Olympic National Park
Fisher Reintroduction Plan / Environmental Assessment
September 2007

National Park Service
U.S. Department of the Interior

Olympic National Park
Washington

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Fisher Kits on a Log.
Photo by C. Raley, USDA Forest Service, Pacific Northwest Research Station

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SUMMARY

BACKGROUND

Olympic National Park encompasses approximately 922,651 acres on the Olympic Peninsula in the northwest corner of Washington State. The Park, of which approximately 95% is designated wilderness, is surrounded by a complex network of lands managed by federal and state agencies, American Indian tribes, and private landowners. At least 16 animal and 8 plant species that occur on the peninsula do not occur anywhere else in the world (NPS n.d.a, 1996b). Two species have been lost from the ecosystem supported at Olympic National Park, including the fisher (*Martes pennanti*). Fishers are medium-sized carnivores with the body build of a stocky weasel. The fisher was listed by the state of Washington as an endangered species in 1998 and as a candidate for listing under the Endangered Species Act in 2004.

Although the fisher is no longer found in the Park, it does exist in other regions of the United States and Canada. Fishers historically occurred throughout much of the low- to mid-elevation forested areas of Washington, including Olympic National Park. Two major factors contributed to the decline of fishers in Washington — over-exploitation from commercial trapping; and loss, degradation, and fragmentation of suitable habitat. Poisoning, predator control, and incidental capture in traps set for other wildlife are also considered contributing factors in the decline of fishers in the state (Lewis and Hayes 2004).

Fisher reintroductions have been undertaken in other areas for three purposes: (1) to reestablish an extirpated species, (2) to reestablish a valuable furbearer, and (3) to reestablish an effective predator of porcupines (*Erethizon dorsatum*). Most reintroductions were undertaken for more than one of these reasons.

While a fisher reintroduction would cause a change in the current ecosystem (e.g., increase in the local diversity and abundance of carnivores), it is expected that the reestablishment of a native species would be beneficial because it would help restore ecosystem functions. The benefit includes restoring balance in the predator/prey communities of forested systems in the Park.

Despite protection from legal harvest in Washington since 1934, fishers have not recovered in the state. Extensive surveys within and outside of Olympic National Park between 1990 and 2003 failed to detect any fishers. Although some people have reported seeing a fisher in the state, no scientific surveys have detected them. Fishers are therefore considered extirpated from Washington (Hayes and Lewis 2006).

Reintroduction is considered the best way to restore fishers in Washington because of the absence of nearby populations to naturally recolonize the state. Fishers have been successfully reintroduced in 10 states and five provinces in North America, including Oregon, Montana, Idaho, and British Columbia. Based on the Washington Department of Fish and Wildlife's *Feasibility Assessment for Reintroducing Fishers to Washington* (Lewis and Hayes 2004), the greatest amount of suitable fisher habitat in the state is in Olympic National Park, Olympic National Forest, and adjacent Washington Department of Natural Resources lands. Consequently, these lands are considered the most suitable location for the first reintroduction of fishers to the state.

PURPOSE OF THE PLAN / ENVIRONMENTAL ASSESSMENT

The purpose of this plan / environmental assessment is to contribute to the statewide restoration of fishers and to help fulfill National Park Service (NPS) policies to restore extirpated native species by establishing a self-sustaining fisher population in Olympic National Park.

NEED FOR ACTION

Olympic National Park is 95% designated wilderness; without fishers a key wilderness value is absent. Because reintroductions require the translocation of individuals from a source population, action is needed at this time because opportunities for genetically similar source populations are available now, but may decrease in the near future. The following further define the need for taking action:

1. Fishers are native to Washington State, including Olympic National Park, but have been extirpated.
2. Washington State has a stewardship responsibility to protect, restore, and enhance native wildlife populations and their habitat, in accordance with policies of the WDFW.
3. Under the NPS *Management Policies 2006* (sec. 4.1.5 and 4.4.2.2), the NPS will strive to restore the biological and physical components of natural systems in parks, including the restoring native plants and animals. See page 16 for restoration criteria.
4. Olympic National Park is 95% designated wilderness. It is the policy of the NPS (NPS *Management Policies 2006*, sec. 6.3.7) to recognize wilderness as a composite resource with interrelated parts. Indigenous species are essential components of wilderness and the wilderness experience. Without fishers a key wilderness value is missing from Olympic National Park.
5. Olympic National Park was established in part to provide permanent protection to indigenous wildlife (House Report No. 2247, 1938).
6. Recent analyses identified the Olympic Peninsula as the best place to initiate fisher restoration in Washington State.

OBJECTIVES IN TAKING ACTION

The following objectives were developed for this plan.

1. Engage and inform the public about the restoration effort and the role of the fisher in the ecosystem.
2. Establish a fisher population as genetically similar as possible to the population that originally occupied the Olympic Peninsula (NPS *Management Policies 2006*, sec. 4.4.1.2).
3. Promote the establishment of a self-sustaining fisher population.
4. Promote the occupation of suitable habitat throughout the Park, including wilderness.
5. Maintain a fisher population that would persist for an extended time (at least 8 to 10 generations).
6. Maintain a fisher population that could be a possible source for reintroductions to restore fishers in other areas of the state, including other suitable National Park System units.
7. Gather information about fisher habitat use, movement, and survival that would be used to guide and define future fisher conservation efforts.
8. Contribute to meeting the state recovery plan objectives.

ALTERNATIVES CONSIDERED

Alternative A, the no-action alternative, would not restore fishers in Olympic National Park. Fishers would not naturally repopulate the Park or the Olympic Peninsula, as no fisher populations occur near the peninsula. Given that it is unlikely that fishers exist on the Olympic Peninsula, NPS personnel would not

continue surveying for fishers. However, Park staff may repeat forest carnivore inventory and monitoring efforts, which could detect a fisher if one does exist in the Park.

Alternative B proposes that fishers would be captured from a source population that is most closely related to that which historically occurred in the state (preferably from British Columbia) and would be reintroduced into Olympic National Park. A founder population of at least 100 fishers would be released over a three-year period, with a bias on adults and females. Fishers would be released in male-female pairs or in groups, depending on the number available. Three initial reintroduction areas were identified based on the availability of suitable habitat and habitat connectivity and include the Elwha-Sol Duc area, the Hoh-Bogachiel area, and the Queets-Quinault area. The preference would be to release fishers in the late fall / early winter to allow them to acclimate before the breeding and mating season, establish home ranges, locate suitable den sites before the birthing season, and become aware of potential mates.

Alternative C would use captive breeding to produce fishers for the reintroduction. If fisher availability from Canada is limited, alternative C would use available fishers as breeding stock to produce a sufficiently large source population (e.g., 100 fishers) for reintroduction. After being successfully bred in captivity, fishers would be released as described under alternative B. Captive breeding would provide an opportunity to re-establish populations where direct translocation might risk the persistence of the donor population (Gilpin and Soule 1986) or where no animals were available for translocation. Breeding stock would be obtained from a source population in British Columbia or Alberta. This alternative would apply if a limited number of animals were available for reintroduction, and might reduce the number of fishers needed from the source population.

ENVIRONMENTAL CONSEQUENCES

The summary of environmental consequences considers the impacts of the actions being proposed and the cumulative impacts of actions inside and outside the Park. The potential environmental consequences of the actions are addressed for species of special concern, wildlife and wildlife habitat, visitor use and experience, wilderness values, soundscapes, neighboring landowners, socioeconomic conditions, and park management and operations. Impacts are briefly summarized in the following Summary of Environmental Consequences table. “Chapter 4 – Environmental Consequences,” contains a complete analysis of impacts of the proposed actions and cumulative impacts of actions inside and outside the Park.

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Summary of Environmental Consequences

Impact Topic	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
Species Of Special Concern	Wildlife species (other than fishers) of special concern would not be affected under alternative A because fishers would not be reintroduced. Alternative A would have an adverse, long-term, and minor to moderate impact on fishers since the species would not be reintroduced into Olympic National Park. Without restoration, fishers would remain listed in the State of Washington, as well as a federal candidate with potential for future federal listing. These impacts would also affect other fisher populations in the West Coast DPS resulting from continued extirpation of the species from suitable habitat and their historical range. There would be adverse, long-term, and moderate cumulative impacts on fishers from alternative A. There would be no cumulative impacts to other species of special concern, as no activities related to fisher reintroduction would be added to other activities in the area of analysis. There would be no impairment to species of special concern under this alternative.	Since adverse impacts to individual fishers and their habitat would not be measurable, overall adverse impacts would be short- to long-term and negligible. There would be no effect on the source population because live trapped and relocated fishers would replace fishers that would otherwise be trapped and killed for fur. There would be major beneficial impacts on the West Coast DPS fisher population as a whole, because reintroduction would result in improvements to population size and viability. The determination of effect on the marbled murrelet from fisher reintroduction under alternative B is “not likely to adversely affect.” Since adverse impacts to marbled murrelets and their habitat would not be measurable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible. The determination of effect for northern spotted owls from fisher reintroduction under alternative B is “not likely to adversely affect.” Since adverse impacts to spotted owls and their habitat would be insignificant and discountable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible. The determination of effect for bald eagles from fisher reintroduction under alternative B is “not likely to adversely affect.” Since adverse impacts to bald eagles and their habitat would not be measurable, and impacts would not affect nesting or habitat, overall adverse impacts would be short-term and negligible. Since adverse impacts to northern goshawks and their habitat would not be measurable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible. The determination of effect for Mazama pocket gopher from fisher reintroduction under alternative B is “not likely to adversely affect.” There would be short- to long-term and negligible impacts from implementation of alternative B on Mazama pocket gopher, since fisher do not inhabit the same habitat as Mazama pocket gopher. Since adverse impacts to pileated woodpeckers and their habitat would not be measurable or measurable but not outside the natural range of variability, and impacts would not affect nesting periods or habitat, overall adverse impacts would be short- to long-term and negligible to minor. Overall adverse impacts to migratory birds would be negligible. Fishers may prey on individual birds, which would have an overall negligible adverse impact on bird populations or on migratory birds as a	Since adverse impacts to individual fishers and their habitat would be either not measurable, or measurable but not outside the natural range of variability, overall adverse impacts would be short- to long-term and negligible to minor. There would be no effect on the source population because live trapped and relocated fishers would replace fishers that would otherwise be trapped and killed for fur. There would be major beneficial impacts on the West Coast DPS fisher population as a whole, since reintroduction would noticeably improve existing population levels. Since captive bred fishers could have a lower likelihood of survival as compared to relocated fishers, adverse impacts to fishers under alternative C would be higher than impacts under alternative B. The determination of effect for marbled murrelets from fisher reintroduction under alternative C is “not likely to adversely affect.” The impacts of to marbled murrelets under alternative C would be the same as those described under alternative B. The determination of effect for northern spotted owls from fisher reintroduction under alternative C is “not likely to adversely affect.” The impacts would be the same as those described under alternative B. The determination of effect for bald eagles is “not likely to adversely affect.” The impacts under alternative C would be the same as those described under alternative B. The impacts on northern goshawk under alternative C would be the same as those described under alternative B. The determination of effect for Mazama pocket gopher from fisher reintroduction under alternative C is “not likely to adversely affect.” The impacts of the fisher reintroduction would be the same as those described under alternative B. The impacts on pileated woodpeckers under alternative C would be the same as those described under alternative B. Impacts to migratory birds would be the same as

Summary of Environmental Consequences

Impact Topic	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
		whole. While fisher restoration would result in a change in the ecosystem and its function, it is expected that the reestablishment of the fisher would be beneficial to the overall ecosystem function. Cumulative impacts on wildlife species of special concern would be minor and adverse due to ongoing maintenance and logging activities in the area, and range from minor to moderate beneficial from existing conservation and habitat restoration plans for the Park and surrounding federal lands. There would be no impairment to species of special concern under this alternative.	alternative B. Cumulative impacts on wildlife species of special concern under alternative C would be the same as described for alternative B. There would be no impairment to species of special concern under alternative C.
Wildlife and Wildlife Habitat	Alternative A would have long-term, negligible to moderate adverse impacts on wildlife species and their habitat, because fishers would not be reintroduced to Park lands. Cumulative impacts on wildlife species and habitat from ongoing maintenance and logging activities in the area would be negligible to minor adverse impact. There would be minor, beneficial cumulative impacts from existing conservation and habitat restoration plans for the park and surrounding federal lands. There would be no impairment to wildlife and wildlife habitat under this alternative.	Since proposed actions would either have no measurable consequence on wildlife, or would be within the natural range of variability, adverse impacts would be long-term and negligible to minor. Impacts to the overall ecosystem from the restoration of the fisher are expected to be beneficial, long-term, and negligible. There would be no impairment to wildlife and wildlife habitat under this alternative. Cumulative impacts on wildlife species and habitat from ongoing maintenance and logging activities in the area would be negligible to minor adverse impact. There would be minor, beneficial cumulative impacts from existing conservation and habitat restoration plans for the park and surrounding federal lands. There would be no impairment to wildlife and wildlife habitat under this alternative.	Impacts under alternative C would be similar to those under alternative B. However, since offspring from the captive breeding program would be the primary source of fishers for reintroduction to the Park, and fewer fishers would be removed from the source population, the impacts of fisher removal and translocation on fisher predators, their prey, and non-target wildlife would be less than those under alternative B. Since adverse effects on wildlife would either have no measurable consequence, or only small changes to the wildlife species' population, adverse impacts would be long-term and negligible to minor. Impacts to the overall ecosystem from the restoration of the fisher are expected to be beneficial, long-term, and negligible. Cumulative impacts under alternative C would be the same as alternative B. There would be no impairment to wildlife and wildlife habitat under this alternative.
Visitor Use and Experience	No impacts to recreation resources would occur under alternative A, as the Park would not take any management actions to restore fishers. Those visitors who are aware of the fishers' absence and would value the addition of this species to the Park's ecosystem and wilderness could be adversely affected by the fishers' continued absence, resulting in adverse, long-term, negligible impacts to their recreational experience or social values. Cumulative impacts would be primarily beneficial, long-term, and negligible to minor.	Impacts to recreation resources would be adverse or beneficial, short-term, and negligible. Impacts to visitors' social values would be beneficial or adverse, long-term, and minor. Overall, cumulative impacts from other Park management activities, both adverse (maintenance activities) and beneficial (ecosystem restoration or improvements in visitor services) would combine with fisher restoration activities and would be beneficial and adverse, short- and long-term, and negligible to minor.	No additional impacts would occur within the area of analysis under alternative C compared to alternative B. Cumulative impacts would be beneficial, long-term, and negligible to minor.

Summary of Environmental Consequences

Impact Topic	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
Wilderness Values	The no-action alternative would have an adverse impact on wilderness values, as the Park would not take any management actions to restore fishers. Those visitors who are aware of the fishers' absence and would value the addition of this species to the Park's ecosystem and wilderness could be adversely affected by the fishers' continued absence, resulting in adverse, long-term, negligible impacts to their wilderness experience. Cumulative impacts would be primarily beneficial, long-term, and negligible to minor.	Impacts to wilderness values would be beneficial, long-term, and negligible to minor, depending on the visitor. Overall, cumulative impacts from other Park management activities, both adverse (maintenance activities) and beneficial (ecosystem restoration or improvements in visitor services) would combine with fisher restoration activities and would be beneficial, short- and long-term, and negligible to minor.	No additional impacts would occur within the area of analysis under alternative C compared to alternative B. Cumulative impacts would be beneficial, long-term, and negligible to minor.
Soundscapes	There would be no impacts to soundscapes as there would be no increase to the natural or human caused sound levels above what currently exists, and there would be no cumulative impacts. No impairment to soundscapes would occur under this alternative.	Noise impacts from fisher reintroduction efforts would be adverse, short- to long-term, and negligible. These impacts would be localized, primarily resulting from the use of helicopters, but such use would be seasonally restricted and implemented only if release or monitoring activities could not be conducted from the ground. Cumulative impacts would be adverse, long- and short-term, and minor to moderate. No impairment to soundscapes would occur under this alternative.	Additional noise impacts would occur within the area of analysis under alternative C as compared to alternative B because of the increased time required to release and monitor fishers under alternative C. These impacts would be adverse, short- to long-term, and negligible to minor. Cumulative impacts would also be the same as alternative B. No impairment to soundscapes would occur under this alternative.
Neighboring Landowners	Since the fisher is believed extirpated from Washington State, no impacts to neighboring landowners would occur if the fisher remained a candidate species or became listed under the Endangered Species Act. Cumulative impacts on neighboring landowners under alternative A would be long-term, negligible and beneficial.	If fisher were delisted by Washington State, impacts to neighboring landowners would be long-term, beneficial, and negligible as fisher habitat would be protected under existing plans (e.g., WDNR's habitat conservation plan and the *Northwest Forest Plan*) or neighboring landowners would not be required to take those conservation actions described above under "Fisher Remains listed as State Endangered" to protect fisher. Impacts to neighboring landowners would be adverse and long-term if the fisher remained a federal candidate species or became listed under the Endangered Species Act. In the unlikely event the fisher becomes listed in the future, federal and state agencies would be the most affected, and impacts would be negligible to moderate. Because only 5% of habitat identified in the feasibility assessment as suitable for fisher occurs on private land, few private parcels directly border the park, and these privately owned parcels are highly fragmented; the likelihood of fishers inhabiting this land is low. Therefore few, if any, private landowners would be affected by formal listing of the fisher. Impacts to affected private landowners would be adverse, long-term, and moderate, as affected landowners would incur additional management tasks to protect the fisher on their lands. If the	If translocated fishers were not surviving or there was a decline in the source population, the need to list the fisher under the Endangered Species Act might become more likely, resulting in adverse impacts to adjacent landowners that would be similar to alternative B and range from negligible to moderate. When combined with a potentially higher possibility of listing, cumulative impacts might be primarily adverse and related to additional actions landowners would have to take to protect fishers, although the combined protection efforts of all landowners would still provide some beneficial effects.

Summary of Environmental Consequences

Impact Topic	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
		fisher became listed under the Endangered Species Act, the Quinault Indian Nation would most likely be the only tribe affected, given the location of suitable fisher habitat. Impacts to the Quinault Indian Nation would range from negligible to moderate, but only 2% of suitable fisher habitat occurs on all tribal land on the peninsula. Some adverse cumulative impacts would occur, but overall cumulative impacts would be primarily beneficial, as combined protective actions by all landowners could preclude the need to list the fisher.	
Socioeconomic Conditions	Because there would be no impacts to timber harvesting activities related to fisher reintroduction or predation by fishers, there would be no impacts to socioeconomic conditions under this alternative. Cumulative impacts would be beneficial to adverse, long-term, and vary in intensity depending on landowner.	Socioeconomic impacts related to timber harvesting would vary by landowner, but are expected to be adverse, long-term, and range from negligible to minor. Cumulative impacts would be primarily related to declines in the timber harvesting industry and the ensuing government payments to affected areas, and would also be adverse, long-term, and vary in intensity, depending on how individuals had been affected by these actions. Local owners of poultry and small pets could be adversely affected over the long-term by negligible to minor impacts. Cumulative impacts would also be adverse, long-term, and negligible to minor.	No impacts specifically related to captive breeding are expected to neighboring landowners; therefore, impacts would be similar to those expected under alternative B — adverse, long-term and negligible to minor. Cumulative impacts would be adverse, long-term, and negligible.
Park Management and Operations	No impacts related to releasing or monitoring fishers would be incurred; therefore, there would be no impacts to Park management and operations. There would also be no cumulative impacts.	Because the Natural Resources Management Division might secure additional funds for fisher reintroduction efforts, and all other divisions would experience no more than negligible impacts, overall impacts to Park management and operations would be adverse, long-term, and negligible to minor. Cumulative impacts would be adverse, long-term, and moderate, given the existing operations and management shortfall and reduced staff.	Impacts would be the similar to alternative B — adverse, long-term, and negligible to minor. Cumulative impacts would be adverse, long-term, and moderate, given the existing shortfall and reduced staff.

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ACRONYM LIST

CEQ	Council on Environmental Quality
dB	decibel
dBA	A-weighted decibel
DOI	Department of Interior
DPS	Distinct Population Segment
FAA	Federal Aviation Administration
FSR	U.S. Forest Service road
FTE	Full-time Equivalent
km	kilometer
Mmbf	thousand thousand board feet (million board feet) of timber
NEPA	*National Environmental Policy Act*
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
PIT	Passive Integrated Transponder
UNESCO	United Nations Educational, Scientific and Cultural Organization
U.S.	United States
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Service
vhf	very high frequency
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOA	Washington Department of Agriculture

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Chapter 1
Purpose of and Need For Action

CHAPTER 1 — PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

Olympic National Park encompasses approximately 922,651 acres on the Olympic Peninsula in the northwest corner of Washington State (see figure 1). The Park, of which approximately 95% is designated wilderness, is surrounded by a complex network of lands managed by federal and state agencies, American Indian tribes, and private landowners (see the "Neighboring Landowners" topic in "Chapter 3 – Affected Environment"). Bordered by the Pacific Ocean on the west, the Strait of Juan de Fuca to the north, and Hood Canal to the east, the peninsula and Park have been geographically isolated for thousands of years. As a result of this isolation and the extreme gradients of elevation, temperature, and precipitation, at least 16 animal and 8 plant species on the peninsula do not occur anywhere else in the world (NPS n.d.a; NPS 1996b).

However, two species have been lost from the Olympic National Park ecosystem, the gray wolf (*Canis lupus*) the fisher. The fisher is a medium-size carnivore and the largest member of the genus *Martes* in the family Mustelidae (Powell and Zielinski 1994). It has the body build of a stocky weasel — a pointed face, rounded ears, a long and slender body, short legs, and a well-furred tail about one-third its total length (Lewis and Hayes 2004).

Fishers historically occurred throughout much of the low- to mid-elevation forested areas of Washington, including Olympic National Park. In addition to the Park, the fisher is believed to be extirpated from the entire state of Washington, and consequently was listed by Washington State as endangered in 1998. Due to its depleted status throughout portions of its former range in Washington, Oregon, and California, the West Coast Distinct Population Segment (DPS) of fishers was listed by the U.S. Fish and Wildlife Service (USFWS) as a federal candidate species in 2004 (USFWS 2004b; see the "Protected Status" section this chapter). Two major factors contributed to the decline of fishers in Washington — over-exploitation from commercial trapping; and loss, degradation, and fragmentation of suitable habitat. Poisoning, predator control, and incidental capture in traps set for other wildlife are also considered contributing factors in the decline of fishers in the state (Lewis and Hayes 2004).

The loss of a species disrupts the structure and function of an ecosystem. Other predators (e.g., coyotes, bobcats, skunks, and martens) likely compensated for some of the functions in the absence of fishers but were unlikely to completely replace the functions of the fisher. The interacting roles of ecosystem members are not fully understood, and in the absence of a more complete understanding, we assume that maintaining an intact ecosystem is the best way to preserve its functions. Consequently, restoring fishers to the Olympic Peninsula ecosystem is considered a way to reestablish a more fully functioning ecosystem. This is consistent with the mission of Olympic National Park, which was established in part to provide permanent protection to indigenous wildlife (House Report no. 2247, 1938).

Fisher reintroductions have been undertaken in other areas for three purposes: (1) to reestablish an extirpated species, (2) to reestablish a valuable furbearer, or (3) to reestablish an effective predator of porcupines (Lewis and Hayes 2004). Most reintroductions were undertaken for more than one of these reasons. Fishers were first reintroduced in areas with overabundant porcupines to reduce porcupine damage to commercial timber. Unfortunately, few reintroduction efforts incorporated research on the effect of fisher reestablishment on an ecosystem, and no research has been conducted on the effects that fisher extirpation has had on an ecosystem.

Despite protection from legal harvest in Washington since 1934, fishers have not recovered in the state. Extensive surveys within and outside Olympic National Park from 1990 to 2003 failed to detect fishers

(Hayes and Lewis 2006). Although some people have reported seeing a fisher in the state, scientific surveys have not detected them. Fishers are therefore considered extirpated from Washington.

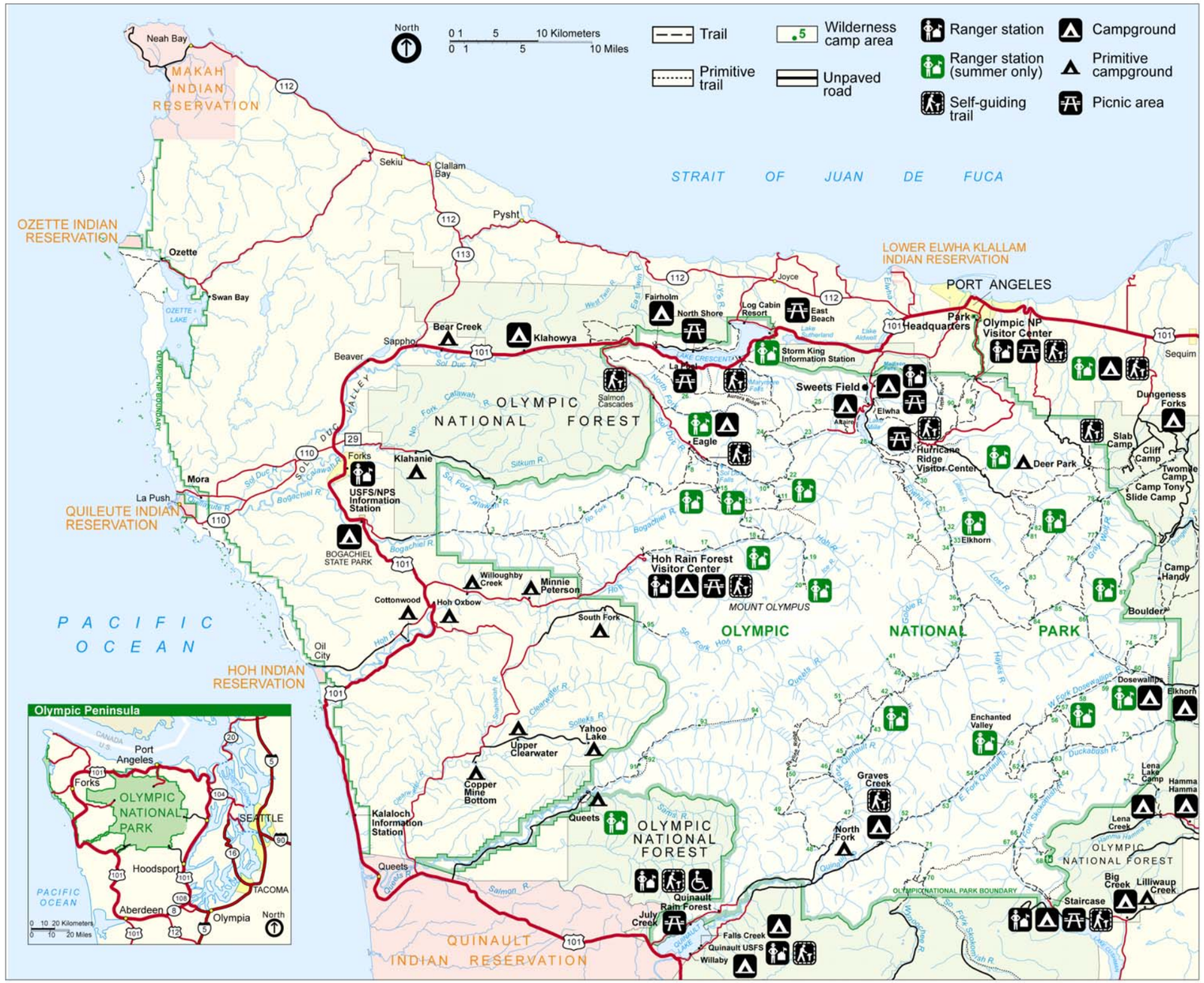
Reintroduction is considered the best way to restore fishers in Washington because of the absence of nearby populations to naturally recolonize the state through immigration. Fishers were reintroduced in 10 states and 5 provinces in North America, including Oregon, Montana, Idaho, and British Columbia. Based on the *Feasibility Assessment for Reintroducing Fishers to Washington* (Lewis and Hayes 2004) prepared by the WDFW, the greatest concentration of suitable fisher habitat in the state is in Olympic National Park, Olympic National Forest, and adjacent lands administered by the WDNR. Consequently, these lands are considered the most suitable location for the first reintroduction of fishers to the state.

FEASIBILITY OF FISHER REINTRODUCTION

The fisher is one of the most frequently and successfully reintroduced carnivores (Berg 1982, Reading and Clark 1996, and Breitenmoser et al. 2001, all as cited in Lewis and Hayes 2004). Although fishers have not been reintroduced in Washington, successful reintroductions or augmentations have occurred in Montana, Oregon, Idaho, and British Columbia that were successful (Lewis and Hayes 2004).

Feasibility studies are recommended to determine if existing habitat, source populations, and the political and social environments are suitable for a successful reintroduction (IUCN 1995). The WDFW, in conjunction with Northwest Ecosystem Alliance and the Fisher Science Team (composed of scientists with expertise in fishers, carnivores, genetics, and spatial habitat modeling), produced a report in 2004 assessing the feasibility of reintroducing fishers into the state (Lewis and Hayes 2004). The objectives of this study included determining if there was an adequate amount and configuration of fisher habitat and prey in Washington, and if there was a suitable source population available for reintroduction. The report concluded that a fisher reintroduction is biologically feasible in Washington (Lewis and Hayes 2004).

Figure 1: Olympic National Park Location Map



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HABITAT ASSESSMENT

In the Pacific coastal states, fishers are closely associated with habitat elements found in late-successional forests such as large trees, snags, and logs, which are important as resting and denning sites. A habitat assessment was a large part of the feasibility assessment, and for the purposes of the habitat assessment, suitable habitat was defined as low- and mid-elevation, late-successional forest. The habitat assessment identified three candidate locations for fisher reintroduction based on available and projected late-successional forest habitat: the Olympic Peninsula, Northwestern Cascades, and Southwestern Cascades. An area including the west side of Olympic National Park and Olympic National Forest was identified as the most suitable location for a fisher reintroduction (Lewis and Hayes 2004; Hayes and Lewis 2006).

The Olympic Peninsula was found to contain both greater amounts and more contiguous suitable habitat than the two potential reintroduction areas in the Cascades. Of the suitable habitat in the potential reintroduction area on the Olympic Peninsula the NPS owns 52%, the U.S. Forest Service (USFS) 33%, the WDNR 8%, private landowners 5%, tribal landowners 2%, and other landowners less than 1% (Hayes and Lewis 2006). Commercial timber harvest on Park lands is prohibited, and the majority of Olympic National Forest is managed as late-successional forest reserves to preserve or restore natural ecosystems. The Olympic National Forest management policies are largely the result of the interagency *Northwest Forest Plan Revisited*, which protects old-growth habitat for the northern spotted owl (*Strix occidentalis caurina*) and marbled murrelet (*Brachyramphus marmoratus*), both federally listed species (REO 1998; Holthausen et al. 1995, as cited in Lewis and Hayes 2004). Because fishers use very similar habitat, implementation of the *Northwest Forest Plan Revisited* could provide additional suitable habitat for fishers over the next 80 years as second-growth forests mature into late-successional forests. The increase in the amount of late-successional forest in the Olympic Peninsula is likely to have the most future benefit for fishers where it occurs adjacent or close to existing large patches of older forest (Lewis and Hayes 2004; Hayes and Lewis 2006). Based on the habitat assessment, a sufficient quantity of habitat for a self-sustaining population of fisher is available in the Olympic Peninsula.

PREY AVAILABILITY

Late-successional forests support a diverse and rich array of potential prey for fishers, often providing greater prey diversity and abundance than second-growth forests (Lewis and Hayes 2004). Because there has been no detected decline in prey abundance and the Park is known to support a diverse array of mid-sized carnivores that use many of the same prey species as fishers, prey availability for fishers is assumed to be both sufficient and similar to what was available within the Park prior to their extirpation.

SOURCE POPULATION

Genetic analyses indicate that fishers from British Columbia would be the most suitable source population for reintroductions in Washington, followed by fishers from California and Alberta. Fishers are available from Alberta and may be available from British Columbia; however, they are not available from California due to the small population size (Lewis and Hayes 2004). Regardless of the source population used, permits would be required, as described in the "Permits" section in this chapter.

Fishers from British Columbia or Alberta would come from coniferous forest habitats with a broader assemblage of potential predators than in Washington. Forested habitats in British Columbia and Alberta vary from those in Washington based on many ecological factors, such as climate, soils and substrates, and topography. While fishers obtained from British Columbia or Alberta would not have experienced a temperate rainforest ecosystem, as occurs on the Olympic Peninsula, they are expected to adapt easily to the mesic coniferous forest structure and diverse prey base that exist on the Olympic Peninsula and previously supported fisher populations. The genetic similarities between British Columbia or Alberta fishers

and fishers that historically occurred in Washington indicate that fishers from these provinces are the most genetically fit individuals to be reintroduced to Washington (Lewis and Hayes 2004).

PROTECTED STATUS

Federal

Currently fishers are not listed as endangered or threatened by the USFWS, and therefore receive no federal protection. However, the Center for Biological Diversity and the Sierra Nevada Forest Protection Campaign petitioned the USFWS to list the West Coast DPS of the fisher in Washington, Oregon, and California, as endangered pursuant to the federal Endangered Species Act and to designate critical habitat. On July 12, 2003, the USFWS announced in the *Federal Register* that the petition presented "substantial information that the West Coast population of the fisher may be a distinct population segment for which listing is warranted" (USDI 2004). On April 8, 2004, the agency published its finding in the *Federal Register* that the petitioned action was warranted, but precluded by higher priority actions. Upon publication of the 12-month petition finding, the West Coast DPS of the fisher was listed as a federal candidate species (Wild and Roessler 2004, as cited in Lewis and Hayes 2004), which means that the USFWS has sufficient information on a species' biological status and threats to its existence to propose them as endangered or threatened under the Endangered Species Act, but for which development of a listing regulation is precluded by other higher priority listing activities (USFWS 2006a).

State

The fisher was listed as a state endangered species in October 1998. However, there is currently no critical habitat rule (WAC 222-16-080) for the fisher under the State Forest Practices Act (RCW 76.09), and thus no restrictions of forest practices activities on state or private timber lands to protect fisher habitat. The WDFW does not anticipate asking the Forest Practices Board for a critical habitat rule. If fishers are reintroduced, the department would encourage the protection of den sites if they become known through research and monitoring (Hayes and Lewis 2006).

Currently, no commercial take of fishers is allowed in Washington. The trapping season for fishers was closed in 1934 and has not been re-opened. As a state endangered species, fishers cannot be legally trapped or killed (Hayes and Lewis 2006). However, fishers are curious animals and can be incidentally captured in traps set for other furbearers. Because Washington passed an initiative in 2000 prohibiting the use of "body-gripping" traps (Hayes and Lewis 2006), incidental captures would have much less impact because fishers captured in cage-type traps are less likely to be injured or killed. In addition, the state has jurisdiction over licensing, establishing seasons, or closing areas to trapping on all lands except tribal and NPS lands in Washington. Some tribal trappers are exempt from the prohibition on body-gripping traps and this reintroduction plan would not affect existing tribal treaty rights. If the 2000 initiative was ever overturned, the closure on fisher harvest would remain in place because of its state protected status, however, fishers could be subject to greater loss from incidental capture in body-gripping traps set for other legally harvested furbearers (Lewis and Hayes 2004).

Protections for Known Fisher Den Sites

Even though the fisher is listed as a state endangered species and a federal candidate species, no protection of known fisher den sites is currently required. However, given the concerted efforts toward reestablishing the species in Washington, landowners would be asked to work voluntarily with the agencies cooperating with the fisher reintroduction to protect known den sites. In addition, the USFS would place seasonal restrictions on mechanized activities within the National Forest to protect known, active fisher dens. These actions are described in more detail in under "Elements Common to All Action Alternatives" in "Chapter 2 – Alternatives."

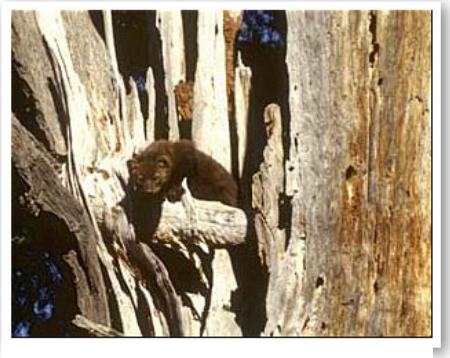
PURPOSE OF AND NEED FOR ACTION

PURPOSE OF THE PLAN / ENVIRONMENTAL ASSESSMENT

The purpose of this plan / environmental assessment is to contribute to the statewide restoration of fishers and to help fulfill NPS policies to restore extirpated native species by establishing a self-sustaining fisher population in Olympic National Park.

NEED FOR ACTION

Olympic National Park is 95% designated wilderness; without fishers a key wilderness value is absent. As stated previously, no known populations of fishers exist in Washington, and there are no populations close enough to the state to naturally re-establish a population through immigration. Because these reintroductions would require the translocation of individuals from a source population, action is needed at this time because opportunities for genetically similar source populations are available now, but might decrease in the near future. The following further define the need for taking action:



Adult female fisher resting on top of a large snag. Photo by T. Catton, PNW Research Station.

1. Fishers are native to Washington State, including Olympic National Park, but have been extirpated.
2. Washington State has a stewardship responsibility to protect, restore, and enhance native wildlife populations and their habitats (WDFW 2003).
3. Under the NPS *Management Policies 2006* (sec. 4.1.5 and 4.4.2.2), the NPS will strive to restore the biological and physical components of natural systems in parks, including restoring native plants and animals. See "NPS Management Policies Specific to Fisher Restoration" later in this chapter.
4. Olympic National Park is 95% designated wilderness. It is the policy of the NPS (NPS *Management Policies 2006*, sec. 6.3.7) to recognize wilderness as a composite resource with interrelated parts. Indigenous species are an essential component of wilderness and the wilderness experience. Without fishers a key wilderness value is missing from Olympic National Park.
5. Olympic National Park was established in part to provide permanent protection to indigenous wildlife (House Report, No. 2247, 1938).
6. Recent analyses identified the Olympic Peninsula as the best place to initiate fisher restoration in Washington State (Lewis and Hayes 2004).

OBJECTIVES IN TAKING ACTION

NPS regulations for implementing the *National Environmental Policy Act* (NEPA) (NPS 2001a) define objectives as "what must be achieved to a large degree for the action to be considered a success." Alternatives selected for a detailed analysis must meet all objectives to a large degree, and resolve the purpose of and need for action. Objectives must also be consistent with, and even draw from, the enabling legislation, purpose and significance, and mission goals of the Park, as well as the direction and guidance provided in Park management documents. The following objectives related to fisher restoration at Olympic National Park were developed for this plan:

- Engage and inform the public about the restoration effort and the role of the fisher in the ecosystem.

- Establish a fisher population as genetically similar as possible to the population that originally occupied the Olympic Peninsula (NPS *Management Policies 2006*, sec. 4.4.1.2; see "NPS Management Policies Specific to Fisher Restoration" later in this chapter.
- Promote the establishment of a reproducing population of fishers.
- Promote the occupation of suitable habitat throughout the Park.
- Maintain a fisher population that would persist for an extended time (at least 8 to 10 generations).
- Maintain a fisher population that could be a possible source for reintroductions to restore fishers in other areas of the state, including other suitable national parks.
- Gather information about habitat use, movement, and survival that would be used to guide and define future conservation efforts for fishers.
- Contribute to meeting the state recovery plan objectives.

GEOGRAPHIC AREA EVALUATED FOR IMPACTS

The proposed reintroduction area would occur within Olympic National Park. Because fishers may use suitable habitats outside the Park, particularly in the Olympic National Forest, the focus of the analysis is Olympic National Park and adjoining wilderness in Olympic National Forest. Where the potential for impacts exists, the analysis also extends onto other adjacent lands with suitable habitat that are in state, private, and tribal ownership.

PARK BACKGROUND

HISTORY OF FISHERS AT OLYMPIC NATIONAL PARK

Forest types at Olympic National Park vary widely with precipitation and elevation, and support a large diversity of habitats. Before extirpation, it is believed that fishers occurred in forested habitats throughout the Park, from sea level to timberline (NPS 2005c).

Only anecdotal data are available to indicate the size of the historical fisher population in Olympic National Park. In 1920 two trappers working in the Queets River watershed west of Clearwater caught 37 fishers during the winter (this area has since been logged and no late-successional forest exists there now). In 1921, 20 fishers were trapped at the East Fork of the Quinault River at elevations between 1,500 and 5,000 feet. This is the last recorded trapping of fishers in that area. The last verified record of a fisher on the Olympic Peninsula was in 1969 at Lilliwaup swamp (NPS 2005c). As mentioned in the "Introduction," two major factors contributed to the decline of fishers in Washington — over-exploitation from commercial trapping; and loss, degradation, and fragmentation of suitable habitat. Poisoning, predator control, and incidental capture in traps set for other wildlife are also considered contributing factors in the decline of fishers in the state (Lewis and Hayes 2004).

Survey efforts have been undertaken to monitor and detect fishers in Olympic National Park since 1972. Despite using survey techniques that have successfully detected fisher presence in other areas, fishers were not detected during these surveys. In 1991 a camera survey conducted by the USFS did not detect any fishers, nor did additional efforts outside and on the periphery of the Park detect any fishers (Jones and Raphael 1991, Sheets 1993). In 2002–2003, Park staff completed a more intensive camera survey for both fishers and American martens (*Martes americana*). Despite the presence of 52 cameras and infrared motion sensors, and over 1,200 pictures of various species that triggered the motion sensors, no fishers were photographed (NPS 2005c).

PURPOSE AND SIGNIFICANCE OF OLYMPIC NATIONAL PARK

All units of the national park system were formed for a specific purpose (the reason for its being) and to preserve significant resources or values for the enjoyment of future generations. The purpose and significance identify uses and values that individual NPS plans should support.

Purpose of Olympic National Park

House Report 2247 of April 28, 1938, described the purpose of Olympic National Park as

> to preserve for the benefit, use, and enjoyment of the people, the finest sample of primeval forests of Sitka spruce, western hemlock, Douglas fir, and western red cedar in the entire United States; to provide suitable winter range and permanent protection for the herds of native Roosevelt elk and other wildlife indigenous to the area; to conserve and render available to the people, for recreational use, this outstanding mountainous country, containing numerous glaciers and perpetual snow fields, and a portion of the surrounding verdant forests together with a narrow strip along the beautiful Washington coast (House Report No. 2247, 1938).

Significance of Olympic National Park

The Park is significant because:

- Olympic National Park protects several distinctly different and relatively pristine ecosystems, ranging from more than 70 miles of wild Pacific coast and islands through densely forested lowlands to the glacier-crowned Olympic Mountains.
- The ecosystems protected within Olympic National Park contain a unique array of habitats and life forms, resulting from thousands of years of geographic isolation, along with extreme gradients of elevation, temperature, and precipitation. At least 16 kinds of animals and 8 kinds of plants on the Olympic Peninsula exist nowhere else in the world.
- Olympic National Park protects the primeval character of one of the largest wilderness areas in the contiguous U.S.
- Conditions within the Park's three ecosystems are, to a great extent, pristine and little changed from the time of the first Euro-American exploration and settlement. Visitors to the Park's wilderness can experience many of the same sights and sounds known to much earlier residents of the area. With few exceptions (such as the fisher), all known members of the Park's ecosystems are still present.
- Olympic National Park protects some of the finest remaining stands of old-growth temperate rainforest in the U.S. These forests of ancient and immense trees provide habitat for dozens of smaller plants and animals, including important habitat for a number of threatened species.
- Olympic National Park protects more than 3,000 miles of rivers and streams within 11 watersheds, and it provides one of the largest remaining tracts of pristine spawning and rearing habitat in the lower 48 states. Nine species of salmon, trout, and char and many other native fish inhabit these waters.
- The Olympic rocky intertidal community is considered to be one of the most complex and diverse shoreline communities in the U.S. Olympic National Park protects about 1,200 square miles of the intertidal, island, and shoreline habitat, and, combined with the neighboring Olympic Coast National Marine Sanctuary and USFWS Washington Islands National Wildlife Refuge, a total of 3,600 square miles of intertidal, island, and ocean habitats is protected.
- Olympic National Park protects the largest population of Roosevelt elk in its natural environment in the world. Decades of protection from human harvest and habitat manipulation have sustained

not only high densities of elk, but also preserved the natural composition, social structure, and dynamics of this unique coastal form of elk as found nowhere else.

- Olympic National Park protects important cultural resources, including 397 identified archeological sites, 500 ethnographic sites, 31 cultural landscapes, and 16 historic districts. There are 128 historic structures within the Park boundaries that are on the NPS List of Classified Structures.

DESIRED CONDITION

This section defines the desired condition for fisher reintroduction at Olympic National Park, which is connected to the plan's purpose, need, and objectives. The objectives factored into the definition of the desired condition include maintenance of a fisher population that would persist for an extended time (at least 8 to 10 generations); maintenance of a fisher population that could be a possible source for fisher reintroductions in other areas of the state, including other suitable national park system units; and contribution to the state recovery plan objectives (Hayes and Lewis 2006).

The reintroduction project would be successful when a self-sustaining fisher population becomes established within Olympic National Park. For the purposes of this plan, a self-sustaining population is defined as one that can survive and reproduce by natural means, without human intervention.

SCOPING PROCESS AND PUBLIC PARTICIPATION

NEPA regulations require an "early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." To determine the scope of issues to be analyzed in depth in this plan, meetings were conducted with Park staff and other parties associated with preparing this document (see "Chapter 5 – Consultation and Coordination" for additional information). Several issues were identified as requiring further analysis in this plan. These issues represent existing concerns, as well as concerns that might arise during consideration and analysis of alternatives. The Council on Environmental Quality (CEQ) regulations (40 CFR sec. 1508.8; CEQ 1978) and NPS *Director's Order #12* (NPS 2001a) use *effect* and *impact* synonymously. *Effect* and *impact* are used synonymously in this EA; both can be either beneficial or adverse. The issue statements developed by the interdisciplinary team are presented below. These issues formed the basis for the affected environment and impact topics.

ISSUES AND IMPACT TOPICS

Species of Special Concern

Ten federally listed animal species, as well as seven state-listed animal species, occur in Olympic National Park. Two state endangered plants and nine state threatened, and four additional USFWS species of concern are known to exist or could occur within the Park (Acker, pers. comm. June 25, 2007). None of the special status plants would be affected by this plan as fishers are not herbivorous and the reintroductions would not involve ground-disturbing activities. There could be some impact to special status animals, including the northern spotted owl, marbled murrelet, bald eagle (*Haliaeetus leucocephalus*), northern goshawk (*Accipiter gentilis*), pileated woodpecker (*Dryocopus pileatus*), and Mazama pocket gopher (*Thomomys mazama*). Potential impacts to these species from fisher reintroduction include predation and/or competition for prey.

In addition, reintroducing fishers would have a beneficial effect on the species itself, increasing the potential for reestablishing a self-sustaining population that could eventually become a source population for other reintroductions. Additionally, reestablishment of fishers on the Olympic Peninsula could reduce the

need to list fishers as a federally threatened or endangered species in the future. See "Chapter 4 – Environmental Consequences" for a detailed description of impacts to special species of concern.

Wildlife or Wildlife Habitat

Fishers use similar forest types and prey on some of the same species as other wildlife in the Park. Thus, there is potential for fishers to compete with other species for habitat and prey, or to prey directly on other species. Principal food items in the Pacific coastal states have been reported to include mice, voles, squirrels, woodrats (*Neotoma* spp.), ungulate carrion, grouse (*Bonasa* and *Dendragapus* spp.), and insects (Lewis and Hayes 2004). See "Chapter 4 - Environmental Consequences" for a detailed description of impacts to wildlife and wildlife habitat from fisher reintroduction is provided.

Visitor Use and Experience

Olympic National Park is known for its ecosystem diversity. Fisher reintroduction could beneficially impact visitor experiences in the Park because visitors would know that an important component of the ecosystem had been restored. In addition, the Park could establish an interpretive program surrounding fisher reintroduction that could enhance visitor experiences.

