Chapter 2:

ALTERNATIVES

CHAPTER 2: ALTERNATIVES

INTRODUCTION

The *National Environmental Policy Act* (NEPA) requires federal agencies to explore a range of alternatives and analyze impacts that any reasonable alternatives could have on the human environment. This chapter describes the various actions that could be implemented for grizzly bear restoration in the U.S. portion of the North Cascades Ecosystem (NCE).

The alternatives under consideration must also include a "no-action" alternative as prescribed by 40 Code of Federal Regulations (CFR) 1502.14. Alternative A in this *North Cascades Ecosystem Grizzly Bear Restoration Plan / Environmental Impact Statement* (draft plan/EIS) is considered to be the "no-action" alternative because it is the continuation of current management. The alternatives presented in this chapter were developed and discussed by the interagency planning team made up of representatives from the U.S. Fish and Wildlife Service (FWS), National Park Service (NPS), U.S. Forest Service (USFS) and the Washington Department of Fish and Wildlife (WDFW). Feedback received during the public scoping process was also considered when developing the range of alternatives (see "Chapter 5: Consultation and Coordination"). For a discussion of the potential costs associated with each alternative see appendix D.

Action alternatives carried forward for detailed analysis must meet the purpose of and need for taking action described in "Chapter 1: Purpose of and Need for Action" to a large degree. Action alternatives are considered to be reasonable if they are technically and economically feasible and show evidence of common sense (CEQ 1981). The "Environmental Consequences" chapter of this draft plan/EIS presents the results of the impact analysis for each alternative. Other alternatives were dismissed from detailed consideration because they would not adequately satisfy the purpose and need for this action or are not technically feasible, and are discussed later in this chapter. Alternatives considered but dismissed from detailed consideration include the following:

- Washington Only Restoration
- Delayed Implementation of Washington Only Restoration
- Natural Recovery
- Ecosystem Restoration and Habitat Preservation Only
- Social Tolerance-Based Grizzly Bear Restoration
- Section 10(j) Population with Citizen Management
- Capture and Release of Healthy, Young Females Only

ALTERNATIVE A: CONTINUATION OF EXISTING GRIZZLY BEAR MANAGEMENT (NO ACTION)

The no-action alternative (alternative A) would continue existing management practices and assumes no new actions would be implemented beyond those available at the outset of the grizzly bear restoration planning process. Based on the Revised Code of Washington 77.12.035, described in chapter 1, alternative A is the only alternative being evaluated in detail that would allow for the full participation by the state of Washington.

The no-action alternative would be a continuation of existing management practices and assumes no new management actions would be implemented beyond those available at the outset of the grizzly bear restoration planning process.

Under the no-action alternative, options for grizzly bear restoration would be limited. The North Cascades National Park Service Complex (park complex) and the surrounding national forests do not have independent grizzly bear restoration plans, and current NPS and USFS planning documents do not call for specific actions related to the restoration of a grizzly bear population. Guidance for grizzly bear restoration and management in the NCE is provided in the NCE chapter of the nationwide Grizzly Bear Recovery Plan (FWS 1997). The priority actions recommended in the NCE chapter of the recovery plan are to develop a strategy for implementing that chapter (through reducing human-related direct and indirect mortality, improved sanitation, poaching control, access management, and other methods); developing an ongoing educational program to provide information about grizzly bears and grizzly bear recovery to the public; conducting research and monitoring to determine grizzly bear population size, distribution and trend, habitat, and home ranges; and initiating an environmental impact statement (EIS) through the NEPA process to evaluate a range of alternatives for how to recover the population in the NCE (FWS 1997). Since the drafting of the NCE chapter, it has become clear that the NCE lacks sufficient evidence to suggest a grizzly bear population exists.

Under the no-action alternative, grizzly bears would not be released into the NCE. However, grizzly bears would not be prevented from moving into the NCE from other ecosystems—the closest ecosystems include the SE and grizzly bear units in British Columbia. Grizzly bears that move into the NCE would be fully protected as a threatened species under the *Endangered Species Act* (ESA).

The direction provided in the 1997 Interagency Memorandum of Understanding (MOU) between NPS and USFS and formalized in the *Ross Lake General Management Plan* (GMP) would continue under the no-action alternative. The intent of the Ross Lake GMP to retain core area ratios at a level of 70% or higher per Bear Management Unit (BMU) would continue to guide access management on NPS lands under the no-action alternative. Most BMUs in the park complex cover areas that extend to USFS lands adjacent to the park complex, and most non-core areas within these shared BMUs are located on USFS land. Any proposal for development within the NPS portion of a shared BMU would consider the portion of the BMU on USFS lands: any loss of core area on NPS lands would affect the core ratio for the entire BMU. Any loss of core area within the park complex would likely require mitigation on USFS land to maintain no net loss of core area for the BMU as a whole. The USFS would continue management under the no-net-loss agreement established by the 1997 interagency MOU until forest plans are revised or amended.

Sanitation measures would continue to be implemented for both black bears and grizzly bears, including bear-resistant trash receptacles and bear-resistant food storage lockers in NPS and USFS campgrounds, and a bear-resistant food canister loan program (on NPS lands). Current backcountry campground design protocol separating food preparation/storage areas from tent pads on NPS lands would continue to be implemented.

Multi-agency public education efforts concerning grizzly bears in the NCE and the governance of ongoing grizzly bear management activities by the Interagency Grizzly Bear Committee (IGBC) would continue. Visitors would be encouraged to report grizzly bear sightings, and the NPS, USFS, and the IGBC would provide opportunities for visitors to report grizzly bear sightings via interpretive media at the park as well as online tools.

Photo Credit: National Park Service

Black bear in hair snag corral

Monitoring with remote cameras and hair snags would continue as funds allow, as would the compilation of a dataset to determine grizzly bear presence and habitat selection (hair snag corrals are composed of a strand of barbed wire strung in a "corral" among trees, with a powerful scent attractant poured onto a brush pile at its center. Animals drawn to the scent leave tufts of hair on the barbs as they investigate).

Consultation with FWS under section 7 of the ESA would continue, and land acquisition by the NPS, USFS, and state agencies to permanently conserve grizzly bear habitat would continue to be a management option.

