascades Complex is just abominable to me, just like they wanted this here Alternative D is a neutron bomb to wipe out the fishes and the lakes, make them all barren, fishless.

I see the great accomplishments that have been done by Washington Department of Fish & Wildlife in conjunction with the National Forest Service groups like the High Lakers, the Trail Blazers, and I don't know much about the Park Service, but I have to believe the Park Service, at least in other parks, are making to try to get good fisheries management. I can see a lot is going down the drain with the neutron bomb of Alternative D. Maybe there is a way out of this yet. The Supreme Court can determine that the National Park Service is a terrorist organization.

10

Raymond Henkel

I am a lifetime trout angler (over 50 years experience) who has visited the North Cascades National Park, but not fished there. However, I have flyfished in much of the U.S., including many other national parks. I support enlightened fisheries management by professional biologists and resource specialists for recreational fishing. Therefore, I support Alternative A, the no-action alternative. I would actually prefer to see expanded opportunities for fishing in the EIS area as NPS policy. I find no conflict between this continued management by NPS and WDFW, and the findings of the draft EIS.

In general, continued stocking under the current management scheme would have no long-term adverse effects on other wildlife or the ecology of the Park. The only major adverse long-term adverse effect would be from Alternatives B, C, and D in the loss of angling and recreational opportunities for the many anglers who visit this great Park.

In summary, do not try to fix what is not broken. Clarify the current fisheries management policy through Alternative A (or an even less stringent policy), then seek Congressional action on enabling legislation.



15

Kept Private

hello. i am writing in regard to the mountain lakes fishery management plan. i think it is great that we have the opportunity to address this issue. we have a wonderful area of the world to live. the park is a great place to nourish the soul, and preserve another place untrammled by man. i feel the obvious choice is Alternative D. the park service is a steward of a public resource with the an empahasis on natural systems, keeping the land and it's environs in a natural flux. so, without going into the viscious impacts non-native fish have on native fish stocks, or the catering (by stocking the lakes)to a special interest group let me say the lakes deserve to follow thier natural processes without the pressure of stocked fish. i urge you to thoroughly consider Alternative D. it is the only alternative that in not in conflict with the mandate of the National Park Service. thank you for your time.

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Rex Johnson

Howdy. My name is Rex Johnson; I'm a long-time resident of Washington state and a strong advocate of protecting our environment and wilderness areas. I have spent significant amounts of time in our majestic mountains both before and after the creation of the park.

The state of Washington has had a long -- pardon -- has had an active fish stocking program in the North Cascades Park long before the park existed. When the park was initially set up, the Park Service made it very clear that fish stocking would continue. There are many references that document this, such as in the paper called "An Historical Case for Fish Stocking the High Lakes in the North Cascades" by Sandy McKean, which has listed and cites several of these facts.

Here is just one of the many citations. During the hearings on the formation of the North Cascades Park, a Stewart Udall, then secretary of the interior said, "Fishing, of course, would be a permitted use in both the national recreation area and the national park," end of quote. At the same hearings, then National Park Service director George Hartzog also confirmed this.

Our federal -- our present federal government is constantly talking about family values. One of the most important values that I know of is keeping one's word. The Park Service promised us that fish stocking would continue in the park, and that is why many of us agreed to have a national park in the North Cascades. Without that assurance, we would not have supported the park's creation. The Park Service needs to keep its word, and there is hard science on their side.

The Park Service commissioned a multi-year, multi-million dollar study to determine the effects of fish in the North Cascades Lakes. This study by Liss & Larson found when lakes are properly managed with low density nonreproducing fish, there is no measurable impact on lake ecosystems and there is no measurable differences between lakes with low density fish and fishless lakes. All responsible fishermen and every fish biologist I ever met support managing lakes for low density, nonreproducing fish populations. This goal is achievable and is the current management goal of the Washington Department of Fish and Wildlife.

In the EIS, the Park Service has indicated that the only way they will continue to allow fish stocking in the park is if there's federal legislation to clarify the situation. I find this unreasonable and unnecessary. The Park Service should keep their original word that they gave to the people of Washington when the park was formed. To say that only federal legislation can resolve this issue is to seriously tarnish the Park Service's honor and to ignore the scientific findings. Let's not make fish stocking in the North Cascades National Park a political issue, but rather, let's find the solution based on principles and scientific facts. Thank you.



To: Bill Paleck, Superintendent NCNP

Subject: Mountain Lakes Fishery Management Plan/EIS

I have lived in Washington State since 1955, long before there was a North Cascades National Park. I remember when the creation of the park was first discussed and the promises made by Stewart Udall (then Secretary of Interior) and George Hartzog (then NPS Director), that we would always have fish in the mountain lakes of this park. I also can remember when a man's word was important. There still are a few men of honor and they still keep their word.

I feel I am very privileged to call Washington State my Home. I think we are all privileged to be able to live here in one of the few states that still has some "Wilderness" where man can commune with nature. When I go into the wilderness with my family where we can watch the animals in the natural settings, enjoy the many plants, flowers, and trees, camp near a lake and maybe even catch a fish, I am no longer caught up in our fast paced society, worried about my job or much of anything. I am at peace and so is my family. We look forward to every second that we can spend in the mountains; it helps us maintain our sanity and teaches us there is much more to life than just life in the city.

There are a total of 91 major lakes in the NCNP complex, which includes the adjacent Recreational Areas. Out of this total, only 62 contain fish. This is 68%. Yet the EIS states that unless there is clarification from congress, all of these fish will be removed. The scientific research initiated by the Park Services (by Liss and Larson) found that in low densities, there is no measurable difference between lakes with and without fish! What more does one need to see that low densities of fish are not a problem to the ecology of a lake? I understand that there is a need to have some lakes with no fish; at present 32% of the lakes in the NCNP complex have no fish. Can we be fair and reasonable? Can't there be some lakes with fish and some without? Why does it have to be ALL one way?

Some people claim that even a few fish cause damage to the ecosystem of a lake. It is peculiar that the science does not agree. But what is much more disturbing to me is that these same people totally ignore the gross damage done by horses. I can take you to many places in the NCNP complex where you would swear you are standing in the middle of a well plowed field due to all the horse damage and other places where there is so much horse crap in the streams and lakes that it is unfit for anything but horses to drink.

I would recommend that the NCNP get its priorities in balance. It is unreasonable to tell me that all the fish have to go because they are not native to the park or that they might do a little damage when the park continues to encourage and allow horses to destroy meadows and other vegetation leaving unsightly areas for years to come and to crap in streams and lakes making once pristine water undrinkable. These horses are not native to the park; in fact they are not native to North America!

Just this last weekend, my family and I went to a lake in Mt. Rainier National Park. It was a beautiful lake with lots of signs of elk and cougar. We had hiked a considerable distance to get to this lake. On this day, no one else was there. The sky was blue, the weather was warm, and there was a light breeze with only a few bugs. The sky blue lake surface reflected the rugged mountains around it. We had time to enjoy the flowers and other plants on the way in and while we were at this lake. It was almost a perfect day. There are no fish in this lake. Have you ever seen the look in a person's eyes when they catch a fish in a mountain lake, especially a kid's? It is an absolutely magical feeling. That was what was missing.



Aug. 23, 2005

To: Bill Paleck, Superintendent NCNP

Subject: Mountain Lakes Fishery Management Plan/EIS

I have lived in Washington State since 1955, long before there was a North Cascades National Park. I remember when the creation of the park was first discussed and the promises made by Stewart Udall (then Secretary of Interior) and George Hartzog (then NPS Director), that we would always have fish in the mountain lakes of this park. I also can remember when a man's word was important. There still are a few men of honor and they still keep their word.

I feel I am very privileged to call Washington State my Home. I think we are all privileged to be able to live here in one of the few states that still has some "Wilderness" where man can commune with nature. When I go into the wilderness with my family where we can watch the animals in the natural settings, enjoy the many plants, flowers, and trees, camp near a lake and maybe even catch a fish, I am no longer caught up in our fast paced society, worried about my job or much of anything. I am at peace and so is my family. We look forward to every second that we can spend in the mountains; it helps us maintain our sanity and teaches us there is much more to life than just life in the city.

There are a total of 245 major lakes in the NCNP complex, which includes the adjacent Recreational Areas. Out of this total, only 62 contain fish. This is only 25%. Yet the EIS states that unless there is clarification from congress, all of these fish will be removed. The scientific research initiated by the Park Services (by Liss and Larson) found that in low densities, there is no measurable difference between lakes with and without fish! What more does one need to see that low densities of fish are not a problem to the ecology of a lake? I understand that there is a need to have some lakes with no fish; at present 75% of the lakes in the NCNP complex have no fish. Can we be fair and reasonable? Can't there be some lakes with fish and some without? Why does it have to be ALL one way?

Some people claim that even a few fish cause damage to the ecosystem of a lake. It is peculiar that the science does not agree. But what is much more disturbing to me is that these same people totally ignore the gross damage done by horses. I can take you to many places in the NCNP complex where you would swear you are standing in the middle of a well plowed field due to all the horse damage and other places where there is so much horse crap in the streams and lakes that it is unfit for anything but horses to drink.

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64

Jim Ledbetter
King County Outdoor Sports Council

I'm Jim Ledbetter. I'm president of the King County Outdoor Sports Council. I came to speak for continued fish stocking in the North Cascades National Park. I've been an Alpine lake fisherman since 1965 when I came home from the service, and it's been one of the most enjoyable things I think I've ever done, and I know there's a lot of people that feel that way.

In 1966, '67 when the park was being talked about, the formation of it in the Seattle newspapers, I was taking note of all the things that was being said, and I think it was around 1967 that the state delegation pinned down the director of the National Park Service and said, "Wait a minute. There's a lot of talk about no fish stocking." And that next day there was a big article in the Seattle Times.

It was entitled "Fisherman's Paradise" and it was Washington's delegation -- congressional delegation says the North Cascades National Park, if approved, will be a fisherman's paradise.

And we've -- after the park was formed, we've had anything but, so I'm here to see that we really do have a fisherman's paradise. And the group that I represent would support continued fish stocking in the park, and there's a lot of benefits for everyone, especially with low-density fish stocking. The Liss & Larson report shows that that does not harm the ecological impact on any of the native invertebrates in those lakes. Thank you.

71

Jim Ledbetter
Snohomish Sportsmen Association

Good evening. My name is Jim Ledbetter, and tonight I'm representing the Snohomish Sportsmen Association. The Snohomish Sportsmen Association

is in complete agreement with continuing fish stocking in NOCA. We think it's a great effort by Trail Blazers and others and the Department of Wildlife. It is a -- fish stocking is the only way to continue with the recreational fishery of any sort in the national park -- North Cascades National Park. In 1967 Washington's congressional delegation was assured by the director of the NPS, Mr. Hertzog, that fish stocking would continue. We believe he convinced our delegation of that fact, or they would have insisted language be added to the enabling legislation so there would be no mistake as to their desires and recreational fishing in this park.

The EIS does not clearly state how many lakes will be available for stocking or if fish stocking will even continue. In the event fish stocking is disallowed, or less than 40 lakes end up on the stocking list, the National Park

Service needs to address how they will mitigate this recreational loss to the public.

Again, we cannot stress the importance of recreational fishing in Alpine lakes. It is an unforgettable experience that leaves a lifetime of memories. Thank you.



Well, there's much to say in three minutes; I'll give it a try. In order to do that, I'm going to focus on just one area of probably 10 or 15 that my written comments will address, and that's wilderness values and the wilderness experience.

First, I would say that the EIS strongly really overstates, I think, that fish stocking is incompatible with the wilderness experience. Let's examine that for a second.

First off, the mandate of the National Park Service and the Wilderness Act of 1964 are for the relevant agencies to protect the resource, but also to provide recreation to people. And obviously, people like Bill Pakeck and Roy Zipp and others in the park have a responsibility to manage those two things. That's your job and you do it well. So let's look at it. If the job is to balance recreation and protection, let's look at those two things.

What is recreation? Recreation tends to be the sensitive areas that are so well managed for protection, historical uses, things like hiking and camping, and as has been said before tonight, fishing. Those are historical uses. They don't tend to include things like snowmobiles or hang gliding or some other things that are more recent after the park's creation, so it's something that has an historical, well-established use, and also particularly if it has some sort of cultural content. So that's recreation.

So what's protection? Protection is doing management actions and manage the park in such a way that there's minimal ecological damage done and you maintain some feeling of wilderness. That seems to me what protection means, in essence.

So the bottom line is there has to be some sort of balance between recreational benefit that you have an obligation to provide and the ecological impact that that recreation causes. You could put a chain-link fence around all wilderness areas and say "Humans, keep out." That would be the least possible damage, and that's not practical, and you guys have to make these trade-offs. Clearly, I believe that fish -- well, I don't believe -- clearly, fishing is an historical use. It even has a cultural side.

Look at your own EIS, look at the picture on the back of the EIS executive summary. Here's a family going fishing in the wilderness in this state. If that's not an historical cultural use or component to that use, I don't know what is. The hearings have already been addressed tonight, but the hearings in the '60s, both the National Park Service and the Department of the Interior promised that fishing would continue, and that's well documented in the historical case that I submitted to the park and is up on your website. It's an eight-page description that I think well documents that. Fishing was clearly intended, and I'm -- by "fishing" I mean also -- not also, but most particularly, wilderness fishing. For instance, you could say we allow hiking in the park. Well, if hiking was restricted to nothing but those two-mile nature trails that are paved and graveled, that would not be backpacking. I think the backpackers of the world would object if you said "Backpacking, you've got it. You can walk this nature trail for two on pavement for two miles." That's not backpacking anymore than fishing here and there by easily accessed trails. The ecological damage the Liss & Larsen study says that low-density, nonreproducing fish has no measurable impact.

So here's the key point: Here's the key point, and that is that low-density nonreproducing fish stocking is the only way -- get that -- the only way to provide fishing with minimum impact, because with nonreproducing fish, you are able to control the fish that are in the lake. So the only way that low-density nonreproducing fish stocking can be considered ecological damage -- it can't be considered ecological damage. The Liss & Larsen study shows that. The only way you can stop using fish stocking for low -- with low-density nonreproducing fish is to say that we are against fishing, period. And that's not what your mandate is.

So the only argument left -- and I will wrap up in 15 seconds here. The only argument left is somehow against wilderness values, the wilderness experience, I think that is completely overstated and discriminatory. I mean, if you compare some fisher rings in the lake, I was just in the Glacier Park -- or the Glacier National Wilderness Area just yesterday, as a matter of fact. The horse damage that's there is unbelievable.

There are double trails, hoof -- I saw this personally just in the last two days -- hoof marks in ponds. The plant destruction is incredible. And you're telling me that somehow fish stocking has more damage than horses that are allowed? I mean, you could say eliminate both, but how do you eliminate one and not the other? I think it's ludicrous to think that somehow the wilderness experience is damage, because you, as EIS states, somehow if you camp next to a lake that has fish in it, even if you don't see them, that somehow your wilderness experience is damaged. Compare that to the thistles, to the dandelions I saw two weeks ago in a Montana wilderness area at 8,000 feet those horses bring, and those are reproducing organisms. Those dandelions can spread; these nonreproducing fish cannot.

It's simply discriminatory to say fish stocking cannot be allowed when it's the only method you have to properly manage and protect the ecology. Only fish stocking with nonreproducing fish can do that.

Form Letter No. 131304
Sandy McKean
Trail Blazers and Hi-Lakers

Comments from Sandy McKean are shown in red. In most cases the EIS language is quoted first (in black font) and my response follows (in red font).

Note that I have not made an attempt to comment on every single instance in the Executive Summary or the main body of the EIS where that comment might apply. Rather I have made the comment once, and I leave in the capable hands of the NPS professionals who will create the final EIS to find all the areas where accepted comments can be applied again in order to make the final document consistent.

Volume One
 Executive Summary

“the 1968 enabling legislation for the North Cascades Complex does not define the fishing and fish-stocking activities that would be allowed within its boundaries”

This phrase is misleading. It implies that if Congress intended for fishing and fish stocking to be allowed within its boundaries that the enabling legislation would have explicitly stated that intention. In fact the enabling legislation doesn't mention any of the visitor activities or park maintenance actions required to support such activity. For example, the enabling legislation does not mention hiking or trail maintenance either; nor does it mention ping. If the EIS is to make the statement it does, then it should indicate that Congress gave no guidance for most, if not all, accepted visitor activities, and that the NPS has taken the authority over the years to make decisions regarding such activities (be it fishing, hiking, snowmobile use, or any other visitor use) without relying on congressional direction.

“Because of the differences in policies and missions between the WDFW and the NPS&.”

This should say:

“Because of the differences in policies, missions, and interpretation of historical events since the park's creation between the WDFW and the NPS&.”

BACKGROUND

History of Fish Management In The North Cascades Mountain Lakes

This history section needs an additional paragraph (or more) to describe the history of the congressional hearings in 1966 and 1967 that lead to the establishment of the park. Much of the disagreement between the NPS and the WDFW stems from differing interpretations of congressional intent as expressed in these hearings. Louter does not cover this issue well enough to be the sole source. I recommend to you the “Historical Case for Fish Stocking the High Lakes in the North Cascades” that I wrote (Sandy McKean). This document has previously been submitted to



the NPS and can be found on the NPS website devoted to this NEPA process (<http://www.nps.gov/noca/highlakes.htm>).

“Fish stocking in the mountain lakes took place for many years prior to the establishment of the North Cascades Complex in 1968; however, the enabling legislation for this newly formed unit of the national park system did not define the fishing and fish-stocking activities . . .”

The underlined phrase is misleading. It should also indicate that congress gave no guidance for most, if not all, accepted visitor activities.

“The agreement expired in December 2004, and any future agreements between the NPS and WDFW concerning mountain lakes fishery management, including fish stocking in the national park, will depend on the outcome of his plan/EIS process.”

The underlined phrase is incorrect. This agreement has been extended to December 2006.

Implementing The Fishery Management Plan Through Congressional Action

“The Washington Park Wilderness Act of 1988 (WPWA) established 93% of the North Cascades Complex as Stephen T. Mather Wilderness and directed the NPS to manage the wilderness in accordance with the Wilderness Act of 1964. At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters, and the WPWA did not include a provision that allowed stocking.”

These sentences are quite misleading since they seem to build the case with no justification that somehow these two pieces of wilderness legislation intended to prohibit fishing or fish stocking. This is absolutely not the case. As in the other instances above both of these acts are silent on fish stocking, just as they are silent on most, if not all, accepted visitor activities. NPS policies may have prohibited fish stocking when the WPWA was passed, but neither piece of wilderness legislation did. These acts and the NPS policies should not be commingled into these sentences. The draft language makes it far too easy for the reader to be confused as to whether the legislation or the policies restrict fish stocking. Not only that, but NPS policies do allow fish stocking in some cases (see written response from Dale Riveland for details).