Fishers den at times of the year when visitor use is low, and they would be expected to select sites where visitation is also low. In addition, fishers may move their kits to a new den if they are disturbed during the denning season (Paragi 1990 and Seglund 1995, both as cited in Lewis and Hayes 2004). For this reason, as well as their secretive nature and their occurrence in forested habitats, fishers are likely to be observed by Park visitors very infrequently. See "Chapter 4 – Environmental Consequences" for a detailed description of impacts to visitor use and experience.

Wilderness Values

Wilderness values include the absence of evidence of people and their activities, as well as the perpetuation of natural ecological relationships and processes and the continued existence of native wildlife populations in largely natural conditions. Reintroduction of fishers would benefit the wilderness value of Olympic National Park by helping to restore forest ecosystems within the Park. See "Chapter 4 – Environmental Consequences" for a description of the impacts to wilderness values in detail.

Soundscapes

During reintroduction efforts, motor vehicles, and possibly helicopters would be used to access release areas. For 3 to 4 years following their release, fisher survival, home range establishment, dispersal, habitat selection, and reproduction would be monitored to assess restoration success. Fisher movements and survival would be monitored by telemetry using fixed-wing aircraft, vehicles, or accessed on foot. Helicopters might be used to recover dead fishers (extractions) if they were not safely and efficiently accessible on foot. The use of telemetry aircraft flights and vehicles for reintroduction and monitoring purposes, as well as the use of helicopters, could increase the level of noise in the Park. See "Chapter 4 – Environmental Consequences" for a detailed analysis of impacts to soundscapes.

Neighboring Landowners

Under current conditions there would be no effect to neighboring landowners. However, in the unlikely event that the fisher was federally listed as threatened or endangered in the future (it is currently a candidate for listing under the Endangered Species Act), there may be new requirements for protecting fishers and their habitat. Under state law, trapping, hunting, possessing, or harming fishers is prohibited. On WDNR-managed lands, a habitat conservation plan is already in place to protect northern spotted owl and marbled murrelet habitat, and this plan would also protect fishers and their habitat. The WDNR habitat

conservation plan is described in more detail in the "Neighboring Landowners" section in "Chapter 3 – Affected Environment." Suitable habitat (mature and old-growth forest timber) is currently found primarily on NPS, USFS, and WDNR lands, with very small, fragmented amounts on tribal and private lands adjacent to the Park and national forest lands. Therefore, only minor to no effect to fishers inhabiting tribal and private land is expected, even if the species becomes listed. Potential changes to requirements for federal agencies include seasonal buffer zones around active den sites, as well as inclusion of potential effects to fishers in biological assessments prepared for proposed timber harvests. See "Chapter 4 – Environmental Consequences" for a detailed analysis of impacts to neighboring landowners.

Socioeconomic Conditions

Seasonal buffer zones from mechanized activity around known active den sites may be required on neighboring lands to protect fishers. Typically, forests that are harvested or commercially thinned are not used by fishers for denning. USFS thins young-aged forested stands to promote the future development of late successional characteristics, which would benefit fishers in the future. Known active den sites would be protected from project activities on USFS land. However, seasonal restrictions to protect fishers outside the Park would be unlikely since locations of fisher den sites would be difficult to determine after active monitoring of radio-collared fishers is completed.

The restoration of fishers would have no impact on trappers, salal harvesters, or individuals who harvest other nontimber forest products on lands adjacent to the Park. (The branches and tips of the salal plant, an evergreen shrub, constitute the mainstays of the floral greens industry in the Pacific Northwest (USFS 2003).) Typical salal harvest areas are not used by fishers, as the habitat in these areas is generally less suitable than other areas.

Fisher biologists and furbearer program managers have documented occurrences of fisher predation on pets and poultry in the Midwest and Northeast. These events typically occur where homes are in remote settings in forested habitats, but local residents of the Olympic Peninsula could be affected. See "Chapter 4 – Environmental Consequences" for a detailed analysis of impacts on socioeconomic conditions.

Park Management and Operations

Fisher reintroduction and ensuing monitoring efforts (such as radio-telemetry, genetic sampling, capture and tagging) could require additional Park resources, including funds and staff time. If the fisher was to be federally listed, additional Park resources would be required to complete biological assessments for projects that would affect fishers. In "Chapter 4 – Environmental Consequences," a detailed description of the impacts to Park management and operations is provided.

ISSUES CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

- *Geohazards* — No known geohazards in the Park would be affected as a result of fisher reintroduction.
- *Air Quality* — The monitoring of released fishers could involve the use of aircraft, which could affect air quality. However, such an increase in aircraft use is expected to be negligible and would not impact overall air quality.
- *Water Quality* — No impacts to water quality or quantity are anticipated as a result of fisher reintroduction.
- *Streamflow Characteristics* — Impacts to streamflow characteristics are not anticipated as a result of fisher reintroduction.
- *Marine or Estuarine Resources* — No marine or estuarine resources are anticipated to experience effects from the reintroduction of fishers.

- *Plant Species of Special Concern* — Fisher reintroduction would not affect plant species of special concern because fishers are carnivores and rarely eat plants and the project would not involve ground disturbing activities under any of the alternatives. Two state endangered plants may occur in the Park: pink sandverbena (*Abronia umbellata* ssp. *breviflora*) and frigid shooting star (*Dodecatheon austrofrigidum*). Nine plant species are listed as state threatened including Cotton's milkvetch (*Astragalus cottonii*), Pacific springbeauty (*Claytonia lanceolata* var. *pacifica*), threeleaf goldthread (*Coptis trifolia*), Quinault fawn-lily (*Erythronium quinaultense*), water lobelia (*Lobelia dortmanna*), royal jacob's ladder (*Polemonium carneum*), Menzies' burnet (*Sanguisorba menziesii*), waving bur-reed (*Sparganium fluctuans*), and cut leaf synthyris (*Synthyris pinnatifida* var. *lanuginosa*) (Happe, pers. comm. July 10, 2007; Acker, pers. comm. June 25, 2007).
- *Rare or Unusual Vegetation* — No impacts to rare or unusual vegetation are anticipated as a result of fisher reintroduction.
- *Vegetation* — Fisher reintroduction is not expected to have an impact on Park vegetation. Although fruit (possibly including huckleberries and salal berries) could become a more important part of the fisher's diet during fall and winter, any seasonal forage would have short-term, negligible adverse impacts on individual plants, but would not affect the plant communities in the Park overall. Fisher predation on herbivores is not expected to have secondary effects on vegetation.
- *Floodplains/Wetlands* — No occupancy, modification, or development of floodplains is expected under this plan. It is possible that fishers could prey on beavers, which could affect wetlands. However, few beavers exist within the Park. The connection between fishers and beavers is likely based on the food habits of fishers in areas where both species are very abundant (e.g., Ontario, Quebec), and where the gentle terrain allows fishers and beavers to extensively coexist. Most of the occurrences of beavers in fisher diets are from trapper-killed fishers, and these individuals likely ingested beaver that was used as bait for trapping. An examination of fisher diets from a number of locations in British Columbia with abundant beaver populations did not identify beaver as a prey species (Weir, pers. comm. July 19, 2005). Therefore, it is believed that fisher predation on beaver, if it occurred, would not affect wetland functions (i.e., wildlife habitat, water retention/purification, etc.).
- *Unique or Important Fish or Fish Habitat* — No impacts to fish or fish habitat are anticipated as a result of fisher reintroduction.
- *Other Wildlife* —

  Olympic marmots (*Marmota olympus*): The Olympic marmot is extremely restricted in distribution, occurring only in alpine zones of the Olympic Mountains in the national park and adjacent national forest wilderness. Because fishers and marmots do not use the same habitat, no effects on the marmot are anticipated from reintroducing fishers.

  Bobcats (*Felis rufus*): Bobcats are numerous in Olympic National Park, and all suitable bobcat habitat in the Park is considered to be occupied. The presence of a bobcat population is not expected to interfere with the success of establishing a fisher population, as the two species previously coexisted at the Park. Findings from previous studies suggest that if fishers were reintroduced to Washington, a stable coexistence between populations of fishers and bobcats would result (Gilbert and Keith 2001). It is expected that although some competition for food and some direct predation could occur (from fishers preying on bobcats and vice versa), a restored fisher population is not expected to negatively affect bobcat populations.

  American martens: The population status of marten is unknown in Olympic National Park. The most recent documentation of marten presence was in 1992 on the east side of the Park (Sheets 1993). Fisher and marten co-exist in other ecosystems, and were known to co-exist in

Olympic National Park prior to fisher extirpation (Powell and Zeilinski 1994; Scheffer 1995). However, martens occur at higher elevations, where fishers do not normally occur. Therefore, impacts to martens from fisher reintroduction are expected to be negligible. For this reason, as well as the uncertainty that martens exist in Olympic National Park, impacts to martens are not analyzed in this document.

- *Nonnative Species* — Precautionary measures (e.g., checking individual fishers for seeds and nonnative pathogens) would ensure that fisher reintroduction would not introduce nonnative species in the Park.
- *Disease Transmission* — Although fishers are susceptible to diseases from domestic dogs and possibly other domestic sources, due to the remoteness of the reintroduction area, fishers are not expected to come into contact with domestic animals. Consequently, no impacts are expected from disease transmission.
- *Archeological Resources* — The implementation of a fisher reintroduction plan is not anticipated to impact archeological resources.
- *Prehistoric/Historic Structures* — The implementation of a fisher reintroduction plan is not anticipated to impact prehistoric or historic structures.
- *Cultural Landscapes* — No impacts to cultural landscapes are anticipated as a result of fisher reintroduction.
- *Museum Collections* —Park resource management records relating to fisher reintroduction would eventually be archived in the Park museum collection. This would result in virtually no impact to Park operations or the museum collection because it would not noticeably increase the volume of records archived.
- *Urban Quality, Gateway Communities* — There is a slight possibility that fishers could prey on cats, dogs, and small livestock (such as chickens) in communities that border the Park. Such occurrences are expected to be rare because fishers generally avoid human communities. This topic is addressed under "Neighboring Landowners" in chapters 3 and 4.
- *Socioeconomics Related to Tourism* — It is possible that tourism in the area could increase due to perceived benefits on the part of visitors as a result of fisher reintroduction, which could benefit local businesses. However, such an increase is likely to be slight and difficult to quantify. Therefore, impacts from increased tourism were dismissed from further analysis.
- *Energy Resources* — The implementation of a fisher reintroduction plan would result in a slight increase in the consumption of fossil fuels associated with aircraft and vehicle use during reintroduction and monitoring. However, such an increase is not anticipated to measurably impact energy resources. Therefore, this topic was dismissed from further analysis.
- *Resource, Including Energy, Conservation Potential* — Fisher reintroduction actions are not expected to impact resource conservation potential.
- *Long-term Management of Resources* — Fisher reintroduction actions are not expected to impact the long-term management of resources beyond those already described under "Issues and Impact Topics" in "Chapter 1 – Purpose and Need for Action."
- *Other Important Environmental Resources* — No additional important environmental resources have been identified that could be impacted by fisher reintroduction activities.
- *Minority and Low-Income Populations* — Executive Order No. 12898 requires federal agencies to consider the impact of their actions on disadvantaged human populations. Federal agencies must assess whether actions would have a disproportionately high and adverse human health or environmental effect on minority and low-income populations. Fisher reintroduction would have no

impact on salal harvesters or other individuals who harvest non-timber forest products on adjacent lands. Salal harvesting is not permitted in Olympic National Park, and typical harvest areas are not likely to be used by fishers, as the habitat is not as suitable as other areas. Furthermore, there is no anticipated need to close roads (vehicular access) to protect fisher dens, because it would be difficult to determine where fisher den sites exist. For these reasons, analysis of impacts to minority and low-income populations has been dismissed.

- *Biosphere Reserves and World Heritage Sites* — In 1976, the United Nations Educational, Scientific and Cultural Organization (UNESCO) designated Olympic National Park as a Biosphere Reserve, which identifies the Park as an internationally significant ecosystem within one of the world's major biogeographical provinces. In 1981 UNESCO designated the Park a World Heritage Site, joining it to a system of natural and cultural properties that are considered irreplaceable treasures of outstanding universal value. Reintroducing fishers into the Park would enhance its designation as a biosphere reserve and world heritage site. However, none of the alternatives would affect or change the Park's designation by UNESCO, this topic was dismissed from further analysis.
- *Other Agencies*—Neighboring landowners, such as other state and federal agencies, and tribes, could be affected by reintroducing fishers into Olympic National Park. These impacts to other agencies are addressed under the "Neighboring Landowners" topic rather than as a separate topic.
- *Tribal Consultation* — Tribal lands adjacent to the fisher restoration activities could be affected by reintroducing fishers into Olympic National Park. The Quinault Nation is the only tribal land that would be potentially impacted by fisher reintroduction since it is the only tribe to border the proposed reintroduction areas in the Park. Impacts to tribes are not addressed as a separate topic but are addressed under the "Neighboring Landowners" topic.
- *Ethnographic Resources* — Ethnographic resources are defined 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 (NPS 1998a). According to NPS policies contained in NPS *Director's Order #28* and Executive Order 13007 on sacred sites, the NPS should strive to preserve and protect ethnographic resources. It was determined through the scoping process that fishers do not have traditional significance to any group that could be affected by fisher reintroduction efforts. Therefore, this topic was dismissed from further analysis.
- *Indian Trust Lands or Resources* — Secretarial Order 3175 requires that any anticipated impacts to Indian Trust Resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The Federal Indian Trust responsibility is a legally enforceable fiduciary obligation on the part of the U.S. to protect tribal lands, assets, resources, and treaty rights; and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

  The NPS does not manage or administer Indian trust assets; including trust lands and trust resources, however, activities carried out on park lands may sometimes affect tribal trust resources. Trust resources are those natural resources reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by a fiduciary obligation on the part of the U.S. While the overriding mandate for the NPS is to manage the park units in the national park system consistent with park laws and regulations, the federal government, including the NPS, has a trust responsibility to protect Indian's rights and advance their interests.

  The NPS would interact directly with tribal governments regarding the potential impacts of proposed NPS activities on Indian tribes and trust resources. Where Olympic National Park shares boundaries with the Quinault, Hoh, Quileute, Ozette, and Makah reservations, some Park activi-

ties may affect trust assets on the reservation. "When park managers have reason to believe that park activities may affect Indian trust assets, they are responsible for initiating and maintaining government-to-government consultation with the affected tribal government(s)" (Memo to Assistant DOI Secretary, Policy, Management and Budget from Acting NPS Director, dated March 1, 2001, as cited in NPS 2006a). No lands comprising Olympic National Park are held in trust by the secretary of the interior solely for the benefit of American Indians due to their status as American Indians. Therefore, this topic was dismissed from further analysis.

- *Prime and Unique Farmlands* — The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result from the conversion of these lands to non-agricultural uses. Olympic National Park does not contain prime or unique farmlands; therefore, this topic was dismissed from further consideration.
- *Socioeconomics Related to Non-timber Forest Harvesting* — Fisher reintroduction is not expected to impact non-timber forest harvesting activities. Most salal harvesting occurs in habitats unsuitable for fishers. Under the current federal listing status, no road or active den site closures would be required. See discussion under Minority and Low-income Populations above.
- *Socioeconomic Impacts to Trappers* — Trapping is permitted in Washington State for beaver (*Castor canadensis*), river otter (*Lontra canadensis*), red fox (*Vulpes vulpes*), weasel (*Mustela* spp.), marten, mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), and bobcat (badger season is closed in western Washington). However, substantially fewer people are trapping now as a result of a state initiative that prohibited the use of "body-gripping" traps. As a result, there has been a 60%–80% reduction in the number of trapper licenses sold, and a comparable reduction in the number of pelts taken, independent of the price of pelts (Lewis, pers. comm. January 12, 2007). Trapping data gathered by the WDFW shows that in 2005 only three raccoons and one skunk were trapped in Clallam County (both species are often trapped for nuisance reasons), and no animals were trapped in Jefferson County. These two counties comprise a substantial majority of the area of analysis. More trapping activity occurs in Grays Harbor and Mason counties, where 221 beaver and 228 beaver were trapped, respectively, in 2005 (WDFW 2007). As part of implementation of this plan, the WDFW would contact trapper associations and people who receive permits to the reintroduction effort and to seek trapper cooperation in the protection of fishers. Under current regulations trappers must check their traps every 24 hours. There would be no additional restrictions on trapping under this plan. Therefore, impacts to trappers are expected to be no more than negligible, and this topic was dismissed from further analysis.

PUBLIC PARTICIPATION

A 30-day public comment period about the proposal to reintroduce fishers occurred between January 9 and February 10, 2006, to help define the issues and alternatives to be addressed in this environmental assessment. The *Internal Scoping Report* for the fisher reintroduction plan was released for public review on January 9, 2006. The Park received 46 correspondences comprised of 138 comments on the proposed plan. More information about public participation is presented in "Chapter 5 – Consultation and Coordination."

RELATED LAWS, POLICIES, PLANS, AND CONSTRAINTS

NPS LAWS, POLICIES, AND PLANS

NPS Organic Act

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of the Interior (DOI) and the NPS to manage units of the national park system "to conserve the scenery and the

natural and historic objects and wild life therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations" (16 USC 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC 1a-1).

Despite these mandates, the Organic Act and its amendments afford the NPS latitude when making resource decisions that balance visitor recreation and resource preservation. By these acts Congress "empowered [the NPS] with the authority to determine what uses of park resources are proper and what proportion of the parks resources are available for each use" (*Bicycle Trails Council of Marin v. Babbitt,* 82 F.3d 1445, 1453 [9th Cir. 1996]).

Because conservation remains its predominant mandate, the NPS seeks to avoid or to minimize adverse impacts on park resources and values. Yet, the NPS has discretion to allow negative impacts when necessary (NPS *Management Policies 2006,* sec. 1.4.3 [NPS 2006b]). However, while some actions and activities cause impacts, the NPS cannot allow an adverse impact that constitutes resource impairment (NPS 2006b, sec. 1.4.4). The Organic Act prohibits actions that impair park resources unless a law directly and specifically allows for the acts (16 USC 1a-1). An action constitutes an impairment when its impacts "harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values" (NPS 2006b, sec. 1.4.5).

To determine impairment, the NPS must evaluate "the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts" (NPS 2006b, sec. 1.4.5). Therefore, this plan assesses the effects of the management alternatives on Park resources and values, and it determines if these effects would cause impairment.

NPS Management Policies

NPS Management Policies Specific to Fisher Restoration

The NPS *Management Policies 2006* include the service wide policies for the NPS (NPS 2006b). Adherence to the policies is mandatory unless specifically waived or modified by the secretary of the interior, the assistant secretary, or the director of the NPS.

Section 4 of the NPS *Management Policies 2006* addresses natural resource management:

> The National Park Service will strive to understand, maintain, restore, and protect the inherent integrity of the natural resources, processes, systems, and values of the parks while providing meaningful and appropriate opportunities to enjoy them. . . . Natural resources, processes, systems, and values found in parks include . . . biological resources such as native plants, animals, and communities [and] ecosystems (NPS 2006b).

Section 4.1 further defines general management concepts for natural resource management, stating, "The Service will . . . try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems" (NPS 2006b).

The restoration of natural systems is addressed in section 4.1.5, which states that "The Service will reestablish natural functions and processes in parks unless otherwise directed by Congress." The policies further state that:

> The Service will seek to return disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, ac-

> celerating both their recovery and the recovery of landscape and biological community structure and function. Efforts may include restoration of native plants and animals (NPS 2006b).

Section 6.3.7 addresses the management of natural resources in wilderness areas, saying, "The National Park Service recognizes that wilderness is a composite resource with interrelated parts. Without natural resources, especially indigenous and endemic species, a wilderness experience would not be possible."

Section 4.4 addresses biological resource management, under which general principles for such management are defined. This section states that:

> The National Park Service will maintain as parts of the natural ecosystems of parks all native plants and animals native to park ecosystems. . . . The Service will successfully maintain native plants and animals by:
>
> - preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;
> - restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and
> - minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them (NPS 2006b, sec. 4.4.1).

When human disturbances have resulted in the extirpation of native species, the following policy statements guide parks in restoring them:

> The Service will strive to restore extirpated native plant and animal species to parks whenever all of the following criteria are met:
>
> - Adequate habitat to support the species either exists or can reasonably be restored in the park, and if necessary also on adjacent public lands and waters; once a natural population level is achieved, the population can be self-perpetuating.
> - The species does not, based on an effective management plan, pose a serious threat to the safety of people in parks, park resources, or persons or property within or outside park boundaries.
> - The genetic type used in restoration most nearly approximates the extirpated genetic type.
> - The species disappeared, or was substantially diminished, as a direct or indirect result of human-induced change to the species population or to the ecosystem.
> - Potential impacts upon park management and use have been carefully considered (NPS 2006b, sec. 4.4.2.2).

Section 4.4.1.2 states that "the restoration of native plants and animals will be accomplished using organisms taken from populations as closely related genetically and ecologically as possible to park populations, preferably from similar habitats in adjacent or local areas" (NPS 2006b).

If needed, the policies allow restoration efforts to include confining animals in cages for captive breeding to increase the number of offspring for release into the wild or to manage the population's gene pool (NPS 2006b, sec. 4.4.2.2).

Park units are also obliged to protect and strive to recover any federally listed species (NPS 2006b, sec. 4.4.2.3) and to manage state listed species in the same manner to the greatest extent possible.

The NPS *Management Policies 2006* also direct parks to cooperate with states, tribal governments, and the USFWS to meet the NPS's commitments for maintaining or restoring native species in parks (NPS 2006b, sec. 4.4.1.1). Such cooperative actions that apply to this reintroduction plan include:

- Participating in local and regional scientific and planning efforts, identifying ranges of populations of native plants and animals, and developing cooperative strategies for maintaining or restoring these populations in parks.

- Suggesting mutually beneficial harvest regulations for lands and waters outside the parks for populations that extend across park boundaries.
- Developing data, through monitoring, for use in animal management programs.

Presenting information about species life cycles, ranges, and population dynamics in park interpretive programs for use in increasing public awareness of management needs for all species that occur in parks.

Consultation with tribal governments is addressed in Section 1.11. Section 1.11.1 states the NPS will maintain a government-to-government relationship with federally recognized tribal governments. NPS will work directly with appropriate tribal government officials whenever plans or activities may directly or indirectly affect tribal interests, practices, and/or traditional use areas such as sacred sites (NPS 2006b). The NPS *Management Policies 2006* direct parks to maintain confidentiality and sensitivity to tribal resources in conducting government-to-government consultations. Section 1.11.2 states that:

- Consultations with tribal governments, whether initiated by a tribe or the NPS, will be respectful of tribal sovereignty and tribal needs for privacy and confidentiality of certain kinds of information will be respected.
- Before beginning government-to-government consultations, park managers will consider what information is necessary to record. Culturally sensitive information will be collected and recorded only to the extent necessary to support sound management decisions and only in consultation with tribal representatives.
- NPS managers will be open and candid with tribal governments during consultations so that the affected tribes may fully evaluate the potential impact of the proposal and the NPS may fully consider tribal views in its decision-making processes (NPS 2006b, sec. 1.11.2).

Section 6.3.5 addresses the Minimum Requirement and states all management decisions affecting wilderness must be consistent with the minimum requirement concept which is used to "…determine if administrative actions, projects, or programs undertaken by the NPS or its agents and affecting wilderness character, resources, or the visitor experience are necessary, and if so how to minimize impacts" (NPS 2006b).

Natural Resource Management Guideline, NPS-77, 1991

The purpose of *NPS-77: Natural Resource Management Guideline* is to provide guidance to park managers for all planned and ongoing natural resource management activities. Managers must follow all federal laws, regulations, and policies. This document provides the guidance for park management to design, implement, and evaluate a comprehensive natural resource management program.

Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-making

NPS *Director's Order #12* and its accompanying *Handbook for Environmental Impact Analysis* (NPS 2001a) lay the groundwork for how the NPS complies with NEPA. *Director's Order #12* and the handbook set forth a planning process for incorporating scientific and technical information and for establishing a solid administrative record for NPS projects.

NPS *Director's Order #12* (NPS 2001a) requires that impacts to park resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision-makers to understand the implications of those impacts in the short- and long-term, cumulatively, and within context, based on an understanding and interpretation by resource professionals and specialists. NPS *Director's Order #12* (NPS 2001a) also requires that an analysis of impairment to park resources and values be made as part of the NEPA document.

National Parks Omnibus Management Act of 1998

The National Parks Omnibus Management Act (16 USC 5901 et seq.) underscores the provisions of NEPA in that both are fundamental to park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available, and they provide options for resource impact analysis should this be the case.

The National Parks Omnibus Management Act directs the NPS to obtain scientific and technical information for analysis. NPS *Director's Order #12* (NPS 2001a) states that if "such information cannot be obtained due to excessive cost or technical impossibility, the proposed alternative for decision will be modified to eliminate the action causing the unknown or uncertain impact or other alternatives will be selected" (NPS 2001a, sec. 4.4). When it is not possible to modify alternatives to eliminate an activity with unknown or uncertain potential impacts, and such information is essential to making a well-reasoned decision, NPS decision-makers will follow the provisions of CEQ NEPA regulations (40 CFR 1502.22) for full disclosure regarding incomplete or unavailable information (NPS 2001a, sec. 4.5).

OTHER FEDERAL LAWS, REGULATIONS, AND POLICIES

National Environmental Policy Act of 1969, as Amended

NEPA requires all federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and utilize public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA requirements with other planning requirements and prepare appropriate NEPA documents to facilitate better environmental decision making. The act requires federal agencies to review and comment on federal agency environmental plans and documents when the agency has jurisdiction by law or special expertise with respect to any environmental impacts involved

The CEQ regulations for implementing the provisions of NEPA (40 CFR 1508.90) state that the purposes of an environmental assessment are to:

- Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.
- Aid an agency's compliance with the act when no environmental impact statement is necessary.
- Facilitate preparation of a statement when one is necessary.

NPS *Director's Order #12* (NPS 2001a) and its accompanying handbook guide the NEPA planning process for the NPS.

Endangered Species Act of 1973, as Amended

The Endangered Species Act requires all federal agencies to consult with the secretary of the interior on all projects and proposals having potential impact on federally endangered and threatened plants and animals. It also requires federal agencies to use their authorities in furtherance of the purposes of the Endangered Species Act by carrying out programs for the conservation of endangered and threatened species, and to ensure that any agency action authorized, funded, or implemented is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of designated critical habitat.

National Forest Management Act of 1974

The National Forest Management Act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource man-

agement plan for each unit of the National Forest System. It is the primary statute governing the administration of national forests.

Olympic Experimental State Forest Act

The Olympic Experimental State Forest Act, signed October 23, 1992, is designed to contribute to the conservation of the northern spotted owl and the protection of old-growth resources through an experimental management program on state-owned lands on the western Olympic Peninsula.

Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act of 1918 implements various treaties and conventions between the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the activities prohibited, unless permitted by regulations, to

> pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird (16 USC 703).

Subject to limitations in the act, the secretary of the interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting, or exporting of any migratory bird, part, nest, or egg would be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits, and migratory flight patterns.

Executive Order 13186, signed in 2001, directs executive departments and agencies to take certain actions to further implement the act. Each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within two years, a memorandum of understanding with the USFWS to promote the conservation of migratory bird populations.

STATE/PROVINCIAL AND LOCAL LAWS, REGULATIONS, AND POLICIES

The mission of the WDFW is to "serve Washington's citizens by protecting, restoring and enhancing fish and wildlife and their habitats, while providing sustainable and wildlife related recreational and commercial opportunities." The department is mandated "to preserve, protect, perpetuate, and manage the wildlife and food fish, game fish, and shellfish in state waters and offshore waters" (WDFW 2004). As previously mentioned, the state listed the fisher as an endangered species in October 1998 (RCW 77.12.020, WAC 232.12.297, 232.12.014). While the WDFW does not require permits to import fishers, the Washington Department of Agriculture (WDOA) requires the completion of a health certificate and issuance of a permit before entry of fishers into Washington (see "Permits" later in this chapter).

RELATIONSHIP TO OTHER PLANNING DOCUMENTS FOR OLYMPIC NATIONAL PARK

Park planning documents that may be relevant to possible fisher restoration include those described below.

OLYMPIC NATIONAL PARK PLANNING DOCUMENTS

Draft General Management Plan (NPS 2006a): Olympic National Park is in the process of developing a general management plan. A draft plan was published for public review in 2006; completion is expected by 2007. The new plan replaces the 1976 *Olympic National Park Master Plan* (NPS 1976), whose goal was to "integrate man's actions harmoniously into the natural environment . . . [ensuring that] the demands of the people who will use the resources have been considered, as well as the ability of the resources to withstand use."

Fire Management Plan (NPS 2003): The Park completed a fire management plan that was implemented in 2006. Fire can be important for creating habitat for fishers through the creation of snags, downed logs, and structural defects in live trees. It would also increase fisher prey availability. Before approval of the plan, the Park conducted full wildfire suppression, and very limited prescribed burning occurred. The goal is to reach 200 acres per year for prescribed burning (1,600 acres over 5 years). Mechanized fuel removal has occurred around structures.

Statement for Management: The 1996 *Statement for Management* (NPS 1996b) compiles information about the Park's purpose, the nature and significance of its resources, the existing uses of its lands and waters, its regional context and adjacent land considerations, the legislative and administrative requirements for its management, influences on park resources and park visitor experiences, and nonrecreational park use by Native Americans and others. The document includes the following parkwide management objectives, most of which apply to the fisher reintroduction project:

- *Resource Stewardship and Protection:* The primary responsibility of the NPS must be protection of resources.
- *Access and Enjoyment:* Each park should provide the nation's diverse public access to park resources in a way that is compatible with the understanding and enjoyment of those resources and their preservation for future generations.
- *Education and Interpretation:* Enhance visitor and community understanding, appreciation, and conservation of natural and cultural resources through education and interpretation.
- *Proactive Leadership:* The NPS must be a leader in local, national, and international park affairs, actively pursuing the mission of the NPS and assisting others in managing their resources.
- *Science and Research:* The NPS must engage in a sustained and integrated program of natural, cultural, and social science research and resource management to acquire the information needed to manage and protect park resources.
- *Professionalism:* The NPS must create and maintain a highly professional organization and workforce.

Lake Crescent Management Plan and Environmental Impact Statement (NPS 1998b): Olympic National Park protects a variety of endemic plants and animals that are naturally confined to a specific region and found only within a limited geographic area because of the Olympic Peninsula's isolation.

LOCAL/STATE PLANS, POLICIES, AND ACTIONS

The WDFW analyzed the feasibility of reintroducing fishers to Washington in a 2004 report (Lewis and Hayes 2004). The department also prepared the *Washington State Recovery Plan for the Fisher* (Hayes and Lewis 2006), which sets state recovery objectives for the fisher and strategies needed to achieve recovery. The WDFW also prepared an implementation plan for fisher reintroduction (Lewis 2006). The WDFW is not going to ask the state Forest Practices Board for a critical habitat rule for fishers on state and private land, which is a primary concern of the timber industry.

The WDNR developed a multispecies habitat conservation plan to continue forest management activities on state trust lands while complying with the federal Endangered Species Act (WDNR 1997). This plan covers state trust lands managed by the Department of Natural Resources within the range of the northern spotted owl, and the fisher is covered under this plan (Lewis and Hayes 2004). The plan outlines provisions that would protect fisher habitat while the species is a candidate for listing, or in the event it was federally listed (Lewis, pers. comm. June 2, 2005). Conservation strategies for the Olympic Experimental State Forest Unit, located in the northwest corner of the peninsula, would likely result in some increase in older age tree stands after 80 years, which could benefit fishers (Lewis and Hayes 2004). Otherwise, amounts of suitable fisher habitat are not expected to substantially increase on state and private lands on the Olympic Peninsula.

U.S. Forest Service Plans, Policies, and Actions

The USFS manages the approximately 633,677-acre Olympic National Forest that borders Olympic National Park in many locations. Management of the Olympic National Forest is guided by the Olympic National Forest Land and Resource Management Plan, as amended by the *Northwest Forest Plan*. Management involves (1) operation and maintenance of structures, roads, bridges, trails, and recreation sites and facilities; (2) construction of new sites and facilities; and (3) management practices designed to (a) maintain or enhance habitat for late-successional and old-growth forest related species; and (b) protect and enhance watershed and aquatic habitat conditions (USFS 2004).

Olympic National Forest's Hood Canal Ranger District lies to the east and southeast of Olympic National Park, and the Pacific Ranger District in areas to the north, northwest, and southwest. Planned activities in both districts that could be impacted by fisher reintroduction include the Forest's program of commercial thinning and habitat enhancement activities for deer and elk, which typically involves forest stand thinning. Commercial thinning occurs as part of Olympic National Forest's program of approximately 1,500 acres per year of trees 40 to 60 years old. Proposed thinning of young (15–25 year old) managed stands was planned for 2006 to improve growth and development, promote species and structural diversity, and improve wildlife habitat on approximately 1,300 acres in both districts. However, stands 15 to 60 years old are not considered high quality habitat for fishers that would need to be protected as fisher habitat. Fishers may travel through or forage in these stands but would not be expected to den in this type of forest. In addition, the USFS treats invasive plants on 3,830 acres across the forest, which could promote habitat for fishers (USFS 2004).

Specific projects include habitat development activities within the Bear-Saddle Planning Area (located along U.S. Highway 101 just north of the Sol Duc Valley near Bear Creek). This project would apply commercial thinning in certain second-growth stands to accelerate the development of some of the structural and compositional features of late-successional forests, and to accelerate the growth of the residual stands (USFS 2004). A public scoping letter was published in April 2004, and a rescoping letter was published one year later due to a new addition to the project area, a Decision Notice was signed on September 15, 2006.

An environmental assessment for thinning forests near Quinault in the Matheny Creek watershed (tributary to the Queets River) tiered to the *Northwest Forest Plan* (described in more detail below) was published in January 2005 to "reduce forest stand density and increase forest stand complexity and hasten the development of desired late-successional habitat elements, such as large trees, multi-storied canopies, snags, coarse woody debris, and canopy gaps" (USFS 2004).

A public scoping letter was also published March 2005 for thinning in the Jackson Creek and Mount Walker areas in the Hood Canal District. The reduction in trees per acre would result in increased diameter growth and crown expansion by the remaining trees, while still leaving options for future stand management, such as snag and coarse woody debris creation. The proposed thinning would accelerate devel-

opment of the stands to more quickly become fully functioning late-successional/old-growth forest (USFS 2004).

Olympic National Forest is proposing to thin 69 acres of second-growth forest to enhance structural diversity and promote the development of old-growth characteristics to achieve desired conditions identified in the *Northwest Forest Plan* (REO 2005). This action would occur in the Pine Creek drainage within the South Fork Skokomish Watershed, in Mason County. This is part of the proposed Pine Creek Stewardship Project, in which the receipts from the commercial thinning would be used to fund decommissioning of selected roads that are of high aquatic risk in the Pine Creek area. A public scoping letter was published March 7, 2006, and the USFS expects this project to be categorically excluded from further NEPA-related documentation.

The Pacific Ranger District is proposing a commercial thin and road decommissioning project in the west fork Humptulips drainage to provide habitat benefits to wildlife and aquatic species. The Humptulips Project would propose to thin approximately 5,000 acres of young-aged forested stand. Tribal and public scoping letters were sent on January 12 and February 12, 2007.

Olympic National Forest is also proposing a commercial thin and road decommissioning project in the McDonald Creek drainage to provide habitat benefits to Roosevelt elk and aquatic species. The Dungeness Stewardship Project will thin 69 acres of second-growth forest and decommission 4.8 miles of road. A public scoping letter was sent in September 18, 2006 with the project falling under a categorically exclusion. The USFS finalized NEPA-related documentation on March 16, 2007.

The USFS and the Federal Highways Administration, in cooperation with the NPS, is determining appropriate management actions for USFS Road (FSR) 2610 and NPS Dosewallips Road (which are the same road). A January 2002 storm washed out approximately 300 feet of FSR 2610, cutting off access to approximately 5 miles of road beyond the washout. Since then the washed out section of road has increased to approximately 500 feet. In the national forest the road provided access to the Elkhorn campground and in the Park to the Dosewallips ranger station and campground, as well as several trailheads. Subsequent to the 2002 washout, road damage occurred on Dosewallips Road in the Park, including damage in the vicinity of the Dosewallips Falls. A public scoping letter on August 16, 2005, stated that the proposed action was to reestablish road access by rebuilding FSR 2610 at the washout area. A DEIS on the project is expected to be released for public review in late 2007. As a connected action, the NPS is proposing to reinforce the Dosewallips Road fill slope at the Dosewallips Falls area, and repairing the road surface to current road standards (USFS 2004).

Northwest Forest Plan

The *Northwest Forest Plan* is an overall vision for the Pacific Northwest that would produce timber products while protecting and managing impacted species. The plan covers 24 million acres in Oregon, Washington, and California that are managed by two federal agencies, including the USFS and the Bureau of Land Management. The plan was initiated in 1993 to end the impasse over the management of federal forest lands in the Pacific Northwest within the range of the northern spotted owl. With the signing of the "*Northwest Forest Plan Record of Decision*" in 1994, a framework and system of standards and guidelines were established, using a new ecosystem approach to address resource management.

The original plan had three parts: a program for managing the forests to achieve both sustainable timber production and protection of biological diversity; a system for coordinating federal agency implementation of the forest management effort and receiving advice from nonfederal interests; and an initiative for providing economic assistance and job retraining to displaced timber workers, communities, and others who were adversely affected by reductions in the size of the timber program (REO 1998).

The plan focuses on five key principles (REO 2005):

1. Never forget human and economic dimensions of issues.
2. Protect long-term health of forests, wildlife, and waterways.
3. Focus on scientifically sound, ecologically credible, and legally responsible strategies and implementation.
4. Produce a predictable and sustainable level of timber sales and non-timber resources.
5. Ensure that federal agencies work together.

To support this framework, federal agencies signed a memorandum of understanding that established and maintains an interagency framework (REO 2005). The mission of the plan is to adopt coordinated management direction for the lands administered by the USFS and the Bureau of Land Management, and to adopt complementary approaches by other federal agencies within the range of the northern spotted owl. The management of these public lands must meet dual needs: the need for forest habitat and the need for forest products (REO 2005).

PERMITS

The Canadian government does not require any federal permits for exporting fishers, and the U.S. government does not require disease testing of fishers or health certificates to transfer fishers from Canada to the U.S. The provincial governments of British Columbia and Alberta require a "Possession Permit" for the transport of fishers within the province and out of Canada. However, if rabies is documented in any wild carnivore (including fishers) from the state of origin in the 12 months prior to translocation, it would not be allowed entry into Washington. The USFWS requires fishers to be inspected by a USFWS inspector at the international border and that the animals be "declared" (Declaration Form 3-177) several days prior to state entry. No additional permits would be needed (Lewis 2006).

The WDOA requires completion of a health certificate and the issuance of a permit prior to the entry of fishers into Washington (Lewis 2006). More details about requirements for importation of fishers into Washington are included in "Chapter 2 – Alternatives."

Diseases and Parasites

Fishers are susceptible to a number of diseases that affect other wildlife species, but disease is not a major factor in fisher population dynamics (Lewis and Hayes 2004). Permits and health certificates would be required by the state documenting that source populations from either Canada or the U.S. are healthy and free of diseases harmful to livestock (Lewis and Hayes 2004).

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Chapter 2
Alternatives

CHAPTER 2 — ALTERNATIVES

INTRODUCTION

The "Alternatives" chapter describes the various actions that could be implemented for reintroducing the fisher in Olympic National Park. NEPA requires federal agencies to explore a range of reasonable alternatives, including a "no-action" alternative. In this document, fishers would not be reintroduced to Olympic National Park under the no-action alternative.

NPS *Director's Order #12* (NPS 2001a) states that alternatives must, at a minimum, meet objectives to a large degree while meeting the purpose of and need for action. For this project, the interdisciplinary planning team developed two action alternatives, with input from the public during the planning process, that meet to a large degree the management objectives of Olympic National Park, as well as the purpose of and need for action as discussed in chapter 1. Because these action alternatives would meet the objectives and would be technically and economically feasible, they are considered reasonable.

The interdisciplinary team identified the following set of statements to help guide and define the feasible range of alternatives for this plan:

- Fishers must be reintroduced for restoration to succeed; that is, they will not return on their own. Therefore, restoration must include reintroduction.
- The Olympic Peninsula is the only place to reintroduce fishers if the purpose and objectives of both the Park and the WDFW are to be met (see "How Alternatives Meet Objectives" in this chapter).
- Fishers would be strategically reintroduced to promote a successful reestablishment in the Park and other suitable areas. Fishers would eventually reestablish in all suitable locations in the Park. Wilderness values would not be noticeably adversely affected and would be enhanced by restoring an extirpated species to the wilderness.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

The following elements would be common to all action alternatives.

- The best available science would be used to determine appropriate management actions.
- The management plan would be adaptive, allowing for incorporation of new information over time to affect management actions. Details about the adaptive management plan are included later in this chapter.
- A monitoring plan would be developed by WDFW and the Park and is included in this chapter to monitor the status of the reintroduction efforts. Data gathered as a result of such monitoring would be used to adaptively manage ensuing reintroduction efforts, which would be further defined in the adaptive management plan mentioned above and described later in this chapter.
- If additional funding is available, education and interpretive measures could be implemented and may include brochures, publications, and information on the Park website about the fisher biology, ecology, and the restoration program.
- Communication with Park neighbors would inform them about the status of reintroduction efforts, report on the success of the plan, and provide a forum to hear neighbors' concerns.
- Private landowners would be asked to work voluntarily with cooperating agencies (NPS, USFS, and the WDFW) for fisher reintroduction to protect known den sites. The approved multispecies

habitat conservation plan for the Olympic Experimental State Forest Planning Unit and other state lands includes conservation measures to protect the federally listed spotted owl and marbled murrelet; these measures would also provide protection of suitable habitat for fishers (WDNR 1997). Such protection would include private landowners voluntarily establishing a 0.5-mile buffer from known active fisher dens during the denning season (generally from March 1 until June 31); protections would not be needed outside this period (that is, from July 1 to February 29). Activities that may be restricted around known, active den sites include timber harvest activities (e.g., felling, road building), silvicultural treatments, and other potentially disturbing activities. The use of signs and gates could be used to prevent disturbance in the vicinity of a known den site.

- Conservation measures on the Olympic National Forest would consist of seasonal restrictions applied around known, active fisher denning sites between mid-March and late May for motorized, mechanized activities. Protection would include a 0.25 mile buffer from disturbance for those activities that are long in duration, such as timber harvest and associated activities (e.g., felling, yarding, and road building), as well as road construction. Seasonal restrictions would not be applied for hauling or for general road traffic. Adjustments for the buffer would be based on local conditions such as topography.
- The NPS and the WDFW would seek opportunities and support to involve citizen science in the fisher reintroduction process. Opportunities would focus on fisher monitoring efforts and would include, but would not be limited to, assisting staff with monitoring camera stations, deploying and checking hair snare sites, assisting field crews in locating fishers from the ground, identifying the location of den sites, and conducting follow-up measurements of den site characteristics after females have left the site. As the reintroduction program developed, opportunities could be expanded to include working with the NPS and WDFW outreach and education coordinators (see "Potential Adaptive Management Approaches for Fisher Reintroduction ," in this chapter). Some funding for citizen science has been approved through a joint WDFW and non-government organization. NPS, USFS, and WDFW would seek additional funding in the future. Some funding for citizen science has been approved through a joint WDFW and non-government organization.

MITIGATION MEASURES

MITIGATION FOR ACTION ALTERNATIVES

The following mitigation measures were identified for alternatives B and C.

- Fishers would not be released during marbled murrelet and northern spotted owl nesting seasons.
- Fisher releases would occur along roads or trails by vehicle, foot, or with the use of pack stock animals. Helicopters (not fixed-wing aircraft) would be used only as a minimum tool for release or carcass retrieval in backcountry areas that could not be accomplished by vehicle, foot, horse, or with pack string. Helicopters would be used only between September 15 and February 28 to avoid potential impacts to nesting northern spotted owl and marbled murrelet and to minimize impacts to visitors and wilderness experience. If needed, helicopters would be used infrequently (only one to three times per year).
- All fixed-wing radio telemetry flights would be at flight elevations higher than 120 yards above the tree canopy, although most flights would be even higher.
- All known bald eagle territories would be avoided during telemetry flights.
- Olympic National Park conducted a minimum requirement analysis to determine if the fisher reintroduction is appropriate in wilderness and to determine the most appropriate action and the

minimum tools or techniques to successfully meet the project purpose and objectives. The minimum requirement analysis is included in appendix A.

OPTIONAL MITIGATION FOR ACTION ALTERNATIVES

Although the fisher is not listed as a federally endangered or threatened species, it is a candidate for listing. Fishers are low in the listing priorities, and the USFWS has no plans to list the species in the near future. If this proposed project is implemented and successful, it would be a step in the recovery process needed to preclude the need to list the fisher within the West Coast DPS. In the unlikely event that the fisher is listed, the project, if successful, has the potential to impact local landowners if fishers moved outside Park boundaries. However, few, if any small private landowners are expected to incur impacts from fisher reintroductions because so little suitable habitat for fishers occurs on private land and the amount of private land is small and fragmented. The USFWS provides three voluntary methods for protecting nonfederal (state, private, and tribal) landowners' interests while providing incentives to manage those lands in ways that would benefit species protected by the Endangered Species Act. Tools that could be implemented under this plan to protect local landowners include candidate conservation agreements with assurances, safe harbor agreements, and habitat conservation plans. A habitat conservation plan that protects fishers on state land is currently in place[1]. If individual landowners decided to pursue implementation of a conservation or safe harbor agreement, Olympic National Park and WDFW would provide technical assistance to individual landowners by sharing existing fisher data and research. The Fisher Conservation Assessment and Strategy planned to be available in late 2007 / early 2008 would provide landowners with information needed if they chose to pursue one of these options. Agreements between USFWS and tribes would be determined through government-to-government consultation.

Candidate Conservation Agreement with Assurances

Candidate conservation agreement with assurances are formal agreements between the USFWS and one or more non-federal parties to address the conservation needs of proposed or candidate species (such as the fisher), or those likely to become candidates, before being listed as threatened or endangered. The ultimate goal of agreement is to remove enough threats to the candidate species to eliminate the need for protection under the Endangered Species Act. The agreement provides landowners who voluntarily remove threats to candidate species with assurances that their conservation efforts will not result in future regulatory obligations beyond those in the agreement. In return for the landowner's voluntary management, the USFWS provides "take"[2] authorization through the section 10(a)(1)(A) process of the Endangered Species Act and issues an "enhancement of survival permit" that will enhance the survival of the species (USFWS 2004a). This type of permit is associated with both conservation and safe harbor agreements (USFWS n.d.a). Any take must be at a level consistent with the overall goal of precluding the need to list (USFWS 2004a).

Safe Harbor Agreements

Safe harbor agreements are similar to candidate conservation agreement with assurances, but they apply to species that are already federally listed, rather than candidates (this could apply if the fisher was listed in the future). Safe harbor agreements are voluntary between the USFWS and nonfederal landowners. The goal is to promote voluntary management for listed species on nonfederal property while giving assur-

[1] The WDNR has a Forest Practices Habitat Conservation Plan that covers aquatic species. . . .

2. "Take" is defined in the Endangered Species Act as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting any threatened or endangered species. Harm may include significant habitat modification where a listed species is actually killed or injured through impairment of essential behavior.

ances to participating landowners that no additional future regulatory restrictions would be imposed (USFWS 2004d).

Habitat Conservation Plans

A habitat conservation plan is developed to help protect species from being harmed by activities on nonfederal lands and, at the same time, to protect nonfederal landowners from liability under the Endangered Species Act. The Endangered Species Act was amended under section 10 to authorize "incidental take" through the development and implementation of habitat conservation plans (USFWS 1999, 2005b). An incidental take permit allows a nonfederal property owner to conduct otherwise lawful activities in the presence of listed species. A property owner develops a habitat conservation plan to apply for an incidental take permit under section 10(a)(1)(B) of the Endangered Species Act. The plan integrates the proposed project or activity with the needs of the species. Habitat conservation plans can also include conservation measures for candidate species, species proposed for listing, and other species of concern at the time the plan is developed. Therefore, the terms of the habitat conservation plan do not change over time with subsequent species listings; a plan only applies to those species covered under the plan (USFWS 1999, 2005b). The purpose of the habitat conservation plan is to ensure that the effects of the authorized incidental take are adequately minimized and mitigated. The purpose of the incidental take permit is to authorize the incidental take of a listed species, not to authorize the activities that result in take (USFWS 1999, n.d.b). The private landowner decides whether to pursue an incidental take permit (USFWS 1999, 2005b).