OVERVIEW OF ACTION ALTERNATIVES

The action alternatives described in this chapter represent options for restoring grizzly bears to the NCE. As a result of the alternatives development process, the agencies have identified action alternatives that consider different ways of restoring grizzly bears to the NCE. "Alternative B: Ecosystem Evaluation Restoration" would release up to 10 grizzly bears over the first 2 years of initial restoration activities and monitor released bears for habitat use and incidence of human conflict over several seasons to inform future releases. "Alternative C: Incremental Restoration" would seek to release up to 5 to 7 grizzly bears per year for 5 to 10 years to achieve an initial population of 25 bears intended to reestablish reproduction in the NCE. It is anticipated that each of these alternatives would result in the achievement of the restoration goal of 200 bears within approximately 60 to 100 years. "Alternative D: Expedited Restoration" would seek to release bears into the NCE at a rate similar to alternative C, but over a longer initial period until approximately 200 bears are on the landscape (taking into account reproduction by translocated grizzly bears). While it would be difficult to estimate when precisely 200 bears were present on the landscape, this alternative would likely achieve the restoration goal in approximately 25 years. Each alternative is described in detail below in terms of a primary phase and adaptive management phase. A table included at the end of this chapter shows a summary of the actions proposed under each action alternative.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

Restoration Population Goal

As noted in chapter 1, based on a qualitative assessment by the IGBC technical committee review team, habitat within the NCE was considered to be of sufficient quality and quantity to support a population of 200 to 400 grizzly bears (Servheen et al. 1991). Based on recent modeling, researchers assessing the grizzly bear carrying capacity of the NCE estimated that the habitat could support approximately 280 grizzly bears (Lyons et al. 2016). The agencies established a restoration target of 200 bears in the NCE for the purposes of this draft plan/EIS after considering the NCE's carrying capacity and the professional judgment of grizzly bear experts. The restoration goal is thus seen as a population size that can reasonably be expected to sustain itself in the long term with minimal to no active human intervention. This restoration goal could be adjusted based on information gained through the monitoring of grizzly bears and their overall population response during the adaptive management phase of this project. For the purposes of this plan, the restoration goal would not necessarily mean that the population is recovered to the point of de-listing under the ESA (see appendix C for a discussion of the ESA and delisting process).

Conflict Grizzly Bear Management

In 1986, the IGBC originally developed guidelines for identifying management actions needed to respond to human-grizzly bear conflicts. In 2002, the IGBC NCE Subcommittee revised those guidelines to make them more relevant to conditions within the NCE (appendix E). Current guidelines set forth conditions for determining whether a grizzly bear has caused depredation to livestock or obtained unnatural food sources (human and livestock foods, garbage); displayed aggressive/threatening behavior toward humans; or had a human encounter resulting in substantial human injury or loss of life. Depending on the type of encounter, the age and sex of the grizzly bear, and the number of encounters the grizzly bear has been involved in, the guidelines prescribe either relocation of the grizzly bear or its removal from the population. Prior to the implementation of any action alternative, the agencies intend to ask the subcommittee to consider the need to modify the 2002 revised guidelines to: (1) ensure compliance with applicable federal and state laws, (2) address public input on this draft plan/EIS, and (3) ensure consistency with any 10(j) experimental population designation for the NCE (see "Endangered Species Act Section 10(j) Designation Rulemaking Option," below).

Capture, Release, and Monitoring of Grizzly Bears

Food economy *refers to the dominant foods available to grizzly bears in a given area.*

Under all of the action alternatives, grizzly bears would be captured from multiple areas. The agencies would seek to find source areas that have a healthy grizzly bear population so that removal of grizzly bears would not affect population viability, as the capture and removal of grizzly bears would be considered a mortality for the source population. In addition, it would be more likely that grizzly bears meeting the selection criteria (e.g., sex and age class) may be captured in areas with large grizzly bear populations. The entities managing the donor source area must be willing to donate bears that meet the selection criteria and allow trapping of an adequate number of grizzly bears. All regulatory requirements would be fulfilled prior to translocation of bears, including coordination with Canadian entities as necessary. In addition to a healthy population, source areas must be ecologically similar to the North Cascades (i.e., there should be a high likelihood that candidate bears do not rely on salmon for a significant portion of their diet, and that candidate bears do not have a history of conflict with humans). The lead agencies would focus on capturing grizzly bears that share a similar ecology and food economy to potential release areas. *Food economy* refers to the dominant foods available to grizzly bears in a given area. Dominant foods in the NCE are expected to be

similar to the west side of the Northern Continental Divide Ecosystem (NCDE) in northwestern Montana, adjacent grizzly bear habitat in British Columbia, Canada, and grizzly bear habitat in south-central interior British Columbia. In these areas, berries are the dominant food source providing calories and ultimately fat production necessary for a grizzly bear to survive hibernation and to reproduce. As a result, these areas would be the most likely sources selected for capturing bears for release into the NCE. Additional selection criteria based on the age and sex class of the captured grizzly bears are described in each alternative below.

Under all of the action alternatives, grizzly bears would be captured using baited foot snares or culvert traps (Jonkel 1993). It is possible that helicopter support would be used for the capture of grizzly bears in designated wilderness or roadless areas and could include the use of helicopter-based capture darting. The capture and release of grizzly bears would take place between early summer and early fall, depending on the capture and release site(s) selected and availability of food.

Grizzly bears would be transported from capture locations to release staging areas by truck. Staging areas would be located in previously disturbed areas large enough for the safe landing of a helicopter, parking for a fuel truck, and any other grizzly bear transport and handling needs.

Photo Credit: FWS

Female grizzly bear and cubs being released from culvert trap

Grizzly bears would be transported by helicopter and released in remote areas on NPS or USFS lands. Release sites would be chosen based on selected habitat criteria, connectivity to other areas, and the need to have grizzly bears in close proximity to one another to facilitate interaction and ultimately breeding. Additional criteria for acceptable release sites would include the following:

- The area would largely consist of highly suitable seasonal habitat; specifically, berry-producing plants that are known grizzly bear foods would be readily available in the area.
- The area would be largely roadless, with non-motorized use and low human use. Areas would be an adequate distance from high visitor use, non-motorized areas, such that low human-use areas would be targeted.
- BMUs with a high amount of core area would be prioritized.
- The area would have a suitable helicopter landing site or a suitable vehicle-accessible site (with little public use) available for release.
- Selection of subsequent release sites would be informed by grizzly bear resource selection as determined through monitoring of grizzly bears previously released into the ecosystem.