“However, some disagree with these views and maintain that if nonnative fish were stocked appropriately, there would be o unacceptable adverse impacts on wilderness values because biological integrity would be conserved. “

This sentence is incomplete since it leaves out a vital piece of information. It is true that “some disagree”, but more importantly the NCNP's own research Study (Liss & Larson Study), widely referenced in this EIS, also disagrees. One of that Study's major conclusions is that the stocking of non-reproducing fish in low densities also causes “no unacceptable adverse impacts on wilderness values because biological integrity would be conserved”. Such an important finding can not be simply swept away with the simple phrase “some disagree”.

“Fish stocking has been allowed to continue in the North Cascades Complex under a 1986 policy waiver.”

The Trail Blazers, Hi-Lakers, and perhaps the WDFW do not agree with the characterization of 20 years offish stocking as having occurred under a waiver of policy. On the contrary, in a 1986 NPS memo from NPS Director Mott (reproduced in Appendix A), it is quite clear that the NPS set policy specific to the NCNP that allows fish stocking under a mutual agreement with the WDFW. That policy and the subsequent 1988 Supplemental Agreement (also in Appendix A) requires mutual agreement between the NPS and the WDFW to change. The WDFW would never have agreed in 1986 to a simple policy waiver Mott's memo was clearly intended to settle the dispute not simply postpone it. That intent is clear, given that the 1988 Supplemental Agreement clearly specifies the need for mutual agreement to change the policy. (For more detail and a legal perspective on the subject of “policy waiver”, see the written response of Dale Riveland.)

“Should a management alternative that allows for continued stocking be selected through this plan/EIS decision-making process, a new policy waiver may not be granted for several reasons. First, various national parks (Sequoia-

Kings Canyon National Park, Yosemite National Park, Glacier National Park, Rocky Mountain National Park, and Yellowstone National Park) have discontinued stocking.”

This NEPA process is about the NCNP, not a NPS-wide analysis. I fail to see what actions in other parks that have different histories and different requirements have to do with this decision in the NCNP. Beyond that as stated above, it appears that the NPS has already made a separate policy on fish stocking for the NCNP in 1986. References such as these to other parks should be removed.

“If this plan/EIS process resulted in the selection of an alternative that allowed for continued stocking, issuance of a policy waiver to the North Cascades Complex could encourage other state fish and wildlife agencies to revisit the issue of stocking in NPS units where stocking has been discontinued.”

Once again, what does this have to do with NEPA process for the NCNP? Furthermore, policy for fish stocking in one NCNP was set in 1986, so no waiver is required to continue the practice.

“Second, policy waivers are only temporary and do not provide a permanent solution because they can be rescinded as circumstances change. The goal of this plan/EIS is to forge a lasting solution for mountain lakes fishery management in the North Cascades Complex.”

There is nothing more or less permanent about this plan/EIS as compared to a policy, or a policy waiver for that matter. The EIS itself says elsewhere that it has a 15-year planning horizon. This is a false benefit and should be removed.

“Finally, the minimum requirement analysis for fish stocking in the Stephen T. Mather Wilderness indicates that stocking is not necessary to meet the minimum requirements for administration of the area, and the Wilderness Act is unclear whether stocking is allowed in designated wilderness areas.”

The Trail Blazers and Hi-Lakers strongly disagree with the use of the MRA procedure as it is used in a “programmatic” way regarding fish stocking, and ultimately fishing itself (since fish stocking is the only scientifically proven way to provide the historical fishery without ecological damage). See the MRA section later in this response for detail.

“For these three reasons, a policy waiver would not be pursued if this plan/EIS process resulted in the selection of an alternative that included continued fish stocking.”

This is a bogus conclusion since one, two, or even all three of its justifications, are weak, or perhaps even false.

“If Congress should choose to allow stocking through a change in the enabling legislation, it will have clarified that fish stocking is an appropriate activity in the North Cascades Complex.”

This is a truism that sheds no light on the issues the EIS is attempting to analyze. Of course such clarification would clarify the situation, but it is not necessary. There are many management actions that have or could be contemplated by the NCNP for which this statement could be made. It is akin to a “motherhood and apple pie” statement. Trail maintenance is allowed in the park; but Congress has given no additional clarification to the NCNP enabling legislation for that activity. There is no clarification for camping, for fire building, for horse travel, or nearly any other historical use of the park lands. Why does fish stocking require such clarification when none of these other activities have required it? Is not this NEPA process itself the intended process by which such decisions are made by park management? Could one not argue just as well that if Congress intended for fishing to cease when the park was created via the enabling legislation that it could have included a prohibition against it? The Trail Blazers and Hi-Lakers would welcome such a clarification from Congress, but we certainly don't agree that such clarification is necessary for the preferred alternative (Alternative B) to become their Record of Decision.

“That unambiguous clarification would allow the NPS to implement any of the management alternatives that include the practice of stocking. Congressional action to allow fish stocking would also honor various verbal commitments



in support of stocking that proponents believe were made by federal officials prior to establishing the North Cascades Complex but never codified in law.”

I proclaim my objection to the use of the underlined word “believe” in the sentence quoted above. The word “believe” is used in this fashion throughout the draft EIS and needs to be changed. Consistently in the draft EIS, when various individuals or groups are referenced to provide evidence that fish stocking should not continue (e.g., see the previous paragraph above which states what Congress might have done), the sentence contains a verb that dictates fact or a decision, but when evidence such as this (e.g., statements made in the congressional hearings which support fishing and fish stocking), the draft EIS condescends to that equally valid evidence and says, as it does here, something akin to “proponents believe” as if these proponents present this evidence as an article of faith rather than of fact. This is a subtle objection, but in its very subtlety, it seems to uncover some possible prejudice in the human beings who wrote this language. Humans are fallible. The initial use of this objectionable language in a draft can be forgiven, but the appearance of condescension that this draft language creates should be removed in the final EIS. In summary, particular attention needs to be paid to the recurring use of the word “believe” throughout the draft EIS.

“Congressional action to clarify enabling legislation is an intricate process that could take several years. If the NPS does not receive clarification from Congress by the time a record of decision for this plan/EIS is issued, alternative D (91 Lakes Would Be Fishless) would be implemented until clarification is received.”

There does not seem to be any basis for picking alternative D as this fallback, and presumably temporary, course of action. If the NPS continues to feel that it needs congressional clarification before it has proper guidance to make a decision, I suggest that alternative A is a more appropriate choice. As in most legal or public actions, the expected default course when a definitive decision can not yet be made is normally to retain the status quo (i.e., alternative A). Choosing alternative D in the face of lack of clarification is tantamount to making a de facto decision not based on the evidence in the EIS, but on the political climate in Congress. Surely maintaining the status quo would be a less drastic action until the clarification from Congress can be obtained.

APPLICATION OF RESEARCH

“To relate the purpose of “conserving biological integrity” to mountain lakes fishery management, the Technical Advisory Committee drew upon one of the principle conclusions of the OSU research: the ecological effects of nonnative trout are related to the reproductive status and abundance of trout in lakes. The Technical Advisory Committee interpreted this finding to mean that lakes with the lowest degree of biological integrity (or greatest departure from biological integrity or pristine conditions) contained reproducing populations of nonnative trout or char that had achieved high densities. On the other end of the biological integrity spectrum, the Technical Advisory Committee assumed mountain lakes that had never been stocked represented the highest degree of biological integrity.”

I have no objection to what is said here except that it is incomplete. Besides those considerations mentioned here, equally important was a major conclusion of the Liss & Larson study that determined that non-reproducing fish populations stocked in low densities show no evidence of banning biological integrity. This vitally important aspect of the science needs to be explored in this paragraph in the same way as the other considerations are.

“This conceptual framework was used to craft management alternatives B and C based on the hypothesis that the biological integrity of mountain lakes could potentially be conserved by managing for non-reproducing trout at low densities in some lakes and managing for fishless conditions in other lakes.”

The underlined word “potentially” should be removed. There is no justification to select one of the Liss & Larson study conclusions and qualify it “with the word “potentially”. Other Liss & Larson study conclusions are quoted in this draft EIS without using this word. Nonreproducing trout at low densities is just as valid a conclusion as any other in the study. The evidence is there in the study's data; there is nothing “potential” about it. The data clearly shows no statistically significant difference between fishless lakes and lakes stocked with nonreproducing trout at low densities. If this conclusion needs to be qualified because of the possibility of more data in the future, then so must all the evidence presented in this EIS be so qualified. Indeed, is not the whole idea of “adaptive management” so eloquently discussed in this EIS the very tool to use to handle situations where future data causes a re-evaluation of current management actions?

ALTERNATIVES

This section addresses elements some or all alternatives have in common. Elements relating to the removal of fish are discussed in element #4, but there is no element for fish stocking. A fifth element should be added that discusses, at a minimum, the concept of low density stocking with non-reproducing trout since that is a key distinction of both alternatives B and C. Without that distinction being presented, there is no way to differentiate among the alternatives relating to fish stocking as there is for fish removal in element #4.

ALTERNATIVE B

“The restocking of nonreproducing fish would be allowed only where impacts on biological resources could be minimized.”

As worded this statement can be misunderstood. It should say:

According existing scientific data, the restocking of nonreproducing fish in low densities would be allowed except e impacts on biological resources could be shown to exist.

ISSUES AND IMPACT TOPICS

Predation and competition. Nonnative fish have measurably changed the composition and abundance of native aquatic org isms in some lakes. The most significant impacts are caused by reproducing populations of stocked fish that have become self-sustaining.

As worded this statement can be misunderstood. It should say:

Predation competition. Non-native fish have measurably changed the composition and abundance of native aquatic or organisms in some lakes. Research has shown that the most significant impacts are caused by reproducing populations of stocked fish that have become self-sustaining and overly abundant; in contrast, the research also shown that there is no measurable impact on lakes that contain populations of nonreproducing fish in low densities.

“Impacts o aquatic organisms in lakes stocked with low densities of nonreproducing fish would be the same as alternative, except these impacts would decline further in the future as stocking is curtailed or eliminated in lakes base upon adaptive management decisions pertaining to stocking.”

It needs to be made explicit in this alternative, as well as in alternative A and C, that data show there are no measurable impacts on lakes when low densities of non-reproducing fish are used. Additionally, it makes no sense to say that impacts would decline further since there is no measurable impact in those lakes today.

Aquatic Organisms/Alternative D

“Short- an long-term adverse cumulative impacts on aquatic organisms from threats other than non-native fish would be similar to alternative A.”

The sentence above is also found in alternatives B and C. It should also be in alternative D since alternatives B, C, and D e all the same in this regard with respect to alternative A.

Wildlife

This entire section needs to be re-written. Some of the information is completely wrong, other information is missing. F r example, alternative A states that wildlife will be disturbed because of human presence and use of aircraft, yet alternative D doesn't mention this at all, even though under alternative D fish removal impacts due to causes is the highest of all alternatives. Furthermore, no mention is made of the fact that the vast majority o stocking does not require aircraft, and in fact, all aircraft activity for stocking could be eliminated under alternatives A, B, or C if the Park chose to take that action (for example, using horse packers for the larger lakes now one via fixed wing



aircraft). Beyond that it is a bit ridiculous to assign wildlife disturbance due to human presence required for fishing activities when human presence always has, and always will, exist due to hiking and camping activities. Does the NCNP really believe that fish stocking has any significant impact on wildlife beyond what exists already for activities such as hiking, climbing, camping, and horse travel?

Cultural Resources

This section needs to be re-written due to similar problems that exist in the “Wildlife” section above. For example, in this section alternative B talks about impacts due to fish removal, but in alternative D where such impacts are higher, no mention is made of such impacts. Such omissions as these give the clear impression that the author has a prejudice toward favoring alternative D.

Recreational Use/Alternative B

“Major adverse impacts would occur to some anglers who believe fishing in North Cascade Complex lakes is a truly unique experience that cannot be duplicated elsewhere.”

Here is another example of the selective use of the word “believe”. This same unnecessary use is in the entry for alternative D also. The draft EIS does not shy away from making declarative statements throughout its text when there is reasonable evidence to support the statement; so why when it comes to considering the continuation of fish stocking does this word “believe” invariably come into the text? It is a fact that fishing in the North Cascades is a truly unique experience for anglers; it is not just a belief that some people take as an article of faith. If the experience were not unique visitors who must travel a long distance to see and use the NCNP would simply visit a park or wilderness area nearer to home. Surely every national park managed by the NPS considers that it provides a unique experience.

Social Values/Alternative B

This section needs to briefly address the history of the Park's formation. It makes no sense to comment on the impacts on social values of various groups (such as conservationists) without defining the agreements these social groups accepted when the enabling legislation was discussed and approved via the political process in the 1960s. As is mentioned elsewhere, fishing and therefore the maintenance of a fishery was promised in congressional hearings when the park was created. It is illogical now to say that various groups who oppose the fishery that existed prior to the park's formation can now obtain any benefit due to a management action that attempts to undo this history. Such statements make no sense unless this background history is also given.

“Cumulative impacts related to flood damage to upper Stehekin Valley Road would be minor to moderate, adverse, and long term.”

This should be removed. This observation, if it is even true, has no bearing on fish stocking. Beyond that this sentence only appears in alternative B but it is totally unclear why it should only appear there. I can find no basis for this statement anywhere else in the draft EIS.

Wilderness Values/Alternative B

“There would be a long-term major adverse cumulative impact on those who believe that the continued stocking (as proposed under alternative B) in wilderness and continued presence of reproducing populations of fish would compromise natural processes in wilderness.”

This is in error. Alternative B is no different than alternative D regarding reproducing fish populations. The correct statement is the one found under alternative D.

Wilderness Values/Alternative D

“This would result in long-term moderate to major beneficial impacts on opportunities for solitude in areas where fishing opportunities are eliminated.”

This statement is a gross exaggeration. All but a few of the lakes with fish are quite remote and it is unlikely that two or more parties would be there together except rarely. On the other hand, some lakes that have easy access will see less people, but these same lakes have so many visitors that a few more or less visitors will not make a difference in solitude. This statement is best removed, or at least the benefit level ought to be changed to “minor”.

Due to the cessation of stocking in national park lakes, long-term moderate beneficial cumulative impacts on wilderness values would be expected.

This statement should be removed. There is no development of the connection between “wilderness values” and lakes with nonreproducing fish in low densities in these tables. Elsewhere in the text of the draft EIS an unconvincing case is attempted in order to “prove” that such populations offish harm wilderness values. At best that case is a red herring. How can a few fish, mostly unseen, harm a visitor's wilderness experience? This claim becomes ludicrous when you consider that trails cross meadows without any regard for “wilderness values”, or that horses are allowed in the “wilderness, or even that humans are allowed in wilderness. Since properly managed fish populations have been shown scientifically to cause no harm to the ecosystem, the presence of such fish in lakes is no doubt more in keeping with “wilderness values” than are any of these other accepted practices. It should be remembered that these lakes are a natural environment for these stocked fish, and that such fish would naturally be in these lakes but for the minor fact that the stream gradients in the North Cascades area just happen to be too steep to be navigated by fish. These fish are not unnatural in these lakes, they just happen to be missing.

Purpose And Need For Action

INTRODUCTION

OBJECTIVES IN TAKING ACTION (pg 5)

This plan/EIS must also be consistent with the following mission statement for the North Cascades Complex, which is derived from its enabling legislation (PL 90-544):

As a unit of the National Park Service, the North Cascades National Park Service Complex is dedicated to conserving, unimpaired, the natural and cultural resources and values of North Cascades National Park, Ross Lake National Recreation Area and Lake Chelan National Recreation Area for the enjoyment, education, and inspiration of this and future generations. We also share responsibility for advancing a great variety of national and international programs designed to extend the benefits of natural and cultural resource conservation and outdoor recreation.

There is no foundation in the EIS for this mission statement. Where does it come from? Why is it relevant to this draft EIS? At a minimum the mission statement is incomplete as a mission statement for a national park since it leaves out the park's mission to provide recreational opportunities except to support “national and international programs” - whatever those are.

The enabling legislation mentioned above only contains a broad reference to the August 25, 1916 legislation that established the NPS. Therefore one must look at the NPS's policies to see what the NCNP mission encompasses. The NPS's own policies (see page 67 in the Appendices volume) state in part:

8.2.2 Recreational Activities

The National Park Service will encourage, allow, or not allow recreational activities according to the criteria listed in section 8.2. Examples of recreational activities that may be encouraged or allowed include, but are not limited to,



boating, camping, bicycling, fishing, hiking, horseback riding and parking, outdoor sports, picnicking, scuba diving, cross-country skiing, caving, mountain and rock climbing, and swimming.)

8.2.2.5 Fishing

Recreational fishing will be allowed in parks when it is authorized, or not specifically prohibited, by federal law, provided that it does not jeopardize natural aquatic ecosystems or riparian zones.

The mission statement provided clearly needs to be updated to include not only its “preserve and protect” role, but to include the equally important mission of providing recreational opportunity, particularly as it relates to fishing.

BACKGROUND

ADMINISTRATIVE BACKGROUND

History of Fish Management In North Cascades Mountain Lakes

“When the North Cascades Complex was established in 1968, its enabling legislation did not define the fishing activities that would be allowed within its boundaries.” (pg 11)

This is misleading. The enabling legislation did not define any activities that would be allowed in the park. The underlined word “fishing” should be removed.

“To resolve differences in policy and to foster a spirit of cooperation, the NPS and WDFW negotiated a series of agreements beginning in 1979 that allowed stocking to continue in selected lakes in the North Cascades Complex.” (pg 12)

This statement is incomplete. It leaves out the most important and fundamental disagreement between the NPS and the WDFW regarding the intent of Congress when the park was created in 1968. There is a complex history of agreements between these 2 organizations. Much more of this history needs to be included here especially those areas where the NPS and the WDFW have disagreed. (See the “Historical Case for Fish Stocking the High Lakes in the North Cascades” document referred to earlier for a complete discussion of this nearly 40-year dispute.)

“To be able to continue stocking in light of NPS policies generally prohibiting it, a memorandum from the NPS Director was issued in 1986 (hereinafter referred to as the “policy waiver”).” (pg 13)

It is incorrect to characterize this memo as a policy waiver. In fact, it is a clear state of policy for the NCNP. (See my earlier discussion of this issue, and in particular see the written response from Dale Riveland for details.)