The WDNR, which acts as trustee for tracts of state land, already has a habitat conservation plan in place to cover the northern spotted owl and the marbled murrelet (WDNR 1997). This plan is a 70-year management plan for 1.6 million acres of forested state trust lands, and it provides for predictable timber sales levels. This plan was also written to cover several additional species that could become listed in the future, as well as some state-listed species (WDNR n.d.b). As described in chapter 1, this multispecies plan covers state trust lands managed by the WDNR within the range of the northern spotted owl, and the fisher is already covered under this plan (Lewis and Hayes 2004; WDNR 1997). The plan outlines provisions for fishers that would protect fisher habitats while a candidate for listing, or in the event they became federally listed (Lewis, pers. comm. June 2, 2005).

ALTERNATIVE A — NO-ACTION ALTERNATIVE

Under alternative A, no action would be taken to restore fishers into Olympic National Park. Fishers would not naturally repopulate the Park or the Olympic Peninsula, as no fisher populations occur in areas near the peninsula. Given that it is unlikely that fishers exist on the Olympic Peninsula, the Park would not continue surveying for fishers.

ALTERNATIVE B — REINTRODUCE FISHERS INTO OLYMPIC NATIONAL PARK USING TRANSLOCATION

Under alternative B, fishers would be captured from a source population that is most closely related to that which historically occurred in the state (preferably from British Columbia) and would be reintroduced into Olympic National Park. A founder population of at least 100 fishers released over a three-year period, with a bias on adults and females, would be used for reintroduction efforts. Fishers would be released in male-female pairs. Three initial reintroduction areas were identified based on the availability of suitable habitat and habitat connectivity, and include the Elwha-Sol Duc area, the Hoh-Bogachiel area, and the Queets-Quinault area (Lewis 2006). Fisher releases are likely to occur in each of these three areas. Fishers would likely be released in the late fall / early winter to allow them to acclimatize before winter,

to establish home ranges, to locate suitable den sites before the birthing season, and to become aware of potential mates before mating season. Details are provided below.

SOURCE POPULATION

Analyses to determine the genetic relationships of fishers throughout their range have shown that fishers that historically occurred in Washington were most closely related to the extant fisher population in British Columbia, followed by the California population, and then by the western Alberta population (Lewis and Hayes 2004). Populations elsewhere in the range were considered less closely related and less suitable as a source population for a reintroduction in Washington. Because fishers from British Columbia are most closely related to historical Washington fishers, they are considered the first choice for a Washington reintroduction. Alberta fishers are the second choice as a source population if fishers are unavailable from British Columbia. Officials from Alberta Sustainable Resource Development have indicated that they are willing to assist the WDFW with a translocation of fishers from Alberta to Washington. Informal inquiries also indicate that fishers may be available from British Columbia. Formal requests would be made by the WDFW to ministry authorities in both provinces for their assistance in obtaining fishers for translocation to Washington. The California fisher population is unavailable as a reintroduction source because of its small size.

CAPTURE

WDFW would work with British Columbia or Alberta provincial staff to determine how and where fisher trapping for translocation would occur. Assistance would be necessary from the provincial wildlife veterinarian to coordinate the inspection and approval of captured fishers for translocation, which might include the assistance of local, private veterinarians (Schwantje, pers. comm., as cited in Lewis 2006). Veterinarians would also participate in the preparation of fishers for reintroductions.

Fisher trapping would be done by members of the provincial trapper associations. A trapping coordinator would oversee fisher capture efforts, including managing participating trappers; obtaining captured fishers from trappers, constructing holding units for transporting and housing fishers, assisting in the handling and care of captive fishers, and assisting in the transport of fishers to Washington.

Fishers would be captured using box (cage-type) traps and would be expected to spend two to three weeks in captivity in order to conduct evaluations and treatments, and to prepare them for reintroduction. When a fisher is captured, the holding unit (box or tube) would be combined with a cage and would become the temporary unit to house the fisher before transport to Washington. The length of time in captivity would also be determined by the number of animals captured and available for transport to Washington. For example, fishers would not be transported until 15 or more could be shipped at one time. Consequently, some individuals might spend more time in captivity until 15 or more were obtained, processed, and prepared for translocation according the standard veterinary protocol.

A facility would hold captured fishers in British Columbia or Alberta, and captive wildlife specialists would staff the facility while fishers were in captivity. The captive facility would provide a secure, enclosed space (e.g., barn, outbuilding, or zoo) suitable to quarantine individual fishers, with a capacity for up to 20 fisher pens and subject to minimal disturbance.

Fishers would be examined to evaluate their health and physical condition. Veterinary examinations would be required to determine if individual fishers were suitable for reintroductions (i.e., healthy, no debilitating injuries, sound teeth and claws). The evaluation would confirm the individual's sex; obtain weight and morphological measurements; and identify wounds, deformities, and evidence of disease or external parasites. Age would be estimated for each individual. Because most releases would occur before active gestation, it would be assumed that adult females (older than 1 year) could be pregnant. Cooperating veterinarians would conduct examinations, medical treatments, and any necessary surgeries, and they would be assisted by project biologists and captive wildlife specialists. An examination would also be re-

quired before a veterinarian could issue a health certificate, which is required for each fisher being transported from Canada to Washington.

Fishers would be kept separated to prevent disease transmission, and they would be treated for wounds, injuries, or infections, and they would be vaccinated using standard protocols. Ivermectin treatments (a drug mixture used in veterinary medicine) would be provided for internal parasite infestations, and flea and tick treatments would be provided as necessary.

Fishers would be provided sufficient food to allow for weight gain while in captivity. To monitor fishers after they were released, each individual would be genotyped by taking a tissue sample (i.e., hair sample or ear punch). Each individual would also be marked with a passive integrated transponder (PIT) tag, which is a small cylindrical tag that is inserted under the skin behind the ear. The PIT tag allows individuals to be identified by a unique identification code programmed into the tag, which can be read when an electronic receiver is passed over the tag (e.g., when an animal is captured or found dead). Each animal would also be photographed to allow identification of individuals by any unique markings. Each fisher would be equipped with a VHF (very high frequency) radio-transmitter collar or abdominal implant. Transmitter life is expected to exceed 15 months for either the collar or implant configurations.

A number of tasks would be involved with successfully importing wild animals to Washington from British Columbia or Alberta. These would meet federal, state, and provincial requirements, and they would include completed health certifications, permits, permit processing by federal authorities, border-crossing inspections by customs and USFWS officials, and notifications. During importation, inspections are expected to include only visual inspections of fishers in their transport units; no additional handling or chemical immobilization is expected.

Canadian Provincial Requirements. Fishers captured in Alberta or British Columbia must be inspected by veterinarians accredited by the Canadian Food Inspection Agency. After having been inspected, fishers deemed suitable for transport and reintroduction in Washington would be individually listed on a health certificate. A possession and export permit would also be required from the provincial wildlife authority in conjunction with regional wildlife authorities. A permit might also be required for transport of blood or other tissues to Washington.

Washington State Requirements. The WDOA requires that an accredited and licensed veterinarian inspect each animal. The department would grant an importation permit for those individuals free from infectious and communicable diseases, and permanently and individually marked, as certified by the veterinarian. The inspection and certification would be designed to meet the requirements of all state, provincial or federal agencies requiring inspection of captured fishers. Upon completion of the health certificate, a WSDA agent would provide an importation permit number over the phone, which would then be written on the health certificate.

Canadian Federal Requirements. Canadian Customs agents (or port officers) require prior notification by the trapping coordinator and the WDFW project leader that a shipment of fishers would be leaving Canada. Before departure, a Canadian customs agent may inspect the fishers, their holding units and associated paperwork, and question personnel accompanying the fishers.

U.S. Federal Requirements. U. S. Customs agents would also require prior notification that a shipment of fishers is arriving in the U.S. Before entry, agents would likely inspect fishers, their transport tubes and associated paperwork, and question personnel transporting the fishers. The USFWS requires prior notification of the expected port of entry (by land or air), as well a declaration of importation (completed USFWS Form 3-177) for live animals and tissues being transported into the U.S. A USFWS agent would review paperwork and inspect fishers to confirm humane transport. No Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) permits are required for fishers.

NUMBERS

In successful fisher reintroductions in North America, substantially more fishers were released than in unsuccessful reintroductions (Lewis 2006). A founder population of at least 100 fishers (released over a 3-year period) that is female-biased (60% females, 40% males), and adult-biased (higher percentage of adults than typically found in wild populations) is preferred. Limited capture success may provide the target population size, but not the desired sex- or age-ratio.

A founder population size of at least 100 fishers was based on the success of previous translocations and the findings of population modeling. Population modeling for the Olympic Peninsula suggested that populations that started with 60 or 100 females would result in larger resident population sizes and would become established more quickly than populations that started with 30 females (Lewis and Hayes 2004). A captured population of 60 females would likely be accompanied by a captured population of approximately 47 males, based on sex ratio data (58% females, 42% males) from fisher harvest data from British Columbia (Weir 2003, as cited in Lewis 2006) and Ontario (Douglas and Strickland 1987, as cited in Lewis 2006), totaling 107 fishers.

The founder population would also be adult-biased (i.e., fishers over one year old) to increase productivity, survival, and genetic diversity, based on research from British Columbia (Weir 2003, as cited in Lewis 2006) and Ontario (Douglas and Strickland 1987, as cited in Lewis 2006). For example, a female-biased (60% females) and adult-biased (50% adults) founder population of 100 fishers would consist of 30 adult females, 30 juvenile females, 20 adult males, and 20 juvenile males. Adult females are especially important to obtain because they can be pregnant and may immediately contribute to population increase. Moreover, their fetuses may possess unique genotypes (i.e., fetuses could be sired by males not in the founder population), thereby expanding the genetic diversity of the founder population.

Reintroductions that occur over multiple years are frequently more successful than single-year reintroductions (Lewis 2006). Home range establishment and reproduction are expected to be more successful when animals are released in consecutive years.

RELEASE METHODS AND LOCATIONS

Most fisher translocations have employed hard releases, i.e., releasing fishers immediately upon arriving at a release site. Several translocations have used soft releases, where fishers are temporarily housed at the release site prior to release and provided incentives to help them acclimate to the site and encourage them to remain near the site after release. However, research has failed to conclude that soft releases substantially impact success (Proulx et al. 1994 and Weir 1995, both as cited in Lewis 2006). Because soft releases are more expensive and have not prevented extensive post-release movements of fishers, hard releases would be the preferred choice for this plan.

Fishers would likely be released in Olympic National Park in male-female pairs or in groups, depending on the number of fishers available (Lewis 2006). This approach would vary depending on the number of fishers available for release at a given time and release site limitations. It is expected that fishers released in male-female pairs throughout a large reintroduction area should have sufficient opportunity to find a suitable mate and suitable habitat to establish a home range.

Fishers could be released from roads, or released in remote areas after being transported by pack animals or helicopters. Helicopters would be used only when needed to access priority release sites in backcountry areas infeasible to access on foot or with pack animals or when necessitated by safety considerations, and only from September 15 through February 28 to avoid impacts to nesting northern spotted owl and marbled murrelet.

TIMING

Releases would be timed based on the availability of source animals and the success of prior release efforts. Preference would be to obtain and release fishers in the late fall / early winter, if possible. Fall releases would allow fishers to acclimate to the reintroduction area before the mating and breeding season (March and April), establish home ranges and locate suitable den sites, and become aware of potential mates. Areas of suitable fisher habitat on the Olympic Peninsula are unlikely to receive excessive accumulations of snow and should allow released fishers access to large landscapes that are free of snow for much of the winter (Lewis and Hayes 2004). If winter releases were necessary, they are not anticipated to be a hardship for fishers.

Release Scenarios

It is expected that fishers would be released over a three-year period. The timing, number, and locations of releases would vary depending on fisher availability, available funding, and the findings of monitoring efforts of previously released fishers. Likely release scenarios are as follows:

- ***Year 1*** — Release 35 fishers in the fall and winter months, in at least two of three reintroduction areas (described below).
- ***Year 2*** — Adapt the release approach based on monitoring results from year 1 and the availability of fishers from the source population. If no substantial changes were required and fishers were available, (1) release 35 additional fishers in the fall and winter, and (2) release fishers in two or all three reintroduction areas to maximize survival, occupancy, and population expansion. If fisher availability limited the number that could be released, use monitoring results to determine if releases should occur in a reintroduction area that did not receive fishers in year 1, or if releases should occur in the same locations as in year 1. Similarly, releases may be shifted to a new reintroduction area if initial survival is low in a reintroduction area used in year 1, or if it is otherwise deemed unsuitable.
- ***Year 3 —*** Follow successful release approaches developed in years 1 and 2. Release 35 additional fishers in the fall and winter in reintroduction areas or alternative locations within the larger Olympic recovery area (Lewis 2006).

REINTRODUCTION LOCATIONS

The fisher science team evaluated the distribution of suitable habitat, landownership, habitat composition and climatic conditions to identify suitable reintroduction areas on the Olympic Peninsula. Three areas were chosen because they included large, easily defined areas of suitable habitat that would likely be capable of supporting populations of fishers, and they are connected to each other by corridors of suitable habitat and travel cover (see figure 2). This habitat connectivity would allow fisher movement among reintroduction areas and to other national park and national forest lands on the Olympic Peninsula. The three initial fisher reintroduction areas are described below.

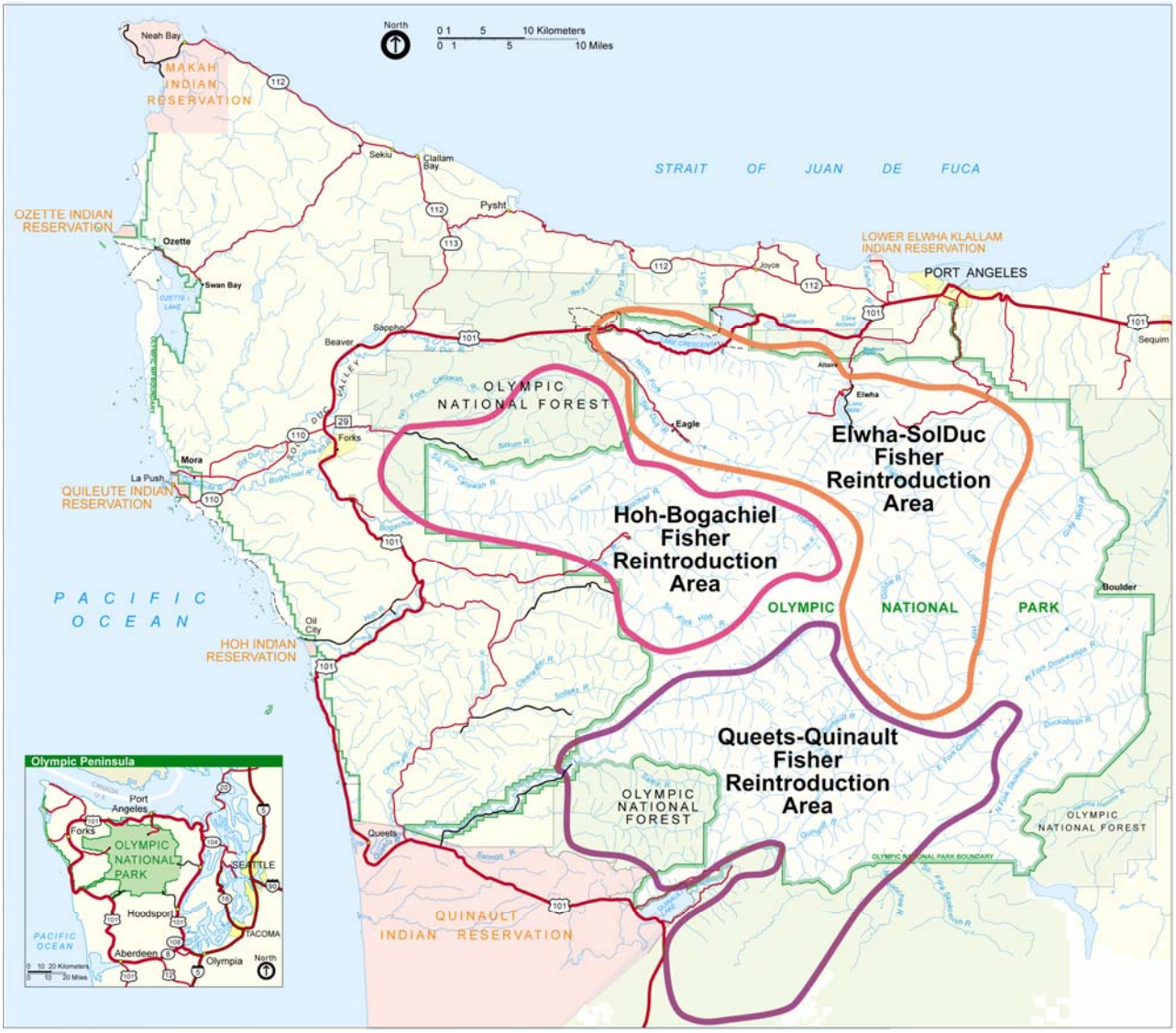
Elwha-Sol Duc Area. The Elwha-Sol Duc area has a large amount of suitable habitat in federal ownership and has the driest forest conditions of the three areas. The fisher science team visited the area and concluded that it has habitat characteristics that are consistent with forests occupied by fishers in Oregon, northern California, and British Columbia, in part because of the drier conditions found in the Elwha-Sol Duc area. The science team concluded that this area should be considered a priority area for release, but also noted that its narrow, linear shape might limit its carrying capacity for released fishers. The team therefore recommended that the first year's releases occur within at least two reintroduction areas, with one of the areas being the Elwha-Sol Duc area. Fishers would likely be released along Park roads in the Sol Duc River and Elwha River drainages, at locations along the Hurricane Ridge Road in the northeast-

ern corner of the reintroduction area, and along Park trails. Scattered clearings and gravel bars along the Elwha River would also provide helicopter access to release sites.

Hoh-Bogachiel Area. The Hoh-Bogachiel area contains a large amount of suitable fisher habitat in federal ownership and is characterized by wet forest conditions. This large area is centrally located between the two other reintroduction areas, providing habitat connectivity among the three reintroduction areas. Because it is adjacent to the Elwha-Sol Duc area, which is considered a priority release area, the science team recommended that fishers also be released in the Hoh-Bogachiel area in the first year of the reintroduction. Within the Hoh-Bogachiel area fishers would likely be released along the Upper Hoh Road or along Park trails in the Bogachiel River and Hoh River drainages. Fishers could also be released near clearings and gravel bars along the Bogachiel and Hoh rivers that were accessible by helicopter if release by other methods is infeasible or where there are safety considerations.

Queets-Quinault Area. The Queets-Quinault area is in the southwestern corner of Olympic National Park and Olympic National Forest, adjacent to Quinault Lake. It is the largest reintroduction area and also has the wettest forest conditions. While the wet forest conditions are unlike any other areas where fishers currently exist in western North America, anecdotal accounts indicate that two trappers captured 37 fishers in the lower portion of the Queets River drainage in 1920, and two brothers captured 20 fishers in the East Fork drainage of the Quinault River in 1921 (Scheffer 1995, as cited in Lewis 2006). These accounts suggest that the Queets-Quinault area previously supported a relatively dense fisher population, despite its wet climate. There are no historical accounts of large harvests of fishers in the other two reintroduction areas; however, that does not indicate that they would be less suitable. Depending on the number of animals available, fishers could be released in the Queets-Quinault area in the first or second year of the reintroduction. Within the Queets-Quinault area, helicopters would be required to access some release sites if release by other methods is infeasible or there are safety considerations. Fishers would be released along the Queets River trail, along the trails on the Quinault River, and near clearings and gravel bars along the Queets or Quinault rivers.

Figure 2: Three Initial Fisher Reintroduction Areas



Fisher releases would likely occur in each of the three reintroduction areas. Park roads, trails, and river corridors are accessible as release sites in each reintroduction area. Access by Park roads and trails could be intermittent depending on various weather conditions, river flows, and maintenance factors. Access to gravel bars and other clearings within each reintroduction area could be obtained by helicopter (September 15 to March 1), and these locations would be used as release locations when road and trail access was limited or not feasible. Some areas of the Park may be more easily accessed though the road network in Olympic National Forest, and these areas could also serve as release sites. The release sites may occur from 0.5 to 20 miles from the Olympic National Park boundary. Male-female pairs would be released along Park roads, Park trails, and river corridors throughout reintroduction areas to saturate suitable habitat.

OUTREACH AND VISITOR USE

Olympic National Park would conduct outreach activities concerning the recovery effort and possible sources of incidental mortality (e.g., trapping, roadkill, and poaching).

IMPLEMENTATION COSTS

Estimated implementation costs have been developed by the Washington Department of Fish and Wildlife (WDFW) and are included in the state's *Implementation Plan for Reintroducing Fishers to Olympic National Park* (Lewis 2006, p. 21). The estimated budget includes costs for obtaining, transporting, releasing, and monitoring fishers over a three-year period. State and national park personnel would provide in-kind contributions of staff time, telemetry equipment, and field and camping supplies for reintroduction tasks not included in the budget.

Olympic National Park was selected to receive funding from the U.S. Geological Survey's National Resources Preservation Program to monitor fishers for three years. The Park would compete for more funding for years 4 through 10, but it is anticipated that costs would be less because radio telemetry efforts would most likely be complete, and non-invasive, lower-cost methods (camera surveys, hair snares, track plates) would be implemented.

Cost estimates for Olympic National Park to conduct monitoring for years 4–10 include salaries (assuming a crew of two employees), travel, vehicle rental, aerial telemetry flight time, equipment and supplies (including setting up hair snares), and DNA analysis on samples taken. The park determined that these efforts would not need to occur in years 6 or 8. The estimate for only NPS involvement comes to:

Year 4 — $45,811

Year 5 — $46,416

Year 7 — $48,282

Year 9 — $50,243

ALTERNATIVE C — REINTRODUCE FISHERS INTO OLYMPIC NATIONAL PARK USING CAPTIVE BREEDING

Under alternative C, fishers would be reintroduced into Olympic National Park using captive breeding to produce fishers for the reintroduction, in addition to translocations (as described under alternative B) if translocations were not working or source animals became unavailable for translocations. If fisher availability from Canada is limited, alternative C would use the available fishers as breeding stock to produce a sufficiently large source population (e.g., 100 fishers) for reintroduction. As mentioned earlier, the NPS *Management Policies 2006* allow restoration efforts to include confining animals in cages for captive breeding. After being successfully bred in captivity, fishers would be released as described under alterna-

tive B. Captive breeding provides an opportunity to re-establish populations where direct translocation may risk the persistence of the donor population (Gilpin and Soule 1986) or where no animals are available for translocation. Breeding stock would be obtained from a source population in British Columbia or Alberta. This alternative would apply if a limited number of animals were available for reintroduction, and might reduce the number of fishers needed from a source population.

CAPTIVE BREEDING

Animals would be captively bred at several off-site (non-NPS) facilities. Multiple facilities would be needed to provide a hedge against catastrophic events, such as an outbreak of disease at one location, and to house the number of breeding fishers needed to produce sufficient numbers of offspring for reintroduction.

From 1991 to 1993 the Northwest Trek Wildlife Park in Eatonville, Washington, worked in cooperation with the WDFW to create a captive breeding program for fishers (no fishers were ultimately released into the wild). The program was successful in that six offspring were produced the first year from six females and two males. Findings that resulted from this effort would be applied to this alternative, as described below (Ellis, pers. comm. July 13, 2005).

Upon arrival at a zoo the source population would be examined by a veterinarian and checked for disease. Animals would be monitored throughout the program for aggressive or abnormal behavior, indicating illness or stress, and would be medically treated as necessary.

Fishers would be held in a series of pens similar to kennels during breeding. Pens would encircle a natural area that would be similar to a fisher's natural habitat. Males and females with offspring would be housed separately to protect the young.

Females typically give birth in March or April. After giving birth, females would be mated again as soon as possible (typically within 10 days of birth) to ensure another pregnancy the following year. Mothers and offspring would be kept together until the kits were able to hunt on their own. Live prey could be provided for mothers so they could train kits to hunt until August or September, when it is expected that the kits would become independent and could be released. This training could occur at the facility or in other areas. Kits could be moved to a location near the release site to allow them to acclimate prior to release.

The goal of the captive breeding program would be to produce about 100 offspring for reintroduction. This could take several years to achieve. Numbers of young produced in the first years of the program would likely be lower than those in future years. Ideally, the program might produce from 20 to 50 offspring per year (equal to what the translocation target would be). The number of females needed at multiple facilities would be determined by survival of breeding animals, lifespan, productivity of females, and survival of young.

A mean litter size of two is common among wild fisher females, but can be higher in females in captivity (Lewis and Hayes 2004). A 50% mortality rate in offspring is expected, which was experienced by the Northwest Trek Wildlife Park. A science team with expertise in fishers, husbandry, and genetics would assist the WDFW in overseeing the breeding and release program. If the fisher became federally listed, provisions of the Endangered Species Act could also influence a captive breeding program. This would require permits and consultation with the USFWS.

IMPLEMENTATION COSTS

Costs to implement alternative C would be the same as alternative B, but with additional costs for captive breeding. To determine a cost of captive breeding fishers, a previous breeding program for pygmy rabbits was used for comparison. Costs for WDFW to develop a captive breeding program for pygmy rabbits were estimated at approximately $700,000 to 750,000 for three years and included hiring a project biolo-

gist to conduct the captive rearing, release, and monitoring. WDFW also assisted with construction of the breeding facility, capture, release and monitoring of pygmy rabbits, as well as the conducting of genetic analyses of the captive population. The zoo consulted on husbandry methods and participated in oversight of the project. A science advisory group from members of various organizations, as well as one expert in genetics, one outside expert in captive rearing, and one expert in the ecology of rabbits, was involved to review all aspects of the project (WDFW 2001).

Although the Park's fisher reintroduction plan might not include all of these tasks, nor be limited to only those listed above, the costs estimated for the pygmy rabbit captive breeding program could apply to fishers as well. However, a captive breeding program for fishers would require more time than the breeding program for pygmy rabbits because fishers have longer gestation and rearing periods and are more likely to have lower survival rates in the wild when captive bred, and therefore would require more time to produce enough animals for release. Furthermore, under alternative C, the genetic diversity of a captive bred population of fishers would be lower than if all animals were taken as adults from a source population and released, as proposed under alternative B. Implementation costs for alternative C would be approximately $700,000 more than alternative B due to the captive breeding program proposed under alternative C.

ADAPTIVE MANAGEMENT APPROACHES INCLUDED IN THE ALTERNATIVES

Both of the action alternatives (B and C) described in this chapter incorporate adaptive management approaches to meeting the objectives of the plan. Each alternative includes a management action followed by a period of monitoring to evaluate the results of the action. By using an adaptive management approach, managers would be able to change the timing or intensity of management treatments to better meet the goals of the plan as new information was obtained. The adaptive management approach and its integration into the action alternatives are more fully described below.

DEFINITION OF ADAPTIVE MANAGEMENT

Successful management of natural systems is a challenging and complicated undertaking. The Department of the Interior requires that its agencies use adaptive management to fully comply with the CEQ guidance that requires "a monitoring and enforcement program to be adopted . . . where applicable, for any mitigation" (516 DM 1.3 D (7); 40 CFR 1505.2). Adaptive management is based on the assumption that current resources and scientific knowledge are limited. Nevertheless, an adaptive management approach attempts to apply available resources and knowledge, and adjusts management techniques as new information is revealed. Holling (1978) first described the principle of adaptive management as requiring management decisions and policies to be viewed as hypotheses subject to change.

USING THE ADAPTIVE MANAGEMENT PROCESS

Adaptive management incorporates scientific experimental methods into the management process while remaining flexible to adjust to changes in the natural world, as well as policies that govern it. The goal is to give policy makers a better framework for applying scientific principles to complex environmental decisions (Wall 2004). Figure 3 illustrates an adaptive management approach to monitoring fishers for three years.

For this plan, adaptive management starts with the hypothesis that a self-sustaining fisher population can become established on the Olympic Peninsula. Monitoring under this plan would test for survival and movement, home range establishment, and reproduction. If the fisher population was not surviving and reproducing by natural means without human intervention (see "Desired Condition" in "Chapter 1 – Purpose of and Need for Action"), data would be examined to identify the most important variable(s) affecting successful restoration (i.e., the fisher population becoming self-sustaining). These could include suit-

able habitat quality, mortality associated with dispersal into unsuitable habitats, competition with other species, or prey abundance.

The adaptive management approach can be divided into the following basic steps: assessment, design, implementation, monitoring, evaluation, and adjustment or continuation (Nyberg 1998). Ideally, the resulting management of a project improves as more information is gathered, analyzed, and incorporated into the process. Adaptive management requires setting quantitative objectives, exploring alternative management strategies, monitoring progress, and evaluating performance in terms of risks and benefits (Goodman and Sojda 2004). The applicability and success of decisions depends on the frequency and precision of monitoring (Williams 1997).

Data collected from monitoring efforts can be used to evaluate the success of various release approaches, monitoring approaches, and overall reintroduction success. These data can also be used to indicate when mid-course adjustments can or should be undertaken to improve the likelihood of reintroduction success. A fisher recovery team would be regularly updated on the status of the reintroduction, and they could be convened at any time to address emerging issues related to the reintroduction process, the monitoring program, or reintroduction success. The recovery team could provide recommendations on how to modify the reintroduction process to improve success, or provide recommendations on how to modify the monitoring program to better evaluate reintroduction success.

POTENTIAL ADAPTIVE MANAGEMENT APPROACHES FOR FISHER REINTRODUCTION

It is envisioned that the adaptive management approach would be used to a limited extent in the following areas (see the discussion for each alternative for additional details).

Source Populations — Both action alternatives would require a fisher source population to be used either for immediate translocation or as breeding stock for a captive breeding program. The location of the source population could vary depending on availability. To best match the fisher population that historically occupied the Olympic Peninsula, preference would be given to obtaining fishers from British Columbia. If this was not possible, efforts would be made to obtain fishers from Alberta. If fisher availability from British Columbia or Alberta was limited, a captive breeding program would be implemented in addition to translocations to produce fishers for reintroduction, as described under alternative C.

Number of Fishers Released — The number of fishers released each year would depend on the availability from the source population, and the availability of funding to purchase additional fishers. The numbers would vary, ideally totaling 100 or more. However, if fewer fishers could be obtained from the source population, as few as only 60 might be released. If the survival rate for a particular year was low in one reintroduction area, more fishers might be released there the following year.

Release Locations — Release locations would be adapted based on monitoring results from the first year and the availability of fishers from the source population. Monitoring results would determine if releases should occur in an area that did not receive fishers in year 1, or if releases should occur in the same locations as year 1. Releases could also be shifted to a new area if initial survival was low in an area used in the first year, or if it was otherwise deemed unsuitable.

Timing of Release — The preference would be to conduct the initial release in the fall and winter in at least two of the reintroduction areas. However, the availability of fishers from the source population could require shifting the release time so that fishers were released earlier or later than the desired time frame.

Citizen Science — The fisher reintroduction efforts would provide an opportunity for local schools, colleges, and communities to be involved in the effort. Opportunities for citizen involvement are described under "Elements Common to All Action Alternatives" in this chapter

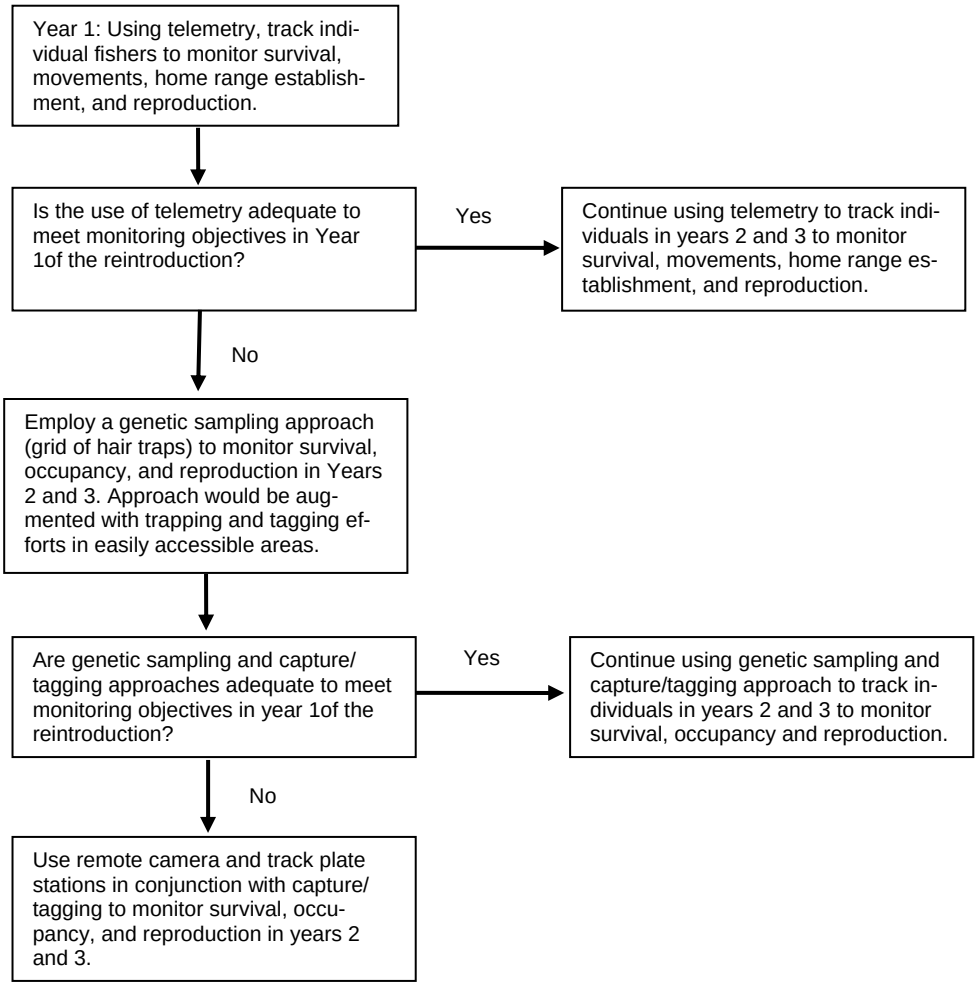
and would primarily involve citizens assisting with monitoring efforts. As the reintroduction efforts developed, opportunities could expand to include working with the NPS and WDFW outreach and education coordinators. Some funding for citizen science has been obtained by Conservation Northwest and WDFW. NPS, USFS, and WDFW would seek additional funding in the future.

MONITORING

The goal of reintroduction monitoring is to determine the success of the effort. Intensive monitoring could indicate whether the reintroduction was failing before it was too late to make mid-course adjustments to improve the likelihood of success. For example, if adult female survival was low in one area in the first year of a reintroduction, or subsequent releases could emphasize the placement of adult females in alternative reintroduction areas. Monitoring should involve the tracking of as many released individuals as possible and should start at the time of their release. Monitoring would continue until it was clearly demonstrated that a self-sustaining population had been established, or until it was determined that no further monitoring was needed because the reintroduction had failed, or was no longer possible due to a lack of support or funding. Because monitoring efforts would be constrained by available funding, measurement of reintroduction success would be based on the three-year period when fishers would be reintroduced and actively monitored. Over this three-year period the NPS and WDFW would consider reintroduction a success if there was evidence of a reproductive population in one or more of the three reintroduction areas (figure 2), as defined in the state's *Implementation Plan for Reintroducing Fishers to Olympic National Park* (Lewis 2006). If additional funding was available, monitoring efforts could extend to years 4 and 5, and subsequently to years 6–10.

Figure 3: An Illustration of the Adaptive Management Approach for the Action Alternatives

This chart is focused on the adaptive approaches as applied to a three-year monitoring program associated with the release of fishers on Olympic National Park. This flow chart is also based on the assumption that 30–35 fishers would be released in Olympic National Park annually for three consecutive years.



A number of tools and levels of monitoring intensity could be employed at various stages in the monitoring program. A fisher recovery team would be involved in implementation planning and would be available to evaluate project success throughout the monitoring phase of the project. Release and monitoring approaches would likely be modified throughout the course of the reintroduction, based on the findings of monitoring and available funding. The team would provide recommendations for adaptively managing the reintroduction based on ongoing monitoring efforts.

MONITORING OBJECTIVES

Monitoring of reintroduced fishers, and the population as a whole, would focus on obtaining information on four biological measures: movements, survival, home range establishment, and reproduction. Tracking these measures would indicate if a reproductive population had become established in a reintroduction area. If additional funding became available, monitoring efforts would be expanded to track recruitment and population expansion.

Movements and Survival — An initial step in monitoring would be to determine if released fishers survived to establish a home range and reproduce, especially females. Radio-telemetry would be used to locate fishers and track movements and survival. Newly released fishers might wander extensively as they explored the reintroduction area, and maintaining frequent contact would make it easier to locate those that traveled extensively. A mortality signal function would be incorporated into each VHF transmitter to efficiently identify mortality events and allow a prompt investigation of the cause of mortality. Tracking would help characterize post-release movement patterns and use of habitats and landscapes, and would allow evaluation and modification of release and monitoring approaches.

Home Range Establishment — After a period of exploration, individual fishers might establish a home range, which would be indicated by the consistent use of a distinct area as determined by telemetry relocations. The establishment of a home range by either a male or a female would be a measure of success as it could indicate that the area was meeting the needs of that individual and was suitable for reproduction. Males tend to use a home range outside of the breeding season, but during the breeding season they tend to wander extensively in search of females. Newly released males may not establish home ranges before the breeding season (January or February) and would not be expected to use a home range during the breeding season (March and April); however, home range establishment is likely to occur after the breeding season (May through December).

Reproduction — Confirming successful reproduction is an important milestone for a reintroduced population and a measure of reintroduction success. In previous studies (e.g., Aubry and Raley 2002, as cited in Lewis and Hayes 2004), reproduction was documented by tracking the movement of reproductive-age (or known pregnant) females to den sites and observing behaviors consistent with birthing and kit rearing. Once a suspected den site was found, kits could be heard, photographed, videotaped, or captured at den sites, thereby confirming reproduction. Reproduction can also be confirmed through photographs or videography of untagged individuals, the collection of hair at hair traps[1] to genetically identify new individuals, the capture of new animals, or the recovery of dead animals without PIT tags or transmitters.

MONITORING TOOLS

Several tools and methodologies can be used to monitor released fishers and their offspring at Olympic National Park.

Radio-telemetry —Telemetry would be the main tool to monitor fishers during the reintroduction, but it is expected to be complicated in Olympic National Park and portions of Olympic National Forest due to access limitations for ground telemetry (e.g., few roads in the Park, numerous road closures on the national forest), and weather limitations for aerial telemetry (using fixed-wing aircraft). The number of telemetry locations obtained for fishers that occur within the Park or the national forest wilderness areas might be limited, whereas the number of locations for fishers in more accessible areas could be much greater. Given the logistical limitations on data collection in roadless areas in the Park and national forest, in most cases it would be possible to get fisher locations only two to three times per month on average, the majority of which would be obtained via aerial telemetry. If a fisher settles in more accessible areas, such as Park front country or roaded USFS lands, more frequent relocations would be possible from ground tracking. Where access was limited, it might be necessary to obtain more than two locations per month for fishers using "walk-ins" or aerial telemetry. Beginning in February the emphasis would be on tracking reproductive-age (or known pregnant) females until their reproductive status was determined. Where

1. Hair traps collect a sample of hair that can be used to genetically identify released fishers or their offspring at a specific time and place.

access allowed, den sites would be investigated on foot to confirm reproduction. If a mortality signal is heard, all attempts would be made to retrieve the carcass as quickly as possible by foot access. If a carcass is not accessible by foot during fall and winter (September 15 through February 28), a helicopter may be used for access; however use of helicopters is not anticipated to be frequent. Helicopters would not be used from March 1 to September 15 to avoid the nesting season of the spotted owl and marbled murrelet, as well as to minimize impacts to visitors and the wilderness experience.

Genetic Sampling — All released and captured fishers (see below for information on capture) would be genotyped through the collection of hair samples to then identify and confirm them as alive through the use of hair traps (Mowat and Paetkau 2002, as cited in Lewis 2006). The traps collect a sample of hair that can be used to genetically identify released individuals or their offspring at a specific time and place. A grid of hair traps located throughout the area of analysis could be used to extensively sample the existing population of fishers. DNA can be extracted in a laboratory from collected hair samples, which can allow the identification of individual fishers, including those that have already been genotyped (i.e., released fishers) and those that have not yet been genotyped (i.e., offspring of genotyped fishers). This genetic sampling can provide information on the survival, location, dispersal, reproductive success, mate selection, offspring, and parentage of individual fishers. It can also be used to estimate population size (Weir, pers. comm. and Mowat and Paetkau 2002, both as cited in Lewis 2006), which is a useful measure of reintroduction success. Genetic sampling may also be used as an additional monitoring technique if funding allows, or as the primary monitoring approach if telemetry is ineffective.

Capture and Tagging — Released animals could be recaptured to replace their transmitters. Monitoring efforts could also extend to first- and second-generation fishers born in the recovery area, which could be captured and equipped with radio-transmitters and PIT tags. Capturing could also provide data for estimates of survival and population size, and allow the collection of hair samples for genotyping individuals that have been born in the area of analysis. When a fisher was captured or recovered, it could be scanned with a PIT tag reader to determine the individual's identity. Capture and tagging could be employed if additional funding is secured for monitoring and research.

Camera and Track-Plate Stations — Camera and track-plate stations are effective for detecting the presence of fishers and determining if they had become established in an area of interest. Camera and video stations could be used to identify marked or unmarked individuals, but the identification of unmarked individuals would be valuable for indicating successful reproduction in the area of analysis. These stations could be employed for monitoring if additional funding was available and genetic sampling proved ineffective at detecting fisher presence.

Incidental Observations — Incidental fisher observations typically include incidental captures of fishers in traps set for other species, road-killed fishers, fishers preying on small livestock, evidence of porcupine predation, or an abundance of sightings of fishers or their tracks. These observations can be important for monitoring the success of a Washington reintroduction, but because of their informal and unpredictable nature, they could not be structured into an active monitoring program. Incidental observations would likely provide important information in the Olympic recovery area and could be followed up with more intensive monitoring efforts.

MONITORING SCENARIOS

Depending on the level of funding available, monitoring scenarios could involve various approaches employed over 3 to 10 years. The monitoring program would involve radio-telemetry for the first three years to track movements, home range establishment, and reproduction of released animals. Subsequent monitoring efforts would depend on available funding and the monitoring results of the first three years.

Year 1 — Track individuals to determine survival, home range establishment, and reproductive success. Beginning in February, emphasis would be placed on monitoring known-pregnant females for reproduction. When possible, den sites would be located to confirm reintroduction, and to capture, PIT tag, and obtain hair samples from kits for genotyping. If additional funding was available, the effectiveness of a hair trap monitoring approach would be tested on a small portion of a reintroduction area.

Year 2 — Adapt monitoring protocols based on monitoring results from year 1 and the availability of fishers from the source population.

If no substantial changes are required and fishers were available:

- Individuals would be tracked to determine survival, movements, home range establishment, and reproductive success. Beginning in February, emphasis would be placed on monitoring all surviving females released in year 1 and all adult females released in year 2. When possible, den sites would be located to confirm reintroduction, and to capture, PIT tag, and obtain hair samples from kits for genotyping.
- If additional funding was available and a hair trap monitoring approach feasible, a grid of hair snares would be established throughout used habitats in reintroduction areas to detect surviving founders and their offspring.

If substantial changes were required to the monitoring protocol because of the inability to adequately monitor the majority of fishers using telemetry:

- If the use of a hair trap grid was feasible, a grid of hair traps would be established throughout suitable and used habitats in reintroduction areas to detect surviving founders and their offspring. If a hair-trap grid was not feasible, camera and track plate stations would be deployed in the same way to detect surviving founders and their offspring.
- Capture and tagging efforts would be undertaken within easily accessible portions of reintroduction areas.

If substantial changes to monitoring protocols were required for other reasons, then the recovery team and project staff would consult and devise alternative approaches.

Year 3 — Follow successful monitoring approaches developed in years 1 and 2, depending on the availability of fishers from the source population.

Years 4 and 5 — If funding was available, continue monitoring of previously released fishers and their offspring. Monitoring occupancy and reproduction within reintroduction areas might still be the highest priority in years 4 and 5 and could indicate if additional releases were needed to boost a failing population, if an established population appeared to be stable, or if the population had expanded beyond the reintroduction areas. If the population had expanded, monitoring efforts could be applied more broadly in the Olympic recovery area.

Years 6–10 — Depending on funding levels and perceived monitoring needs, possibly undertake additional efforts to determine the occupancy and reproduction of fishers within reintroduction areas and the larger recovery area. Efforts using remote hair traps, camera stations, or track-plate stations could be used in years 6, 8, and 10 to track the stability and possible expansion of the population.

HOW ALTERNATIVES MEET OBJECTIVES

As stated in the "Purpose of and Need for Action," all action alternatives selected for analysis must meet all objectives to a large degree. The action alternatives must also address the stated purpose of taking ac-

tion and resolve the need for action; therefore, the alternatives were individually assessed in light of how well they would meet the objectives for this plan and environmental impact statement, which are stated in "Chapter 1 – Purpose of and Need for Action." Alternatives that did not meet the objectives were not analyzed further (see the "Alternatives Considered but Rejected" below).

Table 1 compares the alternatives by summarizing the elements being considered, while table 2 on compares how each of the alternatives would meet the above-listed objectives. The environmental impacts, which are analyzed in detail in chapter 4, are summarized in table 3. These tables can be found at the end of "Chapter 2 – Alternatives."

ALTERNATIVES CONSIDERED BUT REJECTED

The purpose of this planning effort is to "contribute to the statewide restoration of fishers and help fulfill the NPS policies to restore extirpated native species by establishing a fisher population in Olympic National Park that will become self-sustaining." As noted previously, each alternative must resolve need, and meet purpose and objectives to be considered reasonable. Therefore, the interdisciplinary team approached creating a range of alternatives by discussing whether broad options met these requirements. The discussion revealed that each of these options had major logistic or other constraints that would keep them from fully meeting the purpose and objectives or resolving need. These alternatives were therefore dismissed for the reasons described below.

ALLOW FISHERS TO RETURN NATURALLY

Currently, fishers do not appear to exist anywhere in Washington, and the closest population is in British Columbia. Habitat between British Columbia populations and Washington is fragmented. The Olympic Peninsula is surrounded by salt water on three sides, essentially functioning as an island, minimizing the chances of fishers naturally migrating to habitat that exists there. It is the conclusion of the WDFW *Feasibility Assessment for Reintroducing Fishers to Washington* that "there are no populations close enough to Washington to naturally re-establish a population in the state" (Lewis and Hayes 2004).

REINTRODUCE FISHERS ONTO PUBLIC LANDS OUTSIDE OLYMPIC NATIONAL PARK

The interdisciplinary team discussed options regarding state, federal, or other lands outside the boundaries of Olympic National Park. The presumption is that fishers would quickly find their way into the Park forest habitat without transporting and releasing fishers within the Park boundaries, potentially impacting wilderness values. This was rejected as an option because reintroduction of fishers into the Park's wilderness could be accomplished with only negligible impacts to wilderness values (using existing trails with pack animals or on foot, for example), and would be expected to result in fishers occupying the Park's interior sooner than if they were released outside the Park. An additional reason this alternative was rejected was that habitats outside the Park are less suitable for fishers due to such factors as roads and development which has fragmented habitat, which would decrease the potential of a successful reintroduction. A fisher released outside Park boundaries that dispersed into a more developed area would have a greater chance of mortality. In contrast, relocation sites within the Park boundary are chosen based on buffering by all sides by contiguous, suitable habitat.