See figure 2 for general areas where grizzly bears could be released.

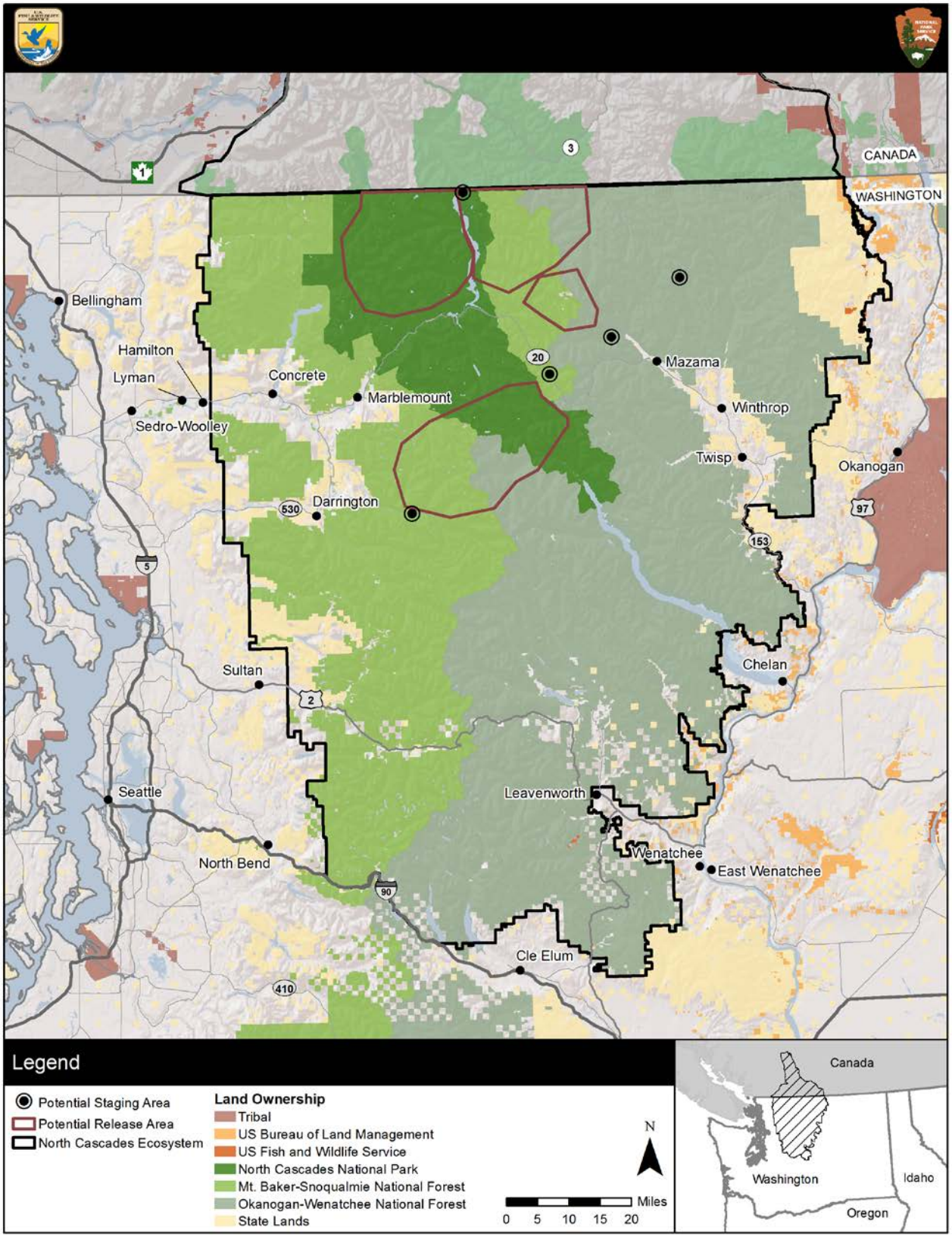

FIGURE 2. GRIZZLY BEAR STAGING AND RELEASE AREAS

All translocated grizzly bears would be fitted with global positioning system (GPS) collars prior to release to monitor habitat use and spatial distribution, and tissue samples would be collected prior to release for genetic monitoring purposes. Sites for subsequent releases of grizzly bears during the adaptive management phase of the restoration process would be chosen based on the criteria listed above and limited to federal lands, unless otherwise authorized by landowners. Recapture of grizzly bears would be conducted periodically to maintain a GPS-collared sample of the population. Helicopters would be used to ferry in culvert traps from which grizzly bears would be released, and could possibly be used for the retrieval of dropped GPS collars or in response to bear mortality.

Each release could take up to eight hours (one day) depending on the distance between staging and release areas, potentially resulting in 5 to 10 days of helicopter use per year for releases. Helicopters would make up to four round trip flights, traveling approximately 500 feet above the ground, and up to four landings in wilderness per grizzly bear, which would be necessary for the release of each grizzly bear and drop-off and retrieval of staff and the culvert trap, although some additional flights may be necessary for collar retrieval and incidental actions. All operations would be conducted during daylight hours. Depending on the location of the release site and corresponding staging area, helicopter flight time over designated wilderness areas would vary. Table 1 provides the range of total hours helicopters would be operating over and in wilderness per grizzly bear release.

TABLE 1. ESTIMATE OF FLIGHT TIME OVER WILDERNESS AREAS

Proposed Staging Area	Hours Over Wilderness Per Release
Eight Mile (Billy Goat)	4–4.8
Hozomeen	2.2–3.6
Swamp Creek Pit	0.15–1.8
Green Mountain	1.6–2.4
West Fork Methow	0

If release sites can be accessed via roads that have been closed with gates or other physical barriers, it is possible that culvert traps could be transported by truck.

Fixed-wing aircraft would be used for periodic monitoring. Monitoring activities would take place from early spring to late fall and would be accomplished through cooperation with FWS, NPS, USFS, and WDFW. Flights would be limited to several days during spring or fall, depending on the number of bears collared, to monitor for reproductive success and population growth. Camera stations would also be set-up in remote areas to monitor grizzly bear presence.