“The 1988 Supplemental Agreement (also known as the Fisheries Management Agreement) formalized these practices in the 40 lakes inside the park for 12 years while planned research on the effects of fish management activities could be completed and assessed. Any additions or deletions to the list of lakes in the park would be made only by mutual agreement, and the two agencies would consult on the number and species of fish, specific lakes, and the schedule for the lakes to be stocked. The agreement added the caveat that research results would be considered in future decisions. A long-term research study was initiated by Oregon State University soon after the 1988 Supplemental Agreement was finalized. The Supplemental Agreement between the NPS and WDFW that permits fish stocking in the national park was reaffirmed in February 2000 and again in July of 2002. The agreement expired in December 2004. Any future agreements between the NPS and WDFW concerning mountain lakes fishery management, including fish stocking in the national park, would depend on the outcome of this plan/EIS process.” (pg 13)

This paragraph mischaracterizes the agreements between the NPS and the WDFW. The language above gives the impression that the agreements made in 1988 were intended to be temporary and that the entire issue would be looked at afresh in 12 years. That is not the case. There was extreme tension between the NPS and the WDFW in the 1986 to 1988 period. In October 1987 John Reynolds, NCNP Superintendent, even threatened to prosecute WDFW employees if they entered the park to stock fish as the WDFW insisted they would do. Only the intervention of

William Horn, Assistant Secretary for Fish and Wildlife and Parks, in an October 29, 1987 letter to WDFW Director Jack Wayland defused the legal confrontation. Furthermore”, an extensive letter from Jack Wayland to Charles Odegaard, Regional Director NPS, on July 29, 1987, clearly outlines the seriousness of the situation and the WDFW's desire to reach permanent resolution. That resolution was reached in part with the 1988 Supplemental Agreement referenced above. An investigation of the history of this agreement clearly shows that the WDFW did not intend a temporary resolution to fish stocking in the NCNP with the 1988 agreement waiting for a final decision at some future date, but rather” that the agreement would simply be reviewed after 12 year to consider the results of the scientific research begun after the 1988 agreement was signed (this research is what we now call the “Liss and Larson” study). In support of that intention, the agreement states that mutual agreement between the NPS and the WDFW would be required to modify the 1988 agreement. This is most clearly demonstrated in Article V (Termination) of the 1988 Supplemental Agreement which states:

“This supplemental Agreement shall remain in full force and effect unless terminated by mutual consent and the Department and the Service.”

Furthermore, the last sentence of the draft EIS statement quoted above is misleading since it does not make explicit that the outcome of the plan/EIS is subject to mutual agreement by the WDFW as the content of the 1988 Supplemental Agreement and its history clearly demand.

(Also see the written response from Dale Riveland for additional details.)

“In May 1967 he stated that within the park the NPS would not participate in a 'put and take' program, and would not concur with stocking lakes that historically did not have fish.” (pg 14)

This sentence needs to be re-written for clarity. Since the draft EIS specifically excludes lakes that do not have a history of fish stocking, the wording of this sentence points to the “Tong qualification. It should be recast along the lines of:

“In May 1967 he stated that within the park the NPS would not participate in a 'put and take' program, and would only concur with stocking lakes that historically had fish.”

Additionally, please cite a reference for this statement (I have been unable to find this quote from Director Hertzog in any of the congressional hearing transcripts).

“Then, in July 1968, Director Hartzog stated, “[w]e have an active fish-[stocking] program in every single major park...[n]ow, if the stream already has its limit of fish comparable with its food-carrying capacity, then obviously, we do not engage in a put-and-take fishing program. But, we [stock] fish in practically every area that I can think of off the top of my head now, including all of our major parks. “ (pg 14)

This quotation should be expanded to include the entire interchange between Director Hartzog and Congressman Meeds (it is only longer by a few lines). To select just this one portion of that interchange too greatly changes its implication. (See the congressional record or the “Historical Case for Fish Stocking the High Lakes in the North Cascades” document referred to earlier for the entire interchange.)

Proponents of stocking believed they were promised that stocking would continue after the park was established...(pg 14)

Once again, it is inappropriate to say proponents simply display an article of faith when they state these promises were made. The promises were made. They can be read in the congressional record (See the congressional record or “Historical Case for Fish Stocking the High Lakes in the North Cascades”).

“While the current NPS Management Policies and practices prohibit stocking in areas designated as national parks, “ (pg 14)



NPS-wide policy on fish stocking does not apply on its own to the NCNP. The 1986 Mott memo clearly states that the NPS adopted a specific NCNP only policy for fish stocking given the history of the park's creation and the controversy between the NPS and the WDFW regarding fishery management within the park. It is misleading to imply that NPS-wide policies somehow apply to the NCNP without reference to these NCNP-specific NPS policies.

SUMMARY OF EXISTING RESEARCH

This entire section needs to be reorganized using the vital concept of nonreproducing, low density fish populations verses reproducing populations, especially those that reach high densities. This distinction is not fully appreciated in much of the research that has been done on the effects of stocked fish in high lake ecosystems. The Liss and Larson study does make this distinction and in doing so makes it clear how important it is to make this distinction when analyzing fish impact data. Since the Liss and Larson study is the best evidence we have for the NCNP high lake ecosystems, we should be guided by it. To mix in research results that do not make this vital distinction regarding fish densities is to mix apples and oranges invalidating any point this section could have. The organizing principle of this entire section must be to segregate scientific evidence based on nonreproducing, low density fish populations from scientific evidence based on reproducing fish populations; to do otherwise is to ignore the NPS's own funded research in the NCNP on the impact offish in lakes.

Lake Characteristics: (pg 17)

“In terms of possible impacts to lake characteristics from fishery management practices, the literature indicates that removal of fish can result in increased water clarity, higher dissolved oxygen concentrations, reduced phosphorus cycling, and decreased ammonia concentrations (Hanson 1990; Sondergaard et al. 1990; Schindler et al. 2001). In contrast to the low-nutrient and relatively undisturbed conditions in mountain lakes analyzed in this plan/EIS, these prior studies were conducted in highly disturbed, nutrient-rich lakes containing high densities of fish. For example, researchers in the Sierra Nevada have demonstrated through modeling and paleolimnological (study of the organic and chemical history of lakes through analysis of bottom sediments) analyses that introduced fish in oligotrophic (nutrient poor) mountain lakes can nearly double the rate of phosphorus regeneration and exploit benthic (lake bottom) sources of phosphorus that would normally not be available to pelagic (open water) communities in the absence of fish. The increased availability of nutrients (such as phosphorus) made possible by stocked fish can stimulate primary productivity and fundamentally alter nutrient cycling (Schindler et al. 2001). The USGS research at the North Cascades Complex did not study the effect of fish on water quality or nutrient cycling. It instead focused on abiotic factors, such as characteristics of the drainage basin and elevation and their effects on water quality (Liss et al. 1995). It is unknown, but considered unlikely, that similar water-quality changes would be associated with the presence of fish or fish removal (Drake and Naiman 2000).”

This paragraph should be removed. There is no reason to believe that the ecosystems of the NCNP are similar to the areas studied in research mentioned here. The flora and fauna are almost certainly different. Beyond these concerns the most important reason to remove this paragraph is the research cited makes no distinction based on fish density. As the most applicable research clearly demonstrates (Liss and Larson study), fish density can strongly determine the outcome of such studies -reversing the conclusions in many cases. It is pointless to include data such as this unless fish densities are taken into account since the very premise of the preferred alternative B rests on this distinction.

Phytoplankton (pg 17)

“Phytoplankton surveys performed in mountain lakes in Mount Rainier National Park showed that, for the most part, the species of phytoplankton in individual lakes remained consistent from year to year (Larson and McIntire et al. 1999). Drake and Naiman (2000) compared fossil remains of one type of phytoplankton (diatom) in historically fishless lakes, lakes with stocked fish, and lakes where stocked fish were removed in Mount Rainier and found that in unstocked lakes, the array (variety and abundance of species) of diatoms had not changed significantly in the last 3 15 years. Changes had occurred in diatom arrays in lakes where fish were introduced and are still present today. For those lakes where the stocked fish had been removed, diatom arrays did not appear to have returned to the arrays similar to those found in fishless lakes. Changes in species arrays, resembling those observed in the Drake and Naiman (2000) study, have also been observed in other studies, such as Douglas et al. (1994). Several studies have shown that removal of fish from lakes can result in decreased total numbers of phytoplankton (Hanson 1990;

Sondergaard et al. 1990). It is difficult to quantify fish impact on nutrient cycling, especially in oligotrophic lentic (still or slow-moving water) systems, and the magnitude and variation of impact has not been fully explored (Schindler et al. 2001).”

This paragraph should be removed for the same reasons as discussed above regarding the “Lake Characteristics” section.

“Researchers found no significant differences in the density of large copepods in lakes with low fish densities (such as in many stocked lakes) and in fishless lakes (Liss et al. 1998).” (pg 18)

It is ludicrous that the only place in this entire “Summary of Existing Research” section that nonreproducing, low density fish populations is mentioned is this brief mention - and it does not mention the nonreproducing aspect at all. The distinction between non-reproducing, low density fish populations and reproducing populations, (especially those that reach high densities) is the key scientific distinction that separates alternatives A, B, and C. There can be little doubt as to the vital importance of non-reproducing, low density fish populations in this EIS. Either the authors did not -this vital scientific distinction, or they had an existing prejudice against the stocking of fish regardless of its impact on the lake and its ecosystem.

“The OUS/USGS team came to several conclusions:

Introduced fish can reduce or eliminate large, more visible diaptomid copepods from lakes if fish abundance is excessive.

Impacts on large copepods vary with fish density, with the greatest effects occurring at high fish densities.

Impacts on large copepods from fish introductions are greater in shallow lakes.

A significant negative relationship between large diaptomid density and *D. tyrrelli* density exists when the species occur together; that is, it appears that larger copepods prey on the smaller *D. tyrrelli*.” (pg 19)

Once again the lack of appreciation for the importance of the distinction between non-reproducing, low density fish populations and reproducing populations in this section is astounding. The quoted paragraph purports to summarize the Liss and Larson conclusions, but does not even mention this most vital finding that separates most of the alternatives in this EIS -including the very essence of the preferred alternative B.

“In mountain lakes that were temporarily stocked with non-reproducing salmonids, the majority of lakes sampled showed that populations of large zooplankton were significantly reduced;...” (pg 19)

At what population density? Once again without specifying the type of fish population in this Stud)', the results are meaningless for the purposes of this EIS.

Macroinvertebrates (pg 20)

“...brook trout under conditions of extreme fish density were able to deplete mayfly and caddis fly populations in a small, high altitude lake in the eastern Sierra Nevada in California.”

Same basic problem. This finding may be so, but it is irrelevant to this EIS since no alternative, none, recommends “extreme fish densities”. This is a red herring at best. The Liss and Larson Study contains evidence on all the population types found in NCNP lakes. Why muddy the water with study results that have no bearing on this EIS?

In fact this entire section should either be removed, or the Liss and Larson data used instead. Furthermore, whatever evidence is presented, it must make the vital distinction between nonreproducing, low density fish population and reproducing populations, (especially those that reach high densities). The information presented in this entire macro invertebrate section is misleading at best for the purposes of this EIS.



Amphibians: (pg 21)

“This is likely because the skin of both the larvae and adult rough-skinned newt contains a potent toxin (Nussbaum et al. 1983).” (pg 21)

“In other parts of Washington, Cascades frogs do not occur in deeper lakes and ponds containing fish, suggesting they are vulnerable to predation.” (pg 21)

“One way to interpret this information is to say that lakes with very high TKN levels can support very high densities of long-toed salamanders. When even low levels of fish are introduced into these lakes, they can reduce these salamander densities enough that it is statistically noticeable.” (pg 23)

These sentences should be removed. They are speculative and do not belong in a section devoted to the presentation of scientific evidence.

“&.which is probably because salamanders require a certain TKN concentration before they can occupy a habitat.” (Pg 22)

This phrase should be dropped since it is speculative.

“For example, surveys in Olympic National Park found few or no long-toed salamanders in lakes containing fish, but many populations in shallow ponds and lakes without fish (Bury and Adams 2000; Bury et al. 2000; Adams et al. 2000).” (pg 23)

This sentence is misleading. One could easily conclude from this sentence that fish, regardless of fish density, decimate long-toed salamander populations. If this sentence is to remain it needs to be qualified so that it eliminates at least the simple possibility that shallow ponds and lakes are the preferred habitat of the long-toed salamander. Furthermore, long-toed salamander population density may very well heavily depend on fish population density. For example, the research quoted above only looked at lakes with high densities of fish, it would be expected that long-toed salamander population densities would be lower, but in lakes with low density fish populations there may be little if any impact on long-toed salamander populations. These interactions are far too complex to simply state that there are no salamanders when fish are present.

“Overall, the OSU/USGS team concluded that lakes with relatively high TKN concentrations (about 0.55 mg/L or greater), and those with warmer temperatures (greater than about 54°F), were favored by native biota such as phytoplankton, large copepods, and long-toed salamanders. The aquatic life in these “more productive” lakes could therefore be at highest risk of impact from high densities of reproducing fish and may benefit most from fish removal. For additional information on the OSU/USGS research, see the section titled “Application of Research” in the “Alternatives” chapter.” (pg 23)

This summary paragraph clearly needs to be rewritten just as this entire “Summary of Existing Research” section needs to be. It is almost unbelievable that the concluding final paragraph of the science section in an EIS that depends vitally on the concept of nonreproducing, low density fish populations to differentiate among its alternatives does not even mention this vital distinction.

SCOPING PROCESS AND PUBLIC PARTICIPATION

ISSUES AND IMPACT TOPICS

Aquatic Organisms

This section is much like the last in that it does not make the distinction between non-reproducing, low density fish populations and reproducing populations. I will not go into as much detail in this section as I did in the last, but suffice it to say that like the previous section, this section is fatally flawed by having ignored this vital distinction for

both its content and organization. The information required to make the changes I suggest below was all presented at the scoping meetings (I personally attended 3 of the 4 meeting held).

Plankton: (pg 24)

No mention of nonreproducing, low density fish populations.

Macroinvertebrates: (pg 25)

No mention of nonreproducing, low density fish populations.

Amphibians: (pg 25)

No mention of nonreproducing, low density fish populations.

Fish: (pg 25)

Here this section makes a similar mistake. The discussion on fish species makes no mention of a second vital aspect of the preferred alternative; namely, that the fish to be stocked will be sterile. Nearly all of the concerns expressed in this paragraph are mitigated by the use of sterile fish, and yet that vital aspect that will later be found in alternatives B and C is not even mentioned.

SPECIAL STATUS SPECIES

Fish: (pg 26)

“The genetic integrity and ability to reproduce in bull trout may be affected if stocked brook trout escape from lakes&”

Brook trout have not been officially stocked in the NCNP lakes for decades. This concern has no bearing on which EIS alternative is finally selected as the Record of Decision since there is no intention in any of the alternatives to stock brook trout. Everyone would like to see these brook trout removed from NCNP complex waters. The implication found in this statement that brook trout might be stocked needs to be removed from this section.

Other Vertebrates: (pg 26)

This section must distinguish between fish removal and fish stocking activities. There is no requirement for noise with fish stocking if the elimination of noise is desired.

VEGETATION (PG 26)

Other comments from the scoping meetings need to be added here. As written, this section implies that fish presence somehow increases the trammeling of vegetation around lake shores. There is no evidence for that. It was stated at the scoping meetings that many believe that hikers and campers who have no intention to fish cause the majority of this damage. (This can easily be seen by noticing the concentration of vegetation damage near camp sites as opposed to other areas of lake shore.)

VISITOR USE AND EXPERIENCE (PG 27)

This characterization of the visitor experience does not represent what was said at the scoping meetings. I can not remember anyone having said words to this effect. Similar concerns might have been expressed, but an equally passionate defense of fish stocking, properly managed, was expressed by the majority of attendees. It is ludicrous to suggest, as this section does, that conservationists care only for natural processes. The “conservationists” that attended those meetings, as far as I could tell, hiked, camped, and built fires, and other non-natural processes. In addition there is nothing utilitarian about anglers. As was expressed clearly in the scoping meetings (but not reported



in these sections), most anglers see the catching of fish in a high mountain lake as part and parcel of their social and wilderness values. In addition there is no justification for singling out fish stocking as “particularly offensive as evidence of human activity” when presumably those who feel that way are doing themselves by a lake in the wilderness having hiked there on trails, or ridden on horses, have set up their camp, and built their fire. How can anyone claim that the addition of unseen fish in that lake is “particularly offensive” when considering that other far more obvious “evidence of human activity” surrounds them and even been increased by their very own activities?

Alternatives

ALTERNATIVES DEVELOPMENT PROCESS

APPLICATION OF RESEARCH (pg 51)

The overview part of this section (pages 51 through 54) once again gives the impression of prejudice toward alternative by virtue of the fact that the benefits and objectives of alternative D are well discussed, but the other 3 alternatives are not discussed at all (except the single phrase “In contrast to alternatives B and C” which is used to produce a lengthy discussion of alternative D only.

This conceptual framework was used to craft management alternatives B and C based on the hypothesis that the biological integrity of mountain lakes could potentially be conserved by managing for non-reproducing trout at low densities in some lakes and managing for fishless conditions in other lakes. (pg 51)

The underlined word “potentially” should be removed. The sentence already says that it is an hypothesis; the word “potentially” is redundant and unnecessarily prejudices the sentence.

ALTERNATIVE A (pg 72)

IMPLEMENTING THE FISHERY MANAGEMENT PLAN THROUGH CONGRESSIONAL ACTION

“The enabling legislation for the North Cascades Complex does not mention fish stocking, and the legislative record regarding fish stocking in the North Cascades Complex is not clear. Therefore, the language in the enabling legislation for the portions of the North Cascades Complex in the national recreation areas does affirm that fishing is an important recreational use, but it does not mention fish stocking as being an appropriate means of fishery management. The Washington Park Wilderness Act of 1988 (WPWA) established 93% of the North Cascades Complex as Stephen T. Mather Wilderness and directed the NPS to manage the wilderness in accordance with the Wilderness Act of 1964. At the time the WPWA was passed, NPS policies prohibited fish stocking in naturally fishless waters, and the WPWA did not include a provision for allowing stocking. (For more detail on legislation and history, please refer to the “History of Fish Management in North Cascades Mountain Lakes” section in the “Purpose of and Need for Action” chapter and Louter 2003).” (PG 73)

As in other places in the draft EIS, this paragraph is misleading since it creates the impression that other activities besides fishing and fish stocking are mentioned in the NCNP enabling legislation and/or the WPWA. That is not the case. None of the typical visitor activities such as fishing, hiking, horse back riding, or camping are mentioned in either document; nor are NPS supporting management actions such as trail maintenance or trail bridge building mentioned. Such paragraphs as these are misleading, and actually seem to expose a prejudice against fishing and fish stocking as an accepted activity within the NPS regardless of the historical context in which legislation was passed.

“However; some disagree with these views and maintain that if nonnative fish were stocked appropriately, there would be o unacceptable adverse impacts on wilderness values because biological integrity would be conserved.” (pg 73)

This is a disingenuous statement at best. The NCNP's own research (Liss and Larson study) concludes that fish stocked appropriately causes no disruption of biological integrity. To ignore this vital conclusion with the dismissive qualifier “some disagree” as is done here is unacceptable.