RESTORE FISHERS IN THE CASCADES AREA

The *Feasibility Assessment for Reintroducing Fishers* identified the Olympic Peninsula as the primary candidate for a restoration effort, but also identified lands in the southwestern and northwestern Cascades as the second and third options, respectively. The interdisciplinary team discussed introducing fishers into the Cascades first as a means of reestablishing fishers in Washington and filling in gaps in the fisher distribution between Oregon and British Columbia, where populations currently exist. However, the state is

interested in beginning restoration in the area with the greatest likelihood of success. The Olympic Peninsula was chosen because it ranked highest in this regard due to many factors, including the amount of suitable habitat it offers and the protection that this habitat receives. In addition, modeling showed additional habitat would become available in the area over the next 80 years. The Washington State *Recovery Plan for the Fisher* also identifies the Olympic Peninsula as the best place to conduct the first reintroduction of fishers in Washington (Hayes and Lewis 2006). Finally, restoring native extirpated species is required by NPS *Management Policies 2006* if restoration is feasible. Therefore, returning fishers to Olympic National Park meets the goals and objectives of both the NPS and the WDFW.

RESTORE FISHERS AS AN EXPERIMENTAL POPULATION

The possibility of restoring fishers to Olympic National Park as an experimental population was considered as an alternative under this plan. Section 10 of the Endangered Species Act provides exceptions to the prohibitions on taking endangered species (USFWS 1998a). To lessen concerns against reintroductions because they may also bring restrictions on the use of private or public lands in the area, Congress added the provision for experimental populations under section 10(j). An experimental population is one separated geographically from nonexperimental populations of the same species. An experimental population may be released outside the existing range of the species if this would further the conservation of the species. Species in experimental populations are considered to be threatened, regardless of the species' designation elsewhere in its range, allowing the development of special rules under the Endangered Species Act, section 4 of which addresses how endangered and threatened species are determined (USFWS 2005b).

Informal consultation with the USFWS determined that it was not legally possible to release fishers as an experimental population under section 10(j), as the fisher is only a candidate species for listing under the Endangered Species Act and therefore is not eligible for section 10(j) (see "Protected Status — Federal," in "Chapter 1 – Purpose of and Need for Action").

THE ENVIRONMENTALLY AND NPS PREFERRED ALTERNATIVE

The NPS is required to identify the environmentally preferred alternative in its NEPA documents for public review and comment. Guidance from the CEQ states that the environmentally preferred alternative means "the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural processes" (CEQ 1981). Continuing current management (alternative A) would promote the continued absence of the fisher, a native species with an integral role in the ecosystem. Alternatives B and C would both enhance natural processes by restoring fisher to the ecosystem. Because alternative B has less potential for loss of reintroduced individuals than alternative C, alternative B was identified as the environmentally preferred alternative.

To identify the preferred alternative, the interdisciplinary planning team evaluated each alternative based on the ability to meet the plan objectives (see table 2) and the potential impacts on the environment ("Chapter 4: Environmental Consequences"). Alternative B is the only alternative that fully meets all of the plan objectives. Additionally it is less expensive and can be implemented more quickly than alternative C, which meets fully all but one of the plan objectives. Alternative A does not meet the plan objectives. Therefore alternative B was identified as the preferred alternative.

Table 1: Comparison of Alternatives

	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers Into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers Into Olympic National Park Using Captive Breeding
Management Actions	Do not reintroduce fishers at Olympic National Park.	Reintroduce fishers into the Park through translocations from populations closely related to fishers historically occurring in Washington.	Captively breed fishers for reintroduction into the Park.
Time Required to Reestablish a Self-Sustaining Fisher Population	N/A	Approximately 10 years.	Approximately 15 years; would require more time than alternative B to assess success.
Monitoring	None related to establishing a fisher population within the Park.	Monitor the reintroduced fisher population for 10 years for signs of restoration; adaptively manage the monitoring process based on results.	Fishers would need to be monitored longer since reintroduction would require more time.
Regulatory Considerations	N/A	Inspect fishers captured in Canada by a veterinarian; a possession and export permit required. Notify Canadian Customs agents in advance that fishers leaving Canada. Inspect fishers by veterinarian in accordance with regulations of the WDOA for an import permit. Notify US Customs agents in advance that fishers are arriving into the U.S. and must be inspected. Notify USFWS in advance of port of entry and declaration of importation.	Same as alternative B for the initial source population. Afterwards, fishers would be captively bred in a U.S. facility.
Park Closure or Restricted Access	N/A	N/A	N/A
Adaptive Management	N/A	Adapt monitoring protocols yearly based on monitoring results and the availability of fishers from the source population.	Same as alternative B.
Estimated Cost (10-year plan)	None	Estimate for monitoring, NPS involvement only: Year 4 — $45,811 Year 5 — $46,416 Year 7 — $48,282 Year 9 — $50,243	More than alternative B because alternative C would take longer to implement, plus additional costs for captive breeding.

Table 2: Analysis of How the Alternatives Meet Objectives

	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
Engage and inform the public about the restoration effort and the role of the fisher in the ecosystem.	**Does not meet objective:** No fisher reintroduction program.	**Fully meets objective:** Education and interpretive measures could include brochures, publications, information on the Park website about the role of fishers.	**Fully meets objective:** Same as alternative B.
Establish a fisher population as genetically similar as possible to the population that originally occupied the Olympic Peninsula (NPS *Management Policies 2006*, sec. 4.4.1.2).	**Does not meet objective:** Fishers would not be reintroduced, so no fisher population would become established on the Olympic Peninsula.	**Fully meets objective:** The source population would be taken from British Columbia or Alberta, which are closely related to fishers historically occurring in Washington.	**Meets objective to a large degree:** The source population for fishers captively bred in the U.S. would be from fishers taken from British Columbia or Alberta. A captive bred population would have less genetic diversity than wild source population.
Promote the establishment of a reproducing population of fishers.	**Does not meet objective:** No fisher reintroduction program.	**Fully meets objective:** Known pregnant females would be monitored for reproductive success. Den sites would be located to confirm reintroduction, and to capture, PIT tag, and obtain hair samples from kits for genotyping.	**Fully meets objective:** Would take longer to accomplish than alternative B due to smaller source population, lower survival of captive bred fishers due to naivety.
Promote the occupation of suitable habitat throughout the Park.	**Does not meet objective:** No fisher reintroduction program.	**Fully meets objective:** Fisher release areas identified in the alternative were based on occupation of suitable habitat.	**Fully meets objective:** Same as alternative B.
Maintain a fisher population that would persist for an extended time (at least 8 to 10 generations).	**Does not meet objective:** No fisher reintroduction program.	**Fully meets objective:** Monitoring adjustments made over the first 10 years would modify management activities to maintain a fisher population for 8–10 generations.	**Fully meets objective:** Same as alternative B.
Maintain a fisher population that could be a possible source for reintroductions to restore fishers in other areas of the state, including other suitable national parks.	**Does not meet objective:** No fisher reintroduction program.	**Fully meets objective:** A self-sustaining fisher population in Olympic National Park would provide a possible source for reintroductions in other areas.	**Fully meets objective:** Same as alternative B.
Gather information about habitat use, movement, and survival that would be used to guide and define future conservation efforts for fishers.	**Does not meet objective:** No fisher reintroduction program.	**Fully meets objective:** Monitoring efforts would include determining survival, home range establishment, and reproductive success.	**Fully meets objective:** Same as alternative B.
Contribute to meeting the state recovery plan objectives.	**Does not meet objective:** No fisher reintroduction program.	**Fully meets objective:** Restoring a self-sustaining fisher population in Olympic National Park would help the state meet its recovery plan goals.	**Fully meets objective:** Same as alternative B.

Table 3: Summary of Environmental Consequences

Impact Topic	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
Species Of Special Concern	Wildlife species (other than fishers) of special concern would not be affected under alternative A because fishers would not be reintroduced. Alternative A would have an adverse, long-term, and minor to moderate impact on fishers since the species would not be reintroduced into Olympic National Park. Without restoration, fishers would remain listed in the State of Washington, as well as a federal candidate with potential for future federal listing. These impacts would also affect other fisher populations in the West Coast DPS resulting from continued extirpation of the species from suitable habitat and their historical range. There would be adverse, long-term, and moderate cumulative impacts on fishers from alternative A. There would be no cumulative impacts to other species of special concern, as no activities related to fisher reintroduction would be added to other activities in the area of analysis. There would be no impairment to species of special concern under this alternative.	Since adverse impacts to individual fishers and their habitat would not be measurable, overall adverse impacts would be short- to long-term and negligible. There would be no effect on the source population because live trapped and relocated fishers would replace fishers that would otherwise be trapped and killed for fur. There would be major beneficial impacts on the West Coast DPS fisher population as a whole, because reintroduction would result in improvements to population size and viability. The determination of effect on the marbled murrelet from fisher reintroduction under alternative B is “not likely to adversely affect.” Since adverse impacts to marbled murrelets and their habitat would not be measurable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible. The determination of effect for northern spotted owls from fisher reintroduction under alternative B is “not likely to adversely affect.” Since adverse impacts to spotted owls and their habitat would be insignificant and discountable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible. The determination of effect for bald eagles from fisher reintroduction under alternative B is “not likely to adversely affect.” Since adverse impacts to bald eagles and their habitat would not be measurable, and impacts would not affect nesting or habitat, overall adverse impacts would be short-term and negligible. Since adverse impacts to northern goshawks and their habitat would not be measurable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible. The determination of effect for Mazama pocket gopher from fisher reintroduction under alternative B is “not likely to adversely affect.” There would be short- to long-term and negligible impacts from implementation of alternative B on Mazama pocket gopher, since fisher do not inhabit the same habitat as Mazama pocket gopher. Since adverse impacts to pileated woodpeckers and their habitat would not be measurable or measurable but not outside the natural range of variability, and impacts would not affect nesting periods or habitat, overall adverse impacts would be short- to long-term and negligible to minor. Overall adverse impacts to migratory birds would be negligible. Fishers may prey on individual birds, which would have an overall negligible adverse impact on bird populations or on migratory birds as a whole. While fisher restoration would result in a change in the ecosystem and its function, it is expected that the reestablishment of the fisher would be beneficial to the overall ecosystem function.	Since adverse impacts to individual fishers and their habitat would be either not measurable, or measurable but not outside the natural range of variability, overall adverse impacts would be short- to long-term and negligible to minor. There would be no effect on the source population because live trapped and relocated fishers would replace fishers that would otherwise be trapped and killed for fur. There would be major beneficial impacts on the West Coast DPS fisher population as a whole, since reintroduction would noticeably improve existing population levels. Since captive bred fishers could have a lower likelihood of survival as compared to relocated fishers, adverse impacts to fishers under alternative C would be higher than impacts under alternative B. The determination of effect for marbled murrelets from fisher reintroduction under alternative C is “not likely to adversely affect.” The impacts of to marbled murrelets under alternative C would be the same as those described under alternative B. The determination of effect for northern spotted owls from fisher reintroduction under alternative C is “not likely to adversely affect.” The impacts would be the same as those described under alternative B. The determination of effect for bald eagles is “not likely to adversely affect.” The impacts under alternative C would be the same as those described under alternative B. The impacts on northern goshawk under alternative C would be the same as those described under alternative B. The determination of effect for Mazama pocket gopher from fisher reintroduction under alternative C is “not likely to adversely affect.” The impacts of the fisher reintroduction would be the same as those described under alternative B. The impacts on pileated woodpeckers under alternative C would be the same as those described under alternative B. Impacts to migratory birds would be the same as alternative B. Cumulative impacts on wildlife species of special

Table 3: Summary of Environmental Consequences

Impact Topic	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
		Cumulative impacts on wildlife species of special concern would be minor and adverse due to ongoing maintenance and logging activities in the area, and range from minor to moderate beneficial from existing conservation and habitat restoration plans for the Park and surrounding federal lands. There would be no impairment to species of special concern under this alternative.	concern under alternative C would be the same as described for alternative B. There would be no impairment to species of special concern under alternative C.
Wildlife and Wildlife Habitat	Alternative A would have long-term, negligible to moderate adverse impacts on wildlife species and their habitat, because fishers would not be reintroduced to Park lands. Cumulative impacts on wildlife species and habitat from ongoing maintenance and logging activities in the area would be negligible to minor adverse impact. There would be minor, beneficial cumulative impacts from existing conservation and habitat restoration plans for the park and surrounding federal lands. There would be no impairment to wildlife and wildlife habitat under this alternative.	Since proposed actions would either have no measurable consequence on wildlife, or would be within the natural range of variability, adverse impacts would be long-term and negligible to minor. Impacts to the overall ecosystem from the restoration of the fisher are expected to be beneficial, long-term, and negligible. There would be no impairment to wildlife and wildlife habitat under this alternative. Cumulative impacts on wildlife species and habitat from ongoing maintenance and logging activities in the area would be negligible to minor adverse impact. There would be minor, beneficial cumulative impacts from existing conservation and habitat restoration plans for the park and surrounding federal lands. There would be no impairment to wildlife and wildlife habitat under this alternative.	Impacts under alternative C would be similar to those under alternative B. However, since offspring from the captive breeding program would be the primary source of fishers for reintroduction to the Park, and fewer fishers would be removed from the source population, the impacts of fisher removal and translocation on fisher predators, their prey, and non-target wildlife would be less than those under alternative B. Since adverse effects on wildlife would either have no measurable consequence, or only small changes to the wildlife species' population, adverse impacts would be long-term and negligible to minor. Impacts to the overall ecosystem from the restoration of the fisher are expected to be beneficial, long-term, and negligible. Cumulative impacts under alternative C would be the same as alternative B. There would be no impairment to wildlife and wildlife habitat under this alternative.
Visitor Use and Experience	No impacts to recreation resources would occur under alternative A, as the Park would not take any management actions to restore fishers. Those visitors who are aware of the fishers' absence and would value the addition of this species to the Park's ecosystem and wilderness could be adversely affected by the fishers' continued absence, resulting in adverse, long-term, negligible impacts to their recreational experience or social values. Cumulative impacts would be primarily beneficial, long-term, and negligible to minor.	Impacts to recreation resources would be adverse or beneficial, short-term, and negligible. Impacts to visitors' social values would be beneficial or adverse, long-term, and minor. Overall, cumulative impacts from other Park management activities, both adverse (maintenance activities) and beneficial (ecosystem restoration or improvements in visitor services) would combine with fisher restoration activities and would be beneficial and adverse, short- and long-term, and negligible to minor.	No additional impacts would occur within the area of analysis under alternative C compared to alternative B. Cumulative impacts would be beneficial, long-term, and negligible to minor.

Table 3: Summary of Environmental Consequences

Impact Topic	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
Wilderness Values	The no-action alternative would have an adverse impact on wilderness values, as the Park would not take any management actions to restore fishers. Those visitors who are aware of the fishers' absence and would value the addition of this species to the Park's ecosystem and wilderness could be adversely affected by the fishers' continued absence, resulting in adverse, long-term, negligible impacts to their wilderness experience. Cumulative impacts would be primarily beneficial, long-term, and negligible to minor.	Impacts to wilderness values would be beneficial, long-term, and negligible to minor, depending on the visitor. Overall, cumulative impacts from other Park management activities, both adverse (maintenance activities) and beneficial (ecosystem restoration or improvements in visitor services) would combine with fisher restoration activities and would be beneficial, short- and long-term, and negligible to minor.	No additional impacts would occur within the area of analysis under alternative C compared to alternative B. Cumulative impacts would be beneficial, long-term, and negligible to minor.
Soundscapes	There would be no impacts to soundscapes as there would be no increase to the natural or human caused sound levels above what currently exists, and there would be no cumulative impacts. No impairment to soundscapes would occur under this alternative.	Noise impacts from fisher reintroduction efforts would be adverse, short- to long-term, and negligible. These impacts would be localized, primarily resulting from the use of helicopters, but such use would be seasonally restricted and implemented only if release or monitoring activities could not be conducted from the ground. Cumulative impacts would be adverse, long- and short-term, and minor to moderate. No impairment to soundscapes would occur under this alternative.	Additional noise impacts would occur within the area of analysis under alternative C as compared to alternative B because of the increased time required to release and monitor fishers under alternative C. These impacts would be adverse, short- to long-term, and negligible to minor. Cumulative impacts would also be the same as alternative B. No impairment to soundscapes would occur under this alternative.
Neighboring Landowners	Since the fisher is believed extirpated from Washington State, no impacts to neighboring landowners would occur if the fisher remained a candidate species or became listed under the Endangered Species Act. Cumulative impacts on neighboring landowners under alternative A would be long-term, negligible and beneficial.	If fisher were delisted by Washington State, impacts to neighboring landowners would be long-term, beneficial, and negligible as fisher habitat would be protected under existing plans (e.g., WDNR's habitat conservation plan and the *Northwest Forest Plan*) or neighboring landowners would not be required to take those conservation actions described above under "Fisher Remains listed as State Endangered" to protect fisher. Impacts to neighboring landowners would be adverse and long-term if the fisher remained a federal candidate species or became listed under the Endangered Species Act. In the unlikely event the fisher becomes listed in the future, federal and state agencies would be the most affected, and impacts would be negligible to moderate. Because only 5% of habitat identified in the feasibility assessment as suitable for fisher occurs on private land, few private parcels directly border the park, and these privately owned parcels are highly fragmented; the likelihood of fishers inhabiting this land is low. Therefore few, if any, private landowners would be affected by formal listing of the fisher. Impacts to affected private landowners would be adverse, long-term, and moderate, as affected landowners would incur additional management tasks to protect the fisher on their lands. If the fisher became listed under the Endangered Species Act, the Quinault Indian Nation would most likely be the only tribe affected,	If translocated fishers were not surviving or there was a decline in the source population, the need to list the fisher under the Endangered Species Act might become more likely, resulting in adverse impacts to adjacent landowners that would be similar to alternative B and range from negligible to moderate. When combined with a potentially higher possibility of listing, cumulative impacts might be primarily adverse and related to additional actions landowners would have to take to protect fishers, although the combined protection efforts of all landowners would still provide some beneficial effects.

Table 3: Summary of Environmental Consequences

Impact Topic	Alternative A — No-Action Alternative	Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation	Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding
		given the location of suitable fisher habitat. Impacts to the Quinault Indian Nation would range from negligible to moderate, but only 2% of suitable fisher habitat occurs on all tribal land on the peninsula. Some adverse cumulative impacts would occur, but overall cumulative impacts would be primarily beneficial, as combined protective actions by all landowners could preclude the need to list the fisher.	
Socioeconomic Conditions	Because there would be no impacts to timber harvesting activities related to fisher reintroduction or predation by fishers, there would be no impacts to socioeconomic conditions under this alternative. Cumulative impacts would be beneficial to adverse, long-term, and vary in intensity depending on landowner.	Socioeconomic impacts related to timber harvesting would vary by landowner, but are expected to be adverse, long-term, and range from negligible to minor. Cumulative impacts would be primarily related to declines in the timber harvesting industry and the ensuing government payments to affected areas, and would also be adverse, long-term, and vary in intensity, depending on how individuals had been affected by these actions. Local owners of poultry and small pets could be adversely affected over the long-term by negligible to minor impacts. Cumulative impacts would also be adverse, long-term, and negligible to minor.	No impacts specifically related to captive breeding are expected to neighboring landowners; therefore, impacts would be similar to those expected under alternative B — adverse, long-term and negligible to minor. Cumulative impacts would be adverse, long-term, and negligible.
Park Management and Operations	No impacts related to releasing or monitoring fishers would be incurred; therefore, there would be no impacts to Park management and operations. There would also be no cumulative impacts.	Because the Natural Resources Management Division might secure additional funds for fisher reintroduction efforts, and all other divisions would experience no more than negligible impacts, overall impacts to Park management and operations would be adverse, long-term, and negligible to minor. Cumulative impacts would be adverse, long-term, and moderate, given the existing operations and management shortfall and reduced staff.	Impacts would be the similar to alternative B — adverse, long-term, and negligible to minor. Cumulative impacts would be adverse, long-term, and moderate, given the existing shortfall and reduced staff.

Olympic National Park
Fisher Reintroduction Plan / Environmental Assessment
September 2007

National Park Service
U.S. Department of the Interior

Olympic National Park
Washington

Olympic National Park

Fisher Reintroduction Plan / Environmental Assessment

Fisher Kits on a Log.
Photo by C. Raley, USDA Forest Service, Pacific Northwest Research Station

September 2007

Chapter 3
Affected Environment

CHAPTER 3 — AFFECTED ENVIRONMENT

The "Affected Environment" describes existing conditions for those elements of the environment that would be affected by the implementation of alternatives considered in this environmental assessment. The natural environment components addressed include species of special concern, wildlife and wildlife habitat, and soundscapes. Human environmental components include visitor use and experience, neighboring landowners, socioeconomic conditions, and Park management and operations. Impacts for each of these topics are then analyzed in "Chapter 4 – Environmental Consequences."

SPECIES OF SPECIAL CONCERN

WILDLIFE

Numerous wildlife species of special concern listed by the USFWS under the Endangered Species Act or by Washington State are supported at Olympic National Park, as shown in table 4. Federal Species of Concern included in table 4 are those that have habitat in the area affected by this plan.

Table 4: State and Federal Listed Species in Olympic National Park

Species	Federal Status	State Status	Critical Habitat in the Park?	Affected by this Plan?
Birds				
Bald eagle (*Haliaeetus leucocephalus*)	N/A	Threatened	No	Yes
Brandt's cormorant (*Phalacrocorax penicillatus*)	N/A	Candidate	No	No
Brown pelican (*Pelicanus occidentalis*)	Endangered	Endangered	No	No
Cassin's auklet (*Ptychoramphus aleuticus*)	Species of Concern	Candidate	No	No
Common loon (*Gavia immer*)	N/A	Sensitive	No	No
Common murre (*Uria aalge*)	N/A	Candidate	No	No
Golden eagle (*Aquila chrysaetos*)	N/A	Candidate	No	No
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened	Threatened	No	Yes
Merlin (*Falco columbarius*)	N/A	Candidate	No	No
Northern goshawk (*Accipiter gentilis*)	Species of Concern	Candidate	No	Yes
Northern spotted owl (*Strix occidentalis caurina)*	Threatened	Endangered	No	Yes
Olive-sided flycatcher (*Contopus cooperi*)	Species of Concern	N/A	No	No
Peregrine falcon (*Falcon peregrinus*)	Species of Concern	Sensitive	No	No
Pileated woodpecker (*Dryocopus pileatus*)	N/A	Candidate	No	Yes
Purple martin (*Progne subis)*	N/A	Candidate	No	No
Streaked horned lark (*Eremophila alpestris strigata)*	Candidate	Endangered	No	No
Tufted puffin (*Fratercula cirrhata)*	Species of Concern	Candidate	No	No
Vaux's swift (*Chaetura vauxi*)	N/A	Candidate	No	No
Western grebe (*Aechmophorus occidentalis)*	N/A	Candidate	No	No
Western snowy plover (*Charadrius alexandrinus nivosus)*	Threatened	Endangered	No	No
Mammals				
Gray wolf (*Canis lupus*)	Endangered	Endangered	No	No
Keen's myotis (*Myotis keenii*)	N/A	Candidate	No	No
Long-eared myotis (*Myotis evotis*)	Species of Concern	N/A	No	No
Long-legged myotis (*Myotis volans*)	Species of Concern	N/A	No	No
Mazama pocket gopher (*Thomomys mazama*)	Candidate	Threatened	No	Yes
Pacific fisher (*Martes pennanti pacifica*)	Candidate (2005)	Endangered	No	Yes
Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii)*	Species of Concern	Candidate	No	No
Amphibians				
Cascade frog (*Rana cascadae*)	Species of Concern	N/A	No	No
Tailed frog (*Ascaphus trueii)*	Species of Concern	N/A	No	No
Van Dyke's salamander (*Plethodon vandykei*)	Species of Concern	Candidate	No	No
Western toad (*Bufo borealis*)	Species of Concern	Candidate	No	No

Table 4: State and Federal Listed Species in Olympic National Park

Species	Federal Status	State Status	Critical Habitat in the Park?	Affected by this Plan?
Olympic torrent salamander (*Rhyacotriton olympicus)*	Species of Concern	N/A	No	No
Insects				
Makah's copper butterfly (*Lycaena mariposa charlottensis)*	Species of Concern	Candidate	No	No
Whulge (Edith's) checkerspot (*Euphydras editha taylori*)	Candidate	Endangered	No	No
Fish				
Bull trout (*Salvelinus confluentus*)	Threatened	N/A	Yes	No
Hood Canal chum (*Oncorhynchus keta*)	Threatened	N/A	Yes	No
Ozette Lake sockeye (*Onocorhynchus nerka*)	Threatened	N/A	Yes	No
Pacific lamprey (*Lampertra tridentata*)	Species of Concern	N/A	No	No
Puget Sound chinook (*Oncorhynshus tshawytscha*)	Threatened	N/A	Yes	No
Puget Sound / Strait of Georgia coho (*Oncorhynchus kisutch*)	Species of Concern	Candidate	Yes	No
River lamprey (*Lampertra ayresi*)	Species of Concern	N/A	No	No

Source: NPS 2006a; Happe, pers. comm. July 10, 2007; Acker pers. comm. June 25, 2007.
N/A = Not Applicable

During internal scoping it was determined that of these special status species, six species may be affected by fisher restoration in the Park — the fisher, bald eagle, northern spotted owl, northern goshawk, marbled murrelet, and Mazama pocket gopher, which are described in more detail below. The remainder of the species in table 4 would not be affected because (1) they inhabit different habitat than fisher, (2) they have different food requirements, or (3) because fishers either do not prey on these species, or prey on them only extremely rarely; therefore, they are not discussed further in this section. A biological assessment was submitted to USFWS on July 24, 2007. The biological assessment is included in appendix B.

Federally-listed Wildlife

Fisher (Federal Candidate, State Endangered)

The fisher is a medium-size mammalian carnivore and the largest member of the genus *Martes* in the family Mustelidae (Powell and Zielinski 1994). It has the body build of a stocky weasel — a pointed face, rounded ears, a long and slender body, short legs, and a well-furred tail about one-third its total length (Lewis and Hayes 2004). Fishers have partially retractable claws that allow them to climb and move through trees, and descend in a headfirst position (Powell 1993).

Fishers inhabit a variety of forest types, however, key forest habitat features that fishers require include canopy cover generally greater than 50%; large trees with cavities sufficiently large enough to provide denning sites; and large limbs, snags, and logs for resting sites (Lewis and Hayes 2004). Because it takes considerable time for those structures to develop in forest stands, fishers are most often associated with late-successional forests. However, the amount of late-successional forest needed to support a fisher population in Washington is unknown. The fishers' association with large structures typically found in late-successional forest, the large home ranges of individuals, and their sensitivity to forest fragmentation suggest that landscapes comprised of large, contiguous patches of late-successional forest are more likely to support a fisher population than more fragmented landscapes containing patches of late-successional forest (Jones 1991). In many parts of their range, fishers use deciduous trees for denning and resting, however deciduous trees are not required as fishers occur in areas without deciduous trees. Deciduous trees may be used more frequently because they have a higher incidence of suitable cavities than conifers.

Fishers are solitary animals; they interact with other fishers during breeding, kit rearing and defense of territory (Powell 1993). Most studies report that fishers exhibit intrasexual territoriality: however, male home ranges may overlap with multiple female home ranges (Powell and Zielinski 1994; Powell 1993; Weir 2003). Based on nine radio-telemetry studies conducted in the western North America, male fishers have an average annual home range of approximately 26.3 square miles (42.3 square kms). Average home range size for female fishers is smaller, at 15.5 square miles (25 square kms) (Lewis and Hayes 2004). Fishers give birth in late March and early April and mate within 10 days after giving birth. Because of the delayed implantation of the fetus (common to some mustelids), fishers do not give birth until approximately a year later (Powell 1993; Frost et al. 1997).

Female fishers give birth to kits in tree cavities (Leonard 1980; Paragi 1990; Paragi et al. 1996). Fisher kits are altricial (Hall 1942; Coulter 1966; Powell 1993). Their eyes and ear canals open at about 7-8 weeks, and shortly thereafter the mother begins bringing them solid food (Coulter 1966; Powell 1993). In the wild, fisher kits at 3-4 months of age were observed to be still learning to climb trees and handle prey that the adult female had captured. Fisher kits appear to stay within their mother's home range through their first fall and early winter before dispersing (Paragi 1990; Aubry and Raley 2006).

The primary fisher denning period (from birth to weaning) lasts about 10 weeks and researchers have found that females with kits may use more than one den site during that time (Arthur and Krohn 1991; Paragi et al. 1996; Truex et al. 1998; Aubry and Raley 2006; Higley and Matthews 2006). After the primary denning period, adult females with kits become more mobile but may still use cavities in various types of structures, such as live and dead trees and hollow logs, for prolonged periods of time (more than two days; Truex et al. 1998; Weir 2007; Aubry and Raley 2006; Higley and Matthews 2006).

Natal den cavity (old pileated woodpecker cavity) in a western white pine snag used by and adult female fisher for 5 weeks. . . . Photo by C. Raley, PNW Research Station.

Fishers use rest sites between periods of activity. Rest sites are generally used for only a single resting or a sleeping bout; however, the same site may be used for many days when weather is severe or a large food item has been cached nearby. Rest structures used by west coast fishers include mistletoe and rust brooms, large lateral limbs and limb clusters in the canopies of live trees, rodent or raptor nests, cavities in snags or logs, ground burrows, or beneath piles of cull logs (Buck et al. 1983; Jones 1991; Seglund 1995; Aubry and Raley 2002; Weir and Harestad 2003; Zielinksi et al. 2004). Rest sites are often in large diameter trees that are usually the largest and tallest in the immediate area (Buck et al. 1983; Seglund 1995; Weir 1995; Zielinski et al. 2004).

There are verified fisher records from all sides of the Olympic Peninsula (Scheffer 1995; Aubry and Houston 1992), however the most numerous accounts are from the western lowlands. Scheffer (1995) recorded that two trappers took 37 fishers in the winter of 1920 in the lower Queets, and that two other trappers took 20 fishers in the East Fork of the Quinault River watershed, between 1,500 and 5,000 feet in elevation.

On the west coast, fishers still inhabit four areas: northern and central British Columbia, Southern Oregon Cascades, Northwestern California (this population extends a bit into southwestern Oregon), and the Southern Sierra of California. Throughout the west coast, fishers are associated with low to mid elevations coniferous or mixed deciduous-coniferous forests (Aubry and Raley 2006; Weir 2007; Zielinski et al. 2006). Fishers are generally confined to areas that do not have deep, soft snow during winter, and therefore tend not to inhabit alpine areas, especially when the ground is snow covered. In California, fishers were primarily limited to areas with less than 9 inches of snow per winter month (Krohn et al. 1997).

Fishers may travel into alpine areas during summer but this is unlikely since lower elevation forests should support sufficient food sources (Weir, pers. comm. July 27, 2005).

The upper limit of life expectancy for fishers is generally believed to be about 10 years of age (Powell 1993), however a fisher in British Columbia was 12 years old when trapped (Weir 2003). Although predation on fishers is recorded as a cause of death in the east (Krohn et al. 1994; York 1996), it appears to be a lesser source of mortality in the east (Douglas and Strickland 1987) than in the west coast populations. Potential predators of fishers on the Olympic Peninsula include coyote, bobcat, mountain lion (*Puma concolor*), other fishers, and golden eagles (*Aquila chrysaetos*) (Powell and Zielinski 1994; Gilbert and Keith 2001).

Using population modeling to estimate the carrying capacity for the Olympic Recovery Area (Lewis and Hayes 2004), projected fisher populations ranged from 50 to 102 females, 20 and 40 years post release. The population estimates would vary annually in the first 5 to 15 years, but tended to stabilize by 20 years (Lewis and Hayes 2004). Assuming a slightly biased female sex ratio of 55:45, the Olympic Peninsula is estimated to support 91 to 185 fishers (Lewis 2006). If the entire 3,300 square km area of suitable fisher habitat were ultimately occupied by fishers, estimated fisher densities would be 0.027 to 0.056 fishers per square km (Lewis and Hayes 2004).

Of the three areas studied for possible fisher reintroduction (the Olympic Peninsula and the northwestern and southwestern Cascades), the Olympic Peninsula has the greatest amount of large, contiguous areas of suitable habitat. Much of this is in Olympic National Park, as well as on Olympic National Forest and WDNR lands adjacent to the Park. Land within the Park is protected from timber harvest and managed almost entirely to preserve or restore natural ecosystems. For analysis purposes in the habitat assessment conducted as part of the Washington State feasibility study (Lewis and Hayes 2004), suitable fisher habitat was defined as low- and mid-elevation, late-successional forest. Much of Olympic National Forest is managed as late-successional forest reserves. Approximately 299,376 hectares of suitable fisher habitat occurs in the potential reintroduction area on the Olympic Peninsula. Of the suitable habitat, the NPS owns 52%, the USFS owns 33%, the WDNR 8%, private landowners 5%, tribal landowners 2%, and other landowners less than 1% (Hayes and Lewis 2006). There is an additional 148,362 hectares of mid seral habitat that fishers could use for travel and foraging (Lewis and Hayes 2004). The greatest density of suitable habitat is found on the west side of the Olympic Peninsula and consequently this is where fisher populations are expected to be the most dense (Lewis and Hayes 2004).

Snow tracks of a male fisher traveling along a log. Photo by PNW Research Station.

The WDNR developed a multispecies habitat conservation plan to continue forest management activities on state trust lands while complying with the Endangered Species Act (WDNR 1997). Three planning units on the Olympic Peninsula are covered by the conservation plan, including the Olympic Experimental State Forest Unit in the northwest corner of the peninsula. All of these lands are managed to support at least 20% old-growth forest. As of 1997, the experimental forest supported at least 19% old-growth forest, and the planning units adjacent to Olympic National Park between the Hoh and Queets rivers supported at least 20% old-growth forest in 2004 (Lewis and Hayes 2004).

Fishers hunt predominantly by sight and hearing, and individuals travel over a large home range in search of prey (Lewis and Hayes 2004). Fishers in western North America are generalists in prey selection and their diet varies by location as well as seasonally within a location, likely in response to prey availability (Zielinski et al. 1999). Fishers consume a variety of small and mid-sized mammals and birds, insects, rep-

tiles, and plant material, although they rarely eat amphibians. In the Pacific states, small and mid-sized mammals comprise more than 70% of their diet. These species include snowshoe hare, porcupines, squirrels (*Tamiasciurus* spp.), woodrats, voles, mice, and mountain beavers (Scheffer 1995 and Powell and Zielinski 1994, both as cited by Lewis and Hayes 2004). Food habits studies infrequently report results to species for birds, however the birds that are most commonly reported are diurnally active species, such as songbirds, jays, grouse, and woodpeckers (NPS 2007).

Although there have been no formal diet analyses conducted on fishers in Washington, Scheffer (1995) did report information gathered by trappers and early naturalists who examined fisher stomach contents or observed fisher foraging. On the Olympic Peninsula, fisher diets likely consisted of mountain beaver, squirrels, and snowshoe hares. Fisher scats were also observed to contain huckleberries and salal berries (Scheffer 1995). The fisher diet also consists of carrion, particularly from ungulates, in the winter and early spring months (Jones 1991).

Marbled Murrelet (Federal Threatened, State Threatened)

The marbled murrelet is a pigeon-sized seabird that lives primarily in the nearshore marine environment but nests in old-growth forests. Most murrelets nest within 37 miles of the coast, although some may go as far as 52 miles inland (Nelson et al. 2006). Murrelets belong to the Alcidae family, whose species are sometimes referred to as the black-and-white "penguins of the north." Based on surveys completed in 1995, it is estimated that 5,000 to 6,500 murrelets occur in Washington State (USFWS 2006c).

Murrelets begin laying their single egg in late March. Chicks hatch after incubation for approximately 30 days, and remain in the nest for 27 to 40 days. Murrelets are solitary nesters; both adults share incubation duty and they exchange incubation duties every 24 hours. The chicks are brooded only for a couple days, after which they sit alone on the nest while the adults forage at sea. Adults bring food to the chicks at dawn and dusk. When ready to fledge, the chicks fly alone, at dusk, directly to sea (Nelson et al. 2006). Because murrelets are asynchronous breeders, and can re-nest after an early nest failure, murrelets nesting season can extend up to 182 days (Nelson et al. 2006).

Suitable nesting habitat for murrelets consists of multilayered, old-growth coniferous stands with moderate to high canopy closure and within approximately 50 miles of saltwater feeding areas (NPS 2006a). Murrelets feed on small ocean fish, such as anchovy (*Engraulis mordax*), herring (*Clupea pallasii*), and sardine (*Sardinops sagax*) (USFWS 2006c). From late March to mid-July marbled murrelets nest on naturally occurring platforms in large-diameter (greater than 6 inches) conifer limbs at heights of 50 feet or more above the ground. They more commonly occupy larger stands (greater than 500 acres) that support trees with large branches or deformities for nest platforms (USFWS 2006c). The nest platforms are created by normal growth, disease, mistletoe, and deformed branches. In the Pacific Northwest, most nests are located on a large branch with a moss substrate and canopy cover over the nest. Murrelets nest in younger stands with remnant large trees or deformities that provide nesting opportunities (NPS 2006a).

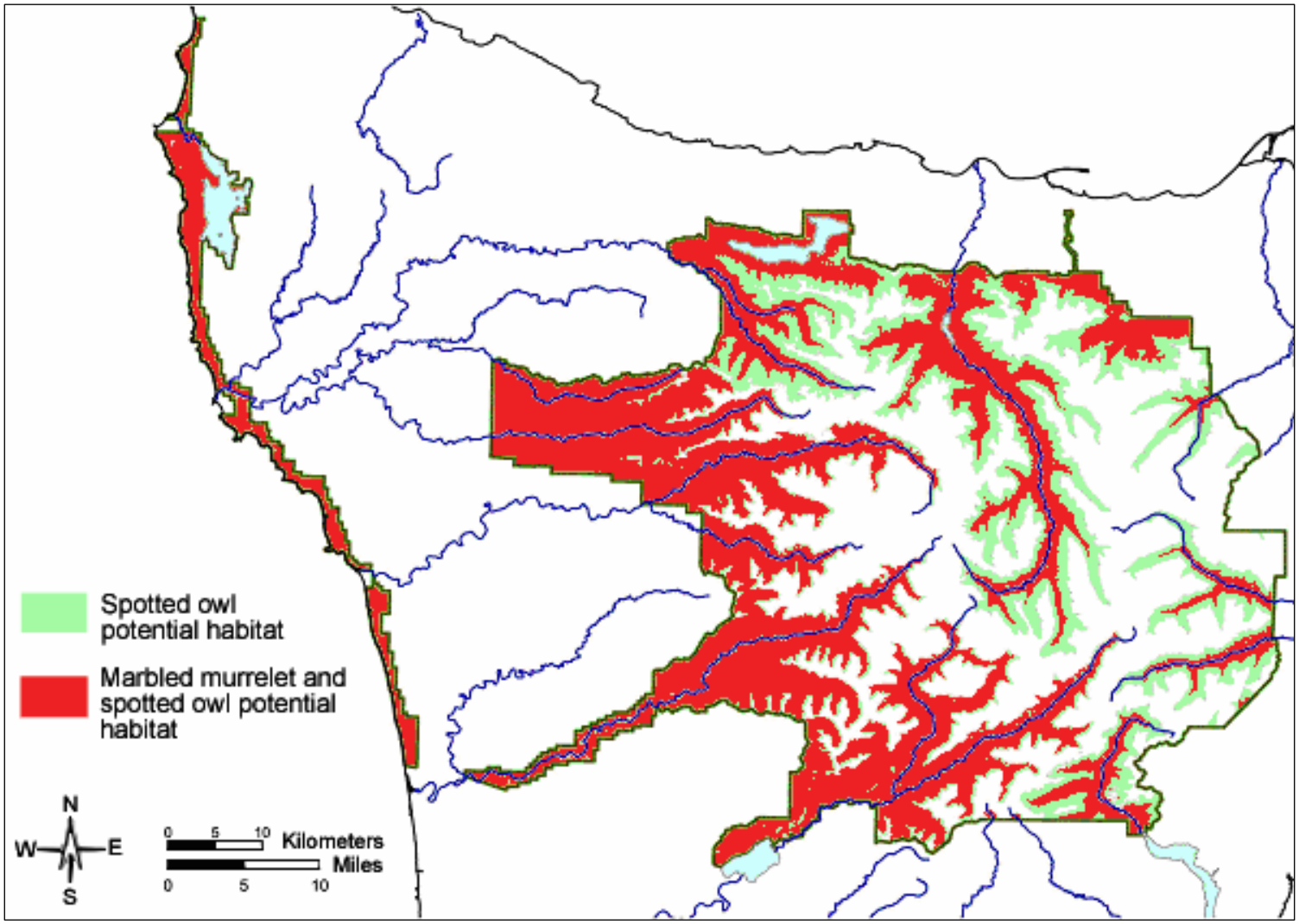
Olympic National Park contains the largest contiguous area of marbled murrelet nesting habitat remaining in the lower 48 states. Murrelets occur within all the major drainages below about 3,000 feet in elevation within the Park. Habitat considered suitable for murrelet occupation includes forested areas to 3,500 feet on the east side of the Park, and to 3,000 feet on the west side of the Park, including the Sol Duc and Skokomish River drainages. Considering these areas, approximately 183,000 acres of forested area within the Park are considered suitable marbled murrelet habitat, overlapping most of the suitable habitat for northern spotted owls (NPS 2006a; see figure 4).

Murrelet surveys have been conducted in all developed areas of the Park, as well as in 18 randomly selected backcountry locations in eight drainage areas during the 1990s. Murrelet use of nesting habitat (as indicated by rates of presence and occupancy) within the Park is substantially greater than use of suitable habitat on the peninsula outside the Park (Hall 2000, as cited in NPS 2003). Nine sites where murrelets are known to nest (signs of nests, chicks, or eggshells) were documented within the Park between 1986

and 1999. Following the Pacific Seabird Group protocols, Park biologists documented murrelet presence at 100% of survey sites throughout the Park, with occupancy documented at 83% of those sites (NPS 2003, 2006a). In general, the Park staff considers any suitable marbled murrelet nesting habitat at Olympic National Park as occupied. Currently no active NPS research or monitoring program is in place, although an ongoing telemetry study is being conducted by the USFS throughout the Peninsula.

As with fishers, suitable habitat for marbled murrelets occurs in the Olympic National Forest (105,109 hectares), much of which is managed as late-successional forest reserves. WDNR lands adjacent to the Park also provide suitable old-growth forest habitat in the three planning units covered by the habitat conservation plan (WDNR 1997). Although habitat of fishers and marbled murrelets overlaps, fishers are not known to prey on marbled murrelets; the primary nest predators of murrelets are corvids, such as ravens and jays; corvids and squirrels were observed to be key predators of artificial nests (Nelson et al. 2006). However, fishers prey on mice and squirrels that are documented predators of decoy marbled murrelet eggs.

Figure 4: Spotted Owl and Marbled Murrelet Potential Habitat in Olympic National Park



Although the USFWS has not officially designated critical habitat for the marbled murrelet within Olympic National Park, much of the Park contains high quality nesting habitat that is managed and safeguarded by virtue of inclusion in the national park system. Critical habitat has been designated on lands on the Olympic Peninsula, although the USFWS is reviewing the designation of a large portion of the critical habitat to reduce redundancy with other plans, such as the *Northwest Forest Plan*, that already protect those lands.

Northern Spotted Owl (Federal Threatened, State Endangered)

The northern spotted owl is a medium-sized owl with dark eyes, dark-to-chestnut brown coloring, and whitish spots on the head and neck, with white mottling on the abdomen and breast (USFWS 2006d). Northern spotted owls nest, roost, and forage in late-successional forests characterized by high canopy cover and complex structure (Forsman et al. 1984, Gutierrez et al. 1995, Hershey et al. 1998, all as cited in Lewis and Hayes 2004). Suitable habitat is characterized by moderate to high canopy closure (60% to 80%); a multilayered, multispecies canopy with large (greater than 30-inch diameter at breast height) overstory trees; a high incidence of large trees with various deformities, cavities, broken tops, or mistletoe infestation; large snags; large accumulations of down trees, and other woody debris on the ground; and sufficient open space below the canopy for flying (Thomas et al. 1990, as cited in NPS 2003; USFWS 2006d).

Olympic National Park contains the largest contiguous area of spotted owl nesting and roosting habitat remaining in the lower 48 states. Extensive suitable habitat for spotted owls occurs throughout Olympic National Park, primarily in lower elevations of major drainages. Spotted owl habitat is similar to that for marbled murrelets but extends to higher elevations in the Park: up to 3000 feet on the west and 4000 feet on the east (figure 4). The Park interior (exclusive of the Pacific coastal section and the Queets River corridor) contains about 199,921 ha of forested area considered potential spotted owl habitat (NPS 2006a).

On the Olympic Peninsula, 93.7% of spotted owl diets are nocturnally active prey, such as flying squirrels (*Glaucomus sabrinus*), but also include juvenile snowshoe hares, bushy-tailed wood rats (*Neotoma cinerea*), and Douglas squirrels (*Tamiasciurus douglasii*; Forsman et al. 2001). Diet composition varies somewhat regionally: owls on the drier, eastern side of the Olympic Peninsula consume more red-backed voles (10.3%) and woodrats (9.6%) and less flying squirrels than northern spotted owls on the west side of the Peninsula (Forsman et al. 2001).

Northern spotted owls have large home ranges containing substantial acreage of old-growth forest to meet their habitat needs. On the Olympic Peninsula, the mean home range size of spotted owls in Olympic National Forest was 2290 hectares (Forsman et al. 2005). There is no data for owl home ranges in Olympic National Park, however due to the lack of fragmentation of habitat, they are expected to be smaller (Seaman et al. 1996).

In the Park, research and monitoring of spotted owls started in the late 1980s. An inventory completed in 1995 estimated 229 pairs (730 individuals) inhabiting the Park (Seaman et al. 1996). Northern spotted owl densities were greater on the east side of the Park (0.297 pairs per square km) than on the west (0.166 pairs per square km), and greater than owl densities observed in the fragmented habitat found on Olympic National Forest (Seaman et al. 1996).

Demographic rates of northern spotted owls have been monitored since 1987, starting first in Olympic National Forest, and in the Park in 1992. The data from both USFS and NPS are combined and comprise the Olympic Study Area: one of eight official effectiveness monitoring study areas for the *Northwest Forest Plan*. At one point, over 130 territories were monitored on the peninsula, including several on WDNR lands, 80 on the USFS land and 52 in the Park. However, in recent years the study has been scaled back; currently 40 sites are monitored in the national forest and 54 in the Park (NPS now monitors 2 sites formerly monitored by USFS).

On the Olympic Peninsula, northern spotted owls generally nest every other year (table 5). The fecundity rate (number of females fledged per adult female) has remained stable over the years, however site occupancy rate and adult survival have declined (Anthony et al. 2006). Overall, the population of northern spotted owls on the Olympic Peninsula has declined at an annual rate of approximately 4.4%, a decline driven by declining adult survival rates. This rate is slightly higher than the range-wide estimate of 4.1%, but the lowest rate of decline in Washington State (Anthony et al. 2006).