A number of mitigation measures have been identified to reduce the potential impacts on resources considered in this draft plan/EIS. The following list of mitigation and best management practices would be implemented:

- Locate and use releases sites that are more than 1,200 feet (400 meters) from suitable nesting habitat for northern spotted owls and marbled murrelets or only use the sites after the nesting period (March 1 to July 31 for northern spotted owls and April 1 to September 23 for marbled murrelet).
- Fly at least 500 feet above ground level to avoid disturbance to any nesting birds when departing staging areas by helicopter.
- Restrict helicopter activity within 1,000 feet of an active bald eagle nest
- Locate and use weed-free project staging areas.

- Avoid or minimize all types of travel through weed-infested areas or restrict travel to those periods when spread of seed or propagules are least likely.
- Conduct pre-implementation staging and release site assessment and implement mitigation as necessary to avoid presence of federal or state-listed species.
- Reduce the time that helicopters spend over campsites or along trails by taking the most efficient routes to and from the release site.

Public Education and Outreach

Under all of the action alternatives, increased public education efforts would be conducted related to the outcome of the restoration program. At the outset of initial restoration activities, NPS and FWS would provide public updates as often as every week. These updates would provide generalized information on grizzly bear movements and locations. As the restoration process moves forward, it is anticipated that these updates would take place less frequently, likely monthly, unless specific events with the potential to affect grizzly behavior, such as a large fire, occur. Each agency would use the NCE grizzly bear website to post the results of management actions and annual monitoring.

Outreach to residents and visitors, including hikers and hunters, would be increased to aid them in avoiding encounters with grizzly bears, including education about bear spray and proper storage of attractants. Hunters could receive increased species identification training to prevent cases of mistaken identity where grizzly bears are mistaken as black bears. All hunters would be provided with additional grizzly bear information.

Replacement and Additional Releases of Grizzly Bears

Under all of the action alternatives, grizzly bears lost during the primary phase of restoration as a result of any source of mortality, human-caused or otherwise, would be replaced on a one-to-one basis. Likewise, grizzly bears that emigrate out of the NCE or are removed as a result of conflict with humans would be replaced. This approach would continue until the initial target population size is reached. For example, under alternatives B and C, the lead agencies would replace grizzly bears if the population dropped to fewer than 10 individuals for alternative B and 25 individuals for alternative C.

Access Management

Under all of the action alternatives, occasional short-term closures (a few hours up to a couple of days) could take place on a case-by-case basis, based on bear activity (e.g., a female with cubs near high human use areas). No long-term closures or modifications to public access would be implemented. The agencies would coordinate with local tribes to ensure that release sites and timing do not restrict access to traditional sites. Other access restrictions may occur under other implementation decisions by the agencies, which would be unrelated to the alternatives considered in this draft plan/EIS.

Habitat Management

The NPS would strive to achieve the current policy of no net loss of core area on lands under management direction provided in the Ross Lake GMP (NPS 2012c). Likewise, the USFS would seek to continue to achieve the same policy on USFS lands until forest plans for Okanogan-Wenatchee and Mt. Baker-Snoqualmie National Forests are revised.

ALTERNATIVE B: ECOSYSTEM EVALUATION RESTORATION

Primary Phase

During the first and second summers of grizzly bear restoration, a total of up to 10 grizzly bears would be released in the NCE at a single remote site. The site would be located on NPS or USFS lands and would be selected based on habitat criteria. Releases would be limited to a single site to facilitate interaction and breeding among the bears that are released. Grizzly bears that would be considered optimal candidates for capture and release would be independent subadults between 2 and 5 years of age that had not yet reproduced and had exhibited no history of human conflict. The target sex ratio for initial releases would be approximately 60% to 80% female and 20% to 40% male.

There would be no additional releases of grizzly bears for two seasons following the initial releases, except for the replacement of grizzly bears lost due to mortality, emigration, or removal due to human conflict. Instead, the grizzly bears released during the first 2 years (years 1 and 2) would be monitored for an additional 2 years (years 3 and 4) with regard to habitat use and instances of human conflict, for a total of 4 years of monitoring. In the fourth year, a decision would be made regarding how management would proceed during subsequent years. Depending on the results of monitoring, the NPS and the FWS may choose to repeat the initial release described above, wherein an additional ten bears would be released at a single site over 2 years followed by two additional years of monitoring. Alternatively, the NPS and the FWS may choose to transition to alternative C with the goal of establishing an initial population of 25 grizzly bears by releasing an additional 5 to 7 grizzly bears in the NCE each summer.

Adaptive Management Phase

Successful management of natural systems is a challenging and complicated undertaking. Adaptive management—a process of monitoring outcomes and adjusting management techniques over time—is based on the assumption that current resources and scientific knowledge are limited, and a certain level of uncertainty exists. An adaptive management approach attempts to apply available resources and knowledge and adjust management techniques as new information is revealed (Williams and Brown 2012). U.S. Department of the Interior regulations define adaptive management as “a system of management practices based on clearly identified outcomes and monitoring to determine whether management actions are meeting desired outcomes; and, if not, facilitating management changes that will best ensure that outcomes are met or re-evaluated” (43 CFR 46.30). Adaptive management recognizes that knowledge about natural resource systems is sometimes uncertain. U.S. Department of the Interior regulations for implementing NEPA suggest that adaptive management should be used “in circumstances where long-term impacts may be uncertain and future monitoring will be needed to make adjustments in subsequent implementation decisions” (43 CFR 46.145).

Key uncertainties associated with the implementation of this draft plan/EIS process include accurately predicting grizzly bear behavior, habitat utilization, and movements once released; reproductive success; genetic limitations; and source and rate of mortality. Therefore, it is important to consider management actions that could be influenced, as well as how various metrics could be managed and monitored. Elements to measure or monitor during the adaptive management phase would include habitat selection, instances of conflicts between humans and grizzly bears, reproductive success and rate of population growth, and genetic composition of the population.

