



United States Department of the Interior

NATIONAL PARK SERVICE
Glen Canyon National Recreation Area
P.O. Box 1507
Page, Arizona 86040



Dear Interested Party:

Accompanying this letter is a copy of the Draft Uplake Development Concept Plan (DCP) / Environmental Assessment (EA) for Bullfrog, Halls Crossing and Hite development districts at Glen Canyon National Recreation Area (NRA). The National Park Service uses DCPs to plan future facilities necessary to meet the park objectives while ensuring the protection of resources, park values, and recreation opportunities consistent with the park's enabling legislation, purpose, mission, and goals. Previous plans for these uplake areas were completed in the mid-1980's and needed updating to address current and anticipated issues affecting the management for these areas. Once finalized, the DCP will guide development for approximately 15 to 20 years.

Over the last several years, Glen Canyon NRA has experienced varying numbers of visitors, drought, and unprecedented changes in lake levels. Lower lake levels have affected the location and access to water-based facilities lake wide. Effects of lower lake levels necessitates our need to evaluate the viability and location of future facilities and services, changing visitor needs and expectations, and carrying capacity issues on Lake Powell when lake conditions change.

The DCP alternatives portion of this document describes a range of actions for future development. The EA sections evaluate the alternatives in terms of potential impacts to the natural and cultural environment. Alternative A, the no-action alternative, describes current facilities and uses that have been implemented under previously approved planning and compliance. Alternative B proposes changes to the current facilities including upgrades and the establishment of development maximums for specific facilities to address future needs. Alternative C includes many of the same proposals described in Alternative B along with additionally specific improvements or changes in facility expansion limits.

We welcome your review and comments during the public comment period from July 18 through August 18, 2006. The document is available in electronic format on the internet at <http://parkplanning.nps.gov> or on compact disk by request. Printed copies are also available at the following public locations:

Regional Libraries: Salt Lake City Public Libraries, Washington County Public Library (St. George, UT), Kanab Public Library, Grand County Public Library (Moab, UT), San Juan County Public Libraries (Monticello & Blanding, UT), Mesa County Public Libraries (Grand Junction, CO), Wayne County Public Library (Bicknell, UT), and Page Public Library.

Other Locations: Bullfrog Visitor Center, Grand Staircase-Escalante Visitor Center (Kanab, UT), Escalante Interagency Visitor Center, Carl Hayden Visitor Center (Page, AZ), Glen Canyon NRA Headquarters (Page, AZ).

If you wish to comment on the Draft Uplake Development Concept Plan / Environmental Assessment you may mail comments to the name and address below or post comments online at <http://parkplanning.nps.gov>. The plan and environmental assessment will be on public review for approximately 30 days. Our practice is to make comments, including names, home addresses, home phone numbers, and email addresses of respondents, available for public review. Individual respondents may request that we withhold their names and/or home addresses, etc., but if you wish us to consider withholding this information you must state this prominently at the beginning of your comments. In addition, you must present a rationale for withholding this information. This rationale must demonstrate that disclosure would constitute a clearly unwarranted invasion of privacy. Unsupported assertions will not meet this burden. In the absence of exceptional, documentable circumstances, this information will be released. We will always make submissions from organizations or businesses, and from individuals identifying themselves as representatives of or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to Glen Canyon National Recreation Area, ATTN: GLCA Draft Uplake DCP/EA at PO Box 1507 in Page, AZ 86040. For more information about this project, please contact the park at 928-608-6200. Thank you for your time and interest in Glen Canyon National Recreation Area.

Sincerely,

Kitty L. Roberts
Superintendent



Draft Uplake Development Concept Plan / Environmental Assessment

July 2006



**U.S. Department of the Interior
National Park Service**

**Draft Uplake Development Concept Plan /
Environmental Assessment**

**Glen Canyon National Recreation Area
Garfield, Kane, and San Juan Counties, Utah**

Abstract

Glen Canyon National Recreation Area (NRA) encompasses more than 1.2 million acres of land and water in northern Arizona and southeastern Utah. The principal feature of the area is Lake Powell, which was formed by construction of Glen Canyon Dam on the Colorado River in 1963. To implement development within Glen Canyon NRA, the National Park Service uses development concept plans (DCPs) to define the facilities and activities necessary to meet the general goals and objectives set forth in the general management plan. This DCP provides guidance for development for approximately 15 to 20 years. The project area covered in this planning effort includes three marinas (Bullfrog, Halls Crossing, and Hite) within Glen Canyon NRA, spanning three counties in Utah. Collectively, these areas are referred to as the uplake area.

Subsequent to development of previous DCPs, the uplake area within Glen Canyon NRA has experienced periods of changing visitation patterns, drought, and unprecedented changes in lake levels. A general reduction in annual visitation during recent drought years, along with changes in visitor needs and expectations, contribute to the need to update long-range planning for uplake areas. Lower lake levels have affected the location and access to water-based facilities and prompted the need to evaluate future facilities and services when low water lake conditions occur. The overall purpose of the Draft Uplake Development Plan / Environmental Assessment is to evaluate a range of alternatives for the future management of the uplake marinas and associated developed areas at Bullfrog, Halls Crossing, and Hite (Uplake DCP) to ensure the protection of NRA resources and values while offering recreation opportunities as provided in Glen Canyon NRA enabling legislation, purpose, mission, and goals.

This environmental assessment evaluates three alternatives for future development in the uplake areas. Alternative A, the no-action alternative, describes and evaluates current facilities and uses that are in place or currently funded for construction based on existing approved plans and amendments. Alternative B (preferred alternative) proposes changes to current facilities to address future needs through upgrades and defined maximum expansion of specific facilities. Alternative C includes many of the same proposals described in alternative B, with additionally specific improvements or facility expansion.

Alternative B is the National Park Service proposed action and the environmentally preferred alternative. The majority of predicted adverse impacts under alternative B would result from construction of new and expanded facilities. All short-term adverse impacts are predicted to be negligible to minor and adverse.

Long-term adverse impacts would be negligible to minor for geology and soils, water resources (waters of the United States, including wetlands and floodplains), wildlife, threatened and endangered species and species of concern / designated critical habitat, visual resources, archeological resources, and ethnographic resources. Long-term minor to moderate adverse impacts would occur to air quality. Long-term adverse impacts to soundscapes would vary seasonally with levels of human-caused sound, and would range from negligible to moderate. Long-term adverse impacts to vegetation would be moderate.

Construction of new facilities or improvements to existing facilities would also result in short- and long-term beneficial impacts. Short-term beneficial impacts to socioeconomics would be minor. Long-term beneficial impacts would generally range from negligible to minor to vegetation, visual resources, park operations, public health and safety, and transportation. Long-term beneficial impacts may reach moderate levels for visitor use and experience, and socioeconomics.