Table 5: Nesting Status and Success Rate of Female Northern Spotted Owls at Monitored Sites in Olympic National Park, 1992-2006

Year	Non-nesting	Nesting	Unknown Status	Total	Known Status (percent)	Females Nesting (percent)	Nest Success[1]
1992	1	15	7	23	0.70	0.94	0.93
1993	16		5	21	0.76	0	*
1994	3	24	7	34	0.79	0.89	0.92
1995	15		6	21	0.71	0	*
1996	5	28	3	36	0.92	0.85	0.92
1997	15	8	6	29	0.79	0.35	0.75
1998	1	24	5	30	0.83	0.96	0.91
1999	9		5	14	0.64	0	*
2000	17	10	5	32	0.84	0.37	0.56
2001	16	9	4	29	0.86	0.36	1.00
2002	3	27		30	1.00	0.90	0.92
2003	23		3	26	0.88	0	*
2004	2	23	4	29	0.86	0.92	0.96
2005	22	1	1	24	0.96	0.04	1.00
2006	2	16	2	20	0.90	0.89	0.94
Total	150	185	63	398	0.84	0.55	0.88

[1] Proportion of nest attempts that result in at least one fledgling, calculated on nests with known outcomes
*No nesting attempts

One factor likely contributing the decline in northern spotted owls, particularly in the Park where habitat has remained stable, has been the invasion of barred owls. Barred owls recently expanded their geographic range into the Pacific Northwest. The first documented occurrence on the Olympic Peninsula was on the west side of the Park in 1985 and the number of sightings continues to increase (Sharpe 1989). Barred owls are dominant in competitive interactions with spotted owls and evidence from many areas suggests that barred owls displace spotted owls from otherwise suitable habitat (Dark et al.1998; Hamer 1988; Kelly 2001).

At sites where northern spotted owls are not displaced from their territory, they have moved upslope. The mean elevation for all occupied northern spotted owl sites in 2006 was 2,698 feet, an increase of over 700 feet from the first year of monitoring in 1992, and the highest yet recorded. The mean elevation of monitored spotted owls on the drier eastside of the Park was 2,914 feet (range 1,850 feet to 4,250 feet); west side sites averaged 1,908 feet (range 1,000 feet to 2,400 feet) in elevation (NPS 2007).

Although habitat that allows spotted owls to disperse may be unsuitable for nesting, roosting, or foraging, it provides an important linkage among blocks of nesting habitat, both locally and over the range of the northern spotted owl. Dispersal habitat, at a minimum, consists of forest stands with adequate tree size and canopy closure to provide some degree of protection to spotted owls from avian predators and to allow the owls to forage at least occasionally (USFWS 2006d).

Extensive suitable habitat for spotted owls occurs in Olympic National Park, primarily in lower elevations of major drainages, and they reside throughout the Park. Spotted owl habitat is similar to that for marbled

murrelets but extends to higher elevations in the Park. The Park interior (exclusive of the Pacific coastal section and the Queets River corridor) contains about 494,000 acres of forested area considered potential spotted owl habitat (NPS 2006a).

The status of the spotted owl along the Park coast and the Queets River corridor seems to be less stable. These two areas contain approximately 41,304 acres of forested area that is considered marginal habitat for spotted owls. Up to 13 owl sites have been documented in these areas during the late 1980s and early 1990s. At the time of the last survey completed in the area, no spotted owl nests were found, though barred owl nests were observed (Weidermeier 1999). Although the habitat in the Park has not changed, it is thought that as habitat surrounding the Park is increasingly altered by timber harvest, these areas within the Park are becoming too narrow and isolated to provide high-quality habitat for spotted owls (NPS 2003).

As with marbled murrelets, suitable habitat for northern spotted owls also occurs in Olympic National Forest, much of which is managed as late-successional forest reserves. WDNR lands adjacent to the Park also provide suitable old-growth forest habitat for northern spotted owls in the three planning units covered by the habitat conservation plan (WDNR 1997). Fishers use the same structures for denning (tree cavities) that spotted owls use for nesting. However, extensive suitable habitat and habitat structures for both species exists throughout the Park.

Critical habitat for the northern spotted owl has not been officially designated in the Park or on adjacent WDNR lands. However, much of the Park contains high-quality northern spotted owl habitat that is managed and safeguarded by virtue of inclusion in the Park. Critical habitat has been designated for this species on USFS lands adjacent to the Park.

Other Wildlife Species of Special Concern

Bald Eagle (State Threatened)

The bald eagle (*Haliaeetus leucocephalus*) has a distinctive white head and white tail offset against a dark brown body and wings in adult birds. This raptor has large, pale eyes; powerful yellow beak; black talons; and a wingspan that reaches seven feet (USFWS 2006b). Bald eagles nest in large trees near open water that is not subjected to intense human activity (Stinson et al. 2001, as cited in NPS 2003). In Washington 99% of known nests are within one mile of a lake, river, or marine shoreline. Bald eagles need an environment of quiet isolation, tall mature trees, and clean waters (USFWS 1995). The breeding range of the bald eagle in North America is associated with aquatic habitats (coastal areas, rivers, lakes, and reservoirs) with forested shorelines or cliffs. Throughout their range, they select large, emergent, canopy trees (mostly conifers) that are open and accessible for roosting. Bald eagles winter primarily in coastal estuaries and river systems of the lower 48 states and Alaska (USFWS 2006b). Although bald eagles may range over great distances, they usually return to nest within 100 miles of where they were raised (USFWS 1995).

Bald eagles are opportunistic foragers, and their diet varies based on prey species available. They prefer fish, but eat a great variety of mammals, amphibians, crustaceans, and birds, including many species of waterfowl (USFWS 2006b). They feed on almost anything they can catch, such as ducks, rodents, snakes, and carrion. In winter northern birds migrate south and gather in large numbers near open water areas where fish or other prey are plentiful (USFWS 1995).

Bald eagles are resident throughout much of Olympic National Park. More than 50 nest territories on the Park coast are routinely monitored. The number of territories has increased substantially since 1980, as have the number of fledglings. In the interior of the Park, eagles are mainly observed foraging or as winter migrants, although several nests are known along inland lakes and rivers. Wintering habitat in the Park is typically along the Pacific coast and some inland rivers (NPS 2006a).

Olympic National Park is within two of Washington State's bald eagle recovery zones — the Washington coast and the interior Olympic Peninsula. The coastal zone is well above the goal of 74 occupied sites (151 sites were occupied in 1998), but usually below the target of more than 1 young fledged per occupied site (0.69 for 1993 to 1997). The Olympic Peninsula interior zone had 15 occupied sites in 1998, which was below the target of 17. However, nest search efforts in the interior have been limited (NPS 2005e).

Critical habitat for the bald eagle has not been designated at the Park, on USFS lands, or on WDNR lands. Bald eagles were delisted as federally threatened on June 27, 2007.

Northern Goshawk (Federal Species of Concern, State Candidate)

The northern goshawk is a large, raven-sized hawk with a long tail and short wings. It has a black crown and cheeks; a broad white stripe over the eye; a pale gray breast; and a darker gray back (USFWS 1998b). Northern goshawks are the largest species of the genus *Accipiter* (Pajerski 2005).

Throughout their range, northern goshawks can be found in coniferous and deciduous forests. Within goshawk home ranges on the Olympic Peninsula, the average habitat composition is late-seral forest. During their nesting period on the Olympic Peninsula, they prefer mature forest stands characterized by greater than 50% canopy cover, two or more canopy layers, gaps in the canopy, abundance of large diameter crowns, and shade-tolerant trees. The average canopy cover was 78% in occupied nest areas on the Olympic Peninsula. In western Washington, nests are typically built in Douglas-fir (*Pseudotsuga menziesii*) and, to a lesser extent, western hemlock (*Tsuga heterophylla*). Goshawks build fairly large, bulky stick nests that are usually placed in the lower third of forest canopy and relatively close to the tree trunk (WDFW 2004).

Nest sites are located in post-fledgling family areas, which are areas where adult females and developing juveniles concentrate after fledging and before dispersal. Family areas typically occur in structurally complex forests that provide foraging opportunities, as well as hiding cover for fledglings. In western Washington family areas occur in mature forests with a dense cover of trees and an abundant number of snags and downed logs (WDFW 2004).

Northern goshawks forage in a variety of forest types, although limited information is available for describing foraging habitat in Washington. In general appropriate foraging conditions include large trees with well-developed canopies and adequate flight space beneath the canopy for goshawk hunting. Goshawks are considered opportunistic foragers, as exhibited by the wide range of prey taken. Douglas squirrel, grouse, and snowshoe hares were the prey species most frequently represented in the diet of goshawks on the Olympic Peninsula. Chipmunks, other squirrels, and birds were also components of the goshawk diet (WDFW 2004).

Resident and migrant populations of northern goshawks occur in Washington, and can occur in any forested area throughout the state. As of 2003, there were 338 documented breeding territories in the state, although the exact number is not known because monitoring is not currently being conducted. About 10% of the documented breeding territories in Washington State occur on the Olympic Peninsula. The number of historical breeding sites lost due to habitat alteration and the number of new territories in suitable habitat are also unknown (WDFW 2004).

Mazama Pocket Gopher (Federal Candidate, State Threatened)

Mazama pocket gophers are small fossorial mammals that spend a large portion of their life underground. Pocket gophers forage on plant roots and above ground plant parts; however above ground vegetation is quickly transported to their burrows for consumption (Maser et al. 1981). On the Olympic Peninsula, Mazama pocket gophers inhabit high elevation subalpine meadows (Steinberg 1999).

Pileated Woodpecker (State Candidate)

Pileated woodpeckers are large woodpeckers that prefer deciduous or mixed mature forests. They occur in the northwestern U.S., parts of Canada, and the eastern U.S. (Robbins 1983). Fishers have been known to use old, unoccupied woodpecker nest sites and other hollowed out trees for rest and den sites (Aubry and Raley 2006). The remains of a female pileated woodpecker were recovered at a fisher rest site, and may indicate that fishers occasionally prey on this species (Lewis, pers. comm. January 4, 2007).

Migratory Birds

The Migratory Bird Treaty Act (16 USC 703–712) provides that it is unlawful to pursue, hunt, capture, or kill any non-game migratory bird, part, nest, egg, or product, manufactured or not. The USFWS allows vacant nests to be taken, but nests with active birds, young, or the presence of eggs must be left alone.

WILDLIFE AND WILDLIFE HABITAT

An estimated 289 avian, 77 mammalian, 13 amphibian, 29 freshwater fish species, and 4 reptilian species inhabit Olympic National Park (NPS 2006a), occupying habitats ranging from intertidal marine to alpine. A key wildlife resource in the Park is the assemblage of species that depend on old-growth coniferous forest for all or some of their habitat requirements. These forests are also the habitat historically occupied by fishers on the Olympic Peninsula. Therefore, this section focuses on those birds, mammals, and reptiles that occur in these habitats and may be affected by fisher restoration at Olympic National Park. A description of the fisher itself was provided in "Species of Special Concern" earlier in this chapter. Amphibians, fish, and fish habitat are not discussed because impacts from fisher restoration are not anticipated to those species.

BIRDS

Birds that are prevalent at Olympic National Park include American crow (*Corvus corvus*), common raven (*Corvus corax*), varied thrush (*Ixoreus naevius*), American robin (*Turdus migratorius*), winter wren (*Troglodytes troglodytes*), Steller's jay (*Cyanocitta stelleri*), gray jay (*Perisoreus canadensis*), ruffed grouse (*Bonasa umbellus*), blue grouse (*Dendragapus obscurus*), belted kingfisher (*Ceryle alcyon*), and a variety of warblers, woodpeckers, kinglets (*Regulus* spp.), and sparrows (NPS 2006a).

The sharp-shinned hawk (*Accipiter striatus*) and Cooper's hawk (*Accipiter cooperii*) are two common raptors that occur in the forests of Olympic National Park and may compete with fishers. The sharp-shinned hawk typically preys on small to medium-sized birds, but may occasionally eat small mammals, lizards, and insects. They usually nest in a tree crotch or on a branch next to the trunk, most often 10 to 59 feet above the ground, and they sometimes reuse old nests or squirrel nests. Cooper's hawks primarily eat medium-sized birds, but also some small birds, small ground-foraging mammals, and occasionally reptiles and amphibians. They typically build new nests on horizontal limbs near the trunk or in the crotch of a tree, approximately 20 to 59 feet above ground; they may also modify an old nest or nests of other animals, such as squirrels or crows (NatureServe 2006).

The barred owl, which was first sighted in Olympic National Park in 1985, has expanded its geographic range to include the Pacific Northwest (Happe, pers. comm.,July 13, 2005). Barred owls are currently monitored in an effort to determine the effects of its distribution on the northern spotted owl population in the Park. Barred owls are dominant in competitive interactions with spotted owls, and evidence from many areas suggests that barred owls displace spotted owls from otherwise suitable habitat (NPS 2005e). Barred owls occur in similar habitats as the fisher and prey primarily on mice, although they also eat other small mammals, birds, reptiles, amphibians, and invertebrates. They usually nest at least 23 to 26 feet above the ground in tree cavities; in abandoned nests of squirrels, crows, or hawks; or in top of hollow tree stubs (NatureServe 2006).

MAMMALS

As noted in chapter 1, Olympic National Park was originally established, in part, to protect the peninsula's population of Roosevelt elk (*Cervus canadensis roosevelti*). Olympic National Park supports high densities of Roosevelt elk (3000 to 5000 individuals) and lesser numbers of black tailed deer (*Odocoileus hemionus*; NPS 2006a). Both elk and deer winter in low elevation areas within the Park, with elk concentrating in floodplains of the west side drainages in what is predicted to be suitable fisher habitat. Ungulate populations in the Park are at carrying capacity, which is typified by low reproductive rates and greater proportions of older age individuals in the populations (NPS 2006a). A major source of mortality for deer and elk in the Park is winterkill, due to the undernutrition of older aged individuals (NPS 2006a). In addition to ungulates, other common mammals in the Park include black bears (*Ursus americanus*), shrews, squirrels, voles (*Microtus/Clethrionomys* spp.), woodrats (*Neotoma* spp.), mice, and snowshoe hares (*Lepus americanus*). More elusive mammals include the mountain lion, bobcat, coyote, mountain beaver, river otter, mink, and striped and spotted skunks (*Mephitis mephitis* and *Spilogale gracilis*) (NPS 2006a).

Four mammal species or subspecies that occur in Olympic National Park are endemic to the peninsula and may be impacted by the plan: Olympic yellow-pine chipmunks (*Tamias amoenus caurinus*), Olympic snow moles (*Scapanus townsendii olympicus*), Olympic ermines (*Mustela erminea olympica*), and Olympic marmots (NPS 2006a). Olympic yellow-pine chipmunks typically occur in brushy areas interspersed with herbaceous vegetation and conifer stands in subalpine and alpine environments. The Olympic snow mole is generally found in more open habitats in alpine and subalpine zones. The Olympic ermine is generally found in wooded areas but rarely occurs in heavily forested locations (NatureServe 2006). The range of Olympic marmots is extremely restricted; the species occurs only in alpine zones of the Olympic Mountains in the park and adjacent national forest wilderness. Fishers generally do not occur in the same habitat as Olympic yellow-pine chipmunks, Olympic snow moles, and Olympic marmots, as these species primarily occur in alpine habitats, and fishers are not expected to establish core territories in alpine zones. The range of fishers and ermines may overlap, but due to size differences, these two species are not expected to compete for prey. Therefore, impacts to these species from fisher restoration are not anticipated, and they are not analyzed further.

Besides the fisher, gray wolf is the other predator that was extirpated from the Olympic Peninsula. Due to the absence of these key predators in the Olympic Peninsula ecosystem, the wildlife community in the Park lacks its normal structure and function.

REPTILES

One lizard species, the northern alligator lizard (*Elgaria coerulea*), and three species of snakes, the common garter (*Thamnophis sirtalis*), northwestern garter (*Thamnophis ordinoides*), and rubber boa (*Charina bottae*) are found in Olympic National Park (NPS 2006a).

VISITOR USE AND EXPERIENCE

The Olympic Peninsula contains numerous recreational areas administered by federal, state, and county governments. Olympic National Park is considered the primary travel destination on the peninsula, and over 3.3 million people visited the Park in 2000, primarily from the Puget Sound area (NPS 2002). The Park is also said to have one of the highest overnight use rates of all parks in the country (NPS 2002). The 649,975-acre Olympic National Forest, almost completely surrounding the Park, has several developed campgrounds with 379 sites and an extensive trail network, some of which access the Park (NPS 2005a).

VISITATION

Visitation to Olympic National Park has fluctuated annually, mirroring trends experienced throughout the National Park System (NPS 1996b), as shown in table 6 and figure 5 (NPS 2006a).

Table 6: Annual Olympic National Park Visitation 1995–2005

Year	Number of visitors	Percentage Change
1995	3,658,615	Baseline
1996	3,348,723	-8.5%
1997	3,846,709	14.9%
1998	3,577,007	-7.0%
1999	3,364,266	-5.9%
2000	3,327,722	-1.1%
2001	3,416,069	2.7%
2002	3,691,310	8.1%
2003	3,225,327	-12.6%
2004	3,073,722	-4.7%
2005	3,142,774	2.2%
Average	3,114,508	0.3%

Source: NPS 2006c.

Most visitation occurs from June through September, with July and August receiving the highest number of visitors (NPS 2006a). As much as 67% of visitors come from the greater Puget Sound area, including the Olympic Peninsula (NPS 1996b).

Weekend visitation patterns in the off-season and daily patterns from June through September reflect the weather predictions for Puget Sound. The Park's 906 campsites and the nearly 2,400 campsites operated privately and by other government agencies are filled on major holidays and sunny weekends in the summer. Although weather can differ greatly from one area of the Park to another, radio and television predictions for the greater Seattle area seem to drive decisions of whether or not to visit the peninsula (NPS 1996b).

Because much of the Park is at lower elevations, visitors also come throughout the year. Although visitation is highest in August and lowest in the winter, the fall months of September and October have become more popular. Much of Olympic's winter visitation is to the coastal strip. Kalaloch, Mora, and Ozette all have year-round appeal as visitors are drawn, rather than driven away, by winter storm events and low tides. Winter visitors engage in the same activities as summer visitors on the coast and rain forests, but also participate in snow-related activities on Hurricane Ridge from December to April (NPS 1996b). Figure 6 shows monthly visitation trends.

Visitation is spread throughout the Park, with some areas drawing more visitors than others. Table 7 shows the total annual visitation to each of the Park's recreation areas for 2004. The average length of stay varies from as long as 3.5 days to only a quarter hour (NPS 1996b) and is less in the off-season (October-April) than during the summer. In the summer the average duration of stay increases, as campgrounds are open and more extensive overnight lodging is available. Day use visitors in the summer also tend to stay longer due to comfortable mountain temperatures, extended daylight hours, and less rain (NPS 2002). About 25% of Olympic visitors stay overnight, compared to a 10% average for overnight use in most national parks (NPS 1996b). Table 8 shows the number of overnight stays at Olympic National Park in 2005.

Table 7: Total Annual Recreation Visits by District, 2004

District	Recreation Visits	Visitor Center Contacts
Lake Crescent	1,194,401	15,947
Hoh	307,720	136,403
Mora	282,235	Not Applicable
Kalaloch	674,474	Not Available
Elwha	144,758	Not Applicable
Hoodsport	67,421	0
Hurricane	354,730	139,474
Ozette	95,316	Not Applicable
Quinault	297,313	3,082

Source: NPS 2006a.

Table 8: Overnight Stays at Olympic National Park, 2005

Concessioner Lodging	Concessioner Campgrounds	Tent Campers	RV Campers	Total RV/Tent Campers	Back-country Campers	Misc. Campers
62,476	6,117	110,320	79,633	189,953	80,520	2,228

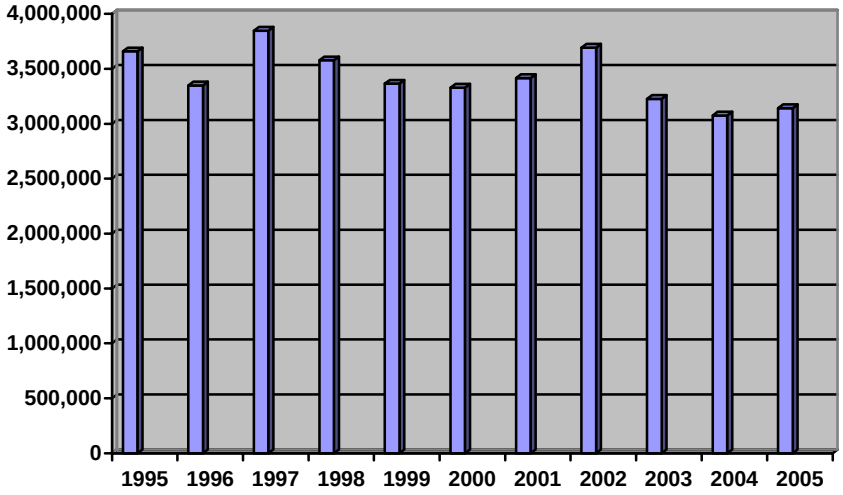
Source: NPS 2006c.

VISITOR ACTIVITIES

Olympic National Park is open for year-round public use, and the Park offers several campgrounds (the largest has 170 sites), nature trails, and visitor contact stations. Visitors come to enjoy the natural resources and social interactions, and to participate in recreational and educational opportunities. A full range of visitor activities, including fishing, wildlife viewing, camping, campfire programs, and ranger-led forest, subalpine, and tidepool walks are available. Evening programs are available at some Park locations in the summer. Primary recreational opportunities include hiking, backpacking, camping, picnicking, stock packing, sightseeing (by car and on foot), boating, fishing, snow recreational activities (downhill skiing, cross-country skiing, snowshoe excursions, and general snow play), and wildlife viewing (some of these activities are discussed in more detail under "Wilderness Use" below). Relatively few visitors use aircraft to view the Park (NPS 2002).

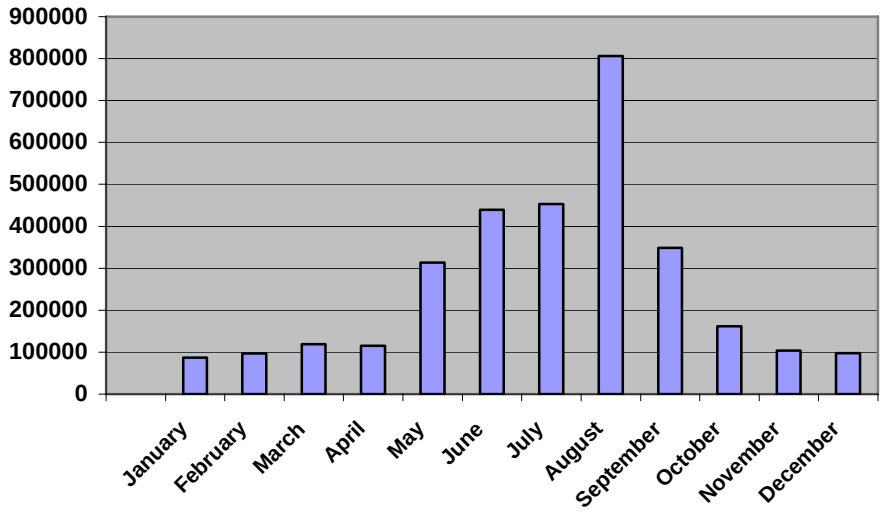
The most popular hiking areas on the Olympic Peninsula are in the Park and include cross-Park corridors such as the Elwha River, Quinault River, and Dosewallips River. The trail system includes 611 miles (978 km) of trail and 32 bridges, with hundreds of smaller spans and footlogs (NPS 2002). Sightseeing includes roadside and trailside wildlife observation, visits to museums and interpretive facilities, and the use of roadside scenic pullouts (NPS 2005a). The parkwide road system includes 69 miles (110 km) of paved roads and 99 miles (158 km) of graded roads (NPS 2002). Many areas contain developed day-use areas suitable for hiking, sightseeing, and picnicking (NPS 2005a).

Figure 5: Annual Olympic National Park Visitation 1995-2005



SOURCE: NPS 2006c.

Figure 6: Monthly Olympic National Park Visitation, 2005



Source: NPS 2006c.

Administrative sites in the Park include the headquarters complex, 16 frontcountry ranger stations (each a complex of buildings), 15 frontcountry campgrounds, 35 picnic sites, 3 visitor centers, 6 concession facilities (4 with overnight lodging), 6 backcountry patrol cabins, several ranger tent platforms, 28 three-sided shelters, and numerous pit-toilets (NPS 2002).

Visitor surveys conducted in 2000 at the Park indicate the following information about Park visitors (NPS 2006a):

- The most common activities were sightseeing / scenic driving (88%); walking on nature trails (77%); enjoying wilderness, solitude, and quiet (73%); viewing wildlife (72%); and hiking (71%).
- Of visitors who took all-day or half-day hikes, the most popular destinations included the Hoh Rain Forest, Hurricane Ridge, Sol Duc, Quinault, Lake Crescent, Rialto Beach, Kalaloch, Staircase, and Marymere Falls.
- The most used interpretive services included the Park brochure/map (91%), entrance station / information desks (65%), and trailhead bulletin boards (52%).
- About 78% of visitors indicated that their primary reason for visiting the Olympic Peninsula was to visit Olympic National Park.
- Most visitors (88%) indicated that they had made one or two visits to Olympic National Park during the last 12 months.
- Most visitor groups (69%) spent one day or more at the Park. Of those groups that spent less than a day at the Park, 65% spent five hours or less.
- Nearly half (47%) of U.S. visitors were from Washington state, 8% were from California, and the remainder were from other states and Washington D.C.

SOCIAL VALUES

Factors Affecting Public Attitudes and Perceptions of Wildlife

Extensive literature exists concerning general social attitudes and values towards wildlife, although no systematic surveys of information specific to the reintroduction of fishers to the Olympic Peninsula exist. For example, Kellert (1976) identified a number of distinct attitudes toward wildlife including aesthetic, dominionistic, ecologistic, humanistic, moralistic, naturalistic, negativistic, scientistic, and utilitarian (see table 9 for definitions).

Most people typically hold more than one attitude toward an issue and react differently in different situations. Nonetheless, it is possible to identify in most people predominant characteristics of a primary attitude toward an issue. For example, ranchers tend to have a utilitarian (value measured in terms of usefulness) attitude towards animals, while scientists tend to take a scientific view (Kellert 1976).

Table 9: People's Perceptions of Animals in American Society

Attitude	Key Identifying Terms	Highly Correlated With	Most Antagonistic Toward
Aesthetic	Artistic character and display	Naturalistic	Negativistic
Dominionistic	Mastery, superiority	Utilitarian, negativistic	Moralistic
Ecologistic	Ecosystem, species interdependence	Naturalistic, scientistic	Negativistic
Humanistic	Pets, love for animals	Moralistic	Negativistic
Moralistic	Ethical concern for animal welfare	Humanistic	Utilitarian, dominionistic, scientistic,
			aesthetic, negativistic
Naturalistic	Wildlife exposure, contact with nature	Ecologistic, humanistic	Negativistic
Negativistic	Avoidance, dislike, indifference, fear	Dominionistic, utilitarian	Moralistic, humanistic, naturalistic
Scientistic	Curiosity, study, knowledge	Ecologistic	None
Utilitarian	Practicality, usefulness	Dominionistic	Moralistic

SOURCE: Kellert 1976.

Public Values toward Wildlife

Wildlife resources and their habitats are managed for the benefit of the general public; thus, the human dimensions of wildlife conservation are important for understanding how and why these resources are managed. Conservation efforts that do not assess human attitudes, perceptions, economics, and values are likely to be unsuccessful, regardless of the quality of the biological science (Edge n.d.). Some values can be assigned a dollar amount, while others are less easy to quantify. Wildlife have both positive and negative values, as shown in table 10.

Table 10: Wildlife Values

Value	Definition	Characteristics
Positive Values		
Aesthetic	Related to an animal's inherent natural beauty or artistic appreciation of a species.	Difficult to assess or measure, but important to conservation. Wildlife in their native habitats have aesthetic value.
Recreational	Assigned to wildlife-related sports or hobbies.	Subdivided into consumptive and nonconsumptive. Hunting is the most common consumptive use of wildlife; birdwatching and photography are nonconsumptive uses.
Ecological	Related to the relationship of a species or group of species to its environment, community, or ecosystem.	Every species plays a role in its natural community and ecosystem. For example, deer and elk have the ability to influence successional patterns of plant communities.
Educational, Scientific	Related to learning and teaching about wildlife.	Wildlife can be used to teach principles of population dynamics, ecosystem management, harvest management, and endangered species management.
Utilitarian	Characteristics that make wildlife useful to humans.	Wildlife is used for food, clothing, and fiber. Wildlife is also used for medical purposes and biomedical research.
Commercial	Qualities that make wildlife economically valuable.	Commercial markets include meat, fur, leather, parts, and exotic pet trade; often leads to a decline in the species.
Negative Values		
Accidents	Related to accidents involving wildlife.	Automobile collisions with animals such as deer usually result in the death of the animal and substantial property damage and injury to drivers.
Property Damage	Related to crop, livestock, and property damage caused by wildlife.	Birds and mammals cause damage to crops in rural, farm, or developed areas. For example, predators kill livestock and deer eat vegetation and landscaping.
Disease Transmission	Related to diseases transmitted to humans.	Wildlife can act as reservoirs for diseases that affect both livestock and humans, such as Lyme disease.

SOURCE: Edge n.d.

Several of the values listed above apply to fisher reintroduction efforts at Olympic National Park.

- *Aesthetic:* Many visitors may enjoy seeing an extirpated species that has been returned to its original habitat.
- *Recreational:* Visitors such as photographers may enjoy the opportunity to photograph a species that has not been in the Park for many years.
- *Ecological:* Fishers have a role in the forest ecosystems of the Olympic Peninsula.
- *Educational:* The Park provides visitors with environmental learning opportunities, and a restored population of fishers could enhance those opportunities.
- *Commercial:* No commercial value would apply to the restored population, although in the past fishers were trapped for their fur.
- *Accidents:* Vehicle collisions with fishers could occur but is not likely to cause substantial damage to motor vehicles, although such collisions could be fatal to fishers.
- *Property damage:* Fishers could prey on small domestic animals.
- *Disease transmission:* Fishers are susceptible to diseases and parasites, but due to the remoteness of the reintroduction area, fishers are unlikely to contact disease or parasites from domestic animals.

Public Values Concerning Fisher Reintroduction at Olympic National Park

The following social values from the table above were identified as important to the public during the public scoping process.[1]

Aesthetic and Ecological

Numerous comments from the public expressed a desire to enhance the area's ecosystem by restoring fishers, such as:

- "Return of the fisher would strengthen the biotic web and enrich visitors, whether or not they were privileged to encounter the animal."
- "I would love to see this beautiful animal back in our area."
- "Put them back as God placed them in the first place. Keep things in the natural course of events."
- "The reintroduction of the fisher makes good sense from the point of view that these animals are part of the natural ecosystem in this region."
- "They were there until we exterminated them, and it is high time we did everything we possibly can to return them to their rightful place in the environment of the park."
- "We must fill this niche left by this known keystone species."
- "You might think this strange coming from a hunter, but I believe in natural balance, and our species has done more to unbalance nature than any other force."

1. Public comments identified several other issues that are not directly related to the "Wildlife Values" list included in Table 9; these issues are analyzed under more appropriate topics, such as "Socioeconomic Resources." More information about public involvement is included in Chapter 5 — "Consultation and Coordination."

Some people perceived that the ecological balance would be compromised, and concerns about the spotted owl were specifically mentioned:

- "The fisher has the potential to become a greater threat to ecological balance and direct competition to the endangered spotted owl and other species of birds."
- "The current wildlife has existed and changed over this period without the presence of the fisher. Reintroduction could offset this established balance."
- "After 70 years of no fishers it seems like the species has naturalized out of the system, that other species no longer have the ability to co-habitat with fishers."
- "Certainly after 100 years a new balance has long since 'naturally' occurred and reintroduction will actually create an unnatural balance."
- "Will the fisher reintroduction reduce the prey base vital to existing spotted owl populations?"
- "What are the interactions between fishers and northern spotted owls?"
- "The areas where you are proposing the introductions have high concentrations of owls . . . so there is more likelihood that fishers and owls would interact."

Recreational

Many comments expressed the importance of fishers from a recreational viewpoint, such as:

- "I have fished in Olympic National Park . . . and while I have enjoyed myself greatly on these occasions I'd prefer for you to choose to move the Park closer to an intact ecosystem by reintroducing fishers, even if that means lessening the number of fish available for catching by visitors."
- "Fishers are an important and missed wildlife species in this state. . . . I look forward to the possibility of seeing a fisher some day in the Park."

One commenter doubted the importance of fishers on visitor experience:

- "Its overall impact to the Park visitor's experience is negligible at best. Said visitors probably would have a greater interest in efforts by the [Park] to improve decaying infrastructure, ensuring the existence of evening and weekend educational programs, and addressing visitor services."

Property

Some members of the public expressed concern about fishers preying on small domestic animals and pets (this issue is addressed under "Socioeconomic Conditions" in this chapter):

- "I lived in Maine previously and we had many problems with people losing their pets to fishers. They are a threat to domestic animals. I . . . do not want fishers in my area because they kill pets."
- "[Fishers] probably prefer lowlands out of the Park with better climate and more chickens, ducks, and cats to prey on."
- "If livestock (i.e., chickens) becomes a victim of fishers, what is the state going to do about it? Are we going to be reimbursed?"

At least one pet owner supports fisher reintroduction:

- "I support the reintroduction of fishers into the [Park] (although it sounds like they will likely eat my cats)."

Disease Transmission

One commenter expressed concern about disease:

- "Are fishers susceptible to diseases, such as distemper, and do they have their own types of diseases?"

WILDERNESS VALUES

About 95% of the Park (876,669 acres) is designated as wilderness, with another 378 acres designated as potential wilderness additions (NPS 2006a). Wilderness generally excludes developed areas and road corridors (NPS 1996b). In accordance with the Wilderness Act of 1964, wilderness areas "shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness" (16 USC 1131) (NPS 2002). Among other mandates are the protection of wilderness areas and the preservation of their wilderness character. Wilderness characteristics are defined in the Wilderness Act, as described below:

- The earth and its community of life are untrammeled by humans, where humans are visitors and do not remain.
- The area is undeveloped and retains its primeval character and influence without permanent improvements or human habitation.
- The area generally appears to have been affected primarily by the forces of nature with the imprint of humans' work substantially unnoticeable.
- The area is protected and managed so as to preserve its natural conditions.
- The area offers outstanding opportunities for solitude or a primitive and unconfined type of recreation. (This wilderness characteristic is addressed under "Soundscapes.")

The Park's interior wilderness offers a variety of pristine resources and unique and interdependent communities, including old-growth forests, subalpine lake basins, and glacier-covered mountain peaks (NPS 2006a). Visitors can experience a variety of opportunities, from hiking on well-maintained trails, to exploring the remote, isolated deep interior of the wilderness, where map and compass skills are necessary. Day hiking, backpacking, camping, fishing, and mountaineering are the principal wilderness activities (NPS 1996b). The majority of backcountry visitors use the trail system; however, a small percentage prefers to travel cross-country. Most backcountry use occurs during the relatively dry summer months (NPS 2002). A number of visitors participate in wilderness mountaineering and alpine scrambling. Non-technical scrambling, glacier travel, and off-trail high elevation traverses are popular activities. Opportunities are also available for hand-powered boating and stock use. Stock use accounts for only 1.5% of visitor use nights in the wilderness. Stock teams are also used extensively for administrative activities in wilderness and support activities, such as trail facility and maintenance (NPS 2006a).

The interior of the Park accounts for approximately 60% of the overnight use of wilderness (the remainder occurs in the coastal portion of the Park). Parkwide, the majority of overnight use occurs on Friday and Saturday nights (40%), and in July and August (49%) (NPS 1996b).

Overnight use of the wilderness reached a high of 124,000 visitor nights in 1995 (NPS 1996b). In the late 1990s, use decreased from the overall high by about 25% (NPS 2006a). In 2000, 34,648 overnight visitors used the Park's wilderness; in the backcountry, stays ranged from one night to two weeks. Backcountry use included 11,907 parties and totaled 81,218 visitor use nights. Group size comprised of six or more

people on 5.4% of the trips, while groups of two people accounted for 51.5% of the trips. By 2003, use levels were approaching 94,500 visitor use nights (NPS 2006a).

Few accurate figures are kept on wilderness day use. It is quite substantial, probably exceeding overnight use several times over. Day use ranges from short walks on nature trails to occasional one-day "marathon" cross-park hikes (NPS 2006a).

The Park's trails (and bridges) are the most conspicuous human imprint on the wilderness. There are a total of 635 miles of trail in 12 major river drainages in the Park; approximately 90% of which are within the Park's wilderness. Several structures are maintained in the wilderness, primarily along trail corridors, such as ranger stations, shelters, and administrative and emergency facilities. Over 1,300 campsites are scattered throughout the wilderness (NPS 2006a).

Commercial services that contribute to public education and the visitor enjoyment of wilderness values are provided within the Park. Some of these services include day hiking, backpacking, and climbing guides; horse, llama, and mule packers; photography; and education and wilderness skills (NPS 2006a).

The Wilderness Information Center, Park visitor centers, information stations, and ranger stations provide wilderness information to Park visitors. Rangers, volunteers and Student Conservation Association employees provide on-site education to Park visitors.

SOUNDSCAPES

The NPS *Management Policies 2006* require the NPS to preserve the natural soundscapes of the Park (natural soundscapes exist in the absence of human-caused sound) (NPS 2006b, sec. 4.9). In addition, The Wilderness Act lists several characteristics that define wilderness, one of which states, "The area offers outstanding opportunities for solitude or a primitive and unconfined type of recreation." As previously mentioned, about 95% of the Park (876,669 acres) is designated as wilderness, and another 378 acres are designated as potential wilderness additions (NPS 2006a). This acreage generally excludes developed areas and road corridors (NPS 1996b). The Olympic Wilderness is managed in accordance with applicable federal laws, regulations, policies, and plans, including the Wilderness Act of 1964, NPS policies for wilderness preservation and management policies (NPS 1999), and the Olympic National Park *Master Plan* (NPS 1976); a wilderness management plan is being prepared.

NOISE LEVELS

Noise is defined as an unwanted sound. Sounds are described as noise if they interfere with an activity or disturb the person hearing them. Sound is measured in a logarithmic unit called a decibel (dB). Since the human ear is more sensitive to middle and high frequency sounds than to low frequency sounds, sound levels are weighted to reflect human perceptions more closely. These "A-weighted" sounds are measured using the decibel unit dBA (Kelso and Perez 1983; FHWA 1995). Table 11 illustrates common sounds measured in decibels.

Table 11: Sound Level Comparison Chart

Decibels	How it Feels	Equivalent Sounds	Sound Levels in Olympic National Park
180		Rocket Launching Pad	
160	Instant perforation of ear drum		
140	Near permanent damage from short exposure	Large caliber rifles (e.g., .243, 30-06); jet plane; gunshot blast	
130	Pain to ears	.22 caliber weapon; riveting steel tank, stock car races, air raid siren, jack hammer	Any construction activities that involve a jack hammer or equally loud equipment.
120		Automobile horn, chain saw, pneumatic drills, ambulance siren	Timber harvesting activities near the park's boundaries.

Decibels	How it Feels	Equivalent Sounds	Sound Levels in Olympic National Park
100	Very loud	Air compressor at 20 feet; garbage trucks and city buses, Boeing 740 jet plane at 4 miles from takeoff.	Trucks traveling on U.S. 101; bulldozers on the Finely Creek streambed.
95	Conversation stops	Power lawnmower; diesel truck at 25 feet; woodworking shop	Trucks traveling on U.S. 101.
90	Intolerable for phone use; sustained exposure may result in hearing loss	Steady flow of freeway traffic; 10 HP outboard motor; garbage disposal; helicopter takeoff at 0.25 mile	Steady traffic on U.S. 101; helicopter at approximately 1,500 feet.
85		Handsaw	Construction activities with hand tools.
80-85		Noisy restaurant	Crowded visitor center; automobile at about 50 feet traveling 35 mph.
75		Busy traffic; Cessna 152 4-cylinder engine airplane at 0.25 mile.	Traffic on nearby roads and highways; small fixed-wing aircraft at about 1,500 feet.
70		Drilling rig at 200 feet; window air conditioner outside at 2 feet	Busy campground.
66		Conversation	Visitors talking to each other; natural sounds of the coastal beach.
60	Quiet	Window air conditioner in room; sewing machine	Quiet visitor center with few or no visitors.
50	Sleep interference	Average home; bird calls; refrigerator; washing machine; large office	Moderate rainfall, bird calls.
40		Quiet office; library; quiet residential area	Hiking along a quiet trail.
30		Soft whisper	Quiet area in natural environment; natural sounds in the rain forest.
20		Quiet house at midnight; whispering at five feet	Leaves rustling.
10		Normal breathing	

Note: Modified from *Final Environmental Impact Statement,* Miccosukee 3-1 Exploratory Well, Broward County, Florida (U.S. Department of the Interior n.d.); Musani n.d.; Galen Carol Audio n.d.; Dumond 2000; League for the Hard of Hearing 2003; and FAA 2005a.

Nearly all agencies and organizations with authority over noise-producing sources (including the World Health Organization and the National Research Council) use 55 dB as the threshold for defining day-night noise levels in urban areas. Many of these organizations recommend a lower threshold for sparsely populated suburb and rural residential areas, and a 10 dB reduction for rural areas (Schomer 2001).

The threshold of perception of the human ear is approximately 3 decibels, and a 5-decibel change is considered to be clearly noticeable. When decibels are doubled, the sound does not become twice as loud. Rather, a 10 dB increase in the measured sound level is typically perceived as being twice as loud, and a 10 dB decrease is perceived as half as loud (Minnesota Pollution Control Agency 1999; endpcnoise.com n.d.).

Many factors affect how an individual responds to noise. Primary acoustical factors include the sound level, its frequency, and duration. Non-acoustical factors also play a role in how an individual responds to sounds. These factors vary from the past experience and adaptability of an individual to the predictability of when a noise may occur. The listener's activity also affects how he/she responds to noise (Mestre Greve Associates 1992).

NOISE ATTENUATION

A number of environmental factors mitigate noise emissions in the environment, including absorption of sound by the air and the effect of barriers (structures), hills, and trees on the emitted noise. However, the most important of these factors is likely the distance between the source and the receiver (OPTI Canada Inc. / Nexen Canada Ltd. 2002).

Distance

Noise levels depend on the distance from the noise source and the attenuation of the surrounding environment. As a sound wave travels through space, the intensity of the sound wave decreases with increasing distance from the source (Henderson n.d.). When the distance from a point source is doubled, the sound level decreases 6 dB, which constitutes a "clearly noticeable change," as shown in table 12 (Minnesota Pollution Control Agency 1999; Komanoff and Shaw 2000; OPTI Canada Inc. / Nexen Canada Ltd. 2002). For example, if a sound level is 95 dB at 50 feet, it will be 89 dB at 100 feet, and 83 dB at 200 feet.

Table 12: Perceptions of Increases in Decibel Level

Amount of Change	Decibel Level
Imperceptible Change	1 dB
Barely Perceptible Change	3 dB
Clearly Noticeable Change	5 dB
About Twice (or Half) as Loud	10 dB
Fourfold Change	20 dB

SOURCE: Minnesota Pollution Control Agency 1999.

Air Absorption

As sound passes through the atmosphere it collides with air molecules, converting some of the energy into heat, which decreases the sound energy. The amount of energy that the atmosphere absorbs varies with the weather conditions and the frequency of the sound. The atmosphere can reduce sounds by as much as 3 dBA for every 100 feet, depending on weather conditions (OPTI Canada Inc. / Nexen Canada Ltd. 2002).

Barriers and Hills

Barriers (such as buildings and other structures) and hills can also attenuate sound in the environment. As sound waves "bend" around obstructions, they lose energy. Therefore, people usually do not hear sounds from sources that are behind hills or buildings. The amount of attenuation provided by an obstruction depends on how much the sound waves bend. This attenuation is greatest closest to the source, but is less effective at greater distances (OPTI Canada Inc. / Nexen Canada Ltd. 2002). Olympic National Park has few built structures, but the terrain is often hilly, as the elevation varies throughout the Park.

Trees

Vegetation can help decrease noise, although not as effectively as barriers. A stand of trees provides a good deal of attenuation if they are over 100 feet (30 meters) tall. Vegetation must be so high, wide, and dense that it cannot be seen through, and taller than the noise source in order to be effective (FHWA 1995; OPTI Canada Inc. / Nexen Canada Ltd. 2002). Many areas of Olympic National Park are heavily vegetated, and some of the Sitka spruce and western hemlock trees (which are the dominant species in the Park) can grow to 300 feet in height and 23 feet in circumference. Nearly all of the Park's space is occupied by thick and protective vegetation (NPS n.d.b).

AIRCRAFT NOISE

A small fixed-wing aircraft that might be used for fisher telemetry monitoring, such as a Cessna 172, emits approximately 74 dBA at about 1,500 feet. When flying over uncongested areas, the Federal Aviation Administration (FAA) requires pilots to fly at a minimum altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure. When flying over congested areas, pilots must

fly at an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft (FAA 2005a, b).

A helicopter, which might be used to release fishers or to retrieve dead animals, generally emits about 90 dBA, with slight fluctuations in takeoff, flyover, and approach, at approximately 1,500 feet. Helicopters may be operated at less than the minimums prescribed for fixed-wing aircraft if the operation is conducted without hazard to people or property on the surface (FAA 2005a, b).

AUTOMOBILE NOISE

Fishers may be released and monitored from roads, which could increase vehicular use in the Park. Vehicle noise is a combination of the noises produced by the engine, exhaust, and tires (FHWA 1995). The noise made by a motor vehicle depends on basic vehicle design, whether the vehicle's exhaust system has become defective with use, whether the vehicle's exhaust system has been modified, and how the vehicle is operated (Miller 1982).

Generally, loudness is increased by heavier traffic volumes, higher speeds, and a greater number of trucks, as well as defective mufflers or other faulty equipment on vehicles. Any condition (such as a steep incline) that causes heavy laboring of motor vehicle engines also increases noise levels. Other, more complicated factors affect the loudness of traffic noise. For example, as a person moves away from a roadway, noise levels are reduced by distance, terrain, vegetation, and natural and manmade obstacles, as discussed above (FHWA 1995).

Most U.S. manufactured passenger automobiles having 8- or 6-cylinder engines, as measured along roads with speed limits of 35 mph or less, produce maximum passby sound levels between 60 dBA and 75 dBA. The mean level, based on a study of 3,936 vehicles, was 67.9 dBA (Miller 1982). Federal regulations define maximum allowable noise levels for motor vehicles, as shown in table 13.

Table 13: Maximum Permissible Sound Level Readings

Distance between Listener and Vehicle	Decibels (dB(A))			
	Soft Site*		Hard Site**	
	35 mph or less	Above 35 mph	35 mph or less	Above 35 mph
31–34 feet	87	91	89	93
35–38 feet	86	90	88	82
39–42 feet	85	89	87	81
43–47 feet	84	88	86	80
48–57 feet	83	87	85	89
58–69 feet	82	86	84	88
70–82 feet	81	85	83	87

SOURCE: USDOT n.d.

* Soft site means that the ground surface is covered with grass, other ground cover, or similar absorptive material for one-half or more of the distance between the listener and the vehicle.

** Hard site means that the ground surface is covered with concrete, asphalt, packed dirt, gravel, or similar reflective material for more than one-half the distance between the listener and the vehicle.

Table 14 shows the decibel levels where noise abatement must be considered for different types of activities, as determined by the U.S. Department of Transportation. The criteria are only used as absolute values which, when approached or exceeded, require the consideration of traffic noise abatement measures (FHWA 1995).

Table 14: Noise Abatement Criteria Hourly A-Weighted Sound Level (dBA)

Decibels	Type of Area
60 (Exterior)	Category A: Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
70 (Exterior)	Category B: Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
75 (Exterior)	Category C: Developed lands, properties, or activities not included in Categories A or B above.
55 (Interior)	Category D: Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

SOURCE: FHWA 1995.

NOISE LEVELS AT OLYMPIC NATIONAL PARK

Olympic National Park is one of the best examples of a natural soundscape found anywhere in the National Park System, and natural sounds are part of the biological or physical resources of the Park. Natural sounds generally predominate throughout the backcountry wilderness, and therefore throughout most of the Park. Extensive sound studies have been conducted at the Park, and measurements of the Park's sound levels are as follows (Hempton n.d.):

alpine environment — 25 dBA
rain forest — 30 dBA
coastal beach — 65 dBA
lakeshore — 45 dBA

These readings can vary by season due to water levels, number of birds, and insect activity. For comparison, a conversation between two people standing 3 feet apart averages 55–65 dB, and a typical outdoor urban setting is in the 70–85 dBA range (NPS 2006a).