***Adaptive management**—a process of monitoring outcomes and adjusting management techniques over time—is based on the assumption that current resources and scientific knowledge are limited and a certain level of uncertainty exists.*

Under alternative B, adaptive management would be built into the primary phase of restoration by way of the two-year monitoring for habitat use and human-bear conflict. This adaptive approach would determine the future course of action taken by the NPS and FWS. Based on monitoring and associated bear behavior, managers would either repeat the primary phase of alternative B and continue to monitor bear habitat use and incidents of human-bear conflicts or transition to implementing the primary phase of alternative C. If the decision is made to transition to alternative C, restoration actions would result in the release of additional bears until an initial restoration goal of approximately 25 grizzly bears is achieved. Subsequent release sites would be chosen based on the habitat selection and utilization data collected during the 4 years of monitoring. In addition, releases would occur during the adaptive management phase based on a number of factors, including human-caused sources of mortality, genetic limitations, population trends, and adjustment of sex ratio. For the purposes of assessing impacts, the agencies assumed that managers would need to add 1 male and/or 1 female grizzly bear every few years depending on monitoring and the need being addressed. Subsequent release sites would continue to be evaluated and selected based on longer-term monitoring of grizzly bear habitat use and movements. Release sites may be removed from use based on factors such as mortality, emigration, or human-bear conflict. Grizzly bears could also be removed or relocated based on conflicts with humans.

ALTERNATIVE C: INCREMENTAL RESTORATION

Primary Phase

During the primary phase of restoration, it is anticipated that 5 to 7 grizzly bears would be released into the NCE each year over roughly 5 to 10 years, with a goal of establishing an initial population of 25 grizzly bears. This is the likely number of grizzly bears that could feasibly be trapped and released within 5 to 10 years, and also serves as a small source population to help reestablish reproduction in the NCE. Taking into account the projected range of mortality and emigration rates for bears released into the NCE under the initial restoration phase of alternative C, it is anticipated that the achievement of the initial restoration goal of 25 bears would require the placement of approximately 34 bears in total.

Grizzly bears released into the U.S. portion of the NCE under alternative C would be selected based on the same criteria as described under alternative B. Grizzly bears would be released at multiple sites in remote areas on NPS and USFS lands, which would be chosen based on selected habitat criteria. Release sites would be in close proximity to one another to facilitate interaction and breeding among grizzly bears released into the ecosystem.

It is expected that additional grizzly bears would be released under the adaptive management phase of the plan as described below.

Adaptive Management Phase

Once an initial population of up to 25 grizzly bears is achieved, a transition to the adaptive management phase would occur. In this phase, additional grizzly bears could be released to address mortality, population trends, genetic limitations, or to improve reproductive success or population distribution. For the purposes of assessing impacts, the agencies assumed that managers would need to add 1 male and/or 1 female grizzly bear every few years depending on monitoring and the need being addressed. Subsequent release sites would be chosen based on habitat selection and utilization data collected through monitoring

Under alternative C, once an initial population of up to 25 grizzly bears is achieved, a transition to the adaptive management phase would occur.

during the primary phase of this alternative. Release sites may be removed from use based on factors such as mortality, emigration, or human-bear conflict. Agencies would continue to monitor grizzly bears to measure reproductive success, survival, and habitat use.

ALTERNATIVE D: EXPEDITED RESTORATION

Primary Phase

Under alternative D, agencies would seek to expedite grizzly bear restoration by releasing additional grizzly bears into the NCE over time until the restoration goal is reached. This alternative would not limit the population goal for the primary restoration phase to 25 animals; rather, the number of suitable grizzly bears captured in a given year would be released into the NCE. It is anticipated that the logistics and capacity of management agencies to carry out capture and release would constrain the ability to release a large number of grizzly bears in any single year under this alternative (the actual number of grizzly bears to be released per year would likely be 5 to 7).

Capture and release efforts would continue each year as necessary until a combination of release efforts and reproduction results in a population of approximately 200 grizzly bears on the landscape. It is estimated that alternative D would require the release of 155 to 168 bears. Criteria for age and sex ratios for grizzly bears captured and released under alternative D would be less restrictive than under alternatives B and C. Grizzly bears up to 10 years old would be targeted for capture and release, and the sex ratio could be as many as 1 male for every 2 females. Similar to alternative C, grizzly bears would be released at multiple sites on NPS and USFS land based on habitat criteria. This alternative could be constrained somewhat by the availability of candidate bears if one or more of the source area populations reaches a point where it can no longer sustain the effective mortality that capture of candidate grizzly bears would entail. In such a case, it may become necessary to re-evaluate the use of certain source areas over the course of the restoration effort. Under alternative D, grizzly bears would be monitored for habitat use and incidences of human conflict, but once the population goal of approximately 200 grizzly bears is reached, no additional grizzly bears would be released.

Adaptive Management Phase

Under alternative D, subsequent releases would be unlikely under an adaptive management framework.

Under alternative D, the initial population established would be equivalent to the restoration goal; therefore, subsequent releases would be unlikely under an adaptive management framework. However, grizzly bears would be monitored for genetic diversity and if necessary additional grizzly bears may be added over time, as described under “Elements Common to All Action Alternatives.”

ENDANGERED SPECIES ACT SECTION 10(J) DESIGNATION RULEMAKING OPTION

Grizzly bears released into the NCE would be managed as a threatened species under the ESA under all action alternatives. However, an option would be available under any of the action alternatives to designate grizzly bears in the U.S. portion of the NCE as a 10(j) experimental population under section 10 of the ESA. To relieve concern that translocations may result in restrictions on the use of private, tribal, or public land, Congress added the provision for experimental populations under section 10(j) of the ESA. An experimental population is a group of reintroduced plants or animals that is geographically isolated from other populations of the species that is typically determined to be “essential” or “nonessential” to the survival of the species as a whole but contributes to their recovery. Section 10(j) provides for the

reintroduction of experimental populations under special regulations and may include protective regulations established under authority of section 4(d) of the ESA.

Designation of grizzly bears released into the NCE as an experimental population would provide the lead and cooperating agencies with greater management flexibility, provided that management actions remain consistent with conservation of the experimental population. The designation allows for the advancement of recovery objectives by providing an opportunity to reestablish self-sustaining populations.