“Fish stocking has been allowed to continue in the North Cascades Complex under a 1986 policy waiver (see appendix A).” (pg 74)

The Trail Blazers and Hi-Lakers and, as far as I know, the WDFW do not agree that the 1988 agreement between the NPS and the WDFW represents a “policy waiver.” Those agreements are binding and can not be changed without mutual agreement. If for no other reason, it is clear that the WDFW does not agree with the EIS in this draft form because of their strong objection to the MRA procedure found in Appendix K.

Throughout this draft EIS these agreements are characterized as “policy waivers”. The concept of “waiver” needs to be removed from the EIS. (See the written response from Dale Riveland for additional details.)

“The NPS has determined that fish stocking in the Stephen T. Mather Wilderness would only be implemented if Congress granted the NPS the unambiguous legal authority to do so. Therefore, should a management alternative that allows for continued stocking be selected through this plan/EIS decision-making process, the NPS intends to ask Congress for a change to the North Cascades Complex enabling legislation to clarify how the mountain lakes should be managed.” (pg 74)

Trail Blazer and Hi-Lakers, as well as the WDFW, do not agree with this requirement. Why has the NPS determined that it needs such direction from the Congress when no other management action the NPS takes in the NCNP is so specified by Congress (e.g., trail building, bridge building, fire management, back country campsite development)? The Trail Blazers, the Hi-Lakers, and the WDFW have no objection to seeking such clarification, and would welcome it if it resolves that issue in the minds of NPS managers, but we certainly do not agree, is concluded at the top of page 75, that without such congressional clarification, alternative D should be implemented as some sort of default. (See the written response from Dale Riveland for additional details.)

MINIMUM REQUIREMENTS (pg 76)

“The results of the minimum requirements analysis show that stocking of nonnative fish to create and enhance an artificial recreational fishery is not necessary to meet the minimum requirements for the administration of the Stephen T. Mather Wilderness (see appendix K).” (pg 75)

The Hi-Lakers and Trail Blazers join the WDFW statement of strong objection to how the interagency Minimum Requirements Analysis (MRA) applied in this draft EIS. The NPS may desire to eliminate the “artificial recreational fishery” that existed before the park was created, but it has greatly overstepped the MRA process in attempt to create evidence in support of that desire. The MRA found in Appendix K seems to be the most extreme MRA ever done by the NPS, and none like it (a programmatic” MRA) has ever been done by the three other federal agencies that use this standardized process. In fact, in the case of the Forest Service their policies would not even allow such a “programmatic” use of an MRA. (See my more extensive comments regarding the Appendix K section; as well as the written response from Dale Riveland.)

CURRENT FISHERY MANAGEMENT PROGRAM (pg 76- 81)

This overall section does a plausible job of describing the current fishery management program; however, there is one glaring omission: there is no section for “Lakes with Low Densities of Non-reproducing Fish”. All other permutations of with fish, fishless, and reproductive status are covered except this most crucial one upon which both alternatives B and C depend. I trust this was an oversight and not yet another example of possible prejudice in favor of alternative D.

CURRENT STOCKING PRACTICES (PG 78)

I congratulate the EIS team for the excellent and accurate description of current stocking practices found in this section.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES (pg 82)



ADAPTIVE MANAGEMENT

“Adaptive management is based on the premise that managed ecosystems are complex and unpredictable. Adaptive management is an analytical process for adjusting management and research decisions to better achieve management objectives. This process recognizes that our knowledge about natural resource systems is uncertain; therefore, some management actions are best conducted as experiments in a continuing attempt to reduce the risk arising from that uncertainty. The goal of such experimentation is to find a way to achieve the objectives while avoiding inadvertent mistakes that could lead to unsatisfactory results (Goodman and Sojda 2004).” (pg 183)

This is an excellent description of how this critical management practice works and of its benefits. Alternative D is a poor choice as an outcome of this NEPA process for precisely the reason that it does not manage the existing situation using this excellent adaptive management process (see the next comment).

“The adaptive management process for the 91 lakes in the study area would evaluate the effects of management actions (for example, allowing management of low densities of non-reproducing fish) on biological resources at an individual lake and identify whether the management action should be modified to meet the objectives for the lake.” (pg 83)

Well said. This sentence describes well why alternative D is a poor choice since alternative D does not provide an opportunity to adaptively manage fish stocking. It is possible that adaptive management over the long haul applied to alternative B will result in the same outcome as alternative D would, but getting there via adaptive management is the safer and more conservative way to get there. This is one reason why the notion that alternative ID should be the “default” alternative makes no sense in the eventuality that congressional clarification does not materialize.

ALTERNATIVE B (pg 98)

GENERAL CONCEPT

“Ultimately, any lake that would contain fish from the initial implementation of this alternative could be considered for complete fish removal in the future based on the results of monitoring (see appendix F for details regarding monitoring).” (pg 98)

In order to be consistent with the “Proposed Management Framework” section on page 101, this statement must be modified to include the other logical management action which could result from monitoring; namely, that any lake could be considered for restocking with nonreproducing fish in low densities once harmful fish populations have been removed.

MINIMUM REQUIREMENTS

“Stocking naturally fishless lakes, even with nonreproducing trout, would not leave the wilderness “ideally free from human control or manipulation. “ (pg 101)

This is misquoted. The proper quote from the MRA guide in Appendix K is:

“ideally free from modern human control or manipulation

Frankly, I doubt this was an oversight since there are so many other examples of apparent prejudice in the draft EIS tending to build a case against the continuation of fish stocking. The MRA procedure 15 designed to insure that modern methods (primarily motorized equipment) are not used if there is a more minimal method of accomplishing the task. This misquote gives the impression that the MRA procedure requires that an activity have no aspect of human manipulation. That would be a misuse of the MRA process which is no doubt why the omitted word “modern” is in the MRA criteria in the first place. Logically in fact, if this criterion were held to no human manipulation, the MRA procedure would be superfluous since no action by humans could ever be considered minimal.

PROPOSED FISHERY MANAGEMENT PROGRAM

PROPOSED MANAGEMENT FRAMEWORK

“The proposed management framework under alternative B would be to eliminate high densities of reproducing fish populations from lakes in the study area while allowing low densities of reproducing and nonreproducing fish populations. Management actions would be applied to the 91 study area lakes throughout the North Cascades Complex. The restocking of nonreproducing fish would be allowed only where impacts on biological resources could be minimized. Based on the best available science, some lakes could be restocked with low densities of nonreproducing fish once reproducing fish have been removed. Lakes where critical information is missing would not be stocked until that information becomes available. An extensive monitoring program (see appendix F) would be implemented to adjust future management and to avoid unacceptable effects on native biota from fish presence.” (pg 101)

This overview of the management framework under alternative B is incomplete. This section needs to be expanded somewhat to include the justification for low density fish populations. Specifically, the following sentence could be used:

“The creation of low density fish populations under alternative B, particularly when those fish are nonreproducing, is designed to maintain the historical fishing opportunity while maintaining the biological integrity of the lakes.”

ALTERNATIVE D

IMPLEMENTING THE FISHERY MANAGEMENT PLAN THROUGH CONGRESSIONAL ACTION

“This alternative would not require congressional action to clarify the North Cascades Complex's enabling legislation.” (pg 112)

This statement is inconsistent with many other places in the EIS where the NPS claims that the Congress was unclear or ambiguous as to its intent. Unclear or ambiguous can go in either direction. How does the NPS know that alternative D reflects the Intent of Congress any more than any other alternative, and particularly more than the preferred alternative B. This statement as is once again creates the impression of prejudice against the continuation of fish stocking.

PROPOSED FISHERY MANAGEMENT PROGRAM

PROPOSED MANAGEMENT FRAMEWORK

“...so these lakes would continue to provide residual sport-fishing opportunities for the foreseeable future, and the goal of complete removal might never be achieved.” (pg 113)

This phrase should be removed. If one understands the concepts presented in this EIS, then one know that lakes with high density fish populations are stunted and wreak havoc with biological integrity. It is disingenuous to offer such a poor fishery as some sort of compensation for the loss of the quality fishery which is possible using nonreproducing fish in low densities under alternative B. At best the phrase is an attempt to justify alternative D over alternative B to the angling community. As a member of that community, I don't accept this ploy as meaningful.

“The NPS Management Policies, section 6.3.7, Natural Resources Management in Wilderness, states:

The principle of non-degradation will be applied to wilderness management, and each wilderness area's condition will be measured and assessed against its own unimpaired standard. Natural processes will be allowed, insofar as possible, to shape and control wilderness ecosystems. Management should seek to sustain the natural distribution, numbers, population composition, and interaction of indigenous species. Management intervention should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and influences originating outside of wilderness boundaries.” (pg 113)



This section is incomplete without giving “equal time” to the recreation policies found in chapter 8 of the NPS Management Policies (such as sections 8.2.2.x found in Appendix D). Statements from chapter 6 alone without consideration of the balance the NPS must maintain with chapter 8 “Use of the Parks” considerations once again creates the appearance of bias toward alternative D.

HOW ALTERNATIVES MEET OBJECTIVES (pg 115)

“As stated in the “Purpose of and Need for Action” chapter, all action alternatives selected for analysis must meet all objectives to a large degree.” (pg 115)

“The plan’ objectives are to:

[&]

Provide a spectrum of recreational opportunities, including sport fishing, while minimizing impacts to the biological integrity of natural mountain lakes.”

[&]

“Even alternative D (91 Lakes Would Be Fishless) would provide sport-fishing opportunities in mountain lakes for a lengthy period because it would take many years to remove all reproducing fish populations from the mountain lakes. If it is not feasible to completely remove fish from larger, deeper lakes, fish densities would be reduced, and these lakes could provide sport-fishing opportunities indefinitely (refer to tables 7 and 8).” (pg 115)

These two sentences from this section represent a gross distortion of the concepts otherwise usually fairly presented in this draft EIS -apparently once again in order to justify alternative D as being acceptable. Alternative D absolutely does not meet the “sport fishing” plan/EIS objective (of a total of four objectives) as claimed here.

Anglers do not appreciate lakes with high densities of reproducing fish any more than conservationists, park employees, consultants, or anyone else. Such lakes not only lack biological integrity, and most anglers abhor that situation, but provide essentially no quality sport fishing opportunity. Such a claim is like saying to a serious golfer that miniature golf provides a sporting opportunity to play golf and improve one's game. Claiming that the removal of the quality fishery via the removal of all nonreproducing low density fish population, while keeping the stunted lakes to “provide sport-fishing opportunities in mountain lakes” is tantamount to making a farce of this entire EIS document, and is insulting to those of us who have worked in good faith with the NPS for over two years on this process.

Even the somewhat reasonable claim of the last sentence is misleading since to accomplish the indefinite reduction of fish populations in these “larger, deeper lakes” that contain high densities of reproducing fish would require periodic use of chemical methods on these lakes. Such an indefinite program would certainly impact the ecosystems, and even wilderness values, more than any of the additional actions required to adopt alternative B.

ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

“Provide sport fishing opportunities by stocking some of the 154 mountain lakes that have never had any fish presence.”

This plan/EIS did not contemplate stocking any of the 29 currently fishless lakes because both the NPS and WDFW assumed that if the lakes have gone fishless, they are undergoing a natural recovery process that should not be interfered with.” (pg 118)

Historical documents show that the WDFW never agreed to this concept. The EIS may not have considered these 29 lakes based on NPS assumptions, but the implication that the WDFW agrees with the conclusion that these lakes should not be interfered with is erroneous.

CONSISTENCY WITH SECTIONS 101(B) AND 102(1) OF THE NATIONAL ENVIRONMENTAL POLICY ACT

“Alternative B, Proposed Adaptive Management of 91 Lakes under a New Framework (42 Lakes May Have Fish), Preferred Alternative.”

“However, because alternative B proposes to continue a fish stocking program in naturally fishless lakes in the North Cascades Complex, it is not totally consistent with NPS Management Policies (NPS 2001a), which seek to preserve native biota and conserve biological integrity. Alternative B may also be viewed by some as inconsistent with the Wilderness Act because it continues a practice of fish stocking and human influence in a designated wilderness area.” (pg 120)

As far as I can tell, concerns of consistency with NPS Management Policies has nothing to do with the requirements of sections 101B and 102(1) of NEPA, nor does consistency with the Wilderness Act.

“Alternative D (91 Lakes Would be Fishless).

This alternative meets the stated purposes of NEPA sections 101(b) and 102(1) to a large degree.” (pg 121)

The phrase “large degree” should be changed to “some degree” for reasons outlined in the “How Alternatives Meet Objectives” section above

“There would, however, still be fishing opportunities in the reservoirs and streams.” (pg 121)

This is another of these disingenuous comments noted before. This EIS is on fishing in the mountain lakes of the NCNP. Opportunities in reservoirs and streams have nothing to do with mountain lakes. A statement like this would be like telling a backpacker that although backpacking would no longer be allowed, strolling on paved, paths in the park would still be available.

“These lakes would continue to provide sport-fishing opportunities for the foreseeable future....” (pg 121) This is a gross exaggeration of the situation (see the “How Alternatives Meet Objectives” section above). “However, illegal stocking may occur under this alternative.” (pg 121)

This is a major issue and is not given enough exposure in this draft of the EIS. If the park were to choose alternative D and thereby essentially eliminate the historical mountain fishery which has been there for decades (well before the creation of the park), visitors to the lands of the park who fish will certainly notice the reduction or elimination of fish from their “favorite” lake. Quite innocently, they might be tempted to “help nature along” by transporting fish fry from a stream or river in the park. This is very easy to do and one person could undo tens of thousands of dollars of work in an afternoon. This scenario ought to be taken more seriously by the NPS as they consider the implications of alternative D versus alternative B. The best way to minimize the risk of unsanctioned stocking by an uninformed public is to maintain a disciplined, well-managed fishery along with public outreach and education.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

“The WDFW does not agree that alternative D is the environmentally preferred alternative because it does not strike any balance between protecting biological integrity and preserving historic processes.” (PG 122)

The Trail Blazers and Hi-Lakers agree with the WDFW's analysis. Additionally it should be noted in this section that the potential of illegal stocking actually and perversely may make alternative D the least environmental friendly alternative (given the ease with which it can be done, and the strong likelihood that some uninformed park angler will consider transporting fish a good idea). Lakes stocked under the guidance of professional biologists must be preferred to haphazard stocking by an ignorant general public.

One does not need to look far to see examples of illegal stocking in the state of Washington. The lowland (warm water) fish~ in this state has had example after example of such activity by an uninformed public. In spite of all the



hard: work by WDFW biologists, intensively managed warm and coldwater fisheries are under constant attack from such illegal stocking activities. It is hard to imagine how much worse it might be in a situation where a fishery has been totally removed in lakes where the public has grown accustomed to fish being present.

I submit that the NPS has been too hasty in picking alternative D as the environmentally preferred alternative. On the surface it might appear that the removal of all fish is best for the environment, but given the existence of an historical fishery, and of the scientific research that demonstrates that the stocking of non-reproducing fish in low densities does not disturb the ecological integrity of the lake, alternative B might well be the best choice under this section. The fish experts in this state, namely the WDFW biologists, clearly think so.

TABLES

TABLE 14 - 16

I have not attempted to make all the comments I might on these tables since they are so redundant with the previous sections where I have made comments above. I leave it to the EIS editors when they update this draft version to the final version to make these tables consistent with comments in other sections. (Actually, this requirement for the editors applies to all sections of the EIS.)

Mitigation/Alternative B

“Reproduction would be limited by inducing genetic sterility or selecting hatchery strains that cannot reproduce due to spawning habitat limitations and/or timing of spawning limitations (e.g., Mount Whitney rainbow trout).” (pg 129)

The use of the underlined word “limited” is misleading. “Limited” gives the impression of reduced somewhat”. This word should be replaced with the word “eliminated” since sterile fish can not reproduce at all.

Vegetation/Alternative D

“Vegetation at these lakes would experience overall beneficial impacts.” (pg 134)

This sentence should be removed. There is no evidence presented in the entire draft EIS that anglers cause f increased damage to vegetation. One person's guess is no better than another's. For all we know the removal of fish would increase impacts on vegetation due to increased use by campers who will no longer need to compete with anglers for presence at the lake. No, such speculation is best removed.

Wilderness Values/Alternative D

“Sport-fishing opportunities would be vastly reduced compared to alternative A because all stocking in the North Cascades Complex would cease, and fish would be removed from all lakes, where feasible. This would result in long-term moderate to major beneficial impacts on opportunities for solitude in areas where fishing opportunities are eliminated.” (pg 138)

The underlined phrase should say “alternatives A, B, and C”.

The second sentence should be removed. There is no evidence that removing fish will lessen the number of visitors at a lake to the extent such that a typical visitor approaching a lake will see no one else (definition of solitude). Certainly such a benefit, if it occurs at all, is highly unlikely to be “major”. (Such statements only serve to undermine the credibility of this draft EIS. Such consistent exaggerations of benefits under alternative D together with the consistent exaggerations of the negative impacts of the other three alternatives is unfortunate and not worthy of the people's National Park Service.)

Wilderness Values/Alternative B

“There would be a long-term major adverse cumulative impact on those who believe that the continued stocking (as proposed under alternative B) in wilderness and continued presence of reproducing populations of fish would compromise natural processes in wilderness.” (pg 139)

The underlined phrase should be removed. One of the objectives of alternative B is to remove all reproducing populations. (Note that it is not relevant whether such removal is an easy or a hard task especially since any such difficulty applies equally well to alternative D.

Objectives/Alternative D

“Does not fully meet objective.” (pg 143)

The sentence should be changed to:

“Does not meet the objective”

The objective is to “provide a spectrum” of opportunities for sport fishing. This entire EIS is about Mountain Lake fishing; that does not include streams and reservoirs. Even if it did, by removing all fish from all high lakes, that fishing opportunity would no longer cut across “a spectrum” of opportunity since an entire end of that spectrum will have been removed. (This is just another example of the prejudicial and preferential treatment shown by authors for alternative D. Hopefully, NPS management can find a way to insist that the final version is purged of this lingering bias.)

Affected Environment

Although I could have made many more comments in this section, I have not because there is so much repetition of issues, statements, conclusions, and all other content that I felt it was redundant to repeat comments which I have already made above in one way or another. I leave it to the EIS editors when they update this draft version to the final version to make the content of this chapter consistent with my comments found in the previous chapters. On the other hand, I have written a few comments on this chapter when I felt the time justified.