Notes to Reviewers and Respondents

If you wish to comment on the Draft Uplake Development Concept Plan / Environmental Assessment, you may mail comments to the name and address below or you may post comments online at <http://parkplanning.nps.gov/>. The DCP and environmental assessment will be on public review for 30 days. Our practice is to make comments, including names, home addresses, home telephone numbers, and e-mail addresses of respondents, available for public review. Individual respondents may request that we withhold their names and/or home addresses, etc.; however, if you wish us to consider withholding this information, you must state this prominently at the beginning of your comments. In addition, you must present a rationale for withholding this information. This rationale must demonstrate that disclosure would constitute a clearly unwarranted invasion of privacy. Unsupported assertions will not meet this burden. In the absence of exceptional, documentable circumstances, this information will be released. We will always make submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to:

Glen Canyon National Recreation Area
ATTN: GLCA Uplake DCP/EA
PO Box 1507
Page, AZ 86040

CONTENTS

ACRONYMS AND ABBREVIATIONS XI

PURPOSE AND NEED 3

Introduction	3
Purpose and Significance of Glen Canyon National Recreation Area	3
Purpose and Need for Action	5
Relationship of the Proposed Action to Other Planning Efforts	8
Public Involvement	9
Visitor Survey	10
Issues and Impact Topics	11
Impact Topics Selected for Detailed Analysis	12
Impact Topics Dismissed from Further Analysis	16

ALTERNATIVES 21

Introduction	21
Disturbed Area Calculations	29
Alternative A (No Action)	29
Employee, Concessioner, and Partner Housing	33
Overnight Accommodations	34
Visitor Camping	41
Shower and Laundry Facilities	42
Land-Based Stores	42
Land-Based Food Service	43
Day-Use Facilities	43
Ranger Station / Visitor Contact Station and Emergency Facilities	43
Concessioner Boat Maintenance and Repair and Property Maintenance Facilities	44
National Park Service Maintenance Facilities	45
Secured Storage	45
Utility Systems	46
Roads and Parking	48
Fee Collection System	48
School	48
Boat Wash-Down Area	49
Marina Facilities	49
Water-Based Stores	51
Water-Based Food Service	51
Public Boat Launch Capabilities	51
Launch Ramp Support Facilities	53
Ferry Service Facilities	53

CONTENTS

River Runner Takeout	54
Alternative B (Preferred Alternative)	54
Employee, Concessioner, and Partner Housing	55
Overnight Accommodations	56
Visitor Camping	56
Shower and Laundry Facilities	57
Land-Based Stores	57
Land-Based Food Service	57
Day-Use Facilities	58
Ranger Station / Visitor Contact Station and Emergency Facilities	58
Concessioner Boat Maintenance and Repair and Property Maintenance Facilities	58
Secured Storage	58
Utility Systems	65
Roads and Parking	65
Fee Collection System	65
School	65
Boat Wash-Down Area	65
Marina Facilities	65
Water-Based Food Service	66
Public Boat Launch Capabilities	66
Ferry Service Facilities	66
Alternative C	66
Visitor Camping	68
Shower and Laundry Facilities	68
Land-Based Stores	68
Ranger Station / Visitor Contact Station and Emergency Facilities	68
National Park Service Maintenance Facilities	75
Marina Facilities	75
Public Boat Launch Capabilities	75
Launch Ramp Support Facilities	75
Comparison to Project Objectives	75
Environmentally Preferred Alternative	76
Alternatives Considered But Dismissed	79
Costs of Alternatives	79
Mitigation Measures	79
General Considerations	79
Sediment Control	83
Soils	84
Paleontology	84
Air Quality	84
Water Resources	85
Floodplains	85
Vegetation	85

Threatened and Endangered Species / State Species of Concern	86
Visual Resources	87
Soundscapes	87
Archeological Resources	87
Visitor Use and Experience	88
Park Operations	88
Public Health and Safety	89
Transportation	89
Supplemental Calculations and Analysis for Lake Powell Carrying Capacity	89
Analysis of Carrying Capacity for Lake Powell	91

AFFECTED ENVIRONMENT 99

Introduction	99
General Description	99
Land Use	100
Soils	100
Geology	104
Geology of the Bullfrog Area	104
Geology of the Halls Crossing Area	104
Geology of the Hite Area	105
Paleontology	105
Potential Paleontological Resources at Bullfrog	105
Potential Paleontological Resources at Halls Crossing	105
Potential Paleontological Resources at Hite	106
Air Quality	107
Water Resources	107
Introduction	107
Lake Level Analysis	109
Water Quality	110
Other Water Resources	111
Siltation	111
Effects of Sedimentation	111
Floodplains	113
Waters of the United States, Including Wetlands	113
Vegetation	114
Introduction	114
Analysis Area Vegetation	115
Wildlife	119
Mammals	119
Birds	120
Reptiles and Amphibians	120
Fish	121

CONTENTS

Invertebrates	121
Threatened and Endangered Species and Species of Concern / Designated Critical Habitat	122
Federally Listed Species Known to Occur in Analysis Area	122
Presence of Designated Critical Habitat for Federally Listed Species	122
Species-Specific Information	129
Utah State Wildlife Species of Concern	130
Visual Resources	132
Soundscapes	133
Archeological Resources	134
Ethnographic Resources	135
Visitor Use and Experience	136
Socioeconomic Environment	137
Affected Counties	138
Gateway Communities	140
Business Activity	141
Lake Powell School	143
Tax Revenue	143
Fee Revenue	144
Park Operations	144
Public Health and Safety	146
Transportation	147
ENVIRONMENTAL CONSEQUENCES	151
Introduction	151
Methodology	151
Cumulative Effects Analysis Method	152
Actions That Make Up the Cumulative Impacts Scenario	152
Impairment Analysis Method	153
Criteria and Thresholds for Impact Analysis	154
Impact Topics	154
Land Use	154
Soils and Geology	157
Paleontology	160
Air Quality	163
Water Resources	167
Waters of the United States, Including Wetlands	172
Floodplains	176
Vegetation	179
Methodology	179
Wildlife	183
Threatened and Endangered Species and Species of Concern/ Designated Critical Habitat	186

Visual Resources	192
Soundscapes	195
Archeological Resources	199
Methodology	200
Ethnographic Resources	205
Visitor Use and Experience	208
Socioeconomic Environment	216
Park Operations	220
Public Health and Safety	225
Transportation	227

CONSULTATION AND COORDINATION 233

Agency Consultation	233
Endangered and Special-Status Species	233
Cultural Resources	234
Public Involvement	235
Individuals Involved in Preparation and Review of the Document	236