The types of management actions anticipated under an experimental population would focus on supporting grizzly bear reestablishment in the NCE while reducing or avoiding potential land use and other conflicts in areas both inside and outside the NCE. These management actions could include retrieving released bears that move outside the NCE or venture into areas with a high potential for conflict; lethal or non-lethal removal of nuisance bears; capture and handling of bears for purposes of monitoring and research; and issuing permits to private landowners to harass, haze, or kill bears that are attacking livestock on private lands when it has not been possible to capture or deter depredations through other means. Experimental population designation is not necessary to kill a bear in self-defense or to defend others; this action would continue to be allowed under an experimental population designation. The allowance to take grizzly bears in self-defense or in the defense of others stems from the 4(d) rule established when the bear was listed (see chapter 1 for a general discussion of the 4(d) rules).

The experimental population area boundary would likely encompass the geographic extent of potential movement of bears restored to the NCE plus a geographic margin of management assurance beyond this extent. In developing an experimental population boundary, the potential movement of bears and how to manage bears in the future needs to be considered as any restoration effort proceeds and as recovery progresses. Three general regions of potential grizzly bear use or future presence can be described in association with this restoration effort: the core region, areas adjacent to the core where bear movements could occur over time, and areas that are incompatible or unnecessary for the recovery of grizzly bears.

The core region or location of primary use is expected to coincide with the area of the NCE grizzly bear recovery zone—the focus of grizzly bear restoration within the NCE. However, towns and cities located within this area would be excluded from this core area and would not be considered suitable grizzly bear habitat.

Adjacent to the NCE, a region could be identified that contains areas of potentially suitable habitat where bears may disperse or move to over time. Within this region, the likelihood of grizzly bear occurrence is expected to greatly diminish farther away from the NCE grizzly bear recovery zone or outside of areas of potentially suitable habitat. Having the management flexibility allowed under an experimental population designation would be important to avoid or minimize any potential conflicts from bears that may enter this region. Although this adjacent region is not the focus of the restoration effort to the NCE, grizzly bears could foreseeably move into and use some areas within this region in the future.

Finally, beyond these areas of potentially suitable habitat or potential dispersal, a region that is incompatible or unnecessary for the recovery of grizzly bears would be identified. This region would contain habitat that is largely unsuitable and in an area where bears are unlikely to disperse. However, including all or a portion of this region as part of any experimental population designation under section 10(j), would allow additional levels of management that would otherwise be unavailable under the ESA should any individual grizzly bear unexpectedly reach this region. This would provide a greater margin of management flexibility and a means to avoid or resolve any land-use conflicts should bears ever make it to areas within this outer region. The maximum outer extent of this region could potentially be drawn as large as the Washington State boundary, with the exception of the area surrounding the SE grizzly bear population and the Kettle-Granby Population Unit of grizzly bear.

If the FWS decides to pursue the designation of a 10(j) experimental population under any of the action alternatives, the FWS would conduct a separate rulemaking process, which would be initiated during this environmental review process and would be subject to its own comment period. In order for a 10(j) designation to occur, the rulemaking process must determine that the translocation of grizzly bears would further the conservation of the species.

Table 2 provides a summary of the three action alternatives that are fully evaluated in this draft plan/EIS.

TABLE 2. SUMMARY OF ACTION ALTERNATIVE ELEMENTS

Element	Alternative B: Ecosystem Evaluation Restoration	Alternative C: Incremental Restoration	Alternative D: Expedited Restoration
Number of Grizzly Bears to be Released			
Source of grizzly bears that share similar ecology	Multisource.	Multisource.	Multisource.
Primary Phase – Number of bears to be released per year Note: Grizzly bears would be replaced based on any source of mortality and emigration for all alternatives during the primary phase.	Up to 10 grizzly bears released in first 2 years; monitor for habitat use and human conflict over years 1–4 and make decision in year 4 for additional release of grizzly bears in year 5.	5 to 7 grizzly bears per year over 5–10 years to achieve an initial population of 25 grizzly bears.	Maximum number of grizzly bears available for capture (anticipated to be 5–7 per year) would be released each year to achieve a minimum population estimate of ~200 grizzly bears on the landscape over shortest possible time frame (the 200 population estimate would include reproduction).
Sex and age class of released grizzly bears	Target grizzly bears roughly 2–5 years old depending on independence and breeding status. Target 40% male; 60% female.	Same as alternative B.	Less restrictive for age and sex ratio given the need for a larger number of grizzly bears. Target grizzly bears up to 10 years old.
Adaptive Management Phase Activities – Number of grizzly bears to be released per year after the primary release	Default to alternative C or repeat primary phase as specified in alternative B depending on results of monitoring information, such as habitat use and human conflict.	Number based on adaptive management criteria. Additional bears would be released based on a number of factors including the following: • human-caused sources of mortality • genetic limitations • population trends • adjustment of sex ratio.	No adaptive management phase.
Time to achieve restoration goal (200 bears in the NCE)	Approximately 60–100 years. Slightly longer (approximately 2 to 5 years) than alternative C because of the 2 year pause for monitoring.	Approximately 60–100 years.	Approximately 25 years.

Element	Alternative B: Ecosystem Evaluation Restoration	Alternative C: Incremental Restoration	Alternative D: Expedited Restoration
ESA Designation			
Section 10(j) designation option	The option to designate the NCE grizzly bear population as an experimental population under section 10(j) of the ESA would be common to all of the action alternatives. If the option was not implemented, the population would be managed as a threatened species under all of the action alternatives.		
Spatial Extent of Grizzly Bear Release Sites	Release sites would be based on capture timing and availability of food.		
Primary release sites on federal lands	Single initial release site based on habitat criteria.	Multiple release sites based on habitat criteria.	Same as alternative C.
Adaptive management phase release sites	Derived from spatial monitoring. Note: No additional releases beyond replacement during 2-year evaluation period in years 3 and 4.	Derived from spatial monitoring.	No adaptive management phase.
Habitat Security			
NCE grizzly habitat conservation (core habitat)	Maintain at least 70% of core habitat under management direction provided in the Ross Lake GMP (NPS 2012c). Maintain no net loss of core habitat for USFS under the 1997 interagency MOU until forest plans are revised.		
Management Tools	Note: Minimum requirements analysis pursuant to the *Wilderness Act* was conducted for actions that could occur in wilderness areas. See appendix F.		
Tools for capture of grizzly bears	Baited foot snares or culvert traps would be used to capture grizzly bears with possible helicopter support in wilderness or roadless areas. Also potential to evaluate and use helicopter-based capture darting.		
Release approach	Grizzly bears would be released from culvert traps transported by truck and/or from culvert traps ferried in by helicopter. Release sites would be remote. All release activities would be conducted by the FWS, NPS, and USFS, in consultation with WDFW.		
Helicopters and other remote access tools	Helicopters used for release and possibly retrieval of collars. Fixed-wing aircraft and satellites used for periodic monitoring. All release activities would be conducted by the FWS, NPS, and USFS in consultation with WDFW.		
Timing of Management Actions			
Initial and adaptive management releases	Early summer-early fall depending on release site (may have more latitude based on food availability). Release timing is food source dependent and may be limited by capture timing.		
Maintenance activities (monitoring activities, etc.)	Monitoring activities would take place from early spring to late fall and would be done in cooperation among the USFS, FWS, NPS, and WDFW.		