AQUATIC ORGANISMS

PIANKTONIC ORGANISMS

ZOOPLANKTON

“Lower densities of fish, more typical of stocked situations, do not have as great an effect. There is not much difference in abundance of diaptomid copepods between these stocked lakes and fishless lakes (Liss et al. 1998), possibly because the densities are not as high in stocked lakes, and the zooplankton can recover between stockings.” (pg 163)

These sentences should read:

“Fish stocked in low densities (for example with nonreproducing fish) have little if any measurable effect. There is not much difference in abundance of diaptomid copepods between these stocked lakes and fishless lakes (Liss et al. 1998).”

The phrase “not...as great” is awkward and gives the wrong impression that the difference between high density and low density fish populations is minor when just the opposite is the case. The ending phrase starting with “possibly” is speculative and likely wrong. Measurements show that the zooplankton populations simply do not depress much at any time in the stocking cycle. The lack of effect of zooplankton is simply a matter of there being low numbers of fish at all times; there is no evidence that zooplankton populations get depressed immediately after a stocking event and then rebound over a few years as this original wording implies. Frankly, the original wording shows a significant misunderstanding by this draft EIS author of low density stocking with nonreproducing fish since low



density populations using this management technique are not primarily the result of infrequent stockings (indeed they could occur every year) but rather the result of using very low numbers of fish per acre at every stocking event.

AMPHIBIANS

LONG- TOED SALAMANDER

“In general, the research indicates that there are far fewer long-toed salamanders in lakes and ponds that contain fish (especially reproducing fish), compared to lakes and ponds that are fishless, although the variation in abundance can be high even within a lake.” (pg 167)

This sentence needs heavy modification. As it stands it is very misleading. The situation is far more complex than to simply consider lakes with fish and lakes without fish (see the NCNP's own Liss and Larson study for pages and pages of evidence that supports my contention). This sentence as it stands implies that there are always far fewer salamanders in a lake with fish than a lake without fish (in spite of the off hand qualifier at the end of the sentence). The research shows this is not true. The important distinction to make is not between lakes with fish and those without fish, but between lakes with reproducing populations of fish in high densities and lakes with nonreproducing populations in low densities. Fishless lakes are just the limiting case of a low density population. In fact, the Liss and Larson study has shown that indeed there is no measurable difference in salamander densities between a lake with nonreproducing fish in low densities and fishless lakes. This is expected if fishlessness is simply the limiting case of low densities. The draft EIS misses this vital distinction of fish density time and time again, and this is just another example.

A key point to remember whenever writing a section such as this is that the research does not show that the mere presence of; fish affects the biological integrity of the lake ecosystem, but rather the biological integrity, is proportionally dependent on the population density of the fish.

“In contrast, in seven lakes containing fish that were either nonreproducing stocked (2 lakes) or reproducing (5 lakes), the range was drastically lower: 0 to 8 individuals per 328 feet of shoreline surveyed.” (pg 167)

I find it unbelievable that the EIS authors seem to have so little understanding of the vital conclusion of the Liss and Larson study that one can not lump reproducing and nonreproducing fish populations in the same statistic. In the context of proper mountain lake fishery management, mixing statistics from these two different data sources (reproducing and nonreproducing fish populations) is the ultimate apples and oranges story. These “slips” always seem to produce a negative image for fish stocking. This consistent pattern can not be the result of honest mistakes, but rather demonstrate a built-in bias of at least some of the EIS authors. The process that produces the final version of this EIS must have some sort of vetting process built-in to avoid this sort of unfortunate misrepresentation.

OTHER AMPHIBIANS

PACIFIC TREE FROG

“Recent research on the impacts of nonnative fish on Pacific tree frogs in the Sierra Nevada Mountains suggests that Pacific tree frogs have declined significantly in areas with large numbers of stocked lakes as a result of fish predation on egg and larval stages (Matthews et al. 2001b).” (pg 170)

Here is yet another example of the failure of at least some of the EIS authors to appreciate the vital distinction of fish population density when analyzing fish impacts on biological integrity. Apparently at least one of the authors was looking for evidence to support an already formed conclusion that the presence of fish in lakes depresses the frog populations. So rather than going to the scientific literature to educate oneself on what a full body of research demonstrates, the author simply used material that supported his or her already formed views.

To make my point, allow me to tell of an opportunity I had on October 24, 2002 to hear Kathleen Matthews speak at the University of Washington on her research in the Sierra Nevada. At that time (and therefore also when the paper referenced here was written), Kathleen herself also lumped low density and high density statistics together. At a

reception after her talk I spoke with her about the newly released Liss and Larson study where the importance of making this vital distinction of fish population density was demonstrated. She had not yet seen the Liss and Larson papers. She and I exchanged email for several weeks after that as she read the Liss and Larson papers using links I provided to her. She quickly came to realize the importance of factoring fish population densities into the process of analyzing predation data in high mountain lakes. She wrote me an email on November 11, 2002 when she said in part:

“I finally had a chance to read through the Liss et al. papers and agree that bringing in the range of predation into the equation is compelling.”

Clearly no attempt was made by the EIS authors to become well informed on the Sierra Nevada research before jumping on the opportunity to confirm their pre-existing views on the undesirability of fish stocking of wilderness lakes. (Incidentally, she went on to say that she was in the process of re-analyzing her data set using fish population density as a key factor; however, I do not feel at liberty to release Ms. Matthews private email in its entirety without her permission, but I'm sure that can be managed if the EIS teams so desires.)

Environmental Consequences

Although I could have spent days making comments in this important section, I have not because there is so much repetition of issues, statements, conclusions, and all other content that I felt it was redundant to repeat comments which I have already made above in one way or another. Although there are many misleading or incorrect statements in this section, I leave it to the EIS editors when they update this draft version (which can be expected to harbor errors) to the final version to make the content of this chapter consistent with my comments found in the previous chapters.

History of Public Involvement

I have no comments to make on this entire section except to say that I congratulate the NCNP employees and management who designed and implemented the public involvement process. I feel the NCNP has been open and fair with the public throughout this entire NEPA process. The public had superb access to information and has been given extraordinary opportunity to participate.

I'd also like to congratulate both NCNP and WDFW personnel for the remarkable degree of respect and cooperation they have shown each other during this process. In an era where federal and state agencies often battle over jurisdictional issues, it is a pleasure to see the difference a few committed individuals can make such that a constructive dialog takes place against a background of such difficult issues.

Volume Two

Appendix A

JUNE 12, 1986 MEMO FROM WILLIAM MOTT TO THE REGIONAL DIRECTOR, PNW REGION

“In your January 27, 1986, memorandum and in follow-up discussions, you requested that we provide you with a clear statement regarding National Park Service policy for management of fisheries resources in the North Cascades Complex.” (pg 8)

Throughout the draft EIS it is claimed that fish stocking has continued in the NCNP under a “policy waiver”. I submit that this memo from the Director of the NPS clearly establishes policy for fish stocking in the NCNP as distinct from any other park in the NPS system. It can not be construed as merely a policy waiver. The word waiver never appears in this memo.

All references to “policy waiver” where ever they appear in the draft EIS need to be changed to read “policy”. Other changes in content will no doubt be required to accommodate the fact that a policy was established in 1986 as opposed to a policy waiver.



“Park waters that are potential candidates for continued fish-stocking are to be reviewed to determine which waters warrant management as an enhanced recreational fishery, and for which continued fish-stocking is to be an acceptable action.” (pg 9)

Furthermore, this memo establishes the policy (not policy waiver) that fish stocking is an acceptable management activity within the NCNP with proper management.

“These data will help provide an informed basis for determining whether changes in our fish-stocking management actions may be needed in the future.” (pg 9)

Here the memo provides the basis of the very NEPA process underway now- a part of which is this EIS. Mott's vision does not include any statement, or even concern, that congressional clarification is required. Mr. Mott apparently felt in 1986 that as Director of the NPS he had full authority to establish a fish stocking policy for the NCNP, and he anticipated the day when scientific research and data would bring the NCNP to the point of having being able to adopt a preferred alternative (alternative B) which would then implement those “changes in our fish-stocking management actions”. His policy is not dependent on approval by Congress, and as such the provisions of this draft EIS that proclaim that alternative D must prevail until such congressional clarification is obtained are in contradiction to this NPS policy adopted at the highest NPS level in 1986.

JULY 12, 1988 SUPPLEMENTAL AGREEMENT TO MOU BETWEEN NPS AND WDFW

“This Supplemental Agreement shall first be subject to mutual review and evaluation by July 2000. The Intent is to give this Agreement a 12-year life and that upon mutual review, the Agreement may be continued or modified based on information available at the time of review.” (pg 11)

This agreement between the NPS and the WDFW further demonstrates that this NEPA process ought to be the complete and whole procedure to determine any changes to the fish stocking policy first established by Mott in 1986 and implemented in detail here with this MOU supplement in 1988. The deadline of July 2000 was not met due to the unavailability of the Liss and Larson data upon which Mott's vision depends. The MOU and this Supplemental Agreement have been extended to December 31, 2006 via mutual agreement between the NPS and the WDFW. Once again there is no mention of the need for congressional clarification. There is no reason why the NPS needs guidance from Congress in order to adopt the preferred alternative B.

“Additions or deletions to the list of 40 lakes may be made only by mutual agreement of the Department and the Service. Research results will be considered in future decisions.” (pg 10)

Furthermore, if the NPS were to insist on defaulting to alternative D without such congressional clarification it would be in violation of this provision of the Supplement Agreement since alternative D would delete all lakes from the list of 40 referred to here. The WDFW has not agreed to such deletions, but only to the plan found in the preferred alternative B.

Appendix B

“June 12, 1986 - The director of the NPS issued a policy statement that placed all mountain lakes in the North Cascades Complex into three categories: (1) natural fish-free waters, (2) self-sustaining fish population waters, and (3) continue-to-stock waters.” (pg 28)

This confirms that before 1986 there may have been the conception, or misconception that fish stocking was done under a “policy variance; however, in 1986 the Mott memo resolves any possible misunderstanding in the past by creating a NPS policy.

Appendix K

MINIMUM REQUIREMENTS DECISION GUIDE

ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

“except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”

- The Wilderness Act, 1964

Before I get into the specific comments on the MRA, allow me to present the results of some research I have done on the MRA procedure itself and its use.

When I first saw this MRA I was appalled. Its reasoning and conclusions were so absurd that I just could not believe that it made it into an otherwise quality document such as this draft EIS. In fact, I was so sure that this MRA was an abuse of the procedure that I some checking with various sources in an attempt to better understand the MRA process, and in particular, to better understand the circumstances under which it was designed to be used.

The first thing I did was to go the Arthur Carhart National Wilderness Training Center's website to get the forms and instructions that make up the MRA procedure. Next, I spoke with several NCNP employees to get examples of how the MRA process had been used in the past. It eventually became clear that the MRA found in this draft EIS was highly unusual since no one seemed to know if one like it had ever been done before. The MRA examples all seemed to have been done in the more traditional way of helping agencies decide primarily whether motorized equipment could be used.

Finally, I was able to speak to NPS and the National Forest Service (NFS) employees at the Arthur Carhart National Wilderness Training Center who have knowledge of how MRAs are used on a nationwide basis. I learned that four federal agencies developed the MRA process and use it. I discovered that an MRA such as the one found in this MRA is loosely called a “programmatic” MRA. (Basically a “programmatic” MRA is one that looks at an activity rather than a tool.) With further discussion it became apparent that it is highly unusual for an MRA to be used in this programmatic fashion.

I happened to talk first to Tom Carlson who is the NFS representative at the Carhart Training Center. He stated that programmatic MRAs are not done by the NFS and it is against their policy to do so. He confirmed that to his knowledge an MRA such as the one in this draft EIS had never been done by the NFS. Furthermore Tom was on the committee that designed the MRA procedure in the first place, and he was of the opinion that the MRA design was not appropriate to be used in this programmatic manner. He felt that the overall NEPA process itself was better able to handle such decision making since it was designed to analyze such broad issues whereas the MRA question set was designed to address the Wilderness Act 4(c) exclusions only (i.e., use of modern tools).

Next, I planned to talk to the NPS representative at the Carhart Training Center but instead ended up talking to his boss in Washington DC. It is my understanding that no one in the NPS knows more about the use of MRAs in the NPS than does Rick Potts, National Wilderness and Recreation Programs Manager for the NPS. Rick agreed that although the NPS does not have a policy forbidding the use of the MRA in programmatic situations like the NFS does, it has been highly unusual in the NPS to do programmatic MRAs. In fact, he was only aware of four such MRAs of the many MRAs the NPS has done. One is in this NCNP draft EIS on fish stocking; the other three are: one in the Rocky Mountain NP for trails; another in the Kings Canyon NP for fire management; and one in the Shenandoah NP for trails. Rick noted that the MRA procedure was relatively new having been created in 2000 and was still evolving. He mentioned that an effort was currently underway to revamp the MRA procedure such that it could be used across the four agencies in a standardized manner: in particular between the NFS and the NPS. Rick did not yet know what the outcome of that effort would be, but he thought the new standards would make it even less likely that the NPS would do programmatic MRAs in the future.

In my opinion the MRA found in this draft EIS is the most sweeping use of an MRA that has ever been done in the NPS. In none of the other three programmatic MRAs is an historic management activity disapproved across an



entire park. These other three programmatic MRAs allow the management activity to continue, but simply restrict certain instances of its use where harm can be shown. Frankly, that is not unlike what preferred alternative B attempts to accomplish within the overall NEPA process; namely, the continuance of the of fish stocking, but limiting in it in situations where harm can be shown. There is no justification' for a separate MRA procedure to usurp the overall objective of the NEPA process by pushing the use of the MRA procedure to the most extreme use it has ever been subjected to.

This NCNP fish stocking NEPA process is filled with enough controversy without unnecessarily introducing the use of a fairly new procedure in a way that pushes its use to an extreme limit -especially just as efforts are underway within the NPS and the NFS to evolve the MRA procedure to its next incarnation which is very likely to restrict or even eliminate "programmatic" MRAs such as the one unwisely included in this draft EIS.

Here are my comments specific to the implementation of the MRA in this draft EIS:

A. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

"Fish Stocking: There is no provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that explicitly allows for fish stocking." (pg 289)

Neither is there any provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that forbids stocking. In addition there is no provision in the enabling legislation, the Wilderness Act, or the Washington Park Wilderness Act that allows for trail building, trail maintenance, bridge building, campsite construction, or dozens of other actions the park engages in every day. This reference to these pieces of legislation is at best a red herring since such legislation is designed to leave such details to the administering agency as is proven by the total lack of such authorization for any action. Why expect these pieces of legislation to authorize fish stocking when it authorizes none of these other actions?

Beyond these considerations is the fact that the Wilderness Act permits fishing, and today's science clearly shows that the only way to provide biological integrity is to stock with nonreproducing fish in low densities.

C. Describe Other Guidance

"Fish Stocking: Stocking of naturally fishless lakes in the National Park portion of the Stephen T. Mather Wilderness violates current NPS management policies regarding stocking of nonnative fish into national park waters." (pg 289)

This is incorrect. The Mott memo of 1986 explicitly creates a policy for fish stocking in the NCNP. Fish stocking in the NCNP today is wholly within NPS policy.

Explain: (pg 290)

NPS Management Policies (2001)

This section is incomplete. It quotes NPS policy from chapters 4 and 6 but leaves out anything from chapter 8 except a brief excerpt. Chapter 8 concerns itself with the NPS's mandate to provide recreation, whereas chapters 4 and 6 concern themselves the NPS's mandate to preserve and protect natural resources. Even the one brief excerpt from chapter 8 has a preserve and protect theme.

Once again we see the appearance of bias favoring the elimination of fish stocking by the EIS authors since it is only when you balance the preserve/protect policies of the NPS with its recreation policies that a fair analysis can be made.

"In contrast to sport fishing, the practice of stocking fish is generally prohibited in park units." (pg 290)

This is incorrect. General policy does not apply to the NCNP because the fish stocking policy for the NCNP was set by Director Mott in his 1986 memo.

Memorandum of Understanding between the NPS and WDFW

“Currently, the management of mountain lakes is performed under a temporary extension of the 1985 Memorandum of Understanding and 1988 Supplemental Agreement between the two agencies.” (pg 291)

The underlined word “temporary” should be removed. All MOUs between the NPS and state agencies are intended to be renegotiated from time to time. There is nothing “temporary” about these agreements.

E. Wilderness Character

Untrammelled:

“Stocking naturally fishless lakes, even with nonreproducing trout, would not leave the wilderness “ideally unhindered and free from modern human control or manipulation.” Stocking of fish would manipulate the native ecology of a lake and introduce a nonnative species for the purpose of enhancing recreation.” (pg 292)

Even though the word “modern” is retained in this case (unlike in the main body of the draft EIS - see previous comments), the connotation of this word is totally ignored in this rationale. Fish have been stocked in lakes for centuries, including by native peoples well before the white man's arrival. There is nothing “modern” about fish stocking. This paragraph once again demonstrates how the intent of the MRA process is being subverted here to support a predetermined conclusion to eliminate fish stocking from the NCNP.

Anyone who has prior experience with the MRA procedure knows that in the vast majority of MRAs, they are used to determine whether truly modern techniques (primarily motorized equipment) must be used to accomplish a particular activity. This is the reason the word “modern” appears in this part of the MRA. How can anyone consider the packing of fish fry on the backs of people, or by horse, to be a “modern human control or manipulation”. Aircraft is not necessary to stock lakes. Now, if one wanted to do an MRA to determine whether aircraft should be used to stock fish as opposed to hand methods, that would be a perfectly valid use of the MRA process. However, this MRA as it stands is a sham, perhaps even a scam.

Natural:

“Stocking with nonreproducing trout would temporarily affect the natural character of naturally fishless lakes in wilderness by introducing a nonnative species, thus manipulating the ecological structure of the lakes.” (pg 292)

The MRA procedure defines this “natural” character as:

“Natural” - Wilderness ecological and evolutionary systems are substantially free from the effects of modern civilization.

How can anyone with a straight face believe that the backpacking of fish fry into a lake, where such fish would naturally live if the stream gradients of the North Cascades were not so steep, as being an “effect of modern civilization”? It is ludicrous to make such an argument. Even the practice of fish stocking itself has no connotations of “modern civilization” since it has been practiced for thousands of years all over the world in all civilizations. One may object to the stocking of fish in the NCNP, but one can't misuse the MRA procedure in an attempt to prove your point.

Furthermore, the Liss and Larson study belies the last few words of this section. Nonreproducing fish populations in low densities do not manipulate the ecological structure of the lake in any measurable way. Their research could find no measurable difference in the ecological structure of a fishless lake and one which has been stocked with nonreproducing fish populations in low densities.