SELECTED BIBLIOGRAPHY 239

APPENDIX A: PUBLIC INVOLVEMENT (NEWSLETTERS AND PUBLIC COMMENT FORM) 249

APPENDIX B: CLASS C COSTS 275

APPENDIX C: BALD EAGLE SIGHTINGS 295

APPENDIX D: CONSULTATION 301

APPENDIX E: 2005 VISITOR SURVEY EXCERPT 319

FIGURES

Figure 1. Glen Canyon National Recreation Area	4
Figure 2. Uplake Developed Areas	6
Figure 3. Grand Junction Public Meeting	9
Figure 4. Open House Events at Lake Powell	10
Figure 5. Concessioner Housing Units at Bullfrog	33
Figure 6. Concessioner Trailer Housing Units at Bullfrog	33
Figure 7. Defiance House Lodge	34
Figure 8. Typical Family Rental Units	34
Figure 9. Bullfrog Marina, Alternative A: No-Action Alternative	35
Figure 10. Halls Crossing Marina, Alternative A: No-Action Alternative	37
Figure 11. Hite Marina, Alternative A: No-Action Alternative	39
Figure 12. Bullfrog Campground	41
Figure 13. Halls Crossing RV Park	42
Figure 14. Bullfrog Village Center	43
Figure 15. Hite Store	43

CONTENTS

Figure 16. Boat Maintenance and Repair and Concessioner Maintenance Area at Bullfrog	45
Figure 17. Aerial View of Halls Crossing Secured Storage and Construction of New Access to Marina Facilities	46
Figure 18. Aerial View of Wet Slips and Water-Based Stores at Bullfrog	49
Figure 19. Hite Launch Ramp at Low Water	51
Figure 20. Main Launch Ramp at Bullfrog Developed Area	52
Figure 21. Bullfrog Marina: Alternative B	
Figure 22. Halls Crossing Marina: Alternative B	61
Figure 23. Hite Marina: Alternative B	63
Figure 24. Bullfrog Marina: Alternative C	69
Figure 25. Halls Crossing Marina: Alternative C	71
Figure 26. Hite Marina: Alternative C	73
Figure 27. Visitor Use Zones	90
Figure 28. Soils of Bullfrog Developed Area	101
Figure 29. Soils of Halls Crossing Developed Area	102
Figure 30. Soils of Hite Developed Area	103
Figure 31. Annual Elevation	108
Figure 32. Estimate of Sediment	112
Figure 33. Vegetation of Bullfrog Developed Area	116
Figure 34. Vegetation of Halls Crossing Developed Area	117
Figure 35. Vegetation of Hite Developed Area	118
Figure 36. Open House Meeting	233

TABLES

Table 1. Summary of Alternatives	22
Table 2. Changes and Comparisons in Development/Disturbed Area Acreages	30
Table 3. Wet Moorage Summary	50
Table 4. Launch Ramps	53
Table 5. Comparison with Project Objectives	77
Table 6. Comparison of Ability to meet NEPA Criteria for Each Alternative	78
Table 7. Summary and Comparison of Potential Environmental Consequences	80
Table 8. 2005 Limiting Factor Matrix Lake Elevation 3,500	92
Table 9. 2005 Limiting Factor Matrix Lake Elevation 3,550	92
Table 10. 2005 Limiting Factor Matrix Lake Elevation 3,600	93
Table 11. 2005 Limiting Factor Matrix Lake Elevation 3,700	93
Table 12. Carrying Capacity Launch Rates / Current Capacity Comparison Table	94
Table 13. Carrying Capacity Launch Rates (Updated Carrying Capacity Limits Compared to Alternative B)	95
Table 14. Carrying Capacity Launch Rates, Updated Carrying Capacity compared to Alternative C	95
Table 15. Federal Threatened, Endangered, or Candidate Species of Garfield, Kane, and San Juan Counties, Utah	123
Table 16. Location of Endangered Fish Species Critical Habitat	128
Table 17. Uplake Visitation 1995–2005	136
Table 18. Demographic Profile of the State of Utah and Potentially Affected Counties	138

Table 19. Economic Profile of the State of Utah and Potentially Affected Counties	139
Table 20. Lodge Room and Peak Occupancy	142
Table 21. Housekeeping (Family Rental) Unit Peak Occupancy	142
Table 22. Resource and Visitor Protection Activity in GLCA NRA 2005	146

CONTENTS

ACRONYMS AND ABBREVIATIONS

amsl	Above Mean Sea Level
ARAMARK	ARAMARK Sports and Entertainment Services, Inc.
BLM	Bureau of Land Management
BMP	Best Management Practice
BAOT	Boats At One Time
BP	Before Present
CCLR	Carrying Capacity Launch Rates
CFR	Code of Federal Regulations
dB	Decibel
dBA	A-Weighted Decibel
DCP	Development Concept Plan
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
GMP	Glen Canyon National Recreation Area General Management Plan and Environmental Impact Statement, 1979
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NEPA	National Environmental Policy Act of 1969
NPS	National Park Service
NRA	National Recreation Area
NRHP	National Register of Historic Places
PL	Public Law
ROS	Recreational Opportunity Spectrum
RRU	Recreation and Resource Utilization
RV	Recreational Vehicle
SH	State Highway
SHPO	State Historic Preservation Office
Typ.	Typical
UDOT	Utah Department of Transportation
Uplake	Uplake Districts of Lake Powell
Uplake DCP	Uplake Districts of Lake Powell included in the Development Concept Plan
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service

Purpose and Need

PURPOSE AND NEED

INTRODUCTION

Glen Canyon National Recreation Area (NRA) encompasses more than 1.2 million acres of land and water in northern Arizona and southeastern Utah. The southern boundary is contiguous with Navajo Nation lands. Other boundaries adjoin Grand Canyon National Park, Capitol Reef National Park, Canyonlands National Park, and Rainbow Bridge National Monument, all managed by the National Park Service (NPS). The recreation area also adjoins areas administered by the Bureau of Land Management (BLM), including Grand Staircase–Escalante National Monument and Vermilion Cliffs National Monument (which includes the Paria Canyon Wilderness).

The principal feature of the area is Lake Powell, which was formed by the Glen Canyon Dam on the Colorado River. At full pool, approximately 3,700 feet above mean sea level (amsl), the lake occupies approximately 163,000 surface acres, with about 1,960 miles of shoreline. The reservoir stores approximately 27 million acre-feet of water.