Some natural sounds are part of the biological or physical resources of the Park. Examples of such natural sounds in Olympic include (NPS 2006a):

- sounds produced by birds, frogs, or insects to define territories or attract mates
- sounds received by animals to detect and avoid predators or other danger
- sounds produced by physical processes, such as wind in the trees, ocean waves, flowing streams, or thunder

The primary human-caused sounds are usually confined to developed areas and along major roads. Brakes used by logging trucks on U.S. 101 at Lake Crescent are a common source of noise, although it is illegal to use brakes in this area. The level of noise varies by location and time of year (relating to number of visitors). In certain areas, such as beside a major river, the natural sound level is great enough to overcome high levels of human sounds. Some threats to natural soundscapes come from lands adjacent to the Park boundaries, such as noise from logging or construction activities, NPS project-related aircraft, and non-NPS aircraft, such as military, commercial, and private sector aircraft (the William R. Fairchild International Airport is located in the western end of Port Angeles) (NPS 2006a).

SOUNDS WITHIN WILDERNESS AND DEVELOPED AREAS

As mentioned earlier, wilderness areas "offer outstanding opportunities for solitude." Areas of the Park lying outside designated wilderness include lands north of Lake Crescent, south of the Queets road, the north shore of Lake Quinault, areas east of the North Fork Quinault Road and north of the Graves Creek Road, and Park lands west of the Staircase Road (see the figure 1). An area in the vicinity of Kalaloch is

non-wilderness and is administered primarily for recreational purposes (NPS 2006a). In addition, major road corridors with 200-foot buffers extending from the centerline, minor road corridors with 100-foot buffers, developed areas (such as campgrounds and lodges), and private lands or inholdings are not within designated wilderness (NPS 2006a).

If helicopters are used for fisher release or carcass retrieval, they would primarily be staged from the local regional airports outside the Park, including Port Angeles and Forks airports. Sweets Field and Lewis Ranch would be used as back-up staging locations during foggy weather conditions. Sweets Field is one of the few landing areas in the Park that remains somewhat open and clear in bad weather conditions, and frequently functions as a safe zone for helicopter flights to retreat to when cloudy conditions overtake the high country. The Elwha Sweets Field area is non-wilderness land surrounded by wilderness. It is approximately 2 miles south of U.S. 101 on the east side of the Olympic Hot Springs Road, just south of the Park boundary (NPS 2003). Lewis Ranch is also non-wilderness and is located on private land outside the Park in the Hoh Valley. In addition, fixed-wing aircraft would be used for fisher monitoring 3 times per month. Fixed-wing aircraft would be staged out of the airports in Port Angeles or Forks.

Sweets Field serves as the primary helicopter landing area servicing the interior of Olympic National Park, particularly for the Hurricane Ridge and Elwha districts, and is used for most fire, search-and-rescue, and backcountry maintenance flights. The Park typically uses Sweets Field for five to seven operations per year (approximately 10 to 11 days per year on average).

In addition to NPS project-related aerial operations, non-NPS aircraft, such as military, commercial, and private sector aircraft, fly over the Park's wilderness. The quality of the wilderness experience is currently being impacted by air traffic, especially on the east side and along the coast (NPS 2006a). Very few (one or two) commercial air tour operators exist at Olympic National Park. The Park is expecting to prepare an air tour management plan in upcoming years. Because the weather is so unpredictable (clouds, rain, and fog are common), there has not been a demand for Park overflights. Frequent commercial transportation flights that occur (at high altitude) and the noise they create currently appear to have a greater effect on the Park's wilderness character than air tours (Hendricks, pers. comm. May 22, 2006).

Section 6.3.6 of the NPS *Management Policies 2006* states, "All management decisions affecting wilderness must be consistent with a minimum requirement concept" (NPS 2006b). If fisher reintroduction is found to be appropriate and necessary, then the appropriate tool or technique is the one that causes the least amount of impact to the physical resources and experiential qualities in a wilderness, including aircraft use (NPS 2002).

NEIGHBORING LANDOWNERS

Olympic National Park is surrounded by a complex network of management agencies, Native American reservations, and private landowners (NPS 1996b), including large timber land companies (NPS 2003). All timber company tracts within the park have been acquired (NPS 1996b). All landowners surrounding the Park are subject to the provisions of the Endangered Species Act.

The management of biological resources outside the Park occurs through a variety of managers (NPS 1996a). A large percentage of the lands immediately surrounding the Park (approximately 60%, excluding the coastal strip) are managed by the USFS, primarily to the east and south of the Park (NPS 1995). Most of the USFS lands to the east of the Park contain wilderness areas along the Park's boundaries, where the provisions of the Wilderness Act prohibit commercial enterprises and permanent roads. Smaller wilderness areas also border the Park along parts of USFS lands south of the Park. WDNR and USFS lands primarily border the Park's western boundary. State, private, and small pockets of USFS land lie north of the Park (see figure 7).

Twenty-five percent of the Olympic Peninsula (566,800 acres) is considered suitable fisher habitat. Of this amount, 85% is on federal land (primarily in Olympic National Park and Olympic National Forest) and 8% is on state land (Lewis and Hayes 2004) as shown in table 15.

Table 15: Landownership on the Olympic Peninsula

	Landownership on the Olympic Peninsula		Amount of Suitable Fisher Habitat on the Olympic Peninsula (25% of the peninsula)	
Landowner	Acres	Percentage	Acres	Percentage
National Park Service	865,588	38%	297,228	52%
U.S. Forest Service	617,487	27%	184,494	33%
Washington Department of Natural Resources	277,307	12%	47,464	8%
Private	403,348	18%	27,577	5%
Tribal	127,057	6%	9,464	2%
Other	8,520	<1%	573	<1%

SOURCE: Lewis and Hayes 2004.

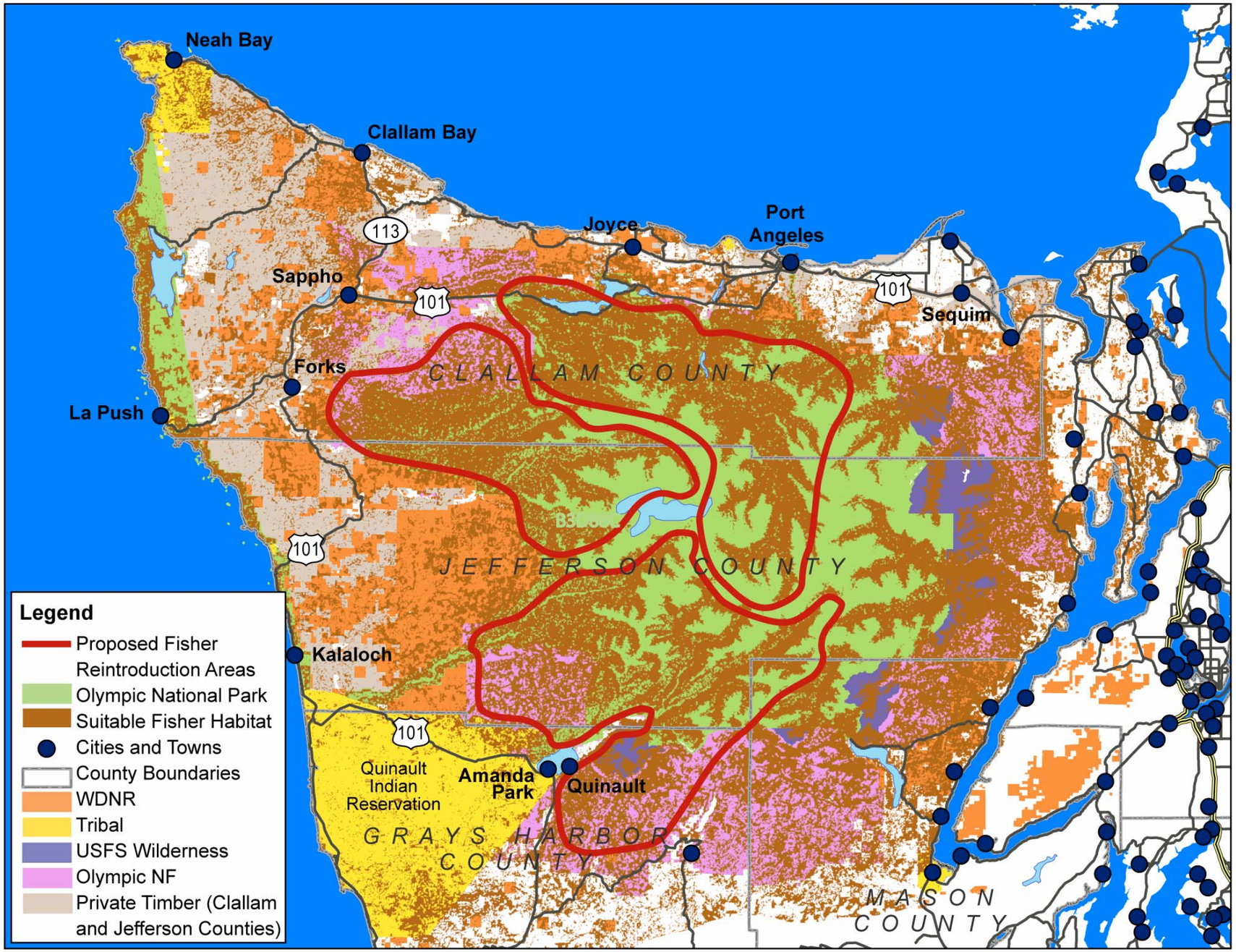
U.S. FOREST SERVICE

Wildlife populations in Olympic National Forest are administered by the WDFW (NPS 1995). As a signer of the Memorandum of Understanding for the *Northwest Forest Plan* (see "Chapter 1 – Purpose of and Need for Action" for more details), the USFS agreed to a framework and system of standards and guidelines for forest management based on an ecosystem approach to address resource management. These standards and guidelines were attached to the 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl*. The document specifies that resource management and the quantity of timber offered for sale "will reflect the implications of these standards and guidelines and the land allocations." It presents a combination of land allocations managed primarily to protect and enhance habitat for late-successional and old-growth forest related species, and standards and guidelines for the management of the land allocations (REO 2005).

To protect federally listed threatened and endangered species, such as the northern spotted owl and the marbled murrelet, ground-disturbing activity (including timber harvests, road construction, and other activities that generate above-ambient noise during the nesting season of federally listed species) in national forests that could potentially harass and harm listed species often have area and seasonal operation restrictions to reduce the effects of these activities on listed species. As a result, activities can only occur during certain times of day and year (such as non-nesting periods), so it may take longer to complete some timber harvesting projects. The continuation of these timing restrictions would most likely continue to affect project implementation, which can reduce the volume of timber harvesting that is carried out (USFS 2006).

The USFS Manual defines the status of species on USFS lands (*Forest Service Manual* 2670.22). The USFS lists the fisher as a "sensitive" species, which is defined by the agency as any species for which the regional forester has determined there is a concern for population viability within the state, as evidenced by a substantial current or predicted downward trend in populations or habitat (Montana Natural Heritage Program n.d.). Conservation measures for sensitive species are under the discretion of the line officer (the district ranger or the forest supervisor), who makes the decision to allow or disallow impacts to the species. However, decisions about surveys or conservation measures must not result in loss of species viability or the creation of trends toward federal listing (Piper, pers. comm. October 13, 2006).

Figure 7: Land Use Surrounding Olympic National Park



Conservation measures that have been applied in other national forests that support fishers would be applied to the Olympic National Forest should fishers be reintroduced. Seasonal restrictions would be applied on motorized, mechanized activities within 0.25-mile (adjustments for the buffer distance would be based on local conditions, such as topography) of a known, active fisher den site from mid-March to late May (USFS 2001).

WASHINGTON DEPARTMENT OF NATURAL RESOURCES

The WDNR manages over 364,700 acres on the Olympic Peninsula, primarily for timber production. WDNR policy "indicates prudence" in "managing state lands so as to help prevent the listing of additional species as threatened or endangered" (WDNR 1997). As noted in chapter 1, the department has developed a multispecies habitat conservation plan to continue forest management activities on state trust lands while complying with the federal Endangered Species Act (WDNR 1997). A habitat conservation plan allows private landowners to develop land occupied by listed species provided that they undertake conservation measures. The "No Surprises Policy" assures participating landowners that they would incur no additional mitigation requirements beyond those they agreed to in their habitat conservation plans, even if circumstances change or additional species are subsequently listed (USFWS n.d.a). Habitat conservation plans can include conservation measures for candidate species, proposed species, and other species of concern at the time a plan is developed.

The Department of Natural Resource's 1997 multispecies habitat conservation plan protects the private timber companies to whom the state leases land for timber harvest. The state plan also covers state trust lands managed by the agency within the range of the northern spotted owl, and the fisher is covered under this plan (WDNR 1997; Lewis and Hayes 2004).

The combination of conservation strategies included in the WDNR habitat conservation plan for listed species is expected to provide forest conditions suitable for fisher breeding, foraging, and resting habitat by ensuring the development of large landscapes of mature and old-growth forest. To meet the plan's objective of providing habitat to support fishers, additional mitigation was necessary to ensure the reproductive success of breeding adults in WDNR-managed forests. In particular, special management was identified to minimize human disturbance around active den sites and to eliminate trapping mortality. This includes restrictions placed by the department on its contracts for the sale of timber and other valuable materials, as well as in its grants and rights-of-way and easements, to prohibit activities within 0.5 mile of a known active fisher den site between February 1 and July 31 where such activities would appreciably reduce the likelihood of denning success (WDNR 1997).

Conservation measures defined in the habitat conservation plan for large snags and large, structurally unique trees ensure that elements required by fishers for denning and resting are retained (WDNR 1997).

PRIVATE LANDOWNERS

As shown in table 15, 18% of land on the Olympic Peninsula is privately owned; 5% of that private land is considered suitable fisher habitat. The majority of private timber lands in Clallam County occur west of the Park; none have been identified east of the Park, and a few occur north of the Park. Some private timber companies in Jefferson County exist east of the Park, but most are to the west (as shown in figure 7), which is also where fishers would most likely be released (see the "Socioeconomic Conditions" section for more information about these counties). Figure 7 shows the private timber lands that abut Olympic National park just south of U.S. 101 east of Sappho. Larger parcels west of this area occur north of the Sitkum River and south of U.S. 101 and are surrounded by the Olympic National Forest. Some private timberlands also abut the Park near the county line between Clallam and Jefferson counties. The majority of remaining private timberlands are west of U.S. 110 and Highway 113.

NATIVE AMERICAN TRIBES

Tribes Associated with Olympic National Park

Eight federally recognized tribes have traditional associations with the Olympic Peninsula — the Lower Elwha Klallam, Jamestown S'Klallam, Port Gamble S'Klallam, Skokomish, Quinault, Hoh, Quileute, and Makah (NPS 2006a). There is a special relationship between federally recognized Indian Tribes and the federal government. Executive Order 13084 of May 14, 1998, addresses consultation and coordination with Indian Tribal Governments as follows (NPS 2006a):

> The United States has a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, executive orders, and court decisions. Since the formation of the Union, the United States has recognized Indian tribes as domestic dependent nations under its protection. In treaties, our Nation has guaranteed the right of Indian tribes to self-government. As domestic dependent nations, Indian tribes exercise inherent sovereign powers over their members and territory. Olympic National Park will continue to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, trust resources, and Indian tribal treaty and other rights.

These treaties secured certain rights to the tribes in exchange for Indian cession of lands that are now within the boundaries of Olympic National Park. The treaties were not a grant of rights to the Indians, but a grant of rights from them, and a reservation of those rights not granted (*United States v. State of Washington,* 384 F. Supp. 312 [1974]: 323). These reserved treaty rights were recognized and included in section 4 of the bill to establish Olympic National Park (H.R. 4724) in 1938. This section stipulates that "the rights reserved by treaty to the Indians of any tribe . . . shall not be affected by the establishment of the National Park." The three peninsula treaties secured the rights of the eight tribes to take "fish at usual and accustomed grounds and stations . . . together with the privilege of hunting and gathering roots and berries on all open and unclaimed lands" (NPS 2006a).

Of the eight tribes listed above, the Quinault Tribe, with a reservation southwest of Olympic National Park, would be the tribe most likely affected by fisher reintroduction efforts because it is the only reservation that borders the proposed fisher restoration project area in Olympic National Park and/or national forest lands surrounding the Park. The Makah, Quileute, and Hoh reservations are all along the Pacific coast and are outside the area of analysis. The Skokomish reservation is to the southeast of the Park adjacent to Hood Canal; it is separated from Park lands by private lands, as well as USFS and state lands. In addition, fishers would be released primarily on the west side of Olympic National Park. The Lower Elwha Klallam and the Jamestown S'Klallam reservations are located along the southern shores of the Strait of Juan de Fuca. The Port Gamble S'Klallam reservation is on the east side of Hood Canal. These tribal lands would also not be affected by fisher reintroduction efforts, as it is not expected that fishers would reach these areas.

The Quinault Tribe first inhabited the Lake Quinault area, southwest of the Park. The Quinault. as well as the Queets, established fishing and hunting villages on the shores of the lake and river that were in place for thousands of years. The Quinault Indian Reservation was created by an 1859 treaty, when the tribes ceded land to the U.S. Non-Indian settlement near Lake Quinault began in 1888, and soon after a small settlement was established on the south shore (NPS 2005b).

Lake Quinault is bordered on the north by Park lands, on the south by Olympic National Forest lands, and on the west by the Quinault Indian Nation lands (see figure 7). The lake itself is part of the Quinault Indian Nation (NPS 2005b).

American Indian Tribal Rights and the Endangered Species Act

Currently the fisher is a federal candidate for listing under the Endangered Species Act. As such, the provisions of the act do not apply to the fisher. However, a candidate species could become listed in the fu-

ture if and when the USFWS has sufficient information on the species' biological status and threats, and if and when development of a listing regulation is not precluded by other higher priority listing activities.

Secretarial Order # 3206: American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act (June 1997), clarifies Department of the Interior responsibilities when the implementation of the Endangered Species Act would affect Indian lands, tribal trust resources, or the exercise of tribal rights. The order states:

> Indian lands are not federal public lands or part of the public domain, and are not subject to federal public land laws. They were retained by tribes or were set aside for tribal use pursuant to treaties, statutes, judicial decisions, executive orders or agreements. These lands are managed by Indian tribes in accordance with tribal goals and objectives, within the framework of applicable laws.

Under this order, the tribes acknowledge that the Endangered Species Act is administered by the USFWS and the National Oceanic and Atmospheric Administration (NOAA) Fisheries. By participating in the development of this order, the tribes sought to ensure that tribal sovereignty, tribal rights, and the federal trust responsibility to Indian people would receive full and fair recognition in the implementation of the Endangered Species Act. Both the federal and tribal teams acknowledged that species conservation could be best achieved through government-to-government collaboration and communication rather than through litigation (USFWS n.d.c).

The Department of Interior recognizes that Indian tribes value and take responsibility for the management of their lands and resources. Deference would be given to those tribal conservation plans that (a) speak to those activities on Indian lands (including tribally owned fee lands), and (b) address the conservation needs of the listed species. In other words, if the tribe has a conservation plan that addresses departmental concerns for a particular listed species, even if it was not specifically developed for that species, the plan would be given deference. There would be no expectation or requirement for the tribe to develop an alternative plan. Upon the tribes' request, the Department of the Interior may review and assess tribal conservation plans and other measures for conserving sensitive species (USFWS n.d.c).

Secretarial Order #3206 does not authorize the "direct take" of listed species by Indian tribes. It does not override the statutory provisions of the Endangered Species Act, including the prohibition against direct take. If a situation about the issue of direct take arose, a government-to-government consultation would occur to ascertain the appropriate action to take given the statutory mission of the department, the federal trust responsibility, and the role of sovereignty (USFWS n.d.c).

Critical habitat shall not be designated on Indian lands unless it is determined essential to conserve a listed species. This is consistent with the special trust responsibility the federal government has to Indian people to preserve and protect their lands and resources (USFWS n.d.c).

Through government-to-government protocols, the Department of the Interior would make a special effort to include the affected tribes in meaningful ways in the Endangered Species Act process. Face-to-face meetings would be standard protocol. Tribal information would be solicited not only on the species at issue, but also on tribal cultural values, hunting, fishing, and gathering rights; a review of treaty obligations; and impacts on tribal economy (USFWS n.d.c).

The order allows for the use of information provided by the affected tribes in habitat conservation plans. While this would not require that plan applicants include the tribes in actual negotiations, information provided by the tribes through formal submissions and during the public comment process would be taken full advantage of. This information would be shared with habitat conservation plan applicants, and incorporation of measures into habitat conservation plans that would restore or enhance tribal trust resources would be advocated (USFWS n.d.c).

SOCIOECONOMIC CONDITIONS

Socioeconomic impacts related to reintroducing fishers at Olympic National Park focus on impacts to loggers, particularly impacts that could result from possible seasonal restrictions on activities around an active den site on USFS land or state trust lands. However the likelihood of a fisher using a forest stand that is subject to harvest is low as fishers are closely associated with late successional forests, which are managed by USFS as old growth and are protected. Impacts to local residents could also result from possible predation of fishers on domestic animals.

Olympic National Park includes Clallam, Jefferson, Grays Harbor and Mason counties, although the majority of the Park is in Clallam and Jefferson counties. The population of the four counties is 207,000 (NPS 2003). Within these counties several small cities, towns, and villages exist along U.S Highway 101, which encircles the Park. The primary industry outside the Park has traditionally been logging and timber harvest activities. The area around the town of Forks, which is west of the Park, was a major timber industry center for many years; however, timber industry activities have drastically decreased over the past decade (NPS 2003).

TIMBER HARVESTING

Counties

Clallam and Jefferson counties comprise the majority of the area of analysis for reintroducing fishers. Each of these counties has prepared comprehensive plans in response to the state's Growth Management Act, which identifies specific goals that local comprehensive plans are to achieve and contains certain requirements that must be met (Clallam County 2002).

The Growth Management Act requires state and local governments to manage Washington's growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, preparing comprehensive plans and implementing them through capital investments and development regulations.

The goal for natural resource industries is to "maintain and enhance [the] industries, including productive timber. . . . Encourage the conservation of productive forest lands and . . . discourage incompatible uses" (*Revised Code of Washington,* sec. 36.70A.020). The act requires local governments to classify and designate forest resource lands and to adopt interim development regulations to assure their conservation.

Clallam County

Timber harvesting is the dominant land use in Clallam County, with 285,842 acres in large commercial timber holdings (Clallam County n.d.). One of the county's economic development goals is to "recognize and endorse the forest resources industry as an economically significant industry in which Clallam County has unique qualities and competitive advantages" (Clallam County 2002).

Clallam County's *Comprehensive Plan* describes the economic importance of the county's forests:

> The forest lands within the county . . . are a significant value not only to the County but to the State and the nation. The County has lost significant tax revenues due to changing global economic conditions and environmental regulations. This reduction in revenue has led to significant budget reductions and cuts in public services (Clallam County 2002, sec. 31.02.110).

Challam County has also identified the following forest land goals that are applicable to this fisher reintroduction plan (Clallam County 2002):

- Retain suitable forest land in the county in commercial forest land use, because of general economic benefits to the people of the county derived from forests, including timber production and processing, watershed conservation, recreation, and fish and wildlife conservation.

- Encourage the retention of public and private commercial large forest landholdings in commercial forest land uses, primarily as a timber resource base for the perpetuation of the county's forest and timber products industries.
- Conserve forest resources for productive use by designating resource lands where the principal and preferred land uses will be commercial resource management activities.
- Encourage forestry both within and outside of designated commercial forest lands.
- Work with cities, other public agencies, tribes, and private landowners to conserve public and private resource lands, and to encourage continued resource management.
- Resource industries shall use management practices that maintain forest productivity, protect the environment, and protect adjacent land uses. Clallam County shall support implementation of "best management practices" as defined by the Forest Practices Act on forested lands to provide for environmental protection, wildlife habitat conservation and a viable forest industry.
- Lands designated as commercial forest shall remain in large parcels and ownership patterns conducive to forestry.
- Offer incentives to encourage conservation of forested lands. Incentives should include right-to-practice forest practices in the accustomed manner, and technical assistance in harvest techniques.

Businesses in Clallam County have historically been centered around natural resource-based industries, including timber extraction and wood products manufacturing. However, in recent decades service-related industries have outpaced the growth of large-scale resource-based businesses. The majority of county businesses in 2004 were service-oriented, followed by construction trades and retail and wholesale.

The average number of firms in the county generally increased from 1994 through 2004, with a dip in 1997 and in 2003–4; the overall increase generally reflects the strong growth in the services sector. The number of businesses in agriculture, forestry, and fishing decreased (Clallam County 2002, 2006). In 2004 less than 2% of businesses in the county were in the forestry sector (42 firms out of a total of 2,345 firms), and employed 394 people (out of a total employment of 21,473). Forestry wages totaled $14,325,113, or 2.4% of a total of $601,611,112 wages paid for all county businesses (Clallam County 2002, 2006).

The Clallam County *Comprehensive Plan* identifies "increasing environmental issues and associated regulations result in prolonged planning process for harvest management by government agencies, expensive mitigation requirements, and reduced predictability for future harvest prospects" as a threat to the economic value of forest products businesses. Other threats include transportation disadvantages, market fluctuations and the cyclical nature of industry, and substitute products for structural wood components (Clallam County 2002, 2006).

Clallam County is divided into four regional planning areas. The western region would most likely be affected by fisher reintroduction efforts, given land use patterns, the preferred fisher release areas, and the tendency of fishers to avoid traveling through deep snow (which would be required to reach the eastern areas of the Park).

The land base for private land use in the county's western region is limited. Table 16 shows the actual acreage and percentage of lands within this area. The category for commercial forest lands in this table indicates state and private lands. Olympic National Forest has also been designated as commercial forest lands (Clallam County 2002).

Table 16: Acreage and Percentage of General Land Use Designations in Western Clallam County

Designation	Acres	Percentage
Rural Lands	15,133	5%
Commercial Forest Lands	142,892	48%
National Forest Lands	118,884	40%
National Park Lands	15,323	5%
Forks Urban Growth Area	4,767	2%

SOURCE: Clallam County 2002.

Jefferson County

Jefferson County is a rural county, and over 77% of its total land area is within Olympic National Park, Olympic National Forest, and state forest. Therefore, the portion of land addressed by the county's comprehensive plan is relatively small (Jefferson County 2004).

Jefferson County features a diverse economy, with pulp and paper, and wood products industries playing important roles. The county's forests provide employment in wood, paper, recreation, tourism, and fishing industries (Jefferson County 2004).

Jefferson County's economic base is presently in a state of transition. Historically, the county's economic base was closely tied to resource-based "extractive" activities, including timber. For various reasons, this economic base is facing a "major restructuring." The economic opportunities historically provided by the county's natural environment are no longer as abundant and/or profitable (Jefferson County 2004).

Industries related to logging, primary manufacturing, and pulp and paper have felt the effects of recent reductions in the available resource, resulting in fewer jobs in these industries. Employment in lumber and wood products, historically the mainstay of Jefferson County's economy, declined "significantly" between 1983 and 1993, with a decline from over 250 jobs to 60 jobs. Wages also fell "significantly" in this sector over this same time period (Jefferson County 2004).

While the county has lost family-wage paying jobs in the resource-based sector of the economy, new job opportunities have been created in other areas. This represents a dramatic shift in Jefferson County's employment base over the past two decades towards the service sector, much like Clallam County. However, these new jobs do not pay wages comparable with the resource industries (Jefferson County 2004).

Jefferson County's *Comprehensive Plan* identifies a need to conserve forest lands while maintaining commercial timber production:

> There is a genuine need to promote conservation of productive forest land through regulatory protection. . . . However, this must also be balanced by providing incentives to maintain lands in long-term commercial timber production. . . . Premature conversion of those productive forest lands to other land uses which are incompatible with the management of forest resources is recognized as a "significant" threat to the forest industry (Jefferson County 2004).

The following natural resource goals and supporting policies identified in the county's plan are relevant to this fisher reintroduction plan (Jefferson County 2004):

- Maintain and enhance natural resource-based industries, including productive timber. Encourage the conservation of productive forest lands.
- Conserve and manage the forest resources for sustainable natural resource-based economic activities.

- Conserve natural resource lands through land use designations and encourage resource based industries that provide rural employment opportunities.
- Support cooperative resource and habitat management processes between stakeholders and local, state, federal and tribal governments by integrating cooperative agreements and plans into land use ordinances and regulations.
- Work with resource-based industries to achieve compliance with all applicable regulations to protect environmental values and to protect surrounding land uses.

- Encourage the conservation of resource lands and the long-term sustainable use of natural resource-based economic activities throughout Jefferson County:
  - Support resource-based economic activities that comply with applicable federal, state, and local regulations.
  - Support cooperative resource management among natural resource landowners, environmental groups, state, federal and tribal governments.
- Encourage resource-based economic activities which are compatible with environmental quality.
  - Regulate resource-based economic activities so as to mitigate adverse impacts to the environment and adjacent properties.
  - Regulate resource management and harvest practices in a manner consistent with local, state, and federal regulations for the protection of environmental quality and critical areas. Work with stakeholders in cooperative processes to protect the long-term viability of resource lands consistent with watershed management and fisheries recovery plans developed in response to proposed listings of fish species under the Endangered Species Act.
  - Protect the environment from cumulative adverse impacts resulting from resource management practices.
- Conserve and protect forest resource lands for long-term economic use.
  - Encourage the continued diversity of forestry by designating classes of long-term commercially significant forest land that allows the continued existence of a range of approaches to forest management.
  - Allow commercial forest management and harvest . . . operations and those land uses which maintain, enhance, or have no impact on the long-term management of designated commercial forest lands.
  - Support and facilitate the improvement of state and local environmental regulations affecting the forest products industry in order to improve operational predictability, minimize regulatory costs to forest land owners, and encourage protection of the forest environment.
- Provide regulatory incentives to encourage and facilitate economic opportunities within the county.
  - Continue to work with state, federal and local agencies to coordinate and streamline environmental review procedures and processes.

The isolated western portion of Jefferson County has no existing commercial lands. This area is not projected to experience substantial growth, with a total 20-year population projection of 43 additional people. The regional decline of forestry and fishing has resulted in distressed economic conditions in this area. The county's *Comprehensive Plan* states, "The decline of natural resource-based industries requires that new employment opportunities in available economic sectors areas be developed for a transition to a more diversified economy" (Jefferson County 2004).

Located in western Jefferson County, Allen Logging relies on timber stands to produce dimensional lumber, chips, and other products for a world-wide market. The county has a growing number of specialty value-added manufacturers, including Maizefield Mantles, focused on architectural woodworking, and Washington Cabinet Door, supplying cabinet-makers throughout Puget Sound. These manufacturers are supported by Edensaw Woods, which continues to rapidly expand its regional and export wholesale operations. This company focuses on specialty and exotic woods. Jefferson County is also home to Timbercraft, Inc. which designs and builds custom timber frame homes and structures (Jefferson County 2004).

Grays Harbor County

More than half of the land in Grays Harbor County (58.7%) is managed for timber. The WDNR manages 6% of county lands for timber production. Total non-timber lands managed the state constitutes less than 0.5%. The USFS manages just over 10% of total county land, but only 1% of those lands are managed for timber; the rest are managed for recreation, habitat, and environmental protection (see "Washington Department of Natural Resources Lands" and "National Forest Lands" below). Slightly less than 1% of Grays Harbor County lies within Olympic National Park (Grays Harbor County n.d.). These USFS and NPS lands represent the southernmost area in which fishers would be released. As shown in figure 7, only a very small amount of suitable habitat occurs in Grays Harbor County.

Mason County

The southeast portion of Olympic National Park lies within Mason County. Approximately 57% of the land within the county is designated long-term commercial forest land, national park land, and national forest land, which are not available for development. Only a small portion of Mason County might be affected by fisher releases because the west side of Olympic National Park and Olympic National Forest were identified as the most suitable locations for fisher reintroduction (see figure 2). The state and federal lands in the northern part of the county are described in more detail below.

Mason County's 1996 *Comprehensive Plan* states, "Without question, timber is the foundation upon which Mason County's economy is built. Forest Products continues to be Mason County's premier natural resource industry." Long-term commercial forest lands and forest products represent the primary land uses throughout Mason County and within each of its seven watersheds. Mason County currently has an abundance of forested lands with long-term commercial significance." The planning policies for Mason County are to

- maintain and enhance natural resource based industries, including those dependent on forest resource lands; and
- encourage the conservation of productive forestry lands.

The Mason County planning policies contain provisions intended to mitigate the impacts to forest resource lands. These policies include a focus on the establishment of various performance districts intended to concentrate growth and protect critical areas and resource lands (Mason County 2005).

As with Clallam and Jefferson counties, the forests products industry provided the economic foundation on which Mason County was built, and this sector was the county's key economic driver up until the 1970s. Beginning in the early 1980s, the forests products industry experienced a "significant," long-term decline statewide, which was coupled with a regional decline in the 1990s. Due to the general downsizing of this industry and growth in other business sectors over the past 25 years, a more diversified economic base has emerged within Mason County (Mason County 2005).

National Forest Lands

The USFS administers Olympic National Forest, which includes five wilderness areas totaling 88,265 acres (15% of the forest) (USFS 2004), where commercial activities and permanent roads are prohibited. Timber production and forestry are managed by the USFS (NPS 1996a). From 2000 to 2006, an average of 1,000 acres of timber was harvested annually in Olympic National Forest (Piper, pers. comm. July 5, 2007).

As described under "Neighboring Landowners," provisions under the Endangered Species Act to protect threatened and endangered species (the northern spotted owl and marbled murrelet) have led to timing restrictions on ground-disturbing activity, including timber harvests, that could potentially harm these listed species. If fisher retained its status as a federal candidate or state endangered, USFS would treat the species as "sensitive" and apply seasonal restrictions on motorized, mechanical activities around known, active fisher denning sites, where such activities would appreciably reduce the likelihood of denning success between mid-March to the end of May. A buffer of 0.25 mile (based on local conditions, such as topography) would be applied around a known, active den to protect fishers from disturbance from those activities that area long in durations, such as timber harvest and associated activities (e.g., felling, yarding, and road building), and road construction. Seasonal restrictions would not be applied for hauling or for general road traffic. More information about USFS lands is provided in the "Neighboring Landowners" section.

Washington Department of Natural Resources Lands

The WDNR manages over 364,700 acres on the Olympic Peninsula, primarily for timber production. The WDNR markets forest products to earn income to build public schools, universities, state mental hospitals, and other institutions; and to help fund local services in many counties (WDNR n.d.a). As designated trustee for federally granted and Forest Board trust lands in the state, the department is required by statute to "achieve the maximum effective development and use of such lands and resources consistent with laws applicable thereto" (WDNR 1997).

The 1992 *Forest Resource Plan* states that sustainable, even-flow timber harvest is a goal for forest holdings, with flow harvest level calculated by county (WDNR 1992). Forest products from the 2.1 million acres of forest trust lands include standing softwood and hardwood trees, and special products such as poles. Forest products also include commercial brush-picking, bough sales, mushrooms, and other gathered commodities (WDNR n.d.a), which are described in more detail below. In 2005 the department harvested 17,022 million board feet in Clallam County, 6,699 in Jefferson County, 17,433 in Mason County, and 1,094 in Grays Harbor County, for a total of 42,248 million board feet in areas west and south of the Park (WDNR 2005).

The WDNR habitat conservation plan (described in more detail in "Neighboring Landowners") defines additional mitigation to ensure the reproductive success of breeding adult fishers in WDNR-managed forests. This includes restrictions on WDNR contracts for sales of timber and other valuable materials, as well as grants and rights-of-way and easements, and the prohibition of activities within 0.5 mile of a known active fisher den site between February 1 and July 31 where such activities would appreciably reduce the likelihood of denning success (WDNR 1997).

WDNR-managed roads are routinely closed for cost-effective forest management and protection of public resources, including wildlife. Road closures would benefit the fisher population by limiting human disturbance and reducing the likelihood of accidental trapping. Under the habitat conservation plan road closures would continue on WDNR-managed lands (WDNR 1997).

Tribal Lands

As described in the "Neighboring Landowners" section, the Quinault Nation may be affected by actions proposed under the fisher reintroduction plan, if fishers were listed or became established on their land. Today, reservation landownership consists of trust, fee, and tribal land. Trust land is owned by individual Indian families and held in trust by the Bureau of Indian Affairs; fee land is privately owned by non-Indians; and tribal land is owned by the Quinault Indian Nation. In 1980 the Quinault Nation owned only 2% of the land on the reservation. Through an aggressive land acquisition program, the tribe now owns 65,000 acres (31% of all Quinault Indian Reservation lands), with 70,000 acres of trust land and 73,150 acres of fee lands. Because trust lands cannot be divided, many are owned by multiple generations of families. Large timber companies own a large portion of the fee lands (USFS 2006). Although most revenues from logging in the area went to non-Indians in the past 100 years, many Quinault tribe members worked in the timber industry as loggers and mill workers. With the decline in the regional timber industry, many Quinault members shifted to other types of work. Some of those who remained in the business have become owners and operators of timber companies and mills. Two logging companies are currently owned by Quinault tribe members and three cedar shake mills are also owned by tribal members (USFS 2006).

Timber has become an important source of revenue for the tribe, particularly regarding efforts to buy back reservation land for the Quinault Indian Nation. Of the 208,115 acres of reservation land, about 165,000 acres (80%) is suitable for commercial timber production. In 1988 the Quinault Indian Nation created Quinault Land and Timber Enterprises as a timber and land acquisition program. Revenues generated from the sale of timber are used to purchase property for the tribe (USFS 2006).

Fisher Predation on Domestic Animals

Fisher biologists and furbearer program managers have documented fisher predation on pets and small livestock in the Midwest and Northeast. These events typically occur where homes are in remote, forested habitats. In these situations fishers might prey on feral cats or house cats that spend time outdoors. Small dogs may also be vulnerable, but less so than cats. Fishers may also prey on small livestock, such as chickens, ducks, geese, and rabbits that range outside a predator-proof coop or barn. In Wisconsin, where fisher densities are extremely high (one fisher per 2 square miles), approximately 10 damage reports per year are attributed to fishers. While some of these problems are actually caused by fishers, some are likely to have other causes. Biologists and managers indicate that while fishers may opportunistically prey on pets (especially cats) and small livestock, these events are uncommon because fishers tend to avoid people and developed areas, even when their numbers are high (Lewis, pers. comm. October 2, 2006).

Farm earnings for the three counties that could be most affected by this plan include earnings related to both livestock and crops. Farm earnings for 2004 for these counties comprised 0.3% of total earnings by place of work for Clallam County, and 0.9% for both Jefferson County and Grays Harbor County (Bureau of Economic Analysis 2004). Fishers would not impact crops; therefore, the amount of livestock represented by these figures would likely be lower, particularly since only small livestock would be affected.

Predation by other predators on pets and small livestock has occurred in the past on the Olympic Peninsula. In August 2006 a mountain lion killed and seriously injured a dog in the town of Sequim, which is east of Port Angeles (*Peninsula Daily News* 2006). A similar event occurred in Sequim in September 2000, where a mountain lion killed a pet dog (L. Lewis n.d.). A cougar attacked and wounded a pig off of West Sequim Bay Road in February 2004, inflicting injuries requiring euthanasia. The *Peninsula Daily News* stated, "There have been several reported cougar attacks and sightings on the North Olympic Peninsula in the past year" [2003], but no details were provided (*Peninsula Daily News* 2004). Pet and small livestock owners who may be susceptible to loss of animals from fisher predation already need to protect their pets and poultry from cougar, coyote, raccoon, skunks, bobcats and weasels. The addition of fishers would not be noticeable, and would not cause any changes to management and animal husbandry.

PARK MANAGEMENT AND OPERATIONS

Olympic National Park is managed by a park superintendent, deputy superintendent, and several division chiefs housed at the headquarters area in Port Angeles. Administrative divisions include Administration, Natural Resources Management, Cultural Resources Management, Resource and Visitor Protection, Resource Education, and Maintenance (NPS 2006a). These functional areas are further broken down into 35 programs that cover a broad range of park activities (NPS 2005d).

In 2005 there were 130 permanent, full time employees. Olympic National Park's business plan for fiscal year 2001 identified $6.6 million in unmet needs Parkwide at that time (NPS 2005d). Since then, a reduction of 30 full-time equivalents (FTEs) has occurred in the Park (one FTE represents a full year of work, whether performed by one full-time employee or multiple part-time or seasonal employees) (NPS 2006a). To support permanent employees, seasonal employees are hired during the summer to provide improved visitor services during the busy season (NPS 2006a).

Of the five divisions listed above, fisher reintroduction efforts would most likely affect the following:

- The Natural Resources Management Division is responsible for preserving and managing the natural resources of the Park and coordinating scientific research. It is responsible for resource inventory, monitoring and evaluation, impacts restoration and mitigation, fish and wildlife management, and wilderness preservation and monitoring (NPS 2006a).
- Responsibilities of the Resource and Visitor Protection Division include various visitor management and resource protection duties, including law enforcement, emergency medical services, wildland fire fighting, visitor use management in the Park, search-and-rescue activities, and wilderness management and permitting (NPS 2006a).
- The Resource Education Division facilitates the connections between Park resources and the public through the operation of the Park visitor centers, programs, written materials, off-site programs, and the Park's website (NPS 2006a).
- The Maintenance Division conducts periodic maintenance of the Park's infrastructure and equipment. Approximately 1% of the Park consists of road-accessible, developed frontcountry areas with various infrastructure, including trails and roads within the Park. In addition, some infrastructure exists in Park wilderness (NPS 2006a).

Olympic's business plan shows a "significant shortfall in ongoing operations and management needs at Olympic," and states that many of the Park's most pressing operational needs are currently not being met. One of the Park's top five operational priorities includes $357,000 to conduct ecological monitoring and solicit additional research. Five FTEs are requested to fill this need. These funds would provide support to developing a comprehensive ecological monitoring program designed to respond to local issues (NPS 2005d).

Olympic National Park has received $210,000 in funding from the U.S. Geological Survey to evaluate success of fisher restoration in Olympic National Park for fiscal years 2008–2011. The funds are to determine survival of translocated fisher; determine dispersal distances of translocated fisher; determine landscape and habitat correlates of fisher survival; and develop resource selection models to predict optimum fisher habitats. The funds would primarily cover equipment and supplies (e.g., transmitters, field supplies, use of fixed-wing aircraft), and costs for personnel to conduct release and monitoring efforts. The fisher reintroduction would be a joint project between NPS and WDFW, and because other cooperating agencies may become involved, more funding would be secured.

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Chapter 4
Environmental Consequences

CHAPTER 4 — ENVIRONMENTAL CONSEQUENCES

The "Environmental Consequences" chapter analyzes both beneficial and adverse impacts that would result from the implementation of any of the alternatives considered in this *Draft Fisher Reintroduction Plan / Environmental Assessment.* This chapter also includes a summary of laws and policies relevant to each impact topic, definitions of impact thresholds (e.g., negligible, minor, moderate, and major), methods used to analyze impacts, and the analysis methods used for determining cumulative effects. As required by the CEQ regulations implementing NEPA, a summary of the environmental consequences for each alternative is provided in table 3. The resource topics presented in this chapter, and the organization of the topics, correspond to the resource discussions contained in "Chapter 3 – Affected Environment."

INTRODUCTION

SUMMARY OF LAWS AND POLICIES

Three overarching environmental protection laws and their implementing policies guide the actions of the NPS in the management of the parks and their resources — the Organic Act of 1916, NEPA and its implementing regulations, and the National Parks Omnibus Management Act. For a complete discussion of these and other guiding authorities, refer to "Related Laws, Policies, Plans, and Constraints," in "Chapter 1 – Purpose of and Need for Action." These guiding authorities are briefly described below.

- The Organic Act of 1916 (16 USC 1), as amended or supplemented, commits the NPS to making informed decisions that perpetuate the conservation and protection of park resources unimpaired for the benefit and enjoyment of future generations.
- The *National Environmental Policy Act* of 1969 is implemented through CEQ regulations (40 CFR Parts 1500–1508). The NPS has, in turn, adopted procedures to comply with these requirements, as found in NPS *Director's Order #12* and its accompanying handbook (NPS 2001a).
- The National Parks Omnibus Management Act (16 USC 5901 et seq.) underscores the NEPA provisions in that both acts are fundamental to park management decisions. Both acts provide direction for connecting resource management decisions to the analysis of impacts and communicating the impacts of those decisions to the public, using appropriate technical and scientific information. Both acts also recognize that such data may not be readily available, and they provide options for resource impact analysis should this be the case. Section 4.5 of NPS *Director's Order #12* adds to this guidance by stating, "when it is not possible to modify alternatives to eliminate an activity with unknown or uncertain potential impacts, and such information is essential to making a well-reasoned decision, the National Park Service will follow the provisions of the CEQ regulations (40 CFR 1502.22)." In summary, the NPS must state in an environmental assessment or impact statement (1) whether such information is incomplete or unavailable; (2) the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific adverse impacts that is relevant to evaluating the reasonably foreseeable significant adverse impacts; and (4) an evaluation of such impacts based on theoretical approaches or research methods generally accepted in the scientific community. Collectively, these guiding regulations provide a framework and process for evaluating the impacts of the alternatives considered in this draft environmental assessment.

GENERAL METHODOLOGY FOR ESTABLISHING IMPACT THRESHOLDS AND MEASURING EFFECTS BY RESOURCE

The following elements are used in the general approach for establishing impact thresholds and measuring the effects of the alternatives on each resource category:

- general analysis methods as described in guiding regulations, including the context and duration of environmental effects
- basic assumptions used to formulate the specific methods used in this analysis
- thresholds used to define the level of impact resulting from each alternative
- methods used to evaluate the cumulative effects of each alternative in combination with unrelated factors or actions affecting Park resources
- methods and thresholds used to determine if impairment of specific resources would occur under any alternative

These elements are described in the following sections.

General Analysis Methods

The analysis of impacts follows CEQ guidelines and NPS *Director's Order #12* procedures (NPS 2001a) and is based on the underlying goal of supporting fisher reintroduction. This analysis incorporates the best available scientific literature applicable to the region and setting, the species being evaluated, and the actions being considered in the alternatives.

For each resource topic addressed in this chapter, the applicable analysis methods are discussed, including assumptions and impact intensity thresholds.

Assumptions

Several guiding assumptions were made to provide context for this analysis. These assumptions are described below.

- *Analysis Period* — Goals, objectives, and specific implementation actions needed to reintroduce and restore fishers at Olympic National Park are established for the next approximately 10 years (the life of this plan); therefore, the analysis period used for assessing impacts is up to 10 years. The impact analysis for each alternative is based on the principles of adaptive management, which would allow the NPS to change management actions as new information emerges from monitoring the results of management actions and ongoing research throughout the life of this plan.
- *Geographic Area Evaluated for Impacts (Area of Analysis)* — The geographic area of analysis for this plan includes Olympic National Park in its entirety. The area of analysis may extend beyond the Park's boundaries for some cumulative impact assessments, as indicated in the definition of impact thresholds for each topic. The specific area of analysis for each impact topic is defined at the beginning of the each topic discussion.
- *Duration and Type of Impacts* — The following assumptions are used for impact topics, unless otherwise defined in the impact thresholds for each topic (the terms "impact" and "effect" are used interchangeably throughout this document):
    - Short-term impacts — Impacts would last from a few days up to three years following an action.

- Long-term impacts — Impacts would last longer than three years up to the life of the plan (approximately 10 years).
- Direct impacts — Impacts would occur as a direct result of fisher reintroduction actions.
- Indirect impacts — Impacts would occur from fisher reintroduction actions and would occur later in time or farther in distance from the action.

- *Future Trends* — Visitor use and demand are anticipated to follow trends similar to recent years. Visitation to Olympic National Park has fluctuated annually, mirroring trends throughout the National Park System (NPS 1996b). During the 1980s the average annual recreation visits to Olympic National Park were about 2.6 million people. In the 1990s that average rose to just over 3.2 million recreational visits per year, representing an increase of about 24% (NPS 2006a).