F. Describe Effects to the Public Purposes of Wilderness

Explain:

“For example, some of the mountain lakes would no longer provide scientists with the opportunity to study the ecology of naturally fishless mountain lakes because the lakes would contain nonnative fish.” (pg 293)

Here is another ridiculous claim that demonstrates the lack of integrity in the use of this MRA procedure. The EIS itself declares that there are 245 lakes in the NCNP complex. It also declares that only 91 of those lakes have ever had a history of fish stocking. Alternative B proposes to continue fish populations in only 29 of these 91 lakes with a possible addition of 13 more once there is sufficient data to determine a proper management strategy for those 13 lakes. So even if all 13 of those lakes now in limbo are added to the 29, there would only be a total of 42 of the total 245 lakes that would not be available as “fishless lakes” for research. This leaves the remaining 203 lakes available to researchers. Furthermore, many scientists might even consider it a benefit to have a few lakes that are not fishless to provide contrast and controls in the research area. In any case, research in California parks and in Idaho wilderness areas has shown that a lake returns to its natural state in about 11-20 years, even after having been subjected to the devastation of high density fish populations. The extreme position presented in this section is a far reach indeed and exposes a likely bias on the part of the MRA author.

Step 1 Decision: Is it necessary to take action?

Explain:

“Fish Stocking: No. Stocking non reproducing trout into the high mountain lakes would continue to benefit the recreational wilderness experience for certain wilderness anglers. Stocking, however, would adversely impact the wilderness experience for other wilderness users. Fish stocking would also adversely impact, to varying degrees, the scientific, conservation and natural purposes of wilderness. If stocking were discontinued, opportunities for fishing in the high mountain lakes would be severely limited. However, various opportunities for sport fishing would remain in the rivers and streams, and other types of primitive and unconfined forms of recreation would still exist in the Steven T. Mather Wilderness. Therefore, the NPS believes that fish stocking is not required for administration of the area as wilderness.” (pg 294)

This logic has nothing to do with reaching the conclusion. You could apply this same logic to essentially any management action the park takes and presumably reach the very same conclusion; namely, that the action ought to stop.

To prove this point I have substituted “trail building” for “fish stocking” and “hiking” for “fishing” into the logic expressed above. I believe this exercise clearly demonstrates that the reasoning in the MRA must have been essentially “manufactured” to reach a pre-determined conclusion.

Trail Building: No. Building trails into the high mountain lakes would continue to benefit the recreational wilderness experience for certain wilderness hikers. Trails, however, would adversely impact the wilderness experience for other wilderness users. Trail building would also adversely impact, to varying degrees, the scientific, conservation, and natural purposes of wilderness. If trails were not built, opportunities for hiking in the high mountains would be severely limited. However, various opportunities for trail biking would remain in the lowland areas, and other types of primitive and unconfined forms of recreation would still exist in the Steven Mather Wilderness. Therefore, the National Park Service believes that trail building is not required for administration of the area as wilderness.

Note how the reasoning still makes perfect sense. In other words, if the park were to do a similarly reasoned MRA on building or maintaining trails in the park, it presumably would once again conclude that trail building or maintenance should stop in the park.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE COMMENTS ON THE MINIMUM REQUIREMENTS ANALYSIS

The Trail Blazers and Hi-Lakers agree totally with this view of a misapplied and disingenuous MRA exercise.

Good evening. As is often the case in a document such as this EIS, the conclusions reached by a well-intended reader will often be determined not by the facts and ideas alone, but how the presentation of these facts and ideas are emphasized. Here are three areas where the EIS obscures the fundamental underlying issues by either adding too much emphasis or by providing too little.

Number one, many people are rightly concerned about maintaining the ecological balance in these magnificent lakes when fish are introduced by man for his recreational benefit. The park itself funded a 15-year study of this issue. It is commonly referred as the Liss & Larson study.

The key conclusion of that study in regard to the fish stocking is there is no measurable difference between a fishless lake and a lake that has nonreproducing fish stocked in low densities.

Let me repeat that: There is no measurable difference between a fishless lake and a lake that has nonreproducing fish stocked in low densities.

I doubt many who are concerned about the biological integrity of these lakes understand that science has shown that these negative impacts simply don't exist. This vital scientific conclusion is given too little emphasis in the EIS.

Number two, there is a key concept which has been learned over the past several decades regarding how to balance the protection of these Alpine lakes but at the same time continue the well-established high lake fishery that was promised in the congressional hearings held in the mid 1960s when the park was established. This concept is a bit hard to catch the first time around since it is counterintuitive.

Here it is: Fish stocking with nonreproducing, that is, sterile fish in low densities is the best and only way to ensure the ecological health of these lakes. Intuitively you might think the best situation might be to stock a lake once and then hope the fish reproduce on their own after that. As the Liss & Larson study demonstrates, that is just not true. Reproducing fish lead to the overpopulation problems the EIS does a good job of condemning.

Fish stocking is the friend of the ecologically concerned citizen, not a practice to be scorned. Why would you want to eliminate fishing as a visitor activity if it causes no more damage than hiking and camping do? Why single out fishing? This key concept is given too little emphasis in the EIS.

And finally, allow me to describe an area where there is too much emphasis in the EIS, namely, the idea that stocking fish in high lakes somehow destroys the visitor's wilderness experience. There is nothing unnatural about a fish being in high lakes. In fact, they'd be there naturally if the creeks and the streams of the Cascades were less steep. To say that a visitor camping by a lake is somehow going to have their, quote, "wilderness experience," unquote, harmed by the presence of often unseen fish when this same visitor has just stared all day at the hiking trail they are walking on as it cuts through otherwise natural meadows or is standing in a well-used campsite as they look out into the lake or look down and see the scar of a fire ring in that campsite makes no sense. The comparison is even more ludicrous when you consider that the same visitor may have seen the unbelievably ugly scars that horses leave on lake shores, not to mention the evasive plants such as thistles and dandelions that stock animals spread throughout the North Cascades. Surely these approved activities are far more visible disturbances to the wilderness experience than the fish ring a visitor might happen to see on the surface of a lake. Thank you.

Deja vu all over again. Much has been said in these public meetings supporting the Washington Department of Fish & Wildlife's dissenting opinion found in Appendix K stating that the Minimum Requirements Analysis or MRA has been misapplied to fish stocking. I have expressed my agreement with the Department of Fish & Wildlife position myself, but want to present additional evidence demonstrating the flawed nature of the MRA.

On Page 294 of Volume II, the last question in the MRA asks: "Is it necessary to take action?" I am going to read verbatim the EIS answer to this question in regard to fish stocking. Then I am going to read essentially the very same words again, except that I will substitute "trail building" for "fish stocking" and "hiking" for "fishing." I believe this exercise clearly demonstrates that the reasoning in the MRA must have been, essentially, manufactured to reach a predetermined conclusion.

Now for the version as it exists in the draft EIS: "Is it necessary to take action? Fish stocking, no. Stocking nonreproducing trout in the high lake mountain lakes would continue to benefit the recreational wilderness experience for certain wilderness anglers. Stocking however, would adversely impact the wilderness experience for other wilderness users. Fish stocking would also adversely impact to varying degrees the scientific conservation and natural purposes of the wilderness. If stocking were to continue, opportunities for fishing in the high mountain lakes would be severely limited. However, various opportunities for sport fishing would remain in the rivers and the streams and other types of primitive and unconfined forms of recreation would still exist in the Steven T. Mather Wilderness. Therefore, the Park Service believes that fish stocking is not required for the administration of the area as wilderness."

Okay. Now I substitute "hiking" and "trail building" for "fishing" and "fish stocking." Note how the reasoning still makes perfect sense. In other words, if the park were to do a similarly reasoned MRA on the building or maintaining of trails in the park, it would presumably once again conclude that trail building or maintenance should stop in the park. Listen carefully. Listen for how this version makes just as much sense or nonsense as the first version does.

"Is it necessary to take action? Trail building, no. Building trails into the high mountain lakes" -- now listen to how this perfectly makes sense -- "building trails into the high mountain lakes would continue to benefit the recreational" -- I screwed up here. "Building trails into the high mountain lakes would continue to benefit the recreational wilderness experience for certain wilderness hikers. Trails, however, would adversely impact the wilderness experience for other wilderness users. Trail building would also adversely impact to varying degrees the scientific conservation and natural purposes of the wilderness. If trails were not built, opportunities for hiking to the high mountain lakes would be severely limited.

However, various opportunities for trail hiking would remain in the low land areas, and other types of primitive and unconfined forms of recreation would still exist in the Steven Mather Wilderness. Therefore, the National Park Service believes that trail building is not required for the administration of the areas of the wilderness."

Can you hear it? The logic has nothing to do with reaching a conclusion. You could apply the same logic to essentially any management action the Park takes and presumably reach the very same conclusion; namely, that the action ought to stop. No. Clearly the reasoning was written after the conclusion had already been reached. The reasoning as presented in the draft EIS does not compel the conclusion, since if it did, essentially all management action of the park would have to cease. The MRA -- if the MRA is to remain in the final EIS, it will need to be completely rewritten in order to be an unbiased look at the proposed action and restrict itself to activities as delineated in Section 4(c) of the 1964 Wilderness Act as expressed in the dissenting opinion of the Department of Fish & Wildlife.

Incidentally, and interestingly enough, current Forest Service policy also agrees with the Department of Fish & Wildlife view. The Forest Service, which manages far more wilderness than the Park Service does, has never done an NRA on a management action of this type. It would simply be against their policy to do so. Thank you.

Historical Case for Fish Stocking the High Lakes in the North Cascades (including recent scientific conclusions)

Preface

Much of this “tour” through the history of fish stocking in the North Cascades was gleaned and guided by the excellent book “Contested Terrain: Administrative History,” written in 1998 by David Louter.

Louter was employed at the time by the National Park Service (NPS) as a professional historian. In spite of the excellence of Louter's book, it was so broad in scope that it excluded much of the detailed history critical to a full understanding of fish stocking in the area now known as the North Cascades National Park Complex (NOCA):

As part of the NOCA Environmental Impact Statement (EIS) on fish stocking begun in March of 2003, Louter wrote a white paper entitled “The Fish-Stocking Controversy” to add the missing detail.

Although Louter's white paper was a welcome contribution, several important events were either skipped or characterized in a way that favors the NPS's general preference for removing already introduced fish species from national parks on the ideological grounds of wilderness values. Specifically the white paper spends little time discussing either the historical rationale for the continuation of fish stocking in the NOCA, or the remarkable scientific evidence that has accumulated showing no measurable impact on park ecosystems when fish stocking is properly managed.

This “Historical Case for Fish Stocking the High Lakes in the North Cascades” document is meant to remedy these aspects of Louter's white paper by presenting the historical case for fish stocking in the NOCA from actual documents and records -including the documented written or spoken words of notable figures who directly participated in this history (e.g., members of Congress, officials of the NPS). It also draws heavily from Louter's “Contested Terrain” book (given its neutral character) to chronicle the various events that occurred during this fascinating 40-year history.

Woven throughout this history is an example of the equally fascinating corollary issue of conflict between federal and state rights in the management of wildlife on federal lands.

The scientific evidence pertaining to fish stocking in the North Cascades comes primarily from the Liss & Larson report: a comprehensive, 15-year, million dollar study of the north Cascades alpine lake ecosystems conducted by Oregon State University and completed in 1999.³

Early History

This paper will not attempt to review the history of fishing and the park before 1963. It was in 1963 that the “Study Team Report effort was launched by the then new Kennedy administration. The history of the fish stocking controversy essentially dates from the initiation of this study. As far as earlier history,

1. Louter, David. Contested Terrain: North Cascades National Park Service Complex An Administrative History. Seattle: National Park Service, 1998[Hereafter cited As “Contested”]
2. The North Cascades National Park Complex (NOCA) includes the North Cascades National Park (NCNP) and the surrounding Ross Lake and Lake Chelan National Recreation Areas. Although not technically correct, the names NOCA and NCNP are sometimes used interchangeably in the literature.
3. Ecological Effects Of Stocked Trout In Naturally Fishless High-Elevation Lakes. North Cascades National Park Service Complex, WA, USA: Phases I, II, III. April 1999.



4. Dept of Interior and Dept of Agriculture. The North Cascades: A Report to the Secretary of Interior and the Secretary of Agriculture, October 1965 Page I of 8 Version 18(512105) suffice it to say that the area now occupied by the NOCA was always admired for its exquisite beauty and many people did many things to focus attention on its preservation and proper use. During this early period the federal lands which eventually became the park were administered by the Forest Service (FS) under its “many uses” mandate.

Study Team Report of 1965

The Study Team Report almost never happened. There was a call to do a study of the North Cascades area as early as 1959 by Congressman Pelly, but the effort became bogged down in jurisdictional disputes between the FS and the NPS.

This theme of jurisdictional disputes arose time and time again over the next decade. Which agency and which land and wildlife management policy/culture was to prevail? Those who preferred using land and wildlife for the benefit of the surrounding people favored the Forest Service structure; whereas those who were concerned with preserving the land and wildlife looked to the NPS structure.^{5,6}

The debate over how to balance these two competing views, policy sets, and cultures was intense. The logjam at this time was finally broken with what became known as the “Treaty of the Potomac.” This “treaty” between the two agencies paved the way for the study team to do its work. The study was completed in October 1965 and released to the public on January 6, 1966.⁷

Ed Craft, Chairman of the study team, termed the study a “compromise proposal” since the team members remained heavily split, and said “undoubtedly the most controversial” aspect of the study was whether there would be a park at all. (The alternative being to allow the land to continue to be managed by the FS.) Craft's compromise proposal claimed that a park should be established for the purposes of “mass recreation use.” It was clear to all involved on the study team that however a park was established, traditional uses of the land such as fishing and camping could not be excluded in a major way. These concerns would become one of the primary reasons for the eventual creation of a park complex consisting of a national park and national recreation areas. Compromise on public use versus preservation was evident from the very beginning and all through the remaining history of the NOCA. ⁸

The Creation of the North Cascades Park Complex

US Senator Henry Jackson held committee hearings in Seattle on February 11-12, 1966 to get public input on the Study Team Report. Hundreds of statements and communications were heard or received. Fishing was one of the areas addressed by the committee members and the public as they considered this statement made in the Study Team Report in the Resources section:

“Fishing would not be affected because fishing, habitat development, and stocking are allowed in a National Park.”⁹

1

Kept Private

Subj: EIS Written Comment

What is Wilderness? Well, to me it's the place where raw land and man meet, like in the North Cascades National Park. And rightly so, it's where man finds his inner self. Wilderness fishing in remote lakes enhances the experience, making it all much more richer. In short, the wilderness experience and fishing goes hand in hand . . . certainly there would be a great void in one without the other.

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Michael Mitchell

The draft EIS is a technically exhaustive and well-written document. Although this is not a technical response (much more qualified people than I can provide that), I feel it's just as important as it addresses the unjustified negative implication that fish stocking is contrary to a park visitor's "wilderness experience".

I have camped, climbed, hiked, fished, and taken pictures in the park. We all are stewards of the park and are obligated to manage the park so that there is still a wilderness to experience for future generations, including my 14-year-old son. I emphasize the word manage, because all activity in the park should be subject to management.

I fail to understand the opposition to managed fish stocking when research clearly demonstrates that it has no measurable impact on the ecology in the mountain lakes. Other activities such as camping can be more intrusive to the park and yet it is allowed to continue under proper management. Why is fishing singled out?

Fishing is a significant part of my wilderness experience and that of my son. I in no way condone improper fish stocking. Since we have a proven process for effectively managing fish stocking I urge you to allow it to continue.

Michael Mitchell

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Jeff Mix

I'm also a member of the Trail Blazers, and I, too, would like to thank the National Park Service for their great work on the EIS. It has a lot of good science in it, sound reasoning.

One of the items I disagree with in particular is the use of the MRA. I believe the National Park Service misused the Minimum Requirements Analysis -- or I'll abbreviate it MRA -- methodology in Appendix K of the draft EIS.

The 1964 Wilderness Act, in Section 4(c), reads exactly as follows: "Section 4(c): Except as specifically provided for in this act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act, including measures required in emergencies involving the health and safety of persons within the area. There shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area."

Nowhere in the aforementioned list of "prohibited uses" is fish stocking listed. The MRA analysis is a methodical way for the Park Service to find the minimum tool or method for performing a task at hand in a wilderness. For logging out a trail, an MRA may find that a cross-cut saw is the tool preferred over a gas-powered chainsaw. For stocking fish, an MRA may find that carrying fry with backpacks is the method preferred over dropping fry from a fixed-wing aircraft. Stocking nonproducing trout in the Steven T. Mather Wilderness is necessary for its administration. The MRA is to be used to find the best method for stocking these fish. To use the MRA methodology to eliminate fish stocking is simply an abuse of the MRA system. Thank you.



Kept Private

High mountain lakes that have sustainable fish population are a valued asset and every effort should be undertaken to protect these lakes so that future generations can enjoy them for their recreation opportunities. A lot of effort has gone into stocking these lakes which are enjoyed by many people, both fisherman and nonfisherman. it would be a shameful to allow overfishing to purposefully destroy this fishery.

I have fished lakes in the mt raineer national park and am appalled that the limits were increased to purposefully eradicate the fishery. The answer i received from a park ranger was that they were trying to recreate a natural park, so the salamanders, frogs, and etc would be able to make a comeback. that is a really absurd plan. I would hate to see this philosophy adopted in any another areas.

Bob Pfeifer

Thanks for the opportunity to comment. I'm going to try and comment as a private citizen on this draft. I'm only speaking to you -- I'm speaking to you today not as a member of Technical Advisory Committee that helped draft the EIS, nor as a member of any organized hiking or fishing group. I am submitting these brief comments as a Washingtonian who happens to greatly enjoy our natural and fishery management heritage in this state's mountains.

I've only a few general comments today on the technical aspects of the draft. First, the numerous years of studies in the Park Complex demonstrated what I had learned from first-hand experience managing sub-alpine and alpine lakes in the western Alpine Lakes Wilderness and Henry M. Jackson Wilderness. I learned that it is possible to preserve the native biota of these lake ecosystems if the fish populations are maintained at low densities. Naturally, fish eat bugs, and they will depress their prey resources temporarily. But the overall invertebrate species diversity is maintained. Thus it is possible to have an extremely valuable fishery that greatly enhances our quality of life in this state for extremely low cost and with no long-term damage. The studies that were done in the Park support my personal experience and observations.

Equally important, studies in other states have proved that fish removal will restore original ecosystem conditions nearly completely, if not completely, so there is no long-term impairment from responsible fishery management. And I have long been a strong advocate for removing problem fish populations that unquestionably harm these lake ecosystems. However, that lost fishery opportunity must be replaced in place or in kind within the Park Complex.

Much has been said and published about the impacts of trout in high lake ecosystems on native salamanders. There most definitely is a problem with some amphibian species in some areas, such as the yellow-legged frog in the Sierras of California. This is not California.

A well-done study in the Olympics showed that native salamanders are well-distributed across their natural range despite many decades of fish planting.