Glen Canyon NRA provides boating, fishing, hiking, and camping opportunities to approximately 2 million people per year. As shown in figure 1, recreational activities and supporting facilities are concentrated at six developed areas: Antelope Point, Bullfrog, Dangling Rope, Halls Crossing, Hite, and Wahweap. This development concept plan (DCP) includes proposed management actions for three of these areas: Hite, Halls Crossing, and Bullfrog (Uplake DCP).

PURPOSE AND SIGNIFICANCE OF GLEN CANYON NATIONAL RECREATION AREA

National park system units are established by Congress to fulfill specific purposes based on the unit's unique resources. A unit's purpose, as established by Congress, is the foundation on which later management decisions are based to conserve resources while providing for the enjoyment of future generations. The purpose and significance of Glen Canyon NRA and its broad mission goals are derived from its enabling legislation and are summarized in the *Glen Canyon National Recreation Area General Management Plan and Environmental Impact Statement* (GMP) (NPS 1979) and strategic plan (NPS 2005f).

Glen Canyon NRA was established by enactment of Public Law (PL) 92-593 on October 27, 1972. The legislation defines the purposes of the recreation area: “. . .to provide for public outdoor recreation use and enjoyment of Lake Powell and lands adjacent thereto. . . and to preserve scenic, scientific, and historic features contributing to public enjoyment of the area” (NPS 1979).

The primary objective of the NRA, as established in the GMP, is “. . . to manage the recreation area so that it provides maximal recreational enjoyment to the American public and their guests” (NPS 1979).

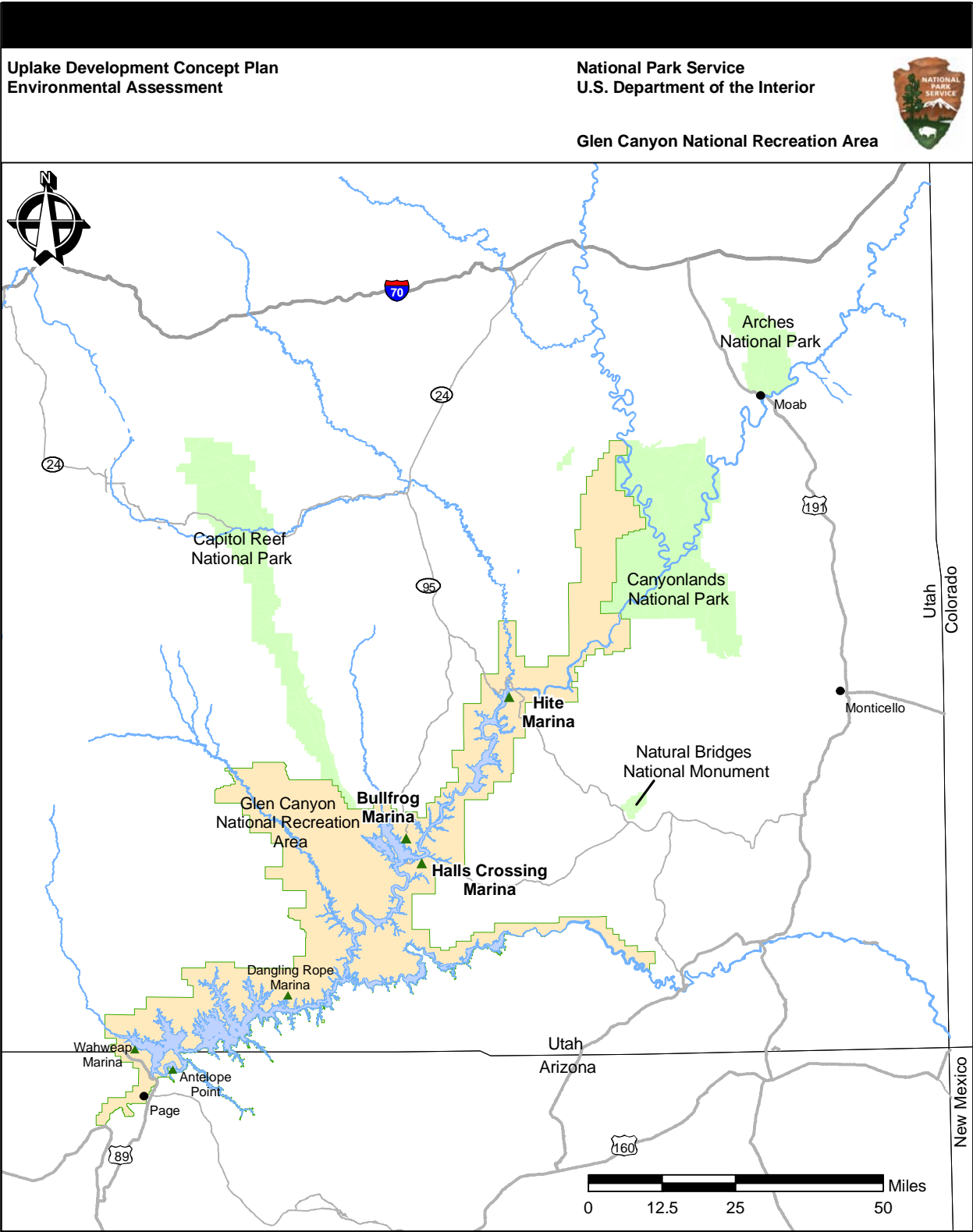


FIGURE 1. GLEN CANYON NATIONAL RECREATION AREA

The enabling legislation for Glen Canyon NRA states that “The Secretary shall administer, protect, and develop the recreation area in accordance with the provision of the [Organic Act]. . . and with any other statutory authority available to him for the conservation and management of natural resources” (16 *United States Code* [USC] 459f-5(a)).

This act also specifies that “nothing. . . shall affect or interfere with the authority of the Secretary. . . to operate Glen Canyon dam and reservoir” for the purposes of the Colorado River Storage Project Act, the achievement of which is the responsibility of the Bureau of Reclamation.

As stated in the GMP (NPS 1979) and strategic plan (NPS 2005f), Glen Canyon NRA is important because of the following:

- Glen Canyon NRA offers a tremendous diversity of both water- and land-based recreational opportunities.
- Glen Canyon NRA contains Lake Powell, the second-largest human-made lake in North America, which provides both a unique opportunity to recreate in a natural environment and a transportation corridor to remote backcountry areas of Glen Canyon NRA.
- Glen Canyon NRA is in the heart of the Colorado Plateau region, which offers a unique combination of water and desert environments. It offers a natural diversity of rugged water- and wind-carved canyons, buttes, mesas, and other outstanding physiographic features.
- The climate and physical features of Glen Canyon NRA have created local environments favorable to the preservation of scientifically valuable objects, sites, populations, habitats, or communities that are important in and of themselves, or provided opportunities to add to our understanding of past or ongoing events.
- Evidence of 11,000 years of human occupation and use of resources within Glen Canyon NRA provides a continuing story of prehistoric, historic, and present-day affiliation of humans and their environment.
- Glen Canyon NRA constitutes a substantial part of the outstanding public lands of the Colorado Plateau.