IMPACT THRESHOLDS

Determining impact thresholds is a key component in applying NPS *Management Policies 2006* (NPS 2006b) and NPS *Director's Order #12* (NPS 2001a). These thresholds provide the reader with an idea of the intensity of a given impact on a specific topic. The impact threshold is determined primarily by comparing the effect to a relevant standard based on regulations, scientific literature and research, or best professional judgment. Definitions of intensity for negligible, minor, moderate, and major impacts vary by impact topic, and definitions are provided separately for each impact topic analyzed in this document. In all cases the impact thresholds are defined for adverse impacts. Beneficial impacts are addressed qualitatively.

CUMULATIVE EFFECTS ANALYSIS METHOD

The CEQ regulations to implement the NEPA require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7). As stated in the CEQ handbook, *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997), cumulative effects need to be analyzed in terms of the specific resource, ecosystem, and human community being affected and should focus on effects that are truly meaningful. Cumulative impacts are considered for all alternatives, including the no-action alternative.

Cumulative impacts were determined by combining the impacts of the alternative being considered with other past, present, and reasonably foreseeable future actions. "Appendix C – Cumulative Actions Table" summarizes other ongoing or reasonably foreseeable future projects and plans at Olympic National Park and, if applicable, in the surrounding area that could affect the various resources at the Park.

The analysis of cumulative effects was accomplished using four steps:

- *Step 1 — Identify Resources Affected:* Fully identify resources affected by any of the alternatives.
- *Step 2 — Set Boundaries:* Identify an appropriate spatial and temporal boundary for each resource.
- *Step 3 — Identify Cumulative Action Scenario:* Determine which past, present, and reasonably foreseeable future actions to include with each resource.
- *Step 4 — Cumulative Impact Analysis:* Summarize impacts of these other actions, plus impacts of the proposed action, to arrive at the total cumulative impact.

CUMULATIVE IMPACT SCENARIO

Past, present, and reasonably foreseeable future actions are listed in appendix C. Relevant plans and actions that could combine with those described for this plan are described in more detail below. These actions are then discussed cumulatively under each impact topic.

Olympic National Park

Park Plans and Actions

Fire Management Plan Environmental Assessment (NPS 2003)— The Park implemented a fire management plan in 2006 that includes mechanized fuel reduction around Park facilities, limited wildland fire use for resource benefit, and full suppression. This is the first step towards restoring natural fire conditions in the Park and meeting resource management objectives while ensuring that firefighter and public safety are not compromised. Restoring the natural fire regime could result in more prey base for fishers.

Elwha River Restoration Plan and Supplemental Environmental Impact Statement, Notice of Intent (September, 2002) — The result of numerous plans and reports on dam removal, sedimentation, erosion, ecosystem restoration, and water quality regarding the Elwha River, led to the decision to remove the Glines Canyon and Elwha dams. The start date of this project is uncertain, due to funding and construction uncertainties. Implementation of this plan would result in short-term noise impacts to the area. Dam and reservoir removal would be beneficial to fishers in the long-term by removing a barrier to dispersal, restoring habitat, and increased prey availability in riparian and side slope forests following regeneration.

Queets Road Repair Environmental Assessment — A road slide occurred in spring 2005. Alternatives to reopen the road were analyzed in an environmental assessment and construction is scheduled to begin in late 2007.

Other Planned or Ongoing Park Projects

Olympic National Park Draft General Management Plan (NPS 2006a) — The plan analyzes four alternatives for managing the Park for the next 15 to 20 years. The "no-action" alternative, emphasize natural and cultural resource protection, emphasize visitor opportunities, or the NPS preferred alternative, a combination of the other alternatives.

Trail Maintenance — Maintenance occurs on approximately 20% of the Park's frontcountry and wilderness trails each year. These activities include brushing and trail clearing, construction or replacement of minor trail bridges, and the eradication of social trails.

Natural Resources Management — Activities related to resource management include monitoring wildlife (e.g., northern spotted owls, bull trout, and forest species), monitoring forest processes and landscape change, rehabilitation of wilderness camping areas, exotic plant species removal, and restoration projects.

Hazard Tree Management Plan (2002) — The purpose of this plan is to identify and correct detectable tree hazards within designated areas of the Park in order to protect Park visitors, staff, and facilities. This program has the potential to remove habitat trees for northern spotted owls, bald eagles, and marbled murrelets. In all cases, potential nest trees are evaluated by Park biologists for active nests prior to removal, and, if occupied, are not removed until the nestlings fledge. Other methods, such as closures around the hazard tree, are utilized to protect the public.

Olympic National Forest

Dosewallips Road Washout (2002) — As described under "U.S. Forest Service Plans, Policies, and Actions" (see "Chapter 1 – Purpose of and Need for Action"), the Dosewallips Road, which provides access from U.S. 101 to the NPS Dosewallips area, is closed due to a washout at milepost 10 on the USFS land.

The USFS and NPS are preparing an environmental impact statement to determine the options to reopen the road to vehicular access. Restoring access to the road would increase administrative access to the area, facilitating monitoring of restoration success on the east side of the Park and adjacent USFS lands, as well as restoring recreational use of the area.

Actions Related to the Northwest Forest Plan (1994) — The *Northwest Forest Plan* is a comprehensive strategy designed to provide for the conservation of late-successional forest species, including the northern spotted owl, at the same time providing a predictable level of forest products for commercial harvest for forests in Washington, Oregon, California. (See "Chapter 1 – Purpose of and Need for Action" for more information.)

Washington Department of Natural Resources

The WDNR developed a multispecies habitat conservation plan to continue forest management activities on state trust lands while complying with the federal Endangered Species Act (WDNR 1997). Details are included under "Neighboring Landowners."

County / Community Plans and Activities

County Comprehensive Plans — Grays Harbor (1999), Clallam (2002), Jefferson (2004), and Mason (2005) — Most of the unincorporated lands surrounding Olympic National Park are designated as natural resource lands under the Washington State Growth Management Act, and they are further classified as forestry or agricultural lands as part of the land use element of the county comprehensive plans. Some rural lands are designated as rural residential, with densities averaging between 1 residential unit per 5 acres or 20 acres. These designations, and the applicable development regulations and comprehensive plan policies, help manage growth and maintain the rural character of the communities adjacent to the Park.

Northwest Forest Plan Socioeconomic Monitoring

Since early 1990s, timber harvest activity has declined on the Olympic Peninsula. Current harvest in the Olympic National Forest is an average of 1,000 acres annually (Piper pers comm. July 5, 2007). To help offset job losses and economic downturns associated with reductions in access to timber in Olympic National Forest, the Northwest Economic Adjustment Initiative was launched in 1994 as the socioeconomic companion to the *Northwest Forest Plan*.

Under the Payments to States Act of 1908, county governments received 25% of national forest revenues generated through collection receipts. Timber receipts were by far the largest source of revenue to the counties during the 1970s and 1980s. The 25% of payments to the counties were used to fund public schools and roads. In 1993 Congress passed the Omnibus Budget Reconciliation Act, which provided an alternative payment to 72 counties in Washington, Oregon, and northern California affected by the drop in federal timber harvest and associated timber revenues that resulted from administrative and judicial decisions designed to protect the northern spotted owl. Under this act counties were to receive a declining percentage of the average annual payment they received between 1986 and 1990 (known as "spotted owl safety nets" or "owl guarantee payments"); payments were to expire in 2003 (USFS 2006). Approximately $1.2 billion was awarded to counties and communities in the spotted owl region between 1994 and 2000 (USFS 2006).

In 2000 Congress replaced the spotted owl safety net with the Secure Rural Schools and Community Self-Determination Act, which expired in 2006. Under this act counties received money each year equal to the average of the payments received during the three highest years between 1986 and 1999. The spotted owl safety net measures resulted in substantially higher payments to counties than they would have received through forest revenue sharing alone, in many cases more than doubling the revenues. The Secure Rural Schools Act has provided the highest level of payments to counties since 1990. Payments to counties un-

der this act also represented a "significant" amount of money to support local resource-related projects in and around the Olympic National Forest, providing funding for joint forest stewardship projects between the forest and the public. These payments are also an important source of new grant money to communities (USFS 2006).

IMPAIRMENT ANALYSIS METHOD

Related federal acts and policies regarding the prohibition against impairing park resources and values in units of the National Park System are described chapter 1. According to NPS *Management Policies 2006*, an action constitutes an impairment when an impact "would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values" (NPS 2006b, sec. 1.4.5). To determine impairment, the NPS must evaluate "the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts" (NPS 2006b, sec. 1.4.5).

National Park System units vary based on their enabling legislation, natural and cultural resources, and park missions; likewise, the activities appropriate in each unit or park area vary. For example, an action appropriate in one park unit could impair resources in another unit. Thus, this document analyzes the context, duration, and intensity of impacts of the alternatives, as well as the potential for resource impairment, as required by NPS *Director's Order #12* (NPS 2001a). As stated in the NPS *Management Policies 2006* (NPS 2006b, sec. 1.4.5), an impact on any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance

This definition was used for the impairment analysis unless otherwise defined within the impact thresholds for a particular topic.

The following process was used to determine whether this plan's alternatives had the potential to impair Park resources and values:

- *Step 1* — The enabling legislation and other relevant background information for Olympic National Park were reviewed to ascertain its purpose and significance, resource values, and resource management goals or desired future conditions.
- *Step 2* — Resource management goals were identified.
- *Step 3* — Thresholds were established for each resource of concern to determine the context, intensity, and duration of impacts, as defined earlier in this chapter under "Impact Thresholds."
- *Step 4* — An analysis was conducted to determine if the magnitude of impact would constitute "impairment," as defined by the NPS *Management Policies 2006* (NPS 2006b).

The impact analysis includes findings of impairment of Park resources for each of the management alternatives. Neighboring landowners, visitor use and experience, Park management and operations, and socioeconomic conditions are not considered resources per se, although they are dependent on the conservation of Park resources. Impairment findings are not included as part of the impact analysis for these topics.

IMPACTS ON SPECIES OF SPECIAL CONCERN

GUIDING REGULATIONS AND POLICIES

The Endangered Species Act (16 USC 1531 et seq.) mandates that all federal agencies consider the potential effects of their actions on species listed as threatened or endangered. If the NPS determines that an action is likely to adversely affect a federally listed species or designated critical habitat, formal consultation with the USFWS or the NOAA is required to ensure that the action "is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification" of designated critical habitat (Endangered Species Act, sec. 7(2)).

State and federally listed species relevant to this document have been identified through discussions with Park staff, informal consultation with the USFWS, and project review by the WDNR. Informal consultation was initiated with the USFWS during the internal scoping period for this project. A list of federally listed species is included in "Species of Special Concern" in "Chapter 3 – Affected Environment." For the purpose of this analysis, only those species known to occur in Olympic National Park and adjacent lands that could become inhabited by fishers are addressed in this section.

An analysis of the potential impacts to each identified species is included in this section. Formal consultation would be initiated if the NPS determines that actions in the preferred alternative are likely to adversely affect one or more of the federally listed threatened or endangered species identified in the Park or designated critical habitat. At that point a biological assessment is prepared to document the potential effects. From the date that formal consultation is initiated, the USFWS is allowed 90 days to consult with the agency and 45 days to prepare a biological opinion. Based on the biological assessment and other scientific sources, the USFWS would issue a biological opinion determining whether the proposed action is likely to jeopardize the continued existence of the listed species or result in the destruction or adverse modification of designated critical habitat.

If a species is proposed for listing as endangered or threatened, or if critical habitat is proposed, the NPS would confer with the USFWS under section 7(a)(4) of the Endangered Species Act regarding the likely impact of an action on a proposed species or proposed critical habitat. Conferences are designed to help federal agencies identify and resolve potential conflicts between an action and species conservation early in a project's planning and to develop recommendations to minimize or avoid adverse effects to proposed species or proposed crucial habitat. Those recommendations are integrated into the preferred alternative.

NPS *Management Policies 2006* state that the NPS will inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible. In addition, the NPS will inventory other native species that are of special management concern to parks (such as rare, declining, sensitive, or unique species and their habitats) and will manage them to maintain their natural distribution and abundance.

Animal species at Olympic National Park that have the potential to be affected by the management alternatives include the fisher (state endangered and federal candidate), northern spotted owl (federal threatened and state endangered), marbled murrelet (federal and state threatened), northern goshawk (state candidate), bald eagle (state threatened), pileated woodpecker (state candidate), and Mazama pocket gopher (federal candidate and state threatened).

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The primary steps in assessing impacts on listed species are taken to determine which species inhabit areas likely to be affected by fisher reintroduction actions described in the alternatives.

Three aspects of the proposed project effects on federally listed species is evaluated: (1) the direct effects of the implementation process whereby fishers would be released, (2) up to 10 years of post release moni-

toring, and (3) the indirect effects of a restored fisher population (in perpetuity). Analysis would be limited to those species that live in or near predicted fisher habitat. The information in this analysis was obtained through best professional judgment of staff from the NPS, WDFW, USFS, USFWS, fisher and spotted owl experts, and available literature.

Impacts on special status species include any activity that would be considered a "take," which is defined under the Endangered Species Act §3(19) as *to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.* "Harm" is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. "Harass" is defined by the USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering (50 CFR §17.3). A determination of the potential effects to listed species is treated very conservatively in order to provide maximum protection. Reintroducing fishers in an area where they no longer exist could affect other listed species by creating competition for resources, such as prey. Potential impacts on special status species or their habitat were evaluated based on species presence, a species' historical association with fishers, and the effects on competition for resources caused by the reintroduction of fishers. Alternative A (the no-action alternative) is the baseline condition against which the action alternatives are compared because it represents current management. The analysis is focused on the effects to special status species from reintroducing fishers, as well as impacts from other management activities.

USFWS Impact Threshold Definitions for Federally Listed Special Status Wildlife Species

Guidance by the USFWS for implementing section 7 consultation under the Endangered Species Act defines the terminology used to assess impacts to listed species as follows (USFWS 1998a):

> **No Effect** — This is the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat. (USFWS 1998a, p. xvi).
>
> **Is not likely to adversely affect** — This is the "appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. *Beneficial effects* are contemporaneous positive effects without any adverse effects to the species. *Insignificant effects* relate to the size of the impact and should never reach the scale where take occurs. *Discountable effects* are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect or evaluate insignificant effects; or (2) expect discountable effects to occur" (USFWS 1998a, pp. xv-xvi).
>
> **Is likely to adversely affect** — This is the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. An "is likely to adversely affect" determination requires the initiation of formal section 7 consultation" (USFWS 1998a, p. xv).

The NPS does not make determinations of "likely to jeopardize the continued existence of a threatened or endangered species" or "likely to result in the destruction or adverse modification of critical habitat." For this project those determinations would be made by the USFWS.

NEPA Impact Threshold Definitions

The following NEPA thresholds can be used to determine the magnitude of effects on federally listed special status species and their associated habitat that would result from implementation of any of the alternatives.

Federally Listed Species without Designated Critical Habitat

Negligible Adverse: There would be no observable or measurable impacts to federally listed species, their habitats, or the natural processes sustaining them in the proposed project area.

Negligible Beneficial: There would be no observable or measurable impacts to federal listed species, their habitats, or the natural processes sustaining them in the proposed project area.

Minor Adverse: Individuals might temporarily avoid areas. Impacts would not affect critical periods (e.g., breeding, nesting, denning, feeding, resting) or habitat.

Minor Beneficial: Impacts would result in slight increases to viability of the species in the Park as species-limiting factors (e.g., habitat loss, competition, and mortality) are kept in check.

Moderate Adverse: Individuals might be impacted by disturbances that would interfere with critical periods (e.g., breeding, nesting, denning, feeding, resting) or habitat; however, the level of impact would not result in a physical injury, mortality, or extirpation from the Park.

Moderate Beneficial: Impacts would result in improved viability of the species, population structure, and species population levels in the Park, as species-limiting factors (e.g., habitat loss, competition, and mortality) are reduced.

Major Adverse: Individuals might suffer physical injury or mortality or populations might be extirpated from the Park.

Major Beneficial: Impacts would result in highly noticeable improvements to species viability, population structure, and species population levels in the Park, as species-limiting factors (e.g., habitat loss, competition, and mortality) are nearly eliminated.

Impairment: The action would contribute substantially to the deterioration of a federally listed species in the (park unit) to the extent it would no longer function as a part of the natural system. In addition, some of these adverse major impacts on the Park's resources and values would

- contribute to deterioration of a federally listed species to the extent that the purpose of the (park unit) would not be fulfilled as established in its enabling legislation
- affect resources key to the natural or cultural integrity or opportunities for enjoyment in the (park unit)
- affect the resource whose conservation is identified as a goal in the draft general management plan (NPS 2006a) or other planning documents for the (park unit).

State Listed and Special Status Species

The assessment of impacts on wildlife species listed by Washington State (but not under the federal Endangered Species Act) and species protected under the Migratory Bird Treaty Act that the Park has identified as needing special management consideration uses the same thresholds developed for the assessment of impacts on wildlife.

Negligible: There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.

Minor Adverse: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, but would not be outside the natural range of variability. Occasional responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, or other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors might occur. However, some impacts might occur during critical reproduction periods for a protected species, but would not result in injury or mortality. Sufficient habitat in the Park would remain functional to maintain the viability of the species in the Park.

Minor Beneficial: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, but would not be outside the natural range of variability. Improvements to key characteristics of habitat in the Park would sustain or slightly improve existing population levels, population structure, or other factors and maintain the viability of the species.

Moderate Adverse: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Frequent responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, or other factors affecting local population levels. Some impacts might occur during critical periods of reproduction or in key habitats in the Park and result in harassment, injury, or mortality to one or more individuals. However, sufficient population numbers or habitat in the Park would remain functional to maintain the viability of the species in the Park.

Moderate Beneficial: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Changes to key characteristics of habit in the Park during critical periods of reproduction would minimize or prevent harassment or injury to one or more individuals and improve the viability of the species in the Park.

Major Adverse: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, would be expected to be outside the natural range of variability, and would be permanent. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a decrease in Park population levels. Impacts would occur during critical periods of reproduction or in key habitats in the Park and result in direct mortality or loss of habitat that might affect the viability of a sensitive species. Lo-

cal population numbers, population structure, and other demographic factors might experience large declines.

Major Beneficial: Impacts on native species, their habitats in the Park, or the natural processes sustaining them would be detectable, would be expected to be outside the natural range of variability, and would be permanent. Changes during critical periods of reproduction or in key habitats in the Park would prevent mortality or loss of habitat and would result in notable increases in Park population levels.

Impairment: The action would contribute substantially to the deterioration of state listed or special status species in the Park to the extent they would no longer function as a part of the natural system. In addition, some of these adverse major impacts on the Park's resources and values would

- contribute to deterioration of state listed or special status wildlife resources and values to the extent that the purpose of the Park would not be fulfilled as established in its enabling legislation
- affect resources key to the natural or cultural integrity or opportunities for enjoyment in the Park
- affect the resource whose conservation is identified as a goal in the draft general management plan (NPS 2006a) or other planning documents for the Park

Area of Analysis

The area of analysis (including cumulative impacts) is Olympic National Park and surrounding habitat that could become inhabited by fishers.

IMPACTS OF THE ALTERNATIVES

Alternative A — No-Action Alternative

Analysis

Under alternative A, fishers would not be reintroduced into Olympic National Park. Alternative A would result in adverse, long-term, and minor to moderate impacts to fishers. Since fishers are currently limited to three populations in the West Coast DPS, none of which are in Washington, fisher would continue to be affected by a greatly reduced distribution in the Washington, Oregon, and California DPS. Therefore, impacts to fishers would result from not reintroducing the species, especially if fishers are eventually listed under the Endangered Species Act. If fishers are not restored to the Park, fishers would not be delisted in the state of Washington and would remain a federal candidate. These impacts would also affect other fisher populations resulting from continued extirpation of the species from suitable habitat and their historical range. Alternative A would have no effect on other threatened, endangered, or sensitive wildlife species related to fisher reintroduction activities, as reintroductions would not occur.

Cumulative Impacts

Past, present, and reasonably foreseeable future activities occurring within and around Olympic National Park have affected, and would continue to affect, special status species. The construction, maintenance, and use of roads, trails, utility lines, buildings, and other development in Olympic National Park could disturb wildlife species of special concern through noise and human presence. Logging and other modifications to suitable habitat outside NPS boundaries could negatively affect marbled murrelets, northern

spotted owls, and bald eagles. The marbled murrelet is also sensitive to oil spills and other sources of pollution. These past and potential future activities would have minor adverse cumulative impacts on wildlife species of special concern in the Park, as individuals might temporarily avoid areas, but impacts would not be expected to affect critical periods, such as nesting.

Several ongoing projects and plans would have a beneficial impact on multiple special status wildlife species and their habitat. Within the Park, natural resource management activities that include monitoring of northern spotted owls and restoring Park areas (including the Elwha River ecosystem by removing two dams) would beneficially affect species of special concern.

Outside Park boundaries, the 1997 multispecies habitat conservation plan developed by the WDNR to continue forest management activities on state trust lands is specific to the marbled murrelet, spotted owl, and bald eagle. The *Northwest Forest Plan* defines an overall vision for the Pacific Northwest that allows for the production of timber while protecting and managing impacted species. The plan's strategy meets the conservation obligations towards the spotted owl and other protected species, while allowing for a stable and sustainable supply of timber. Multiple forest thinning projects planned in the adjacent Olympic National Forest would thin second-growth forest and young managed stands. Olympic National Forest has historically emphasized commercial thinning of young forest stands. These projects would enhance species and structural diversity and improve habitat for protected species, which would result in a beneficial impact. The USFS began treating invasive plants across 3,830 acres in the Olympic National Forest in the fall of 2006 and plans to continue treatment in the future, which could promote wildlife habitat and result in a beneficial impact. Conservation strategies for the Olympic Experimental State Forest Unit, in the northwest corner of the Olympic Peninsula, would likely result in some increase in older age tree stands after 80 years, which could benefit marbled murrelets and spotted owls. These projects would have a cumulative, minor to moderate, beneficial impact on wildlife species of special concern, as the vitality of species would increase or improve, and species-limiting factors would be kept in check or reduced.

Cumulative impacts resulting from not reintroducing fishers would be a continued absence of a predator species that leaves the ecological system and wildlife communities on the Olympic Peninsula out of balance. When combined with impacts from not reintroducing fisher, cumulative impacts under alternative A would be adverse, long-term and moderate. There would be no cumulative impacts to other species of special concern, as no activities related to fisher reintroduction would be added to other activities in the area of analysis. There would be no impairment to species of special concern under this alternative.

Conclusion

Wildlife species (other than fishers) of special concern would not be affected under alternative A because fishers would not be reintroduced. Alternative A would have an adverse, long-term, and minor to moderate impact on fishers since the species would not be reintroduced into Olympic National Park. Without restoration, fishers would remain listed in the State of Washington, as well as a federal candidate with potential for future federal listing. These impacts would also affect other fisher populations in the West Coast DPS resulting from continued extirpation of the species from suitable habitat and their historical range. There would be adverse, long-term, and moderate cumulative impacts on fishers from alternative A. There would be no cumulative impacts to other species of special concern, as no activities related to fisher reintroduction would be added to other activities in the area of analysis. There would be no impairment to species of special concern under this alternative.

Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation

Analysis

Under alternative B at least 100 fishers would be translocated to the Park over a three-year period. Actions involved would include live-trapping fishers from a source population and transporting them to the Park; releasing them from roads or in remote areas after being transported by pack animals or helicopters; and monitoring movements survival, home range establishment, and reproduction.

Impacts on Federally-listed Wildlife

Fishers. Fishers would be live-trapped and translocated in the fall from source populations in either British Columbia or Alberta. Fishers from these Canadian provinces would come from coniferous forest habitats and are expected to easily adapt to the forest structure and diverse prey base that exists on the Olympic Peninsula. The genetic similarities that exist between these populations and the fishers that historically occurred in Washington suggest that they are the most genetically fit individuals to be reintroduced to Washington (Lewis, pers. comm. October 19, 2006).

Radio-collaring an immobilized fisher.
Photo by PNW Research Station.

Appropriate steps would be taken to minimize stress to fishers after they were captured; and during handling they would be chemically immobilized to facilitate examination, and for fitting and attaching radio collars (Lewis and Hayes 2004). A trapping coordinator would be hired to coordinate and oversee fisher capture efforts. The trapping coordinator would explain the capture techniques and equipment to trappers, assist trappers as needed, and obtain captured fishers from trappers for temporary placement in a captive facility. The coordinator would also assist in the handling and care of fishers held in captivity, and would assist in the transport of fishers to Washington. The captive facility would be staffed by at least one on-site captive wildlife specialist to facilitate preparing fishers for transport and release (Lewis 2006). A wildlife veterinarian would also be available to treat injuries that occurred as part of the live-trapping and collaring program. If an animal was injured, it would be chemically immobilized and examined. If the injuries were deemed untreatable, then the animal would be euthanized (Weir, pers. comm. June 21, 2006). When enough animals had been captured, they would be transferred to travel boxes and transported by vehicle or aircraft to release sites. The utilization of a trapping coordinator, captive wildlife specialists, and veterinarians would minimize adverse impacts of translocation on the fishers. An incidental loss of individual fishers during trapping is not likely to affect the stability of the source population.

The loss of fishers from the source population would not cause a decline in that population. Alternative B would not result in removal of additional fishers, instead trappers would be paid to live trap approximately 33 fishers each year for three years for the reintroduction project, rather than trapping and killing them for fur. Fishers would be removed from a source population that is large enough to withstand the loss of 100 individuals over a three-year period. It is estimated that between 700 and 1,050 fishers occur in the 27,000 square mile (70,000 square km) area of interest in British Columbia (Weir and Corbould 2006; Lofroth 2004). Removing 33 fishers per year would result in the removal of between 3.1% and 4.7% of the population. The greater British Columbia area has activities such as trapping that result in the removal of between 100 and 400 fishers a year. For example, in 2006, approximately 400 fishers were captured during the commercial trapping season in British Columbia. Thus, the translocation of 100 fish-

ers to Washington over three years under this plan is expected to replace the loss of a similar number of fishers that would be legally trapped for fur each year in British Columbia.

Releasing fishers at Olympic National Park would require the use of vehicles on Park roads, as well as pack animals to reach remote areas. Vehicle use may cause previously released fishers near the road to temporarily take cover into surrounding habitats. The use of pack animals and the associated human presence in remote areas of the Park may temporarily disturb individual fishers in the immediate area. Fisher response to this type of disturbance could range from slight behavior changes for the duration of the disturbance, such as hiding or temporary displacement. If fishers were released during the preferred timeframe in the late fall / early winter, there would be no impacts to previously released individuals that could potentially be breeding, as fishers breed from March to May and typically give birth the following March to April.

Sources of mortality of released fishers are expected to include fisher-vehicle collisions, incidental capture, predation, poaching, or other causes. The time of year that fishers were ultimately released could influence survival rates. For example, fishers released during summer and fall might benefit from better site fidelity because greater amounts of prey and cover would be available, whereas fishers released in January or February, when prey availability would be relatively low and travel impeded by snow, could be at a disadvantage. Late winter releases would also limit the amount of time fishers had to establish territories and find a den site before the birthing and breeding season in March to April. Ultimately, the adaptive management protocols identified in chapter 2 would be implemented if monitoring efforts indicated that a self-sustaining fisher population was not being established at an acceptable level. This could include changing release sites or altering the time of year that fishers were reintroduced, which could reduce the potential for vehicle collisions or reduced prey availability. Impacts to previously released fishers during monitoring of the reintroduction efforts would be similar to impacts expected during the releases but to a lesser degree since fixed-wing aircraft would be used for telemetry at an elevation greater than 120 yards above the tree canopy, which would not disturb fishers. The use of helicopters to retrieve dead animals could cause temporary disturbance to previously released fishers. However, helicopters would only be used if dead animals could not be accessed in a safe and timely manner on foot or by horse or mule. Furthermore, helicopters would land in open areas, which are not used by fishers, and retrieval of a carcass would likely require personnel to hike to the carcass from the helicopter. In addition, helicopters would not be used during the nesting season for northern spotted owl and marbled murrelet (March 1 to September 15), which would limit the potential for any associated disturbances to denning fishers. The temporary and intermittent nature of the disturbances related to monitoring activities would allow disturbed individuals to quickly return to their normal behavior. Due to the seasonal restrictions on helicopter use, the infrequency of use, and the limited landing locations, the use helicopters for carcass retrieval is unlikely to disturb fishers.

Assuming that a self-sustaining population of fishers was restored to Olympic National Park, there would be long-term beneficial effects on the fisher population by increasing the size and expanding the geographic range of this species to the Olympic Peninsula ecosystem. Additionally, if the Olympic Peninsula population was restored and became self-sustaining, it could be used as a source population for other reintroduction efforts in the state, which would presumably further increase the numbers and geographic range of the species. Reestablishment of fishers in Washington would contribute to meeting state recovery goals and assist with removal of fishers from federal candidate listing.

While a fisher reintroduction would cause a change in the current ecosystem (e.g., increase in the local diversity and abundance of carnivores), it is expected that the reestablishment of a native species would be beneficial because it would help restore ecosystem functions. The benefit includes restoring balance in the predator/prey communities of forested systems in the Park.

Because adverse impacts to individual fishers and their habitat would not be measurable, overall adverse impacts would be short- to long-term and negligible. There would be no effect on the source population

because live trapped and relocated fishers would replace fishers that would otherwise be trapped and killed for fur. There would be major beneficial impacts on the West Coast DPS fisher population as a whole, because reintroduction would result in improvements to population size and viability.

Marbled Murrelet. Trapping and transporting fishers from the source population to Olympic National Park would not be expected to have an effect on marbled murrelets. Fisher releases are not expected to take place during murrelet nesting season. Furthermore, helicopters would not be used for releases in marbled murrelet habitat from March 1 to September 15, which would eliminate the potential effects to marbled murrelets. Consequently, fisher release actions would have no effect on marbled murrelets.

Fishers use the same structures for resting (large limbs) that murrelets use for nesting. However, extensive suitable habitat and habitat structures for both species exists throughout the Park. Fishers and marbled murrelets coexisted on the Olympic Peninsula for millennia prior to the extirpation of the fishers from 38 years ago. Because both species would exist at low densities, interactions between these two species are not expected to occur.

Because fishers forage occasionally in trees, and consume birds, they may be a potential predator of incubating adult murrelets or chicks. However, fisher predation on marbled murrelets is expected to be extremely unlikely to occur, and to be insignificant and discountable. Fishers and murrelets co-exist in portions of northwest California and there is no documentation of fishers preying on murrelets. Reintroduced fishers are expected to have large home ranges and occur at low densities, so it is unlikely that a fisher would encounter a nesting murrelet. The most likely nest predators are corvids (such as crows) and great horned owls (*Bubo virginianus*); mammalian predation of murrelet nests has not been documented (Nelson and Hamer 1995), however, recent radio-telemetry studies of marbled murrelets on the Olympic Peninsula have not detected any nest failures due to predation. Instead the cause appears to be related to poor ocean conditions resulting in chick starvation or adults abandoning eggs prior to completion of the incubation period (Raphael 2007). In addition, several factors could limit the fisher's ability to detect marbled murrelet nests, such as murrelet adults arriving and departing nest sites during periods of low light, cryptic coloration of both adults and chicks, and general lack of movement while at the nest. Most of fisher foraging activities occur on the ground (Powell 1993). Fledgling murrelets could become vulnerable to fishers if they became grounded during flights from the nest to the ocean, however, the fledging strategy for murrelets is for the chick to fly directly from the limb to the sea (Lewis and Hayes 2004). Grounded nestlings are either sick or fell out of the tree prematurely and are not expected to survive in the wild. Furthermore, the majority of fishers' prey is small and medium sized terrestrial mammals, not birds (NPS 2007).

Factors affecting marbled murrelets during monitoring activities associated with a fisher reintroduction in Olympic National Park would be similar to those discussed for the release efforts. Post release monitoring would be conducted via road and foot access in front country areas, and through the use of small fixed wing aircraft in the backcountry areas of the Park and Olympic National Forest. Carcass retrievals would be conducted primarily on foot, however helicopters may be used occasionally to access remote sites, but only between September 15 and March 1. The use of vehicles on Park roads, and foot access on trails during monitoring efforts would not likely disturb murrelets that inhabit the surrounding areas. The level of monitoring traffic would not be above background use of the areas, and murrelets that inhabit areas near roads and trails have probably adapted to some levels of noise and human presence associated with roads and trails. All fixed wing telemetry would be flown at elevations greater than 120 yards above the tree canopy: this distance is greater than the threshold distance that could adversely affect murrelets through disturbance (USFWS 2003). Helicopters would not be used during murrelet nesting season. Consequently, fisher monitoring actions are not likely to adversely affect marbled murrelets.

Given these considerations, the determination of effect on marbled murrelets from the proposed reintroduction of fishers under alternative B is "not likely to adversely affect." Since adverse impacts to marbled

murrelets and their habitat would be extremely unlikely to occur, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible.

Northern Spotted Owl. Factors affecting the northern spotted owl from the reintroduction of fishers would be similar to those identified for the marbled murrelet. Trapping and transporting fishers from the source population to Olympic National Park would not be expected to have an effect on the northern spotted owl. The actual release of fishers in the Park would not take place during northern spotted owl nesting season from March 1 to September 15. Consequently, fisher release actions would have no effect on northern spotted owl.

Because a restored fisher population would inhabit the same forests used by spotted owls for nesting, roosting and foraging, there is a potential for fishers and spotted owls to interact. However, fishers and northern spotted owls coexisted on the Olympic Peninsula for millennia prior to the extirpation of the fisher on the Olympic Peninsula. Because the habitat in the Park is largely intact, it is expected that these two species would co-exist as they did prior to the extirpation of the fisher. Although fishers and spotted owls both prey on some of the same animals, this is not likely to reduce the prey base for either species. Spotted owls are prey specialists, focusing on nocturnally active arboreal small mammals, in particular the northern flying squirrel. Fishers are prey generalists, with flexible diet selection patterns throughout their range; fishers prey on a variety of species, and make large use of ground dwelling and diurnally active species and fishers prey on flying squirrels infrequently (Gutierrez et al. 1995). The diversity of small mammals on the Olympic Peninsula and the flexibility in the fishers' diet would limit their effects on the prey base for northern spotted owls (Lewis and Hayes 2004).

Prey habitat conditions in the Park have not been affected by human land management practices; the Park supports a diverse (Jenkins et al. 2005) and presumably adequate prey base for both species. Fishers make extensive use of carrion, particularly ungulate carrion, in the winter and early spring months and therefore fishers are likely to make extensive use of ungulate carrion in winter months, further decreasing potential competition with spotted owls.

The chance of a fisher preying on a northern spotted owl overall is extremely unlikely; both species are expected to occur in the Park at low densities and the chance of their encountering each other is extremely low. The highest density spotted owl populations are on the eastern side of the Olympics (Seaman et al. 1996); predicted suitable habitat for fishers, based on the best available data, is on the western side of the Peninsula, further lessening their chances for encounters. In areas where the range of fishers overlaps extensively with Northern spotted owls in Oregon and California, there is no documentation of a fisher preying on a spotted owl, either adults, chicks, or eggs, despite extensive research on both species in areas where they co-occur at high densities.

Although anecdotal accounts describe fishers observed in proximity of owl nests, there is no documentation of fisher predation on spotted owls, either adults or chicks, despite extensive research on both species in areas of range overlap. Fisher rest sites tend to be only 40 to 50 feet up in trees, whereas spotted owls nest high up in tree canopies (greater than 100 feet), further decreasing a chance for an encounter or predation (Mark Higley, pers comm. April 16, 2007). Additionally, spotted owls on the Olympic Peninsula only nest every other year, decreasing even further the chance of predation on nesting birds and nestlings.

Due to the effects of barred owls, spotted owls on the Olympic Peninsula have moved to nesting and roosting at higher elevations. Fishers are expected to make greater use of lower elevations, further lessening their chance of encounters.

Factors affecting northern spotted owls during monitoring activities associated with the reintroduction of fishers to Olympic National Park would be similar to those discussed for the marbled murrelet. Post release monitoring would be conducted via road and foot access in front country areas, and through the use of small fixed wing aircraft in the backcountry areas of the Park and Forest. Carcass retrievals would be conducted primarily via foot access, however helicopters may be used occasionally to access remote sites,

but only during September 15-March 1. The use of vehicles on Park roads, and foot access on trails during monitoring efforts would not likely disturb spotted owls that inhabit the surrounding areas. The level of monitoring traffic would not be above background use of the areas, and spotted owls that inhabit areas near roads and trails have probably adapted to some levels of noise and human presence associated with the roads. All fixed wing telemetry would be flown at elevations greater than 120 yards above the tree canopy: this distance is greater than the threshold distance that could adversely affect spotted owls through disturbance (USFWS 2003). Helicopters would not be used during spotted owl nesting seasons. Consequently, fisher monitoring actions are not likely to adversely affect northern spotted owls.

Given these considerations, the determination of effect for northern spotted owls from fisher reintroduction under alternative B is "not likely to adversely affect." Overall, since adverse impacts to spotted owls and their habitat would be insignificant and discountable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible.

Impacts on Other Wildlife Species of Special Concern

Bald Eagle. There would be limited potential for fisher restoration efforts to affect bald eagles. The use of helicopters during release efforts could cause the temporary and intermittent disturbance or dispersal of bald eagles; however, helicopters are anticipated to be used no more than 3 times a year, and only during the period between Sept 15 and March 1. Establishing a self-sustaining population of fishers is not expected to affect bald eagles, as these two species do not have similar habitat requirements, and there is very little overlap in prey. Bald eagles generally nest, forage, and roost near open water, and their primary prey include fish (Stinson et al. 2001). As a result, there would be no impact on bald eagle's habitat or prey species from fisher reintroduction, and fishers are not expected to prey on bald eagles. However, bald eagles may prey on fishers.

Factors affecting bald eagles during monitoring activities would be primary associated with the use of helicopters to retrieve dead fishers, and the use of fixed-wing aircraft during the gathering of radio-telemetry. However, the use of fixed-wing aircraft would be limited to elevations greater than 120 yards above tree canopy, and would be in the Park interior where few eagles nest. Known nests would be avoided in flight paths. The use of helicopters for retrieving dead animals would be precluded from March 1 to September 15.

The determination of effect[1] for bald eagles from fisher reintroduction under alternative B is "not likely to adversely affect." Since adverse impacts to bald eagles and their habitat would not be measurable, and impacts would not affect nesting or habitat, overall adverse impacts would be short-term and negligible.

Northern Goshawks. As with marbled murrelets and northern spotted owls, trapping and transporting fishers from the source population to Olympic National Park would not be expected to affect northern goshawks. The actual release of fishers in the Park could disturb or cause some individual goshawks to temporarily flush for the duration of the disturbance, especially if helicopters were used. However, helicopters would not be used for releases from March 1 to September 15, which would limit the potential effects during goshawk nesting periods.

Establishing a self-sustaining fisher population could have long-term impacts on northern goshawks, as both species occur in similar forest types and exhibit some overlap in prey, including ground squirrels, tree squirrels, snowshoe hares, grouse, corvids, and other birds (Pajerski 2005). However, given that extensive suitable habitat for both the fisher and the northern goshawk occurs in Olympic National Park and

[1] Although the bald eagle was federally delisted as threatened by the USFWS on June 28, 2007, for consistency with the BA for the restoration of fishers to Olympic National Park and the Olympic Peninsula (Appendix B), the determination of effect for federally listed species in the BA is included in the EA.

in the surrounding national forest, and the fact that these species once coexisted, it is expected that adequate resources are available to support both species (NPS 2006e).

Both goshawks and fishers have a diverse prey base and are known to switch to alternative food sources when prey availability is low, so the effect on the prey base for northern goshawks would be limited. In addition, fisher foraging habits are different from those of raptors; fishers commonly flush prey from cover on the forest floor as opposed to identifying prey from above. These factors would make the likelihood of competition for prey between these species minimal (Lewis and Hayes 2004).

Fisher predation of goshawk nestlings or adults is unlikely for several reasons: species of the *Accipter* genus have not been documented in fisher diets (Powell 1993, as cited in Lewis and Hayes 2004); the low population density of even a self-sustaining fisher population limits the chances for interactions; and goshawks and fishers coexist in similar habitats elsewhere in the western U.S. (Lewis and Hayes 2004). Although the potential exists for a fisher to enter a goshawk nest, the adult goshawk would likely defend its territory and fend off the attacking fisher. Therefore, impacts to northern goshawks from predation by fishers are not expected.

Factors affecting northern goshawks during monitoring activities associated with the reintroduction of fishers to Olympic National Park would be similar to those discussed for the marbled murrelet and northern spotted owl. Of primary concern would be the use of helicopters to retrieve dead fishers, and the use of fixed-wing aircraft during the gathering of radio-telemetry information, which would likely cause some individual goshawks to temporarily disperse, which could increase competition for resources. However, as noted previously, the use of fixed-wing aircraft would be limited to situations when telemetry information could not be obtained on the ground; helicopter and fixed-wing aircraft use for retrieving dead animals would be precluded from March 1 to September 15; and the disturbances associated with monitoring efforts would be temporary and intermittent. These factors would limit the potential effects associated with monitoring activities, especially during nesting or feeding times. Since adverse impacts to northern goshawks and their habitat would not be measurable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible.

Mazama Pocket Gopher. No fisher restoration and monitoring activities would occur in Mazama pocket gopher habitat. Fishers forage primarily in forested habitats, inhabit low and mid elevation forests, and generally do not prey on fossorial mammals. The determination of effect for Mazama pocket gopher from fisher reintroduction under alternative B is “not likely to adversely affect.” The effect of the fisher reintroduction would not be measurable, and therefore overall adverse impacts would be short- to long-term and negligible.

Pileated Woodpecker. As with the other species discussed previously, trapping and transporting fishers from the source population to Olympic National Park would not be expected to affect pileated woodpeckers. Establishing a self-sustaining fisher population could have long-term impacts on pileated woodpeckers, as both species occur in similar forest types. Cavities created by pileated woodpeckers in hollow trees and snags are frequently used by fishers for den and rest sites. The remains of a female pileated woodpecker were found at a fisher rest site in the southern Oregon Cascades, indicating that fishers may occasionally prey on pileated woodpeckers (Lewis, pers. comm. January 4, 2007). Because adverse impacts to pileated woodpeckers and their habitat would not be measurable or measurable but not outside the natural range of variability, and impacts would not affect nesting periods or habitat, overall adverse impacts would be short- to long-term and negligible to minor.

The remainder of the wildlife species of special concern listed in table 4 would not be impacted by fisher restoration in the Park either because of different habitat or food requirements or because fishers generally do not prey on these species.

Migratory birds in the Park might become prey species for fishers after a population was reestablished. While fisher may prey on individual birds, fisher predation on migratory birds would have an overall neg-

ligible adverse impact on bird populations or on migratory birds as a whole. Furthermore, the fisher and its prey, including birds, coexisted prior to the extirpation of the fisher from Washington, and it is assumed that a balance between these species would be reached again (NPS 2006e). While fisher restoration would result in a change in the ecosystem and its function, it is expected that the reestablishment of the fisher would be beneficial to the overall ecosystem function (Lewis, pers. comm. Oct. 19, 2006).

Cumulative Impacts

As discussed under alternative A, past and future project activities and development in Olympic National Park could disturb wildlife species of special concern through noise and human presence. These past and potential future activities would have minor adverse cumulative impacts on wildlife species of special concern in the Park, as individuals might temporarily avoid areas, but impacts would not be expected to affect critical periods, such as nesting. Other ongoing projects and plans would have a beneficial impact on special status wildlife species and their habitat. Restoring the natural fire regime, as defined for the fire management plan (NPS 2003), could result in greater prey abundance for fishers.

The 1997 multispecies habitat conservation plan developed by the WDNR to continue forest management activities on state trust lands is specific to the marbled murrelet, spotted owl, and bald eagle, as well as the fisher. The *Northwest Forest Plan* would allow for a stable and sustainable supply of timber, while protecting habitat for special status species, including the fisher. Conservation strategies for the Olympic Experimental State Forest Unit could benefit fishers, marbled murrelets, and spotted owls. These projects would have a cumulative, minor to moderate, beneficial impact on wildlife species of special concern, as they would result in increased suitable habitat and habitat connectivity.

Conclusion

Since adverse impacts to individual fishers and their habitat would not be measurable, overall adverse impacts would be short- to long-term and negligible. There would be no effect on the source population because live trapped and relocated fishers would replace fishers that would otherwise be trapped and killed for fur. There would be major beneficial impacts on the West Coast DPS fisher population as a whole, because reintroduction would result in improvements to population size and viability.

The determination of effect on the marbled murrelet under alternative B is “not likely to adversely affect.” Since adverse impacts to marbled murrelets and their habitat would not be measurable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible.

The determination of effect for northern spotted owls from fisher reintroduction under alternative B is “not likely to adversely affect.” Since adverse impacts to spotted owls and their habitat would be insignificant and discountable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible.

The determination of effect for bald eagles from fisher reintroduction under alternative B is “not likely to adversely affect.” Since adverse impacts to bald eagles and their habitat would not be measurable, and impacts would not affect nesting or habitat, overall adverse impacts would be short-term and negligible.

Since adverse impacts to northern goshawks and their habitat would not be measurable, and impacts would not affect critical periods or habitat, overall adverse impacts would be short- to long-term and negligible.

The determination of effect for Mazama pocket gopher from fisher reintroduction under alternative B is “not likely to adversely affect.” There would be short- to long-term and negligible impacts from implementation of alternative B on Mazama pocket gopher, since fisher do not inhabit the same habitat as Mazama pocket gopher.

Since adverse impacts to pileated woodpeckers and their habitat would not be measurable or measurable but not outside the natural range of variability, and impacts would not affect nesting periods or habitat, overall adverse impacts would be short- to long-term and negligible to minor.

Overall adverse impacts to migratory birds would be negligible. Fishers may prey on individual birds, which would have an overall negligible adverse impact on bird populations or on migratory birds as a whole. While fisher restoration would result in a change in the ecosystem and its function, it is expected that the reestablishment of the fisher would be beneficial to the overall ecosystem function.

Cumulative impacts on wildlife species of special concern would be minor and adverse due to ongoing maintenance and logging activities in the area, and range from minor to moderate beneficial from existing conservation and habitat restoration plans for the Park and surrounding federal lands.

There would be no impairment to species of special concern under this alternative.

Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding

Analysis

Under alternative C fishers would be reintroduced into Olympic National Park using captive breeding in addition to translocations (as described under alternative B). This alternative would involve live-trapping fishers from a source population and transporting them to the Park or to zoos for captive breeding; conducting captive breeding; releasing fishers via roads, pack animals, or helicopters; and monitoring movements, survival, home range establishment, and reproduction.

Impacts on Federally-listed Wildlife

Fishers. The source of impacts related to live trapping and transporting fishers under alternative C would be the same as those discussed under alternative B. However, fewer individuals would need to be trapped or transported as the offspring from the captive breeding program would be the primary source of fishers for reintroduction to the Park.

Fishers would be captively bred at several facilities. Multiple facilities would be needed to provide a hedge against catastrophic events, such as an outbreak of disease at one location, and to house the number of breeding fishers needed to produce sufficient numbers of offspring for reintroduction (approximately 100). Upon arrival at a zoo or other facility, the source population would be examined by a veterinarian and checked for disease. Individuals would be monitored throughout the captive breeding program for aggressive or abnormal behavior indicating illness or stress, and they would be medically treated as necessary. A science team with expertise in fishers, husbandry, and genetics would assist the WDFW in overseeing the breeding program.

Ideally, the program might produce 20 to 50 offspring per year (equal to what the translocation target would be). A mean litter size of two is common among wild fisher females, but can be higher in females in captivity (Lewis and Hayes 2004), and a 50% mortality rate in offspring is expected (based on the experiences of the Northwest Trek Wildlife Park, as described in chapter 2 for alternative C). As a result, it could take several years for 100 offspring to be produced for reintroduction. Therefore, the captive breeding program would have long-term, beneficial effects on fishers by increasing their numbers, and by providing a source of individuals for expanding its geographic range.