Here's my bottom line: No one has demonstrated -- I worded this very carefully. No one has demonstrated that the general distribution of native amphibians has been diminished in this state from planting trout fry

into high lakes. While it is true that fish can temporarily depress salamanders or their larvae in some lakes under some conditions, this does not necessarily translate into species extinction, even as low as the meta-population level. The EIS could be more accurate and complete if it made and emphasized this point in my opinion. Most of the assessment of salamander impacts was based on assumptions about their movements and various geographic criteria. I respectfully challenge those assumptions since so far I have seen no data from Washington that supports them. On the contrary, the data from the Olympics supports my position and opinion that native amphibians can coexist with responsible fishery management when viewed on a landscape level. I'm aware that general Park Service policy seeks to preserve natural systems in as natural and unimpaired a condition as possible. This sets the stage for the perceived conflict that you all are well aware of, that is, the Park enabling legislation.



This leads to my next point. I recognize the pressure you folks are probably getting from within the national organization. If North Cascades allows fish planting to continue, you will likely be viewed as a pariah -- traitorous as to the National Parks Service mission statement. Well, in short, maybe Parks people like then Park Service Director George Hartzog should have thought about that more before making promises in 1968 that fish planting would continue if a park was created in an area that already had a history of fish planting in the mountains.

As in most things political, it comes down to compromises. We high-lake hiker/anglers have been willing to compromise heavily by accepting a greatly reduced list of lakes to be maintained with fisheries.

North Cascades staff needs to compromise by being willing to accept the heat from colleagues within the Park Service and respond to that pressure by explaining and educating that NOCA was unique in its creation and in the promises that were made. Perhaps it is naive of me to believe that local Park staff can take that sort of position. And, yes, we need to clarify the Park's enabling legislation. But the tone and details in the EIS need to be revised to accept the premise of continued fish planting, not the premise that all the lakes will be returned to fishless conditions as the Environmentally Preferred Alternative. The science that we all paid for supports taking the position that disciplined planting can continue.

And finally, in my opinion, the Draft EIS errs by incorrectly applying the Minimum Requirements Analysis protocol. I suspect a more detailed critique of this will be submitted by the sport fishing groups. I believe an MRA should only address those actions explicitly prohibited by the Wilderness Act, such as use of motorized vehicles or aircraft. Fish planting, per se, is not prohibited and should not be the subject of an MRA. I think we all agree that backpack planting of fry is a minimum tool. On the other hand, an MRA should be done for the needed fish removals in some lakes since that would involve some of the actions prohibited by the Wilderness Act, that is, aircraft use.

Thank you for the opportunity to provide personal comments.

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Dale Riveland

My name is Dale Riveland and I'm a high laker, and I'm submitting written comments that are parallel to my oral comments, but they are much more complete.

The draft EIS Environmental Impact Statement includes at the back in Appendix K the Minimum Requirements Analysis. The MRA answers questions and directions, and the step one question is: Is it necessary to take action? And therein is the answer: The fish stocking is not necessary for the administration of the wilderness area.

The Wilderness Act provides that except as necessary to meet minimum requirements for the administration of the wilderness, there shall be no structures, no permanent roads, no temporary roads, et cetera. Ten prohibitions, none of which have anything to do with fish stocking. And since the statute, the Wilderness Act, does not make fish stocking one of the prohibitions, the statutory test of the Act necessary to meet the minimum requirements does not apply. I submit that it's not required at all to have the minimum requirements assessment.

Stocking in selected lakes in a manner that is consistent with biological integrity is not something that is controlled by this statute.

This is also the Washington Department of Fish and Wildlife's position, but there's a policy, and that policy some say would require that a minimum requirement analysis be done, and the policy number is NPS Management Policy 6.3.5 which says "All management decisions affecting wilderness must be consistent with the minimum requirements concept."

So if there's a requirement, this is the policy that puts it forward. The point here is that the requirements in the policy as distinguished from the statute are far different from those in the statute, and I quote, "The minimum requirements concept will be applied as a two-step process that determines whether the proposed management action is



appropriate or necessary for the administration of the area as wilderness and does not pose a significant impact to wilderness resources and character.”

So, the question is: What is appropriate as well as necessary, and does it pose a significant impact to wilderness resources? Those are the questions posed. It is indeed logical that the Park Service would utilize a lesser standard to make general management decisions than those that are decisions that are required to upset the prohibitions in the statute that Congress has passed. So using the correct test of appropriateness or necessity, the answer should be it is appropriate to continue stocking selected lakes in a manner that's consistent with biological integrity because that would support recreational and historical use purposes of the North Cascades Wilderness Area while minimizing impact to biological integrity. Thank you.

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Dale Riveland

SUBSTANTIVE NORTH CASCADES EIS COMMENT
DALE RIVELAND, HI-LAKER

27-Jul-05

Issue Discussed

This comment questions the application in Appendix K of the Minimum Requirements Decision Guide (MRDG) to the fish stocking decisions. The Step 1 of the MRDG provides: “Is it necessary to take action?” This is not a proper question regarding fish stocking. The MRDG questions were designed for decisions to overcome one of the ten statutory prohibitions, not for general management decisions. The result of answering a misleading question is that the minimum requirements analysis provides a misleading answer.

Comment

The Washington Department of fish and Wildlife (WDFW) Comments on the Minimum Requirements Analysis (Appendix K, p.299-300) are correct in concluding that no MRA is required for continuation of century old fish stocking in limited lakes selected by biologists in order to maintain biological integrity. If it is determined that an MRA is required, then the correct standards are those specified in National Park Service (NPS) management policy 6.3.5. Apparently when the WDFW comments were authored the WDFW did not have before it the language of NPS management policy 6.3.5. I submit these comments as my supplement to those of the WDFW.

The MRGD states that it is derived from Section 4(c) of the Wilderness Act. Instructions- p.1. If an MRA is required at all for fish stocking, it is not because fish stocking is one of the ten prohibited activities in Section 4(c), but because NPS has issued policy 6.3.5 which provides:

All management decisions affecting wilderness must be consistent with the minimum requirement concept.

Policy 6.3.5 describes a two step process that is significantly different than the MRGD process. The two step process under this policy is:

Whether the proposed management action is appropriate or necessary for administration of the area as wilderness and does not pose a significant impact to wilderness resources and character; and the techniques and types of equipment needed to ensure that impact to wilderness resources and character is minimized. Emphasis supplied.

In accordance with this policy, superintendents will apply the minimum requirement concept to the context of wilderness management planning, as well as to all other administrative practices, proposed special uses, scientific activities, and equipment use in wilderness. When determining minimum requirement, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic



efficiency and convenience. If a compromise of wilderness resources or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

It is indeed logical that a lesser standard be applied in the general decision process affecting wilderness than in decisions to overcome statutory prohibitions. There is no logic in using a strict “necessity” standard when deciding whether to go left or right in general management decisions. For the fish stocking issue the proper Step 1 is:

Is the proposed management action “appropriate or necessary for administration of the area as wilderness,” and does it “not pose a significant impact the wilderness resources and character?”

That is the language of the policy. This corrected question elicits a different answer that already appears in the MRA. The correct answer is the paragraph that appears immediately before the Step 1 question as follows:

Following removal of reproducing, self-sustaining populations of trout, restocking of some lakes with nonreproducing populations of trout, as proposed in two alternatives, would support recreational and historical use purposes of the wilderness area while minimizing impacts to biological integrity. (Appendix K, p.293).

It would be violation of NPS policy to apply a decision standard far more stringent than the policy requires.

The minimal tool for fish stocking is hand stocking by backpack access.

3

Charles Russell

This EIS is well writtin and thorough, but leaves and anti-fish taste in my mouth. For example, the MRA arguement looks like a thinly-veiled attempt to disallow continued fish stocking in the Park.

I think there is another viable atlternative. I call it Alternative A Modified. The original agreement in forming the NCNP was that fish stocking would continue. I interpreted that to mean in lakes that already had fish. (62 lake per the EIS)

However, there are lakes that need some sort of Adaptive Management plan due to over-population. So my proposal for a modified Alternative A would be to address this problem through fish removal in these lakes followed by restocking with non-reproducing fish at low densities

I am against any form of fish removal that involves motors, aircraft or chemical methods.

These methods would have more detrimental effects on the area that the fish themselves. It could takes years (if ever) for the areas to recover.

Fishing is a recognized recreation in wilderness areas including the Park and restocking is necessary in certain lakes to maintain it. (just as maintenace is required to maintain trails).

I don't see why Alternative D is the default in case of missing legal justification. An alternative would be to extend the MOU until legal approval is reached if necessary.

The Liss and Larson study concludes that little environmental damage is present in lakes that have low densities of non-reproducing fish. Many of the lakes that now have fish in this model (OR used to have fish) demonstrate that the biota have reached a stable condition. Fish add to the wilderness experience, not detract from it!

Fishing the high lakes is a recreation enjoyed by many. It also attracts more people to the park so that these people, through education, will support continued conservation and respect for the environment. I believe they have more knowledge and concern for the Parks future than the hordes down in the campgrounds!



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Charles Russell

So anyway, I'm Chuck Russell, and I've been hiking in these mountains for 40 years, since 1965, and I wanted to express some appreciation to the National Park Service for preserving one of the most scenic, beautiful, tranquil spots I've seen. I traveled around the world. I've seen the Andes, the Alps, and there's nothing like the North Cascades. But anyway, I think that the National Park Service, if I'm not wrong, is for equal recreational opportunity for all the people. And in my mind, that includes hiking, camping, climbing and fishing. And I was around when the park was formed in 1968, and I remember the agreements that fishing and stocking would continue by the Washington State Department of Game, that's what it was called at the time. And so that original agreement to continue stocking, I think, needs to be honored and written down. Unfortunately, it wasn't at the time, but I agree with I think Virgil, I don't think legislation is required for that. But a couple other things I wanted to say is that my personal preference of the alternatives is a modified version of Alternative A, because I think the original agreement was Alternative A, but now we have a population -- overpopulation problem with certain lakes that needs to be addressed, and through the years we've learned a lot about fish stocking and management of the high lakes, and I think we need to apply that now with nonreproducing fish and somehow addressing the issue of overpopulation, but I'm against the use of helicopters and motorized vehicles like motor boats, and I'm also against chemicals in these high mountain lakes to reduce populations. I don't know what the answer is, but maybe it's for backpacking with gillnets to reduce the population, or maybe predatory fish that would reduce population, but I'm concerned about the environmental damage that would occur through these other methods.

So that's my recommendation, is Modified Alternative A, and I also agree with Virgil on the MRA. I didn't understand that at all how it applied. So I think those are my comments for this point in time.

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Chuck Russell

I'm Chuck Russell, and I spoke last night, but I wanted to make a change to one of the statements that I made. I made a statement that I didn't believe legislation was necessary for continued stocking of fish in the North Cascades National Park, but in a subsequent discussion about the NPS policy, if it takes legislation to change that policy and make it a permanent change, if nowhere else except North Cascades National Park, then I'm all for it. Then another thing I wanted to talk about a little bit was the environmental analysis in EIS. I think certain aspects of that analysis are overblown, and I have no argument that putting fish in a high mountain lake has an impact, it certainly has an impact, but at what point does this impact cause damage? And I think that's still unknown, and I think that there's -- you know, the impact of fish in a lake, to me, pales in comparison to the impact of trails and roads and parking lots and lodges, and the most recent one that I heard of was the cell phone tower in Yellowstone, and if those things don't cause impacts, then I'm really mistaken.

So I think that the EIS statement is a little overblown of the impact of fish in the lakes, and what do you call that analysis that you're -- adaptive management or something like that, hopefully that will help with that process. And so that's it. Thank you.

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Chuck Russell

Chuck Russell from Issaquah. I agree with what Norm was concerned about with the National Parks Service's policy which currently states return all these lakes to their, quote, "natural state," which means no fish. And if we have to get legislation or congressional action to do that, how do we go about it? What kind of process could we use as normal people like us, ordinary Joes, to get this -- to get this changed? Do we have to work through our local congressmen or senators? Is there something else we can do? Is that a process question?



Mr. Superintendent; September 12, 2005

For the last number of years the North Cascades National Park has spent a considerable amount of money expecting, (I believe along with a lot of other people), to come up with a scientific conclusion that all lakes are adversely affected by any population of fish having been introduced to them.

This study, known as the Liss and Larson study, in fact came to the conclusion that lakes which have low density non-reproducing populations of fish do not adversely impact these lakes. In fact they could show no measurable difference between fishless lakes and lakes with low density, non-reproducing populations of fish.

Now that the parks' own study has come to this conclusion, I believe that it is only fair for this study and conclusion to be prominently featured in the draft EIS. It is glossed over so lightly, in fact, that one may be led to believe that since the results are not what the Park thought they would get they are now greatly down playing this multi-million dollar study.

This premise, of low density non-reproducing fish, is what the proponents of fish planting in the North Cascades have been preaching for years.

I support alternative "B" of the North Cascades National Park Complex EIS. I support removing fish from lakes which have spawning, overpopulated and stunted populations of fish. I do not think fish should be removed from any lake automatically, simply because there is any spawning occurring. A very limited amount of natural recruitment, which would result in a low fish per acre density, would be exactly the same as low density sticking and would result in the exact same non-impact to the particular lake. As extensive as the Liss and Larson study is, I do not believe they provided this type of information that would single out the few lakes in the complex which would fall into this category. All spawning lakes, regardless of the level, are lumped together.

Lakes which currently have low density populations of fish should be allowed to remain. Lakes which, after further study, are deemed to have low densities of fish should be added to the list of lakes to remain with fish.

Fish have been a part of the lakes in the North Cascades for a very long time. Since well before it was a National Park. It is clear in the congressional record of the North Cascades National Park proceedings, that Congress INTENDED fish to continue to be a part of this national park experience. They did not think that the sight of a fish rising in an alpine lake would somehow destroy an individuals "wilderness experience". In fact, it could be argued that sighting a fish in an alpine lake would have less of an impact on a persons wilderness experience than coming upon a manmade foot bridge over a creek on a trail cut by a trail crew through the same national park land.

Fish in the lakes of the North Cascades are wonderful. If they do no harm -- they should remain.

Thank you for your time.

Sincerely, Pete Smith



Michael Swayne

My name is Michael Swayne. I've been a member of the Trail Blazers since 1958. I have a Ph.D. in environmental science and engineering from the UW, and I've had the privilege and pleasure of stocking and fishing many high lakes in the Cascade Mountains.

I made comments at the EIS public meeting in Bellevue last night on how important a high lake fishery has been to my life and the lives of my family and friends. I was told my comments were not considered substantive because they did not specifically address any details on the EIS.

Tonight I argue that the word "substantive" was being used in too narrow a sense. Since I am making written comments on many EIS details, a three-minute verbal comment cannot address all of my written comments, but I do believe my comments were substantive in a broader sense.

"Substantive" also means a variable of interest that changes the response of a system. So I spoke about how fishing with my dad in the mountain lakes changed my physical and mental life. "Substantive" also means to denote a thing or an idea. So I spoke about how real the mountain lake fishery was to my family and myself.

A love for the mountain lakes caused me to study science and work on environmental projects. I believe the world environment needs more advocates. The fish are what brought me to the love of the mountains and lakes and plants and animals. I believe the parks and forests need more advocates.

When it comes down to it, the decision on which the EIS alternative is selected and how it is implemented is a series of value judgments on the facts that were collected and presented. The science and analysis presented in the EIS helps clarify the workings of the complex lake environment so we can make better judgments based on our deeper value system.

There is little argument on the facts and the EIS that had been worked over so carefully by so many people. The existing EIS facts show the mountain lake environment as complicated. The more facts we gain, the more we know there is to gain, so it would be very important that the NOCA high lakes database be updated and maintained in perpetuity. Who knows what decision the database can help in the future?

What there is an argument about is the emphasis that certain facts get or do not get in the EIS. This emphasis depends on what value system is being used as the framework to present these facts or how different value systems are being used to balance the factual presentation.

The value system or systems being used to present the EIS facts is a very substantive issue, in fact, is the most substantive issue. My value system applied to the EIS facts agrees with Alternative B to remove high density fish populations demonstrated to cause significant environmental impacts and retain fish stocking in lakes where it has been determined they will cause minimum environmental impact.

I do not believe my value system conflicts much with other wilderness or scientific value systems. I belong to or contributed to wilderness advocacy groups. I study and use science in my daily work. My value system says that the Preferred Alternative B is a good balance between competing value systems.

However, I'm very concerned about the potential impacts of human intervention trying to remove fish from some of the larger, deeper and pristine wilderness lakes. I advise the NPS to learn much more about the removal procedures and impacts starting with the easier lakes before trying to remove fish from the more difficult lakes.

Thank you for taking my comments. I'll be getting ready to go tomorrow with my son David to a high remote lake in the North Cascades Park that was named after my wife.

Subject: Comments on Mountain Lakes Fishery Management Plan/EIS

I was born and raised in the North end of Seattle. I have been a member of the Trail Blazers since 1958; I have a PhD in environmental science and engineering from the University of Washington and worked on many large environmental data management projects. But most important regarding this EIS, I am a lover of our North Cascade mountains and lakes. Therefore, I spent a lot of time becoming familiar with the data that went into the EIS, reviewed the EIS analysis and recommendations, and submit the following written comments on the Draft Mountain Lakes Fishery management Plan/EIS. I am submitting the comments as MS WORD DOC and PDF files on CD with the intention of facilitating EIS staff review.

Please consider my comments part of an overall Trail Blazers response. Due to limited time, the Trail Blazers were not able to compile all member comments into one document. My comments are organized according to the EIS Table of Contents and are inserted into the EIS Table of Comments using a red color font.

I would like to lead off by saying that the oral statement I made in Bellevue summarizes what has driven me to go on so many high lake stocking and survey trips, develop a database of high lake fish stocking and surveying, and work with the Washington Dept of Fish and Wildlife and NPS on data collection and management. The mountain lake fishery is not only important to me personally and culturally but led me to a lifetime of work on environmental issues and problems. I have come to believe that better information is the key not only to better environmental management but also in minimizing or eliminating problems to begin with. I have seen this not only in working with industrial plant managers but with high lake fishers as well. Many people join the Trail Blazers wanting to know where to go to catch fish. After a few years, they begin to understand the high lakes typically do not support very many fish and the habitat is sensitive, so they become much more careful about how they fish and camp and travel. They do not take very many fish, they do not build big camps or cut trees or boughs, they do not leave garbage, they do not trample the shoreline and many do not even like to leave footprints. What causes this change in behavior? It is the information they receive from the Trail Blazers and working with the land management and fish and wildlife agencies.