PURPOSE AND NEED FOR ACTION

To implement development within Glen Canyon NRA, the National Park Service uses DCPs that build on the general goals and objectives set forth in the GMP. The DCPs provide guidance for development for an approximate 15- to 20-year period. This planning effort will guide future development of the three marinas: Bullfrog, Halls Crossing, and Hite (figure 2). Collectively, the area containing these three marinas is referred to as the uplake area.

**Uplake Development Concept Plan
Environmental Assessment**

**National Park Service
U.S. Department of the Interior**



Glen Canyon National Recreation Area

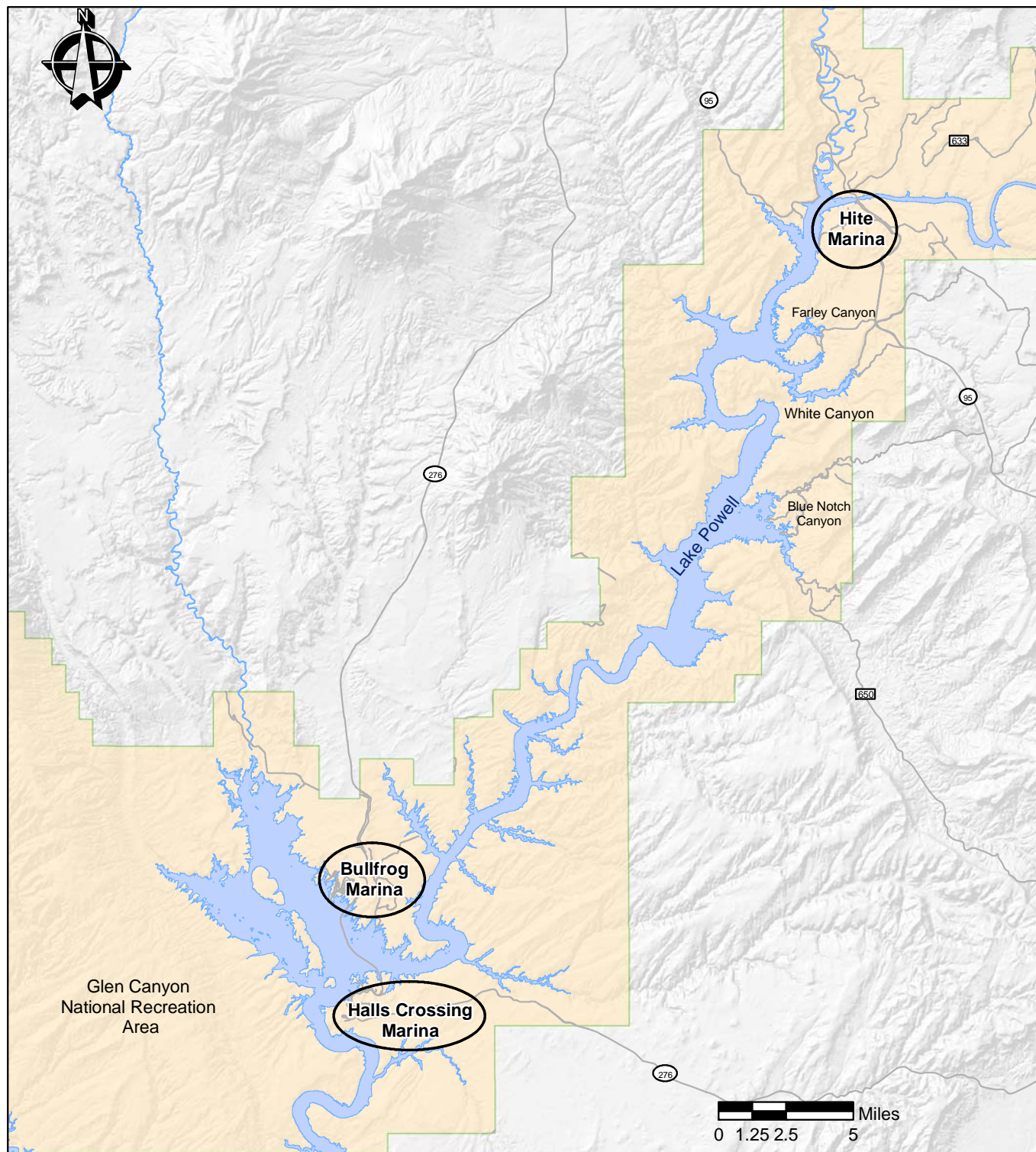


FIGURE 2. UPLAKE DEVELOPED AREAS

Previous plans have been prepared for Bullfrog, Halls Crossing, and Hite developed areas. The most recent DCP for the Hite area was completed in August 1983. A joint DCP for Bullfrog and Halls Crossing was approved in May 1985, and amended in September 1985. Minor updates have occurred since—the most recent for Bullfrog in January 1990.

Subsequent to development of the previous DCPs, the uplake areas within Glen Canyon NRA have experienced periods of increased visitation, drought, and unprecedented low lake levels. Changes in visitation and user demands, and low lake levels that affect water-based facilities, require evaluation of future service needs and anticipated physical limitations.

The Uplake DCP is needed to:

- Determine how to provide future visitor access to the uplake developed areas and tributaries at varying lake levels.
- Determine the need for and scope of additional visitor services in the uplake developed areas in order to address changes in visitation numbers and visitor expectations.
- Consider the impacts of fluctuating lake levels on visitor access and the provision of services.
- Evaluate the impacts of existing developments on the resources within the uplake developed areas.

The overall purpose of the Uplake DCP is to evaluate a range of alternatives for the future management of the uplake marinas and associated developed areas at Bullfrog, Halls Crossing, and Hite to ensure the protection of NRA resources and values while offering recreation opportunities as provided for in the NRA's enabling legislation, purpose, mission, and goals.

To address uplake needs and meet the overall purpose of the Uplake DCP, the following objectives were developed through the planning process:

- Continue to provide visitor access to the uplake areas and tributaries.
- Provide opportunities for a variety of visitor experiences at the uplake areas.
- Provide necessary and appropriate visitor services at the uplake areas, consistent with current and anticipated visitation.
- Accentuate different types of services at each developed area.
- Design facilities and services within uplake developed areas to accommodate fluctuating lake levels.
- Guide efficient and effective organization of services within uplake developed areas.