Element	Alternative B: Ecosystem Evaluation Restoration	Alternative C: Incremental Restoration	Alternative D: Expedited Restoration
Other Considerations			
RCW 77.12.035	As a result of the RCW, participation in active grizzly bear restoration by the WDFW would be subject to state authorization.		
Management actions across jurisdictions	Joint management under IGBC subcommittee. Monitoring would be accomplished through cooperation among FWS, NPS, USFS, and WDFW.		
Conflict grizzly bear management	Responses, including removal/relocation of human-conflict grizzly bears as necessary, would be based on updated 2002 IGBC Guidelines applicable to the NCE (appendix E) and could result in potential temporary, local closures (up to several days) for public safety. Additional modifications could be made in consultation with the IGBC NCE Subcommittee.		
Public access management	No long-term closures expected. Occasional short-term (a few hours to a few days) closures for releases and public safety may occur, but would be site-specific.		
Research and monitoring	Habitat use and spatial distribution monitoring and analysis to inform subsequent releases. Recapture work to maintain collared sample. Hair collection for genetic monitoring. Use of camera traps for monitoring. Includes activities to retrieve collars and bear mortalities.		
Public outreach and education/information	Increased efforts related to outcome of program with regular (initially weekly) updates on grizzly bear restoration efforts; includes education and outreach that are also common to the no-action alternative.		
Ungulate hunting management	Increased public outreach and education efforts for hunters to avoid grizzly bear encounters, increase use of bear spray, clean camping, etc.		
Black bear hunting management	Mandatory species identification training would be considered, additional grizzly bear information would be provided to all bear hunters, especially in areas within the recovery zone and areas immediately adjacent to the recovery zone that grizzly bears are likely to use (public outreach and education).		

ALTERNATIVES CONSIDERED BUT DISMISSED FROM FURTHER DETAILED ANALYSIS

The following alternatives were considered but dismissed from further analysis for reasons explained below.

Washington Only Restoration

As discussed in chapter 1, Washington law prohibits transplanting or introducing grizzly bears into the state, and permits WDFW to utilize only grizzly bears that are native to the State of Washington for management programs. In an effort to develop action alternatives that would be consistent with state law, the interagency planning team assessed the feasibility of a Washington only restoration alternative. Under this alternative, the NPS, FWS, USFWS, and WDFW would release grizzly bears into the U.S. portion of the NCE that had been sourced from other areas within the State of Washington. These areas would include the Washington portion of the SE and the Sheep Creek, or "Wedge," area of northeastern Washington, which is located between the Kettle and Columbia rivers and adjoins grizzly habitat in Canada. Grizzly bears would be released at a single release site to maximize the probability that they would encounter, interact with, and breed with one another.

During the primary phase of restoration, grizzly bears would be released into the NCE annually as their availability permits, with a goal of establishing an initial population of 25 grizzly bears. Given the low grizzly bear population in other areas of Washington, it is anticipated that no more than 1 to 2 grizzly bears could be captured and released into the NCE in a given year. In some years, grizzly bears may not be available for capture. The optimal sex ratio for grizzly bears released into the NCE would be 60% to 80% female and 20% to 40% male; however, because of the limited number of grizzly bears available, grizzly bears up to 10 years old could be targeted for capture and release. As a result, it is likely that the age and sex ratio of grizzly bears that would be sourced from areas in Washington State would depart from the optimal ratio.

The U.S. portion of the SE represents about 1,160 square miles; of this area only about 41% (or 475 square miles) is located in Washington with the remaining area located in Idaho. The overall population in the U.S. portion of the SE was last estimated to be 25 grizzly bears in 2012 (Proctor et al. 2012). Monitoring data suggest that less than 41% of these grizzly bears reside in Washington, while higher densities occur in Idaho (Kasworm et al. 2015). For assessing the feasibility of this alternative in meeting NCE population restoration goals, it was assumed that 40% of the SE grizzly bear population resides in Washington (possibly 10 grizzly bears). Of these 10 grizzly bears, approximately 33% (3 grizzly bears) are expected to be reproductive females (FWS 1993a). Female grizzly bears first reproduce at approximately 6 years of age, and produce a litter of 2 cubs every 3 years. Assuming no adult or cub mortality, these three female grizzly bears would likely produce a total of 2 cubs every third year. Assuming an even sex ratio, the 2 cubs would consist of 1 male and 1 female. If both cubs were used for restoration in the NCE, there would be no recruitment in the Washington portion of the SE, which would result in adverse impacts on the sustainability of the SE population. If only female cubs were used for restoration in the NCE, it would result in a lack of female recruitment and similar adverse impacts on the sustainability of the SE population (Kasworm pers. comm. 2016b).

The use of grizzly bears from the Washington portion of the SE would also require a decision that restoration of the NCE grizzly population was of higher priority than recovery of the SE population; however, even if that were the decision, the small number of candidate grizzly bears available for capture in a given year would not yield a sufficient number of bears within a biologically relevant time period to restore a grizzly bear population in the NCE. This alternative would not enhance the probability of long-

term survival of grizzly bears in the NCE, and thus would not meet the purpose and need of this draft plan/EIS and was dismissed from further analysis.