I believe the most important part of the whole NPS Mountain Lakes Fishery Management Plan/EIS effort in the future will be seen to be the cultural connection many people have to the high lakes and the information and knowledge that was gained. I encourage the NPS to view the information developed for this EIS to be not only useful for making one tactical decision on fish stocking but as part of an important baseline of information to be built on in perpetuity. For how can managers manage and how can scientists do science without knowing the history of the physical, biological, chemical and social conditions? Future generations of a better-educated public will also get much more enjoyment out of their visits to the mountain lakes by knowing more about them. How were the mountains and lakes formed? How did plants and animals colonize the mountain lakes after the ice age? How did the lake environments come to have introduced plants, animals, and fish? Many people think that have always been there. Some people think that stocked fish are interfering with "native" fish, not knowing that all the fish were introduced. How human use of the lakes has changed with our social development. So many things will be of interest to managers, scientists and the public in the future.

Thank you for all the effort you and the NPS staff have put into the development of this EIS. It is without a doubt the most comprehensive study of a high lake fishery ever done. Although some of my comments at first might not be considered substantive because they describe feelings or desires, it is the deeply felt feelings that drive my desire to maintain a mountain lake fishery. While a deeply felt armchair philosophy about wilderness values is important in helping preserve those values, through contributions to organizations that promote those values through science, education and legal action, I believe people who have actually spent a lot of time on the ground in the wilderness should be listened to very carefully. Also, the armchair wilderness philosopher and the wilderness user who fishes, and eats the berries and mushrooms have a lot more in common than either of them may realize. Because it is through the very acts of walking and climbing and catching and picking and eating and drinking and breathing and seeing and listening and feeling and smelling and sleeping on the land that many wilderness advocates are made.

Mike Swayne



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Milt Tanggard

I've been in the Trail Blazers, one more year and it will be 50 years, and I've had the good privilege to plant a lot of lakes in the North Cascades National Park. And I remember sitting in at hearings in 1968, I guess that sounds right, the year, Hearing Director Hartzog along with the great Senator Henry M. Jackson "Oh, no, fishing will go on in this park. There will be no problems with that." Henry Jackson went on. He had gone to a lake which is just east of Everett, it was a Boy Scout camp. He had gone there as a young man. It was a making of a young man, in that sense, but this wouldn't curtail any fishing in the park. There would be fishing in the park. This was all concurred with in these hearings in '68, but nothing was ever definitive legislative-wise. We've been -- Bill Paleck has said we've been arguing over this or looking at this for 35 years and something should be resolved. Other parks, I guess, have retained or restricted fishing to some extent, whether because of disease or people overrunning the country or just what, I don't know.

I remember in '68 the loggers or the timber companies and the Forest Service had gone overboard on selling timber and upset a lot of conservation groups. Well, that instigated a lot of what's going on to create the park in the first place, besides the scenic beauty, but I always contended one brokered timber and the other brokered people.

Now they are both kind of stuck in the same notch. I don't know. It would seem, though, the park would live up to its expectations when they guaranteed fishing would continue, at least to some extent, in some lakes. Naturally, this has to be done in each lake with each species and let lakes do what they do as far as growth and the rest. I remember years ago, if you go to a lot of remote lakes that are very seldom visited, there would be a faint trail around the lake from animals, and of course, fishermen or hikers getting a drink or needing water or camping near water who would use the same trails, so they would expand in the sense that they would get walked on. So there's no shutting down the fact that people would use it, even a primitive park like Olympic National. This is the smallest state west of the Mississippi River. We have three huge national parks, which is fine, if they generate money and tourism, but we have the Glacier Peak Wilderness Area, we've got the Henry M. Jackson, we've got Alpine Lakes. We've effectively -- along with Goat Rocks and on down to the William O. Douglas Wilderness, and I can see where the backbone of the Cascades has effectively been stopped from logging anymore, which is probably good in and of itself. Tree farms exist, that way they will build better timber anyway, but it would seem that the hunter and fisherman haven't been restricted. I quit hunting 25 years ago, probably got buck fever. Thank you. I might submit a written report later.

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Jamie VanEtten

Jamie Van Etten, and I started in the North Cascades about 60 years ago. My father planted lakes in the North Cascades under Mr. Thornton who was the ranger in those days when it was national forest. He planted Blum Lake, so we had a long start.

I've been the trailblazer for about 25 years and had planted quite a few lakes up there, but one thing we've always done is we understand about fish and we try not to put fish in that will overpopulate and that kind of stuff.

A good example of a lake that I planted is Willow Lake. It's a lake of about 18 acres, however, we only put a couple hundred fish in it every year, and there's no problem whatsoever, no population problem.

Another lake near Willow Lake is Ridley. When you go there early in the year you'll see lots of northwest salamander eggs and everything like that. A lot of people say we don't have a problem with -- the fish are wiping out the salmon; it's not true at all. Every year you go there early in the year, they're there.

Those salamanders don't live in the lake all year and people don't understand that. Also there are about 20 lakes in the inland park. We only plant some 49 total, so we certainly don't hurt that. Also, only areas -- we took very good and careful care of and we don't want to see overpopulated lakes. However, Hozomeen Lake is overpopulated, but it does have loons in it, a beautiful bird, and it's the southern edge of their northern migration to be in the state of Washington. And when people say "Oh, the loons will go someplace else," not true. They are born in the lake and they will die at the lake, and we have to let those loons be. Thank you.

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Jamie VanEtten

My name is Jamie Van Etten. I was born in Seattle, Washington a few years ago, and part of my life I was a colonel in the United States Army Corps of Engineers. I went to Vietnam, I went to Korea and I came back because I love our mountains.

I'd like to say in your book there's nothing about culture. Well, I'm going to tell you about culture. It means me. My aunt, her name was Edith, was the first woman customs officer in the United States at the Blaine border.

She went to that park all the time before it was a park, and they started talking about a park, and they said "Well, people don't go there."

Well, she had a picture of her and her kids who were eight to 14 years old, and they were at Berdeen Lake. That can speak for itself how they got places.

My father planted fish. He worked for Walter Thornton. Before there was a park, it was forest service land and he worked for Walter Thornton and planted some lakes, because they had to plant the lakes or they didn't get paid. So your EIS has nothing to do with that kind of stuff, and believe me, that's what we ought to look at is a culture of being there and doing things.

We go to those mountains, and when I see a fish, it's like if I see an eagle; my heart stops. And when I see a fish in a lake, the same thing is true. So believe me, I think that we should continue to have fish in the lakes and plant them at a reasonable amount. Like Liss & Larson said, it would not hurt anything. Thank you.

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Jamie VanEtten

Good evening, Jamie Van Etten. I am a retired colonel, Corps of Engineers United States Army. I grew up in Bellevue, Washington. I went to the University of Washington. And I was a young lieutenant and I went to Korea and Vietnam but I wanted to come back to these mountains. These mountains are very important to me. My family, as I said before, started in those mountains many years ago.

My Aunt Edith, who was the first Customs lady officer in the United States, Blaine border, took her children into Berdeen Lake. Go to Berdeen Lake, and you find out you've got to be a good person to make it in there and out with children. We've always done things. My father planted Plumb Lakes in 1936. And I planted many, many lakes in the North Cascades Park. And we have learned more than we knew to begin with, and we're getting smarter and smarter about planting.

Today we're planting fish, and we're not ruining the water or anything else. At the same time, there is lots of frogs, there's lots of fresh water shrimp, everything. They're still there. We're not destroying anything. So I think that if everybody looks at things, we should be able to continue to plant and it will not hurt anything whatsoever.

My last comment is that I don't know about these people like WW or N triple C. They have not shown up in four meetings. In four meetings, the Trailblazers have been here and I see them. And I'm kind of disgusted at that because they can have a comment equal to our comment without going to the important fact in coming to the meeting.

Thank you very much.



Bill Paleck, Superintendent
 Mountain Lakes Fishery Management Plan/EIS
 North Cascades National Park Service Complex
 810 State Route 20
 Sedro-Woolley, WA 98284-1239

RE: North Cascades National Park Service Complex Mountain Lakes Fishery Management Plan Environmental Impact Statement (EIS).

These comments are in support of “Alternative D: All 91 Lakes Would Be Fishless (Environmentally Preferred Alternative)”. Non-native fish would be removed from all naturally fishless lakes and fish stocking would be discontinued.

While science and legislation both support the return of the lakes to their natural condition (the Environmentally Preferred Alternative), NCNP officials instead prefer to allow the practice of artificial stocking of non-native fish species to continue within numerous lakes in the Park Complex (so-called “Alternative B” Preferred Alternative).

As is well stated in the EIS, the scientific consensus on the impacts of fish stocking of naturally fishless mountain lakes is that both biodiversity and the qualities of wilderness are adversely affected by the presence of non-native fish.

Especially notable are fish-predation related impacts to populations of alpine amphibian species, doubly so given their sensitivity to stresses associated with global climatic change.

Absent is assessment and analysis of adverse impacts to shoreline and lakebed vegetative environments caused by concentrated fisherperson use. I know that some lakes nurture rare populations of sensitive plant species, either right along the lake shore or just below its surface. I don’t see a lake by lake list in the EIS of plant surveys and thus conclude that the Park has not carried out such work and is unable therefore to answer the fundamental question of whether fisherperson use is adversely affecting lake shore and near-shore habitats.

All relevant federal legislation and regulation argues against the artificial stocking of fish in these lakes: Collectively, the Organic Act of 1916, National Park Service Management Policies, the Wilderness Act of 1964, the North Cascades National Park Complex Enabling Act of 1968, and the Washington Park Wilderness Act of 1988 make clear that fish stocking is generally to be prohibited in naturally fishless lakes.

Both facts are well recognized in the EIS. Indeed, the NCNP realizes that it is currently in a legally untenable situation with respect to fish stocking. In order to implement its preferred alternative (continued fish stocking), the NCNP is therefore requesting that the U.S. Congress re-write the 1968 Enabling Act in order to weaken its requirements for the protection of biodiversity.

This proposed alternative is unnecessary, expensive, counter to best available science, and would set a dangerous and embarrassing precedent. Our National Parks and Park Wilderness Areas are - and must remain - our most natural, biologically diverse, and important national treasures.

As a citizen acting in good faith to participate in the public planning process, I believe that it is my responsibility to understand both scientific and regulatory principles behind the planning process, and to offer substantive comments based upon such an understanding. Having done so to the best of my limited abilities in the case of this EIS, I can only note the irrelevance to the process of any and all comments when the stated plan of the EIS document itself is a congressional revision of Park legislation. The public process is obviously ill-served when all facts and laws point towards one decision, yet a clearly untenable decision is chosen as “preferred” and the Park is willing to ask the US Congress to weaken its rules in pursuit of this decision. An EIS is not a place for re-writing the Enabling Legislation of a National Park. In short, I feel cheated.

Steve Walker

North Cascades Draft EIS Comments

The North Cascades Draft Fish Management EIS, while an extensive and elaborate document, is remiss in not providing adequate protection for the fishing heritage that was very influential in the original formation of the park. Specifically, none of the alternatives provides the proper level of present and future quality fishing opportunity (QFO) so necessary in maintaining the unique characteristics of one of the finest national parks in our country.

Alternative A, while providing the highest level of QFO via periodic stocking of low densities of non-reproducing (LDNR) fish, a practice which has no discernable affect on the non-fish biota, fails to address the egregious problem of lakes with over-reproducing fish and the subsequent negative biotic affects and poor fishing (yes, fisherman also hate small, stunted fish, no matter how easy they are to catch).

Alternative B, given adequate funding, solves the stunted fish problem, but allows the QFO to fall below an acceptable level due to the immediate cessation of stocking in so many lakes. In a relatively short time these lakes will be fishless, while a much longer time will be necessary to rehabilitate the stunted lakes and replant them in such a way as to provide quality fishing. Temporary cessation of stocking in many lakes deemed to have insufficient data for proper placement will also contribute to lowered QFO. The resulting dismal QFO will concentrate use on the decreasing number of quality lakes which will surely result in overuse issues.

Alternative C is even less acceptable for the same reasons as for Alternative B.

Alternative D completely ignores the responsibility entrusted to the park's managers to uphold generations of tradition that the bond of fishing in the high lakes so uniquely has provided and will continue to provide.

I therefore propose Alternative B-QFO (the fisherman's preferred alternative). Lakes shall be managed as called for in Alternative B with certain timing considerations that allow QFO to be maintained above a desirable level. Lakes scheduled to be permanently or temporarily dropped from the stocking cycle will be dropped ONLY as replacement lakes are made available. Replacements can come from two sources. 1) lakes that have had the stunted fish removed and been subsequently stocked with LDNR fish. 2) Lakes on the insufficient-data list receive the research necessary to allow continued stocking of LDNR fish.

Finally, provision shall be made such that any lake which through natural means currently is maintaining quality fishing without stocking, but in the future turns fishless, shall be added to the stocking cycle in order that adequate QFO is maintained.



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Don Wicklund

The primary (and only) reason I go to the North Cascades National Park area is to hike up to a beautiful mountain lake and go fishing.

In order for me to enjoy a wilderness experience it is necessary for my family, friends and I to drive up to the area on man made roads, hike into the mountains on man made trails and fish in the lakes stocked by man. (and women)

A properly managed lake stocked with fish does not take away from anyone's wilderness experience anymore than a trail through the forest would. Both enhance the experience while making it possible and worthwhile.

I tend not to get too much into legalities or extremism in any direction. The human experience is usually optimized simply using logic and reasonable common sense. In that vein: Please continue properly managed fish stocking in the NCNP.

Thank you for your attention.

Don Wicklund, Current Vice President of the Hi-Lakers Club of WA
Belinda Wicklund

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Allison Woods

Here are my comments on the Fisheries EIS:

Why is the Wilderness Act being cited as a compelling reason to discontinue stocking? If stocking in the Mather were to be discontinued on the basis that stocking contravenes the Wilderness Act, then every Wilderness in the country would have to be considered for elimination of stocking. Stocking is permitted under the current interpretation of the Act, and should thusly continue until such time as a legislative act or judicial decision prohibits it. Elimination of stocking in the Mather based on Wilderness status could lead to massive unforeseen consequences in the rest of the Wilderness system.

The EIS states that Congressional clarification will be required to continue stocking in the Park. This is unreasonable, illogical, and puts the historically-performed activity of stocking at an extreme disadvantage. This matter should be resolved through the EIS process, and will (hopefully) be clarified enough to not require a project of this scale in the future.

The scope of the analysis: The EIS states, (Volume 1, page 459) "The public also expressed a concern that the analysis occur on a landscape scale, so the Technical Advisory

Committee took a broad look at lakes in the NOCA and selected a representative number of lakes to remain fishless under each alternative." Then it goes on to say, (Volume 1, page 48) "A total of 245 mountain lakes are in the NOCA, and at least 154 of these lakes have always been fishless and would continue to be fishless under any alternative. Because they would remain fishless and because they have never been part of the managed fishery, these 154 lakes were not analyzed in this plan/EIS."

The problem with this should be apparent. If a lake is going to be removed from the stocking program on the basis of its "unique character", then all 245 lakes in the Park must be included in the study group, at least to create the standard for "unique."

Antimycin: While I appreciate that it represents an inexpensive method of fish removal, it is also known to kill other things living in the water, potentially causing unintended disruption/damage to the biota. For this reason, I strongly oppose the use of this chemical. The other methods described in the EIS are all acceptable.



Future Stocking: I'd like to see, when it becomes feasible, for stocking to be done with fish that are unable to reproduce, rather than "functionally sterile." Fish are highly adaptable organisms, and every precaution must be taken to prevent the overreproduction problem facing us in some high lakes today. Fish used to stock should also be true native species, such as the Ross Lake rainbow.

Conclusions: I support Alternative B, with continued adaptive management and research on the effects of stocking in these lakes. If future research proves that stocking is detrimental to a level considered to be unacceptable, stocking should be discontinued. The review process must be streamlined and standardized whenever possible.

Allison Woods
Hi-Laker Member
Washington Native

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Yanling Yu

My name is Yanling Yu and I live in the Seattle area, and I would like to take this opportunity to express my concerns over the newly drafted Mountain Lakes Fishery Management Plan/Environmental Impact Statement for the North Cascades Complex.

I have hiked to many popular remote places in the mountains of Washington state, including those in the national parks, and I'm keenly interested in preserving our wilderness and environment and I always try to do my best. However, I'm against a proposed environmentally preferred Alternative D and favor the preferred Alternative B, and please let me explain why I prefer Alternative B, not D. Reason No. 1, the park-sponsored research known as the Liss & Larson study has indicated that nonreproducing low density trout populations have no perceivable impact on high lakes' ecosystems. Based on this study, responsible stocking does not endanger the existing high lake biological integrity, and therefore is not in contradiction of wilderness values. These values do not mean to eliminate all existing human traces from the wilderness but are argued for minimal impact.

Number two, this EIS has not shown any hard evidence that anglers impair the park's ecological integrity. Based on my hiking experience, the impacts on lake environment are not only limited to anglers. It is an undeniable fact that hikers, climbers, boaters, and horse riders are drawn to the lake because all people need to access water. I have seen many lake shores damaged by the general public, especially by horses. An example is McAlester Lake, where many campsites are beaten by horses and we have even seen horse droppings in small streams to the lake. So apparently, if there are no responsible management plans in place, all regular activities that are currently allowed in the park can spoil the wilderness values and damage the ecological integrity.

Number three, fish stocking in the North Cascades mountain lakes took place for many years prior to the establishment of the North Cascades Complex in 1968 and the Washington Park Wilderness Act of 1988. Therefore, fish stocking is grandfathered in and should be allowed to continue so long as the stocking is responsible to meet the minimal requirement, which I believe it does.

An analogy can be drawn to the existing Ross Lake Dam and the road and trail systems that are apparently acceptable by the park. Furthermore, I believe that the revised stocking plan proposed in Alternative B poses no more damage on the wilderness values than the Ross Lake Dam, the roads, and the trail systems, and most certainly much less than horses.

I trust that the Park Service wants to make the right decision. Then, what is the right decision? In my opinion, it is not the one that is made under political pressure, but the one that is derived from hard facts and scientific studies.

In managing our wilderness, I believe we need to respect both wilderness values, the ecological integrity, and the wilderness experience, which are entitled to all park visitors, including anglers. No one wilderness value should take precedence over the other.



Finally, I would like to point out in the Wilderness Act it reiterates that “Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of several states with respect to wildlife and fish in the national forests.” All federal agencies, including the U.S. Forest Service, the National Parks and the Bureau of Land Management and the U.S. Fish and Wildlife Service are under this directive.

According to the language written in the Act, the WDFW clearly has the rights to manage fish population in the wilderness. Given Washington State's disputable and undiminished right to manage the fisheries in the wilderness, I do not understand why the Park Service needs to seek from Congress the unambiguous legal authority for fish stocking in the park complex. I applaud the past cooperation between the NPS and the WDFW and hope the spirit of this cooperation will continue so that we, the citizens of Washington state, will not become the victims of either extreme views on wilderness values or political winds, or both. Thank you for listening.