This DCP / environmental assessment (EA) is being prepared to analyze the proposed action and alternatives and their impact on the environment. The EA is incorporated into the DCP, as appropriate. The EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act of 1966, and regulations of the Council on Environmental Quality (40 *Code of Federal Regulations* [CFR] 1508.9).

RELATIONSHIP OF THE PROPOSED ACTION TO OTHER PLANNING EFFORTS

A variety of NPS, federal, and state plans, policies, and actions influence management of the uplake developed areas and development of the DCP. The most pertinent plans and policies are summarized as follows:

General Management Plan 1979. The Glen Canyon NRA operates under the management goals and objectives set forth in the GMP (NPS 1979). The GMP is the foundation of previous DCPs for the uplake developed areas and will continue to be used for development of this DCP. Any proposals in this DCP must be consistent with and supported by the GMP.

The Carrying Capacity of Lake Powell: A Management Analysis of Capacity for Boater Recreation. The 1987 study identified carrying capacity limits on Lake Powell at full pool based on specific criteria and distribution over 13 visitor use zones. The focus of the study was to develop recommended maximum launch rates to protect lake shoreline, water quality, boater safety, and other limited resources (NPS 1987). Supplemental calculations to this study were prepared for this planning effort to evaluate Lake Powell carrying capacity in the uplake visitor use zones (6-13) at varying water levels using the same methodology as the 1987 study. These calculations provide updated recommended maximum carrying capacity launch rates when Lake Powell water levels fluctuate due to drought. Further discussion and a summary of findings are found in the "Supplemental Calculations and Analysis for Lake Powell Carrying Capacity" section.

Bureau of Reclamation Annual Reservoir Operations Plan and Environmental Impact Statement. Section 602 of the Colorado River Basin Project Act requires the Bureau of Reclamation to prepare an operations plan each year. Glen Canyon Dam is managed primarily to meet statutory water delivery obligations, with consideration given to maintaining or improving instream flow for aquatic resources. The annual plan, which varies according to anticipated hydrologic conditions and other factors, has a substantial influence on water levels at Lake Powell.

Personal Watercraft Environmental Impact Statement and Rule-Making 2003. This document concerned the use of personal watercraft at Glen Canyon NRA. The final document allows personal watercraft use in the recreation area under a special regulation with additional management restrictions.

Environmental Assessment and Management / Development Concept Plan for Lake Powell's Accessible Shorelines, April 1988. The accessible shorelines plan outlined shoreline recreation use areas that would be designated for day use and overnight camping and developed general and site-specific management strategies.

Natural Resource Management Plan, June 1986. The Natural Resource Management Plan provides an overview of strategies to manage natural resources within Glen Canyon NRA as they relate to specific projects and identified problems.

Development Concept Plans. In addition to the aforementioned planning efforts, the development of this document was guided by past DCPs for the three uplake developed areas. These past plans include the following documents:

- Environmental Assessment / Development Concept Plan for Hite Developed Area, November 1982
- Environmental Assessment / Development Concept Plans for Bullfrog Basin and Halls Crossing Development Zones, Rocky Mountain Region, May 1985
- Amended Development Concept Plan, Bullfrog Basin, September 1985
- Amended Development Concept Plan, Halls Crossing, September 1985
- Revision of Bullfrog Development Concept Plan, Internal Memorandum, January 1990

PUBLIC INVOLVEMENT

NEPA requires that federal agencies make a diligent effort to involve the interested and the impacted public before making decisions affecting the environment. To inform the public, project scoping is initiated in the beginning of the planning process to solicit comments about a proposed project. The National Park Service sent out project scoping brochures to a mailing list of approximately 1,800 names comprised of individuals known to have interest in Lake Powell in general, or that use the uplake developed areas in particular. A copy of the scoping brochure is included in Appendix A: Public Involvement.

Two public scoping workshops were conducted in February 2004. One was held in Bullfrog, Utah, and the other in Grand Junction, Colorado (figure 3). These meetings were conducted in an open house format with NPS personnel available at map stations, which addressed various aspects of the planning process and gave the public an opportunity to provide input.



FIGURE 3. GRAND JUNCTION PUBLIC MEETING

meeting minutes in Appendix D: Consultation.

Approximately 69 people attended the Grand Junction meeting and approximately 18 people attended the Bullfrog meeting. A total of 156 comments were received by letter, e-mail, and in person at the public workshops.

Project scoping was also conducted with affiliated tribes by the NPS American Indian liaison at monthly tribal meetings and via project correspondence. Project updates were presented at regular tribal meetings and are summarized in the “Consultation and Coordination” section of this document, along with



FIGURE 4. OPEN HOUSE EVENTS AT LAKE POWELL

A series of open house events were held in July 2004, at various locations in the Bullfrog and Halls Crossing developed areas. These informal sessions offered visitors using the uplake facilities an opportunity to look at maps, consider preliminary issues, and offer input on the effect of low water conditions on their Lake Powell experience (figure 4).

A second newsletter with updated schedule information and draft project alternatives was sent to a revised mailing list of approximately 2,400 individuals, agencies, and organizations in August 2004 (appendix A).

As a result of the public involvement process, the following issues were identified:

- access limitations to water-based facilities at variable lake levels
- long-range impacts of siltation
- extent and scale of facilities available at specific marina areas
- traffic congestion and parking limitations at all marinas
- maintenance and extension of launch ramps
- protection of water quality
- availability of water-based restroom / pump-out facilities
- separation of houseboat rentals from other boat storage

Visitor Survey

The impact of the regional drought continues to have a fundamental effect on water-based access to developed area facilities. To understand the impacts of changing lake levels on visitors and develop supplemental calculations for the carrying capacity at lower lake levels, a visitor survey was prepared. The survey was conducted in May through June 2005. The visitor survey was sent to a random sampling of 500 persons on mailing lists comprised of boaters

who rent slips, secured storage space, or buoys; individuals on NPS or concessioner mailing lists; independent business partners with the NRA; and public information lists used for mailing information notices on past NRA planning efforts. The National Park Service received 328 responses. An excerpted summary of the 2005 visitor survey report can be found in appendix E. The complete visitor survey report is available on the National Park Service Web site at: <http://park.planning.nps.gov>. Key points derived from the visitor survey were considered in the planning of this DCP.

- Nearly 75% of respondents indicated they would be willing to accept seeing and/or hearing more people on Lake Powell if lake access is limited. Nearly 30% of all respondents indicated they would accept seeing and/or hearing any number of visitors to continue to have lake access.
- 57% of respondents indicated that the amount of time spent waiting in line to launch a boat was a moderate or serious problem.
- Nearly 50% of respondents indicated that the level of noise on the lake was no problem.
- Over 78% of respondents indicated they would support increasing facilities on the shoreline, such as launch ramps, parking, etc.
- Nearly 70% of respondents indicated they would support increasing services on the shoreline such as fueling stations, slips, buoys, etc.
- Over 64% of respondents would support improving public access to the lake.
- Expanding the number of marina slips was supported by 45% of respondents, while only 21% would oppose such an increase.
- Approximately 70% of respondents indicated that litter on the shoreline and finding a beach campsite is a moderate or serious problem.