Delayed Implementation of Washington Only Restoration

The interagency planning team also considered an alternative that would release grizzly bears from the SE into the NCE; however, these efforts would be implemented only after it had been determined that recovery of the SE grizzly bear population had been achieved. With an estimated population of 75 bears in the SE, including the British Columbia portion, and an estimated growth rate of 1.8% (Wakkinen and Kasworm 2004), it would take at least 12 years to reach the SE population recovery goal of 90 bears. However, the *Grizzly Bear Recovery Plan* also indicates the need for the SE population to be linked to other populations, as evidenced by documented breeding activity and improvement in genetic diversity before the population is considered fully recovered (FWS 1993a). Additionally, a conservation strategy would need to be prepared and a final rule published before actions could be taken to translocate bears from the SE to the NCE. In aggregate, the steps outlined above could take decades.

Given the low population of grizzly bears in the SE, the very slow reproductive rate of the species, genetic concerns, and other logistical constraints described above, it is not considered likely that full recovery of the SE grizzly bear population could be achieved in sufficient time to avoid the permanent loss of grizzly bears that are present in the NCE. Since this alternative would not enhance the probability of long-term survival of grizzly bears in the NCE, and thus would not meet the purpose and need of this draft plan/EIS, it was dismissed from further analysis.

Natural Recovery

Comments received during public scoping requested that the agencies allow for restoration to occur naturally—allowing grizzly bears to return to the U.S. portion of the NCE on their own. This approach is characterized by the no-action alternative, described above. As noted in chapter 1, although a very small number of grizzly bears still inhabit the NCE, the number of grizzly bears in the NCE does not meet the accepted definition for a population (2 adult females with cubs or 1 adult female tracked through two litters) (FWS 2000a) and it is unlikely the small number of bears in the ecosystem is sufficient for a population to recover on its own. Additionally, the ecosystem is isolated from other ecosystems in the United States and Canada, making it highly unlikely that grizzly bears could migrate in from other populations. As a result, this alternative would not enhance the probability of long-term survival of grizzly bears in the NCE, and therefore would not meet the purpose and need of this draft plan/EIS. As a result, this alternative was dismissed from further analysis.

Ecosystem Restoration and Habitat Preservation Only

Comments received during public scoping requested that the agencies consider an alternative that would not involve the capture and release of grizzly bears into the NCE, but would focus solely on ecosystem restoration and habitat preservation, in an effort to facilitate more movement of grizzly bears into the U.S. portion of the NCE from the British Columbia portion and to increase habitat use by grizzly bears in the U.S. portion of the NCE. Ecosystem restoration and habitat preservation actions could consist of elements including, but not limited to, protecting meadows, prohibiting clear cutting and salvage logging, restoring salmon habitat, and improving connectivity with grizzly bear habitat in British Columbia. As discussed in chapter 1, scientific research indicates that habitat within the NCE is currently capable of supporting a self-sustaining grizzly bear population (FWS 1997). The primary constraints on grizzly bear restoration in the NCE are related to the small number of grizzly bears, the particular characteristics of the species' reproductive biology, and the isolation of the NCE from other grizzly bear populations in both the United

States and Canada. This alternative would not address the key constraints of restoring a grizzly bear population in the NCE and thus would not meet the purpose and need of this plan and was dismissed from further analysis.

Social Tolerance-Based Grizzly Bear Restoration

Comments received during public scoping requested that the agencies consider an alternative that would focus on a very slow grizzly bear restoration process, based on social tolerance of grizzly bears within communities in and surrounding the NCE. This approach would involve releasing only one to two grizzly bears into the ecosystem each year. The goal of this alternative would be to allow residents of the NCE the time and opportunity to become comfortable with the notion of living with grizzly bears in the ecosystem. As discussed above under the dismissal rationale for the Washington-only restoration alternative, the release of only one to two individuals in the NCE per year would not yield a sufficient number of bears within a biologically relevant period to restore a grizzly bear population in the NCE. This alternative was eliminated from further analysis because it would not be feasible to achieve the described restoration goals based on the limited number of grizzly bears released and would thus not meet the purpose and need of this draft plan/EIS. Instead, the agencies have developed alternative B, Ecosystem Evaluation Restoration, under which fewer grizzly bears would be released over the first 2 years of the plan to monitor grizzly bear movements and any potential human use conflicts prior to full implementation of grizzly bear restoration. Alternative B would allow residents of the NCE to become more comfortable living with grizzly bears again, with full restoration likely taking more than six decades depending on results of monitoring information and subsequent decisions.

Section 10(j) Population with Citizen Management

The interagency planning team considered an alternative that would include restoration of grizzly bears as a 10(j) experimental, nonessential population with citizen management. Under this alternative, a Citizen Management Committee would be authorized to have management implementation responsibility for the NCE grizzly bear experimental population. The Citizen Management Committee would implement the North Cascades chapter of the FWS *Grizzly Bear Recovery Plan* as consistent with an ESA section 10(j) final rule for the establishment of a nonessential experimental grizzly bear population in the NCE. As discussed above, all of the action alternatives considered in this draft plan/EIS include an option to manage grizzly bears in the NCE under a 10(j) rule. Alternatives that delegate management implementation responsibility to a citizen committee have been considered in other NEPA documents and have been successfully challenged in court based on over-delegation of federal authority to a local group of citizens who are not federal employees (*National Parks and Conservation Association. v. Stanton*, 54 F. Supp. 2d 7 (D.D.C. 1999)). As a result, evidence exists for a legal precedent against the use of citizen management in implementing grizzly bear restoration actions. This alternative was therefore deemed not to be feasible and was dismissed from further analysis. However, all of the action alternatives being considered would include the dissemination of information related to the progress of the grizzly bear restoration effort. Additionally, all of the alternatives considered could be implemented pursuant to the development of a 10(j) rule.

Capture and Release of Healthy, Young Females Only

Comments received during public scoping requested that the agencies consider an alternative that would release only healthy young female grizzly bears into the NCE. The age and sex demographics of grizzly bears present within the NCE are unknown; however, it is generally accepted that the number of grizzly bears present in the NCE is extremely small. It is not anticipated that the number of male grizzly bears currently present in the ecosystem is sufficient to ensure a reasonable probability of interaction and breeding with females that are released into the ecosystem. Therefore, this alternative would not meet the purpose and need of this plan, and was therefore dismissed from further analysis.