ISSUES AND IMPACT TOPICS

Issues and impact topics were identified based on internal and external scoping; current management issues at Glen Canyon NRA; NPS knowledge of limited, easily impacted, or sensitive resources; federal laws, regulations, and executive orders; NPS *Management Policies 2001*; and information contained in the GMP or other NRA-specific planning documents.

Issues identified comprise the primary areas of concern for evaluation in the DCP/EA. Issues have been consolidated into several topics. Many issues presented in this DCP resemble issues studied in previous DCPs. The intent of this DCP is to evaluate the issues in light of current and predicted future conditions for the recreation area and the uplake developed areas, and to describe concurrent needs.

- There is a need to provide water access and water-based facilities that are usable at varying lake elevations—recognizing access limitation created as lake levels change.
- There is a need to provide water- and land-based facilities for visitor use that recognizes visitor needs and NPS support capabilities, while protecting natural and cultural resources in the developed areas.

- There is a need to provide maintenance and administrative facilities, utility systems, and staffing at levels commensurate with use and development of the uplake developed areas.
- There is a need to provide facilities and services to support NPS and concessioner employees and their families.

Specific impact topics were developed for discussion focus and to provide comparison of the environmental consequences of each alternative. A brief rationale for the selection of each impact topic, as well as the rationale for dismissing specific topics from further consideration, follow.

Impact Topics Selected for Detailed Analysis

Land Use

Bullfrog, Halls Crossing, and Hite developed areas are located in southern Utah, the uplake district of Glen Canyon NRA. These areas have been designated as developed areas under the GMP (NPS 1979). The alternatives considered in this document may affect present or future land use in the developed areas and surrounding lands. Therefore, land use will be addressed as an impact topic.

Soils and Geology

Glen Canyon NRA and the associated uplake developed areas are in the Colorado River watershed of southeastern Utah, which is part of the larger Colorado Plateau system. Low-lying areas in the park were inundated by Lake Powell, leaving upland areas that generally consist of rock outcrops and thin soils. Because the proposed action would involve ground-disturbing activities, soils and geology will be addressed as an impact topic.

Paleontology

Little is known about the paleontological resources of Glen Canyon NRA. Examination of the analysis area by NRA staff determined that there is a potential for paleontological resources within each of the uplake developed areas that could be impacted by development activities (Gillette 2004). Therefore, paleontology will be addressed as an impact topic.

Air Quality

Section 118 of the 1963 Clean Air Act (42 USC 7401 *et seq.*) requires a park to meet all federal, state, and local air pollution standards. Glen Canyon NRA is designated a class II air quality area under the Clean Air Act, as amended. The Clean Air Act states that the federal land manager has an affirmative responsibility to protect recreation area air quality-related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health)

from adverse pollution impacts. Because air quality could be impacted by decisions made as part of the DCP, air quality will be addressed as an impact topic.

Water Resources

Lake Powell's importance as a water-based resource requires that water quality be continually monitored. The Clean Water Act and supporting criteria and standards promulgated by the U.S. Environmental Protection Agency (EPA) and the Utah Department of Environmental Quality apply to all surface waters in Glen Canyon NRA. Runoff from developed areas and other discharges are prohibited in Lake Powell to preserve lake water quality. However, changes proposed under the various alternatives could result in the potential for additional water settling areas and, if not properly implemented, could impact water quality. Therefore, water resources will be addressed as an impact topic.

Waters of the United States, including Wetlands

The U.S. Army Corps of Engineers (USACE) has jurisdiction for the protection of waters of the United States (including wetlands) under section 404 of the Clean Water Act. Waters of the United States are defined as waters that are navigable for interstate commerce and their tributaries. The Colorado River has been identified as a navigable waterway. Additionally, wetlands are defined as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b]). Proposed actions that have the potential to adversely impact wetlands would be addressed in a wetlands statement of findings. The developed areas at the uplake marinas include potential wetlands areas. Therefore, waters of the United States and wetlands will be addressed as an impact topic.

Floodplains

Executive Order 11988 (*Floodplain Management*) requires all federal agencies to avoid construction within the 100-year floodplain unless no other practical alternative exists. Certain construction within a 100-year floodplain requires preparation of a floodplain statement of findings. The 100-year floodplain has been established at the 3,700-foot (amsl) level by the Federal Emergency Management Agency. The developed areas have temporary or portable facilities within the 100-year floodplain. Therefore, floodplains will be addressed as an impact topic.

Vegetation

NEPA requires an examination of impacts on all components of affected ecosystems. NPS policy is to maintain all components and processes of naturally evolving recreation area ecosystems, including the natural abundance, diversity, and ecological integrity of plants and animals (NPS 2001a). Vegetation has the potential to be impacted as a result of the alternatives under consideration. Therefore, vegetation will be addressed as an impact topic.

Wildlife

NEPA requires an examination of the impacts on all components of affected ecosystems. NPS policy is to maintain all components and processes of naturally evolving recreation area ecosystems, including the natural abundance, diversity, and ecological integrity of plants and animals (NPS 2001a). Wildlife has the potential to be impacted as a result of the alternatives under consideration. Therefore, wildlife will be addressed as an impact topic.

Threatened and Endangered Species and Species of Concern / Designated Critical Habitat

The Endangered Species Act of 1973 requires examination of impacts on all federally listed threatened or endangered species. NPS policy also requires examination of the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species. There is habitat for threatened and endangered species within and adjacent to the uplake developed areas. In addition, there is designated critical habitat in the uplake areas. For these reasons, threatened and endangered species and species of concern / designated critical habitat will be addressed as an impact topic.

Visual Resources

The National Park Service strives to preserve and protect visual resources to ensure a quality visitor experience. Visual resource classes and policies have been outlined by the National Park Service in the GMP (NPS 1979) and NPS *Management Policies 2001*. Alternatives could influence the visual quality and lightscapes of the immediate Bullfrog, Halls Crossing, and Hite developed areas. Therefore, visual resources will be addressed as an impact topic.

Soundscapes

NPS *Management Policies 2001* (section 4.9) require the agency to preserve, to the greatest extent possible, the natural soundscapes of park units. Directors Order – 47: *Soundscape Preservation and Noise Management* (NPS 2000a) defines appropriate and inappropriate sound. Although most sound-producing activities defined in the alternatives would be consistent with the enabling legislation, the proposed relocation and construction activities could cause impacts. Therefore, soundscapes will be addressed as an impact topic.

Archeological Resources

The National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq.*); NEPA; NPS Director's Order – 28: *Cultural Resource Management Guideline* (NPS 1998a); NPS *Management Policies 2001* (NPS 2001a); and Director's Order – 12: *Conservation Planning, Environmental Impact Analysis and Decision-making* (NPS 2001b) require the consideration of impacts on cultural resources either listed or eligible for listing on the National Register of Historic Places (NRHP).

There are archeological resources present within and in close proximity to the developed areas evaluated in this DCP/EA. Therefore, archeological resources will be addressed as an impact topic.

The actions described in this document are subject to section 106 of the National Historic Preservation Act, under the terms of both the 1991 programmatic agreement between the National Park Service and the Advisory Council on Historic Preservation, and the 1995 servicewide programmatic agreement (NPS 1995) between the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers. This document would be submitted to the Utah state historic preservation office (SHPO) for review and comment.

Ethnographic Resources

The National Park Service defines ethnographic resources as any

... site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it (Director's Order – 28: Cultural Resource Management Guideline, p.191).

Many Glen Canyon NRA resources are considered sacred by American Indians. An area in the vicinity of Halls Crossing has been designated as a traditional cultural property. Because ethnographic resources are known to exist at or in proximity to the analysis area, ethnographic resources will be addressed as an impact topic.

Visitor Use and Experience

The Glen Canyon NRA receives approximately 2 million visitors per year, with peak visitation occurring during the months of June, July, and August. Visitation and the visitor experience are affected by changing lake elevations and by changes in visitor facilities. Because facility expansion and upgrades included in the alternatives under consideration are intended to improve visitor use and experience at varying lake levels, the topic of visitor use and experience will be addressed as an impact topic.

Socioeconomic Environment

Activities associated with the alternatives relating to visitor services improvements and operations could directly affect the socioeconomics of the developed areas and surrounding region, including the demand for services in the developed areas, the profitability of commercial services contracts within the recreation area, the demand for services, and economic effects of tourism in adjacent communities. Thus, the socioeconomic environment will be addressed as an impact topic.

Park Operations

Park operations would be influenced by future development and visitation as a result of implementation of any of the alternatives. Therefore, park operations will be addressed as an impact topic.

Public Health and Safety

NPS *Management Policies 2001* state that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy park units. Further, the National Park Service will strive to protect human life and provide a safe visit (NPS 2001a). Based on the potential for health and safety impacts as a result of activities associated with the alternatives at Bullfrog, Halls Crossing, and Hite developed areas, public health and safety will be addressed as an impact topic.

Transportation

NPS *Management Policies 2001* (section 9.2) establish guidelines for development, operation, and maintenance of roadways and trails on NPS-managed lands. The alternatives under consideration could impact transportation and change visitor travel and distribution; therefore, transportation will be addressed as an impact topic.

Impact Topics Dismissed from Further Analysis

Historic Structures

The National Historic Preservation Act (16 USC 470 *et seq.*), NEPA, the NPS Organic Act, NPS *Management Policies 2001*, Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (2001), and Director's Order – 28: *Cultural Resources Management Guideline* require the consideration of impacts on cultural resources, including historic structures either listed or eligible to be listed on the NRHP. For the purposes of analysis in this DCP/EA, historic resources are those human-made sites, structures, features, or objects that date from the time of the arrival of European Americans in approximately 1850, up to the middle of the 20th century (i.e., at least 50 years of age). Historic sites, by definition, can be of American Indian association, but are most often associated with European American use and occupation.

Glen Canyon NRA's historic resources include historic structures, trails, cultural landscapes, and archeological sites. The following NRHP-eligible historic properties and districts are located in the NRA: Wahweap Employee Trailer Village Cabins, Lonely Dell Ranch National Historic District, Defiance House Ruin, Hole-In-The-Rock, and the Davis Pictograph Panel. Glen Canyon NRA contains no national historic landscapes. There are no known historic structures within the areas potentially affected by the Uplake DCP. Therefore, historic structures were dismissed from detailed analysis.

Cultural Landscapes

A cultural landscape is defined by the National Park Service as “. . .a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values.” Cultural landscapes may be expressed in a variety of ways such as patterns of settlement or land use, buildings and structures, systems of circulation and transportation, or parks and open spaces, or any related combination thereof. There is a potential cultural landscape along Hole-in-the-Rock trail outside of the project areas, which may be evaluated in the future for cultural landscape significance. The uptake development areas covered under this DCP/EA do not contain any known cultural landscapes; therefore, this topic was dismissed from detailed analysis.

Museum Collections

The actions described in this DCP / EA are subject to Director’s Order – 24: *NPS Museum Collections Management* (NPS 2000b). Museum collections are exhibited at the visitor centers at the developed areas; however, the visitor centers are not proposed for change under the DCP. Therefore, museum collections were dismissed from detailed analysis.

Wild and Scenic Rivers, Other Unique Natural Areas

The areas of Glen Canyon NRA that would be affected by alternatives considered in this DCP/EA do not contain wild and scenic rivers or other unique natural areas as referenced in 40 CFR 1508.27. Therefore, this topic was dismissed from detailed analysis.

Prime and Unique Farmlands

In August 1980, the Council on Environmental Quality directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture, Natural Resource Conservation Service, as prime or unique. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other lands, except urban built-up land or water). Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. The soils in the analysis area have not been classified as prime or unique farmlands by the Natural Resource Conservation Service (see discussion under “Soils and Geology”). Thus, the topic of prime and unique farmlands was dismissed from detailed analysis.

Environmental Justice

Presidential Executive Order 12898 (*General Actions to Address Environmental Justice in Minority Populations and Low-income Populations*) requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their

programs and policies on minorities and low-income populations and communities. According to the EPA, environmental justice is the

... fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The goal of “fair treatment” is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.

The area surrounding Glen Canyon NRA contains both minority and low-income populations and communities. As a whole, these communities would not be disproportionately and/or adversely affected by the alternatives considered in this plan. Potential impacts to these communities do include socioeconomic opportunities generated by employment and potential business opportunities. These impacts are discussed in the “Socioeconomic Environment” impact section.

The alternatives do not result in any identifiable adverse human health effects or impact the natural environment that would disproportionately affect any minority or low-income population or community because all of the proposed actions fall within the boundary of the NRA. Therefore, environmental justice was dismissed from detailed analysis.

Indian Trust Resources

Indian trust resources are assets that the United States holds and administers for Indian tribes. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources within Glen Canyon NRA. Therefore, Indian trust resources was dismissed from detailed analysis.