The impacts of releasing fishers, reintroduction, subsequent monitoring, and establishing a self-sustaining population of fishers under alternative C would be similar to those described under alternative B. However, it is likely that captive bred fishers might not be as successful establishing themselves in the wild as relocated fishers, and the likelihood of survival would be lower as a result. Lower survival rates would likely require more years of releases, which would extend the time period for release and monitoring as-

sociated impacts. A fisher experiencing a captive upbringing would be limited by the lack of exposure to various habitats, the absence of opportunities to catch wild prey, and fewer opportunities learning to avoid predators and other hazards in the wild. This might lead to a higher mortality rate of captive bred fishers as compared to those that are relocated from Canada under alternative B (Lewis, pers. comm. Dec. 5, 2006). Therefore, adverse impacts to relocated fishers would be higher under alternative C.

Since adverse impacts to individual fishers and their habitat would be either not measurable, or measurable but not outside the natural range of variability, overall adverse impacts would be short- to long-term and negligible to minor. There would be no effect on the source population because live trapped and relocated fishers would replace fishers that would otherwise be trapped and killed for fur. There would be major beneficial impacts on the West Coast DPS fisher population as a whole, since reintroduction would noticeably improve existing population levels. Since captive bred fishers could have a lower likelihood of survival as compared to relocated fishers, adverse impacts to fishers under alternative C would be higher than impacts under alternative B.

Marbled Murrelet. Trapping and transporting fishers from the source population to Olympic National Park, as well as captive breeding, would not be expected to affect the marbled murrelet under this alternative.

The determination of effect for marbled murrelets from fisher reintroduction under alternative C is "not likely to adversely affect." The impacts of fisher release, the establishment of a self-sustaining fisher population, and the subsequent monitoring of marbled murrelets under alternative C would be the same as those described under alternative B.

Northern Spotted Owl. Trapping and transporting fishers from the source population to Olympic National Park, as well as captive breeding, would not be expected to affect northern spotted owls under this alternative.

The determination of effect for northern spotted owls from fisher reintroduction under alternative C is "not likely to adversely affect." The impacts of fisher release, the establishment of a self-sustaining fisher population, and the subsequent monitoring of northern spotted owls under alternative C would be the same as those described under alternative B.

Impacts on Other Wildlife Species of Special Concern

Bald Eagle. Trapping and transporting fishers from the source population to Olympic National Park, as well as captive breeding, would not be expected to affect bald eagles under this alternative.

The determination of effect[2] for bald eagles from fisher reintroduction under alternative C is "not likely to adversely affect." The impacts of fisher release, the establishment of a self-sustaining fisher population, and the subsequent monitoring of bald eagles under alternative C would be the same as those described under alternative B, short- to long-term and negligible.

Northern Goshawks. Trapping and transporting fishers from the source population to Olympic National Park, as well as captive breeding, would not be expected to affect northern goshawks under this alternative. The impacts of fisher release, the establishment of a self-sustaining fisher population, and the subsequent monitoring on northern goshawks under alternative C would be the same as those described under alternative B.

[2] Although the bald eagle was federally delisted as threatened by the USFWS on June 28, 2007, for consistency with the BA for the restoration of fishers to Olympic National Park and the Olympic Peninsula (Appendix B), the determination of effect for federally listed species in the BA is included in the EA.

Mazama Pocket Gopher. The determination of effect for Mazama pocket gopher from fisher reintroduction under alternative C is "not likely to adversely affect." The impacts of the fisher reintroduction under alternative C would be the same as those described under alternative B.

Pileated Woodpecker. Trapping and transporting fishers from the source population to Olympic National Park, as well as captive breeding, would not be expected to affect pileated woodpeckers under this alternative. The impacts of fisher release, the establishment of a self-sustaining fisher population, and the subsequent monitoring of pileated woodpeckers under alternative C would be the same as those described under alternative B.

The remainder of the wildlife species of special concern listed in table 4 on would not be impacted by fisher restoration in the Park either because of different habitat or food requirements or because fishers do not prey on these species.

Impacts to migratory birds would be the same as those described under alternative B.

Cumulative Impacts

Cumulative impacts under alternative C would be the same as alternative B. Overall, impacts of actions under alternative C, combined with impacts from other actions that could affect wildlife species of special concern, would result in cumulative, adverse, minor impacts to animal species of special concern. However, minor to moderate beneficial cumulative impacts would result from conservation plans and habitat restoration plans in place for the Park and surrounding federal lands.

Conclusion

Since adverse impacts to individual fishers and their habitat would be either not measurable, or measurable but not outside the natural range of variability, overall adverse impacts would be short- to long-term and negligible to minor. There would be no effect on the source population because live trapped and relocated fishers would replace fishers that would otherwise be trapped and killed for fur. There would be major beneficial impacts on the West Coast DPS fisher population as a whole, since reintroduction would noticeably improve existing population levels. Since captive bred fishers could have a lower likelihood of survival as compared to relocated fishers, adverse impacts to fishers under alternative C would be higher than impacts under alternative B.

The determination of effect on the marbled murrelet under alternative C is "not likely to adversely affect." Since adverse impacts to the marbled murrelet and its habitat would not be measurable, overall adverse impacts would be short- to long-term and negligible.

The determination of effect for northern spotted owls from fisher reintroduction under alternative C is "not likely to adversely affect." Since adverse impacts to the northern spotted owl and its habitat would not be measurable, overall adverse impacts would be short- to long-term and negligible.

The determination of effect for bald eagles is "not likely to adversely affect." Adverse impacts to the bald eagle and its habitat would not be measurable, therefore overall adverse impacts would be short- to long-term and negligible.

Since adverse impacts to the northern goshawk and its habitat would be either not measurable, overall adverse impacts would be short- to long-term and negligible.

The determination of effect for Mazama pocket gopher from fisher reintroduction under alternative C is "not likely to adversely affect." There would be short- to long-term and negligible impacts from implementation of alternative C on Mazama pocket gopher, since fisher do not inhabit the same habitat as Mazama pocket gopher.

Since adverse impacts to pileated woodpeckers and their habitat would be either not measurable or measurable but not outside the natural range of variability, and impacts would not affect nesting periods or habitat, overall adverse impacts would be short- to long-term and negligible to minor.

Impacts to migratory birds would be the same as alternative B.

Cumulative impacts on wildlife species of special concern would be minor adverse due to ongoing maintenance and logging activities in the area, and range from minor to moderate beneficial from conservation and habitat restoration plans taking place for the Park and surrounding federal lands.

There would be no impairment to species of special concern under this alternative.

IMPACTS ON WILDLIFE AND WILDLIFE HABITAT

As described under "Species of Special Concern" (in "Chapter 3 – Affected Environment"), the fisher source population would be affected due to removing fishers from their original habitat for relocation to the Olympic Peninsula. The reintroduced fishers would also be affected by the action alternatives. Other wildlife potentially affected by the proposed alternative include snowshoe hares, mountain beavers, small mammals (mice, voles, and shrews), porcupines, squirrels (including Douglas squirrels), woodrats, birds (including quail and grouse), reptiles, and insects, all of which are potential prey for fishers. Fisher predators, including coyote, bobcat, and mountain lion would be affected by the restoration of fishers.

GUIDING REGULATIONS AND POLICIES

The NPS Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the agency to mean that native animal life is to be protected and perpetuated as part of the park's natural ecosystem. Parks rely on natural processes to control populations of native species to the greatest extent possible, and they protect them from harvest, harassment, or harm by human activities. According to NPS *Management Policies 2006*, the restoration of native species is a high priority (NPS 2006b, sec. 4.1.5). The NPS would maintain, as parts of the natural ecosystems of parks, all native plants and animals. The NPS is to achieve this by:

- preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and communities and ecosystems in which they occur
- restoring native plant and animal populations in parks where they have been extirpated by past human-caused actions
- minimizing human impacts on native plants, animal populations, communities, and ecosystems, and the processes that sustain them (NPS 2006b, sec. 4.4.1).

Servicewide management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and the ecological integrity of the plant and animal species native to those ecosystems (NPS 2006b, sec. 4.1).

Olympic National Park's desired conditions for native species, as defined in its 2006 draft general management plan (NPS 2006a), support the NPS *Management Policies 2006* (NPS 2006b) and include the following:

- The Park provides naturally evolving examples of plant and animal communities.
- The Park animal and plant populations are managed to promote long-term viability, including maintaining age-structures, abundance, density, and distributions within normal ranges, and a full range of natural genetic variability.

- Extirpated native species are restored when feasible and appropriate.
- Effects of native diseases and pests are within normal range of variation, and are not worsened by human-caused factors.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The following methodology was used to evaluate the impacts of the proposed alternatives on wildlife at Olympic National Park. The analysis focuses on specific wildlife species and/or their habitats that could potentially be impacted by the actions described in the proposed alternatives. Available information on known wildlife, including unique or important wildlife or wildlife habitat, was compiled and analyzed in relation to the management actions. Potential impacts were evaluated based on available scientific literature and professional judgment of fisher experts.

Intensity Thresholds

The following thresholds for the impacts on wildlife and wildlife habitat were defined:

Negligible: There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.

Minor: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, but would not be outside the natural range of variability. Small changes to population numbers, population structure, genetic variability, and other demographic factors might occur. Occasional responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, or other factors affecting population levels. Sufficient habitat would remain functional to maintain viability of all species. Impacts would be outside critical reproduction periods for sensitive native species.

Moderate: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and could be outside the natural range of variability. Frequent responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, or other factors affecting population levels. Changes to population numbers, population structure, genetic variability, and other demographic factors would occur, but species would remain stable and viable. Frequent responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, or other factors affecting population levels. Sufficient habitat would remain functional to maintain viability of all native species. Some impacts might occur during critical periods of reproduction or in key habitat.

Major: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, would be expected to be outside the natural range of variability, and would be permanent. Population numbers, population structure, genetic variability, and other demographic factors might experience large declines. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a decrease in population levels. Loss of habitat might affect the viability of at least some native species.

Impairment: An action would disrupt ecosystem processes resulting in elimination of a species or large population declines, locally and range-wide. In addition, these adverse, major impacts on the Olympic National Park's resources and values would:

- contribute to deterioration of wildlife resources and values to the extent that the purpose of the park would not be fulfilled as established in its enabling legislation
- affect resources key to the natural or cultural integrity or opportunities for enjoyment in the Olympic National Park.
- affect the resource whose conservation is identified as a goal in the draft general management plan (NPS 2006a) or other planning documents for the Olympic National Park

Area of Analysis

The area of analysis is primarily Olympic National Park and surrounding habitats that could become inhabited by fishers.

IMPACTS OF THE ALTERNATIVES

Alternative A — No-Action Alternative

Analysis

Under alternative A, fishers would not be reintroduced into Olympic National Park, and wildlife communities would continue to be adversely impacted by the absence of a native predator. A goal of the NPS is to restore the biological components of the ecosystem; including efforts to restore native animal populations when they have been extirpated by human-caused actions (NPS 2006a). Without the reintroduction of fishers that would restore the historic predator-prey interactions, the Olympic Peninsula would not be maintained as a fully functioning ecosystem. Under alternative A, adverse impacts would be long-term and negligible to moderate on wildlife and wildlife habitat since impacts on native species, their habitats, or the natural processes sustaining them would be detectable.

Cumulative Impacts

Past, present, and reasonably foreseeable future activities occurring within and around Olympic National Park have affected, and would continue to affect, wildlife and habitat. The construction, maintenance, and use of roads, trails, utility lines, buildings, and other development would likely disturb wildlife species through noise and human presence. Fire management activities would temporarily displace some animals. Noise from visitors can disturb wildlife. Hunting and trapping activities on adjacent lands would have an adverse impact on those animals. These activities would have negligible to minor cumulative impacts on wildlife species in the Park, as impacts would be within natural fluctuations, or detectable but not outside the natural range of variability.

Several ongoing projects and plans would also have a beneficial impact on multiple wildlife species and their habitat. The 1997 multispecies habitat conservation plan developed by the WDNR to continue forest management activities on state trust lands was designed to protect the habitat of several threatened and endangered species; however, the plan would also have a beneficial impact on other wildlife species that utilize similar habitat. The *Northwest Forest Plan* provides an overall vision for the Pacific Northwest that allows for the production of timber while protecting and managing impacted species and habitats, including late-successional and old-growth forests. The plan's strategies meet the conservation obligations for the spotted owl and other protected species, while allowing for a stable and sustainable supply of timber. Multiple forest thinning projects planned in Olympic National Forest would thin second-growth forest and young managed stands. These projects would enhance species and structural diversity and improve wildlife habitat, which would have a beneficial impact on many wildlife species. The USFS treated invasive plants across 3,830 acres in the Olympic National Forest beginning in the fall of 2006 and plans

to continue treatment in the future, which could promote wildlife habitat, resulting in a beneficial impact. These projects would have a cumulative, minor, beneficial impact on wildlife, as sufficient habitat would remain functional to maintain viability of all native species.

Conclusion

Alternative A would have long-term, negligible to moderate adverse impacts on wildlife species and their habitat, because fishers would not be reintroduced to Park lands. Cumulative impacts on wildlife species and habitat from ongoing maintenance and logging activities in the area would be negligible to minor adverse impact. There would be minor, beneficial cumulative impacts from existing conservation and habitat restoration plans for the park and surrounding federal lands. There would be no impairment to wildlife and wildlife habitat under this alternative.

Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation

Analysis

Under alternative B at least 100 fishers would be translocated to Olympic National Park over a three-year period. Actions involved would include live-trapping fishers from a source population and transporting them to the Park; releasing them from roads or in remote areas after being transported by pack animals or helicopters; and monitoring movements, survival, home range establishment, and reproduction. Transporting fishers to the Park would not measurably affect other wildlife, and is not discussed further in this section.

Fishers would be live-trapped and translocated in the fall from source populations in either British Columbia or Alberta. During trapping it is possible that non-target wildlife (usually American martens) would be caught. Any captured martens would be fed a small amount of strawberry jam to reduce the likelihood of hypoglycemia and would be released immediately. Any non-target animal captured in a box trap would be released unharmed, if possible. In the unlikely event that an animal was severely injured when captured in a box trap, it would be humanely euthanized (Weir, pers. comm. June 21, 2006).

Removing 100 or more individual fishers from source populations over three years would have beneficial effects on fisher prey species in the vicinity where live trapping would be conducted. Conversely, reintroducing fishers in Olympic National Park would have an adverse effect on fisher prey species in this location. However, since fishers are opportunistic predators and have a varied diet, their reintroduction would not affect most prey populations. Research indicates that populations of ground-nesting birds have actually increased after fishers were reintroduced (Fund for Investigative Reporting and Editing 2002). This is likely due to the fact that fishers more often feed on the bird's predators than the birds themselves, reducing populations of skunks, snakes, and other nest-raiding species.

Removing fishers from the source populations would remove a source of prey for predators that rely on the fisher population as part of their diet. This is not expected to have a measurable effect on predator populations in the vicinity of the trapping sites.

The reintroduction of fishers at Olympic National Park might result in adverse impacts to local domestic and farm animals such as house cats, birds, chickens, and small mammals. Fisher biologists and furbearer program managers in the Midwest and Northeast have documented occurrences of fisher predation on pets and small livestock. These events typically occur in areas where homes are located in remote forested habitats. However, these events are uncommon, even where fishers are abundant, since fishers tend to avoid people and developed areas. Although individual prey animals would suffer, the overall adverse impact on the species' population would be negligible. There would be a beneficial impact to other small animals if fishers fed on feral cats, which can be predators of other small mammals and birds. If fisher predation on domestic and farm animals became a problem in the area surrounding Olympic National

Park, the affected person should contact WDFW for advice about how to address the problem. If the problem could not be solved without intervention, then an effort would be made to capture and relocate the individual fisher. Since the fisher is a state-listed species that receives protection, lethal means of resolving the conflict must be avoided.

Releasing fishers at Olympic National Park would require the use of vehicles on Park roads, as well as pack animals and/or helicopters to reach remote areas. Helicopters would be used only when needed to access release sites in wilderness areas that would be difficult to access on foot or with pack animals. Additionally, fishers would be released during the late fall / early winter (as described in the "Timing" section of "Chapter 2 – Affected Environment"). Helicopters would not be used for releases in spotted owl and marbled murrelet habitat from March 1 to September 15, which would also protect other nesting birds. Vehicle use would likely not disturb other wildlife that inhabit the surrounding areas, as wildlife have likely adapted to current levels of noise and human presence associated with the roads. However, the use of pack animals and/or helicopters, and the associated human presence, in remote areas of the Park would likely cause flushing or temporary displacement of some wildlife species for the duration of the disturbance caused by reintroduction activity. The successful reintroduction of fishers in Olympic National Park would result in the restoration of a native, self-sustaining predator population in the Olympic Peninsula ecosystem. As the most important prey of fishers at the Park is expected to be snowshoe hares and mountain beavers, these species could decline as a result of the reintroduction. Other prey, including small mammals (mice, voles, and shrews), porcupines, squirrels (including Douglas squirrels), woodrats, birds (including quail and grouse), reptiles, and insects, could also experience some decline (NPS 2006e).

While grouse are an important prey item to fishers in some locations, fisher predation does not have a substantial influence on grouse populations. It is unlikely that a reintroduced population of fishers in Washington would cause a decline in resident grouse populations, as fishers are generalist predators that occur in low densities and prey on a wide variety of small and medium sized mammals and birds. Grouse are commonly found in the diet of fishers where they both occur and make up as much as 10% of the diet during the winter in some locations (e.g., British Columbia, Ontario). While grouse are important as a prey item to fishers in some locations, fisher predation would not have a substantial influence on the Park's ruffed and blue grouse populations.

Minnesota, Wisconsin, Michigan, and New York have abundant fisher populations; however, upland game bird managers in these states are not concerned about fisher predation on grouse populations. Some hunters may have concerns due to the presence of fishers in areas where they hunt and may inaccurately attribute poor grouse numbers to fisher predation. In the Midwest, grouse populations fluctuate with the snowshoe hare cycle. As the snowshoe hare population crashes at northern latitudes, a variety of raptors (most notably goshawks) move south into Minnesota, Wisconsin, and Michigan and prey heavily on ruffed grouse. This series of events results in a seven to nine year cycle in grouse populations in the Midwest. In western North America, where fisher densities are much lower than in the Midwest, fisher predation rates on grouse would also be expected to be substantially lower. Given that upland game managers are unconcerned with fisher impacts in areas with high densities of fishers, a reintroduced population of fishers in Washington is not expected to cause a decline in resident grouse populations (Lewis, pers. comm. October 2, 2006).

Other wildlife that might be affected by declines in prey species include those that have overlapping diets and occur in similar habitats as fishers, such as barred owl (NPS 2006e). Impacts to wildlife could be mitigated by fisher predators including coyotes, bobcats, and mountain lions, which occur in small numbers on the peninsula, but could benefit from the restoration of fishers at Olympic National Park.

Fishers, their prey, and predators coexisted prior to the extirpation of the fisher from Washington, and it is assumed that a balance between these species would be reestablished (NPS 2006e). While the fisher introduction would result in a change in the ecosystem and its current function, it would adjust to a more natural ecosystem function with a portion of its predator-prey relationships restored. Therefore, the rein-

troduction of fishers is expected to be beneficial to overall ecosystem function (Lewis 2006). The NPS strives to maintain and protect the inherent integrity of the natural resources and systems of the Park, and to maintain the components and processes of naturally evolving Park ecosystems. One goal of NPS is to restore the biological components of the ecosystem; these efforts may include restoration of native animal populations when they have been extirpated by human-caused actions (NPS 2006a).

Impacts to other wildlife during monitoring of fisher reintroduction efforts would be similar to the impacts during the releases. The use of vehicles on Park roads while locating radio-collared fishers would likely not disturb wildlife in surrounding areas, as they have probably adapted to some levels of noise and human presence associated with the current use of the roads. The use of fixed-wing aircraft for monitoring would fly at an altitude that would not impact wildlife. The use of pack animals and/or helicopters, and the associated human presence, to retrieve dead fishers in remote areas of the Park could temporarily disturb some wildlife species. In addition, helicopters would not be used during the nesting season for northern spotted owl and marbled murrelet (March 1 to September 15), which would limit any associated disturbances to other nesting birds and breeding wildlife.

Since adverse effects on wildlife would either have no measurable consequence, or would be within the natural range of variability, adverse impacts would be long-term and negligible to minor. Impacts to the overall ecosystem from the restoration of the fisher are expected to be beneficial, long-term, and negligible, as sufficient habitat would remain functional to maintain viability of all species.

Cumulative Impacts

As discussed under cumulative impacts for alternative A, other projects occurring in Olympic National Park and surrounding areas could adversely impact wildlife species and their habitat. These activities would have negligible to minor cumulative impacts on wildlife species in the Park, as impacts would be within natural fluctuations, or detectable but not outside the natural range of variability.

Several ongoing projects and plans would also have a beneficial impact on multiple wildlife species and their habitat. WDNR's habitat conservation plan, which includes provisions for the fisher, would also have a beneficial impact on other wildlife species that utilize similar habitat. The *Northwest Forest Plan* would meet the conservation obligations for threatened and endangered species, while benefiting other wildlife and allowing for a stable and sustainable supply of timber. Multiple forest thinning projects planned in Olympic National Forest would thin second-growth forest and young managed stands. These projects would enhance species and structural diversity and improve wildlife habitat, which would have a beneficial impact on many wildlife species. The USFS treated invasive plants across 3,830 acres in the Olympic National Forest beginning in the fall of 2006 and plans to continue treatment in the future, which could improve wildlife habitat, resulting in a beneficial impact. These projects, along with reintroduction of fishers under alternative B would have a cumulative, minor, beneficial impact on wildlife, as sufficient habitat would remain functional to maintain viability of all native species.

Conclusion

Since proposed actions would either have no measurable consequence on wildlife, or would be within the natural range of variability, adverse impacts would be long-term and negligible to minor. Impacts to the overall ecosystem from the restoration of the fisher are expected to be beneficial, long-term, and negligible. There would be no impairment to wildlife and wildlife habitat under this alternative.

Cumulative impacts on wildlife species and habitat from ongoing maintenance and logging activities in the area would be negligible to minor adverse impact. There would be minor, beneficial cumulative impacts from existing conservation and habitat restoration plans for the park and surrounding federal lands. There would be no impairment to wildlife and wildlife habitat under this alternative.

Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding

Under alternative C captive breeding would be used in addition to translocations (as described under alternative B) to provide fishers for reintroduction in Olympic National Park. This alternative would involve live-trapping fishers from a source population and transporting them to the Park or to zoos for captive breeding; conducting captive breeding; releasing fishers via roads, pack animals, or helicopters; and monitoring for survival, reproduction, dispersion, and habitat location. Captive breeding would not affect wildlife other than fishers.

The source of impacts to wildlife associated with trapping fishers from the source population, for either translocation to the Park or to zoos for the captive breeding program, would be the same as those described for trapping under alternative B. However, under this alternative, offspring from the captive breeding program would be the primary source of fishers for reintroduction to the Park, and fewer individuals would be needed from the source population compared to alternative B. The removal of individual fishers from the source population would have a beneficial effect on their prey, although the loss of prey for fisher predators that rely on the source population is expected to have adverse impacts.

The impacts of fisher release and subsequent monitoring under alternative C would be the same as those described under alternative B.

Since adverse effects on wildlife would either have no measurable consequence, or would result in small changes to the wildlife populations, adverse impacts would be long-term and negligible to minor. Impacts to the overall ecosystem from the restoration of the fisher are expected to be beneficial, long-term, and negligible.

Cumulative Impacts

Cumulative impacts from alternative C would be the same as alternative B. Overall, impacts of actions under alternative C, combined with impacts from other actions that could affect wildlife, would result in cumulative adverse, negligible to minor impacts to wildlife species. However, minor, beneficial, cumulative impacts would result from conservation plans and habitat restoration plans in place for the Park and surrounding federal lands.

Conclusion

Impacts under alternative C would be similar to those under alternative B. However, since offspring from the captive breeding program would be the primary source of fishers for reintroduction to the Park, and fewer fishers would be removed from the source population, the impacts of fisher removal and translocation on fisher predators, their prey, and non-target wildlife would be less than those under alternative B. Since adverse effects on wildlife would either have no measurable consequence, or only small changes to the wildlife species' population, adverse impacts would be long-term and negligible to minor. Impacts to the overall ecosystem from the restoration of the fisher are expected to be beneficial, long-term, and negligible. Cumulative impacts under alternative C would be the same as alternative B. There would be no impairment to wildlife and wildlife habitat under this alternative.

IMPACTS ON VISITOR USE AND EXPERIENCE

GUIDING REGULATIONS AND POLICIES

NPS *Management Policies 2006* state that the enjoyment of park resources and values by the people of the U.S. is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks (NPS 2006b). Knowledge of restora-

tion of an important component of the park's ecosystem (fishers) could impact the visitor enjoyment of park resources and values. Olympic National Park's purpose states that it will preserve "for the benefit, use, and enjoyment of the people, the finest sample of primeval forests of Sitka spruce, western hemlock, Douglas fir, and western red cedar in the entire U.S." and will "conserve and render available to the people, for recreational use, this outstanding mountainous country."

While recreation is a key component of the NPS *Management Policies 2006*, park units are also required to maintain all native plants and animals as parts of the natural ecosystem. The NPS would achieve this by preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur (NPS 2006b, sec. 4.4.1).

With regard to recreation and conservation, one of the objectives of this plan is to engage and inform the public about the fisher restoration effort and the role of the fisher in the ecosystem.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

Past visitor use data, comments from the public, and personal observations of visitation patterns were used to estimate the effects of the alternative actions on visitors. The impact on the ability of visitors to experience a full range of Park resources was analyzed by examining resources mentioned in the Park significance statement.

Impact Thresholds

The following thresholds for evaluating impacts on visitor experience were defined:

Negligible: The impact would be barely detectable and/or would affect few visitors. Visitors would not likely be aware of the effects associated with management actions.

Minor: The impact would be detectable and/or would only affect some visitors. Visitors would likely be aware of the effects associated with management actions. The changes in visitor use and experience would be slight but detectable; however, visitor satisfaction would not be measurably affected.

Moderate: The impact would be readily apparent and/or would affect many visitors. Visitors would be aware of the effects associated with management actions. Visitor satisfaction might be measurably affected (visitors could be either satisfied or dissatisfied).

Major: The impact would affect the majority of visitors. Visitors would be highly aware of the effects associated with management actions. Changes in visitor use and experience would be readily apparent.

Area of Analysis

The area of analysis (including cumulative impacts) is Olympic National Park.

IMPACTS OF THE ALTERNATIVES

Alternative A — No-Action Alternative

Analysis

No impacts to recreation resources would occur under this alternative, because no management actions that could affect visitors would be taken to restore fishers. Many visitors are aware that fishers were extirpated from the area, and those visitors who would value the addition of this species to the Park's ecosys-

tem could be adversely affected by the fishers' continued absence, resulting in an impact to their wilderness experience or social values. Such impacts would be long-term but negligible, because the impact would be barely detectable and/or would affect few visitors. Visitors would not likely be aware of the effects associated with management actions.

Cumulative Impacts

The Park's past, current, and reasonably foreseeable activities to protect species and their habitat on the Olympic Peninsula would beneficially affect visitors who value the Park's ecosystem. These efforts might help offset, to an extent, any adverse impacts to those visitors who could be affected by the continuing absence of fishers. Ongoing Park management and operations would continue to beneficially affect visitors, such as the removal of dams on the Elwha River, but these effects would not be combined with fisher reintroduction activities. Therefore, depending on the visitor, the combined actions would result in impacts that would be primarily beneficial, long-term, and range from negligible to minor, as cumulative impacts would be detectable and/or would only affect some visitors. Visitors would likely be aware of the effects associated with other management actions, such as dam removal. The changes in visitor use and experience, primarily related to other Parkwide actions, would be slight but detectable; however, visitor satisfaction would not be measurably affected.

Conclusion

No impacts to recreation resources would occur under alternative A, as the Park would not take any management actions to restore fishers. Those visitors who are aware of the fishers' absence and would value the addition of this species to the Park's ecosystem and wilderness could be adversely affected by the fishers' continued absence, resulting in adverse, long-term, negligible impacts to their recreational experience or social values. Cumulative impacts would be primarily beneficial, long-term, and negligible to minor.

Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation

Analysis

Recreation Resources. The NPS and the WDFW would seek opportunities to involve citizens in monitoring of the fisher reintroduction process. Opportunities would include, but not be limited to, assisting staff with monitoring camera stations, deploying and checking hair snare sites, assisting field crews in locating fishers from the ground, identifying the location of den sites, and conducting follow-up measurements of den site characteristics after females have left the site. As the reintroduction program developed, opportunities could be expanded to include working with NPS and WDFW coordinators for outreach and education. These types of activities would provide visitors and local residents an opportunity to directly participate in and learn more about the fisher reintroduction process, resulting in beneficial, short-term (based on the duration of the activity) impacts that would be available throughout the life of the plan. Additional educational and interpretive measures (e.g., brochures and websites) included in this plan would also beneficially affect visitors. There would be an adverse impact to visitor use if these educational and interpretive programs were not included in the fisher reintroduction process or if additional funding for these programs was not available.

Social Values. The public's attitudes, beliefs, and perceptions of wildlife vary greatly. Some visitors, particularly those who've had greater direct contact with wildlife, could benefit from the knowledge that an extirpated species was being restored to the Park's ecosystem. Some people may associate positive aesthetic, ecological, and recreational values (in "Chapter 3 – Affected Environment") with the restoration of fishers. They might see a fisher, or fisher sign, or they could view a presentation on fisher restoration in Olympic National Park.

However, some people may regard fisher reintroduction as negative, and associate negative aesthetic, ecological, and recreational values with the program. Some could be concerned that restoring a species to an ecosystem that has existed for several years without fishers could harm that ecosystem. People have also expressed concern over the fishers' potential impacts to other species within Olympic's ecosystem (see the discussion under "Impacts on Species of Special Concern" in this chapter). Another social value that could be associated with fishers that could affect visitors is transmission of disease. However, fishers would be inoculated against disease prior to entry into Washington.

People who may never visit Olympic but value its significance as a national park and value its international recognition as a Biosphere Reserve and World Heritage Site could also be affected by the knowledge that an extirpated species was being restored to the peninsula.

Visitors who value a restored ecosystem would experience beneficial, long-term, minor impacts, depending on their individual beliefs (some visitors would be affected, and would be aware of the management actions, resulting in slight but detectable changes in visitor experience). Visitors who believe restoring fishers would disrupt the existing ecosystem would experience adverse, long-term impacts that would also be minor.

Cumulative Impacts

The Park's past, current, and ongoing activities to protect the peninsula's species and their habitat would beneficially affect Park visitors. These activities would combine with both the beneficial and adverse impacts to visitors from fisher restoration, depending on their viewpoint.

Ongoing Park management and operations activities, including trail maintenance, dam removal, and flood damage repair would be expected to have a combined adverse, short- and long-term, negligible to minor impact, as the impact would be barely detectable and/or would affect few visitors. In certain cases, visitors would be aware of the effects associated with management actions. The overall cumulative result would primarily be beneficial, as the short-term restrictions would give way to long-term preservation of the Park's resources and values. The intensity of these beneficial impacts would range from negligible to minor, depending on an individual's visitation goals and personal values, and exposure to these Park activities.

Conclusion

Impacts to recreation resources would be beneficial or adverse, short-term, and negligible. Impacts to visitors' social values would be beneficial or adverse, long-term, and minor. Overall, cumulative impacts from other Park management activities, both adverse (maintenance activities) and beneficial (ecosystem restoration or improvements in visitor services) would combine with fisher restoration activities and would be beneficial and adverse, short- and long-term, and negligible to minor.

Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding

Analysis

Under alternative C captive breeding would be used to produce fishers for reintroduction, which would then be translocated into Olympic National Park. Fishers would be bred at several facilities, such as zoos, outside the boundaries of Olympic National Park. After being successfully bred in captivity, fishers would be released as described under alternative B. Therefore, no additional or different impacts to visitor use, recreation resources, or social values would occur within the area of analysis under alternative C compared to alternative B.

Cumulative Impacts

Cumulative impacts under alternative C would be the similar to those expected under alternative B. Captively bred fishers at off-site facilities might attract visitors who might or might not visit Olympic National Park. Therefore captive breeding of fishers would provide the public with educational opportunities to learn about captive breeding and the fisher reintroduction process, resulting in a slight beneficial effect. When combined with the impacts expected under this alternative, overall cumulative impacts would be primarily beneficial, long-term, and negligible to minor. The impact would affect few to some visitors, who might or might not be aware of the effects associated with management actions. The impact could be slight and detectable, but visitor satisfaction would not be measurably affected.

Conclusion

No additional impacts would occur within the area of analysis under alternative C compared to alternative B. Cumulative impacts would be beneficial, long-term, and negligible to minor.

IMPACTS ON WILDERNESS VALUES

GUIDING REGULATIONS AND POLICIES

The Washington Park Wilderness Act of 1988 established 95% of the Olympic National Park as the Olympic Wilderness and directed NPS to manage the wilderness in accordance with the Wilderness Act of 1964. The Wilderness Act, passed on September 3, 1964, "provides a degree of protection to the resources of the National Park System that the NPS Organic Act does not" (NPS 1999). The House Report accompanying the Act, which helps to clarify congressional intent with respect to the Act, states that its purpose is to establish a National Wilderness Preservation System made up of designated wilderness areas, "because of the undeveloped character of their lands and the need to protect and manage them in order to preserve, as far as possible, the natural conditions that now prevail" (House Report No. 1538, 1964). The section titled "Wilderness Values" in the "Affected Environment" chapter further describes the Wilderness Act, the legislation that created the wilderness areas in the Olympic National Park, and the wilderness characteristics and values specific to the Olympic Wilderness in Olympic National Park.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The analysis of impacts on wilderness values is qualitative and based on past visitor use data, public comments, and personal observations by Park staff of visitation patterns. The impact on the ability of visitors to experience a full range of Park resources was analyzed by examining resources mentioned in the Park significance statement.

With regard to recreation and conservation, one of the objectives of this plan is to engage and inform the public about the fisher restoration effort and the role of the fisher in the ecosystem. Therefore, the analysis of impacts for this topic focuses on wilderness character and wilderness experience, which are integrally related because much of wilderness character can only be subjectively determined by the visitor's experience. Working from definitions included in the Wilderness Act and the tradition of wilderness preservation at Olympic National Park, the following wilderness resource values have been identified for Olympic National Park and are a component of the wilderness character:

> *Naturalness* — the absence of evidence of people and their activities and perpetuation of natural ecological relationships and processes and the continued existence of native wildlife populations in largely natural conditions.
>
> *Wilderness Experiences and Opportunities for Solitude* — likelihood of not encountering other people while in wilderness, including privacy and isolation, absence of distractions (such as large

groups, mechanization, unnatural noise, signs, and other modern artifacts), freedom from the reminders of modern society.

Opportunities for Primitive, Unconfined Recreation — freedom of visitors to explore, with limited or no restrictions; the ability to be spontaneous, self-sufficiency and absence of support facilities or motorized transportation, direct experience of weather, terrain, and wildlife with minimal shelter or assistance from devices of modern civilization.

Impact Thresholds

The following thresholds for evaluating impacts on visitor experience were defined:

Negligible: Fisher reintroduction would have no discernable impact on opportunities for solitude. Opportunities for primitive and unconfined forms of recreation would essentially remain unchanged. Natural conditions would prevail with little evidence of human manipulation. There would be no discernable effect perpetuation of natural ecological relationships and processes and the continued existence of native wildlife populations in largely natural conditions. Native wildlife populations exist in largely natural conditions.

Minor: Fisher reintroduction would have a slightly beneficial or adverse impact on opportunities for solitude in a limited area of wilderness. Opportunities for primitive and unconfined forms of recreation would be slightly improved or reduced in limited areas of the wilderness. There would be a slightly detectable beneficial or adverse effect on the perpetuation of natural ecological relationships and processes. Native wildlife populations would continue to exist in natural conditions.

Moderate: Fisher reintroduction would have a readily apparent, beneficial or adverse impact on opportunities for solitude in limited areas of wilderness. Opportunities for primitive and unconfined forms of recreation would be noticeably improved or reduced in limited areas of the wilderness. There would be readily apparent beneficial or adverse effects on the perpetuation of natural ecological relationships and processes and the continued existence of native wildlife populations in largely natural conditions. There would be detectable human-caused impacts (either beneficial or adverse) to the natural environment and native wildlife populations throughout the wilderness.

Major: Fisher reintroduction would have a readily apparent beneficial or adverse impact on opportunities for solitude throughout the wilderness. Opportunities for primitive and unconfined forms of recreation would be substantially improved or reduced throughout the wilderness area. There would be readily apparent beneficial or adverse impacts on the perpetuation of natural ecological relationships and processes and the continued existence of native wildlife populations in largely natural conditions. There would be readily apparent human-caused impacts (either beneficial or adverse) to the natural environment and native wildlife populations throughout the wilderness.

Impairment: Impairment would occur when the wilderness resources have been substantially altered, eliminating the characteristics that meet the criteria for consideration and classification as wilderness. Criteria for determining classification as wilderness can be found in NPS Management Policy 6.2.1, Assessment of Wilderness Eligibility or Non Eligibility (NPS 2006b).

Area of Analysis

The area of analysis (including cumulative impacts) is Olympic National Park. Members of the public who may be potentially affected include wilderness users who would experience firsthand the potential impacts on wilderness values during their wilderness visit. There are other members of the public, however, who might never visit the Olympic National Park and would never experience impacts on wilderness values firsthand, but they would still be impacted simply by knowing that fisher reintroduction efforts were occurring.

IMPACTS OF THE ALTERNATIVES

Alternative A — No-Action Alternative

Analysis

Under alternative A, no actions would be taken to restore fishers, which would impact wilderness values because a component of the natural condition of the wilderness would be absent. It is likely that no more than a few visitors know that fishers were extirpated from the area, so most visitors would not be impacted by the absence of this species from the ecosystem. However, those visitors who are aware of the fishers' absence and who would value the addition of this species to the Park's ecosystem and wilderness would be adversely affected by the fishers' continued absence, resulting in an impact to their wilderness experience. Such impacts would be long-term but negligible, because the impact would be barely detectable and/or would affect few visitors. Visitors would not likely be aware of the effects associated with management actions under alternative A.

Cumulative Impacts

The Park's past, current, and reasonably foreseeable activities to protect species and their habitat on the Olympic Peninsula would beneficially affect visitors who value the Park's ecosystem. These efforts might help offset, to an extent, any adverse impacts to those visitors who could be affected by the continuing absence of fishers. Ongoing Park management and operations would continue to benefit visitors, such as the removal of dams on the Elwha River, but these effects would not be combined with fisher reintroduction activities. Therefore, depending on the visitor, the combined actions would result in impacts that would be primarily beneficial, long-term, and range from negligible to minor, as cumulative impacts would be detectable and/or would only affect some visitors. Visitors would likely be aware of the effects associated with other management actions, such as dam removal. The changes in visitor use and experience, primarily related to other Parkwide actions, would be slight but detectable; however, visitor satisfaction would not be measurably affected.

Conclusion

The no-action alternative would have an adverse impact on wilderness values, as the Park would not take any management actions to restore fishers. Those visitors who are aware of the fishers' absence and would value the addition of this species to the Park's ecosystem and wilderness could be adversely affected by the fishers' continued absence, resulting in adverse, long-term, negligible impacts to their wilderness experience. Cumulative impacts would be primarily beneficial, long-term, and negligible to minor.

Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation

Analysis

Wilderness Values. Releasing fishers into Olympic National Park could impact visitors' wilderness experience. A preference would be given to releasing fishers from roads or in remote areas by using pack stock, which would be the wilderness management method that would cause the least amount of impact (as determined through the minimum requirement analysis as described in "Chapter 3 – Affected Environment" and included in appendix A). Releasing and monitoring fishers from roads would result in a slight increase in the amount of vehicular use of the Park's roads, particularly in the Elwha-Sol Duc release area and primarily during initial releases. However, the Park's roads exist outside designated wilderness. The Park currently uses stock teams in wilderness to conduct other NPS-related activities, so releasing fishers using this method would be consistent with other wilderness management practices and would not appreciably degrade wilderness values.

Helicopters may be used to release fishers or to recover carcasses, if these activities could not occur by foot or pack animals. Helicopters would not be used from March 1 to September 15. Use of helicopters in the wilderness would be temporary, and would create short-term impacts to opportunities for solitude (as discussed under the "Impacts on Soundscapes" section of this chapter). Helicopters used for releasing fishers or carcass retrieval would likely launch and land at either Port Angeles or Fort airports. Sweets Field or Lewis Ranch, which are non-wilderness, would be used as alternative staging areas during inclement weather, which is unlikely between September 15 and February 28. However, no permanent changes would result, and the "imprint of humans' work" would remain "substantially unnoticeable" on the Olympic wilderness.

After release, fishers would be monitored on foot and by fixed-wing aircraft. Use of aircraft would result in noise impacts to wilderness, which are discussed under the "Soundscapes" section. No other impacts to wilderness values would occur from aircraft use, as such use would result in no permanent changes to Olympic's wilderness.

The presence of an extirpated species in the wilderness would help contribute to the wilderness characteristics of the Park, particularly the Park's "primeval character" — a beneficial impact for wilderness visitors. Reintroduction activities would contribute to the wilderness being "managed so as to preserve its natural conditions." Few adverse impacts would occur, as management activities would leave no permanent "improvements" or leave signs of "human's work" or of "human habitation." (Adverse impacts would be primarily to solitude, which is discussed under "Soundscapes.") Depending on the visitor, overall impacts to wilderness values would be beneficial, long-term, and negligible (no effect on prevalence of natural conditions) to minor (slightly detectable human-caused impacts; natural conditions would continue to predominate). Visitors who value a wilderness experience may become aware of the fisher reintroduction efforts through the Park's outreach efforts. Wilderness visitors may also occasionally see a fisher. The changes in visitor use and experience could be slight but detectable; however, visitor satisfaction would not be measurably affected.

Cumulative Impacts

The Park's past, current, and ongoing activities to protect the peninsula's species and their habitat would beneficially affect Park visitors' wilderness experience. These activities would combine with both the beneficial and adverse impacts to visitors from fisher restoration, depending on their viewpoint.

Ongoing Park management and operations activities, including trail maintenance, dam removal, flood damage repair, would combine with fisher reintroduction release and monitoring activities. These activities are expected to have a combined adverse, short- and long-term, negligible to minor impact, as the impact would be barely detectable and/or would affect very few visitors. In certain cases, visitors would be

aware of the effects associated with management actions. The overall cumulative result would primarily be beneficial, as the short-term restrictions would give way to long-term preservation of the Park's resources and values. The intensity of these beneficial impacts would range from negligible to minor, depending on an individual wilderness values, and exposure to these Park activities.

Conclusion

Impacts to wilderness values would be beneficial, long-term, and negligible to minor, depending on the visitor. Overall, cumulative impacts from other Park management activities, both adverse (maintenance activities) and beneficial (ecosystem restoration or improvements in visitor services) would combine with fisher restoration activities and would be beneficial, short- and long-term, and negligible to minor.

Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding

Analysis

Under alternative C captive breeding would be used to produce fishers for reintroduction, which would then be translocated into Olympic National Park. Fishers would be bred at several facilities, such as zoos, outside the boundaries of Olympic National Park. After being successfully bred in captivity, fishers would be released as described under alternative B. Therefore, no additional or different impacts to wilderness values would occur within the area of analysis under alternative C compared to alternative B.

Cumulative Impacts

Cumulative impacts under alternative C would be the similar to those expected under alternative B. Captively breeding fishers at off-site facilities may provide visitors to those facilities, who might or might not visit Olympic National Park, with educational opportunities to learn about captive breeding and the fisher reintroduction process, resulting in a slight beneficial effect. When combined with the impacts expected under this alternative, overall cumulative impacts would be primarily beneficial, long-term, and negligible to minor. The impact would affect few to some visitors, who might or might not be aware of the effects associated with management actions. The impact could be slight and detectable, but visitor satisfaction would not be measurably affected.

Conclusion

No additional impacts would occur within the area of analysis under alternative C compared to alternative B. Cumulative impacts would be beneficial, long-term, and negligible to minor.

IMPACTS ON SOUNDSCAPES

GUIDING REGULATIONS AND POLICIES

The National Park System includes some of the quietest places on earth, as well as a rich variety of sounds intrinsic to park environments. These intrinsic sounds are recognized and valued as a Park resource in keeping with the NPS mission (NPS *Management Policies 2006*, sec. 1.4.6), and are referred to as the Park's natural soundscape. The natural soundscape, sometimes called natural quiet, is the aggregate of all the natural sounds that occur in parks, including the physical capacity for transmitting the natural sounds (NPS *Management Policies 2006*, sec. 4.9). Some natural sounds are also part of the biological or other physical resource components of parks (e.g., animal communication, sounds produced by physical processes such as wind in trees, thunder, running water).

NPS policy requires the restoration of degraded soundscapes to the natural condition whenever possible, and the protection of natural soundscapes from degradation due to noise (undesirable human-caused sound) (NPS *Management Policies 2006*, sec. 4.9). The NPS is specifically directed to "take action to prevent or minimize all noise that, through frequency, magnitude, or duration, adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified, through monitoring, as being acceptable to, or appropriate for, visitor uses at the sites being monitored" (NPS *Management Policies 2006*, sec. 4.9). Overriding all of this is the fundamental purpose of the National Park System, established in law (e.g., 16 USC 1 et seq.), which is to conserve park resources and values (NPS *Management Policies 2006*. sec. 1.4.3). NPS managers must always seek ways to avoid, or to minimize to the greatest extent practicable, adverse impacts on park resources and values (NPS *Management Policies 2006*, sec 1.4.3).

Noise can adversely affect park resources, including but not limited to natural soundscapes. It can directly impact them, for example, by modifying or intruding on the natural soundscape. It can also indirectly impact resources, for example, by interfering with sounds important for animal communication, navigation, mating, nurturing, predation, and foraging functions. Potential effects from noise to wildlife are evaluated in the "Special Status Species" and "Wildlife and Wildlife Habitat" sections; impacts to natural soundscapes in wilderness are evaluated in the "Wilderness Values" section.

Noise can also adversely impact park visitor experiences. The term "visitor experience" can be defined as the opportunity for visitors to fully appreciate a park's resources and values in a manner appropriate to the park's purpose and significance, and appropriate to the resource protection goals for a specific area or management zone within that park. Noise impacts to visitor experiences can be especially adverse when management objectives for visitor experience include solitude, serenity, tranquility, contemplation, or a completely natural or historical environment.

Management objectives (also called desired conditions) for resource protection and visitor experience are derived through well-established public planning processes from law, policy, regulations, and management direction applicable to the entire National Park System and to each specific park unit. Olympic National Park's desired conditions for soundscapes, as defined in its draft general management plan (NPS 2006a), include the following:

- Park and concession facilities use best available technology and methods to minimize or mitigate artificial noises produced by equipment and management activities.
- Visitors have opportunities to experience and understand natural soundscapes.
- The Park maintains an inventory of natural soundscapes and, as feasible, monitors key locations for maintaining natural quiet.
- Ecological interactions that depend upon or are affected by sound are protected.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The methodology used to assess noise impacts in this document is consistent with NPS *Management Policies 2006*, NPS *Director's Order #47: Soundscape Preservation and Noise Management*, and the methodology being developed for the reference manual for NPS *Director's Order #47* (NPS 2000).

Context, time, and intensity together determine the level of impact for an activity. For example, noise for a certain period and intensity would be a greater impact in a highly sensitive context, and a given intensity would be a greater impact if it occurred more often, or for longer duration. It is usually necessary to evaluate all three factors together to determine the level of noise impact. In some cases an analysis of one or more factors may indicate one impact level, while an analysis of another factor may indicate a different impact level, according to the criteria below. In such cases, best professional judgment based on a docu-

mented rationale must be used to determine which impact level best applies to the situation being evaluated.

1. National literature was used to estimate the average decibel levels of various activities.
2. Areas of use by visitors were identified in relation to where the activity is proposed. Personal observation from Park staff and visitation reports were used to identify these areas.
3. Other considerations, such as topography, were then used to identify areas where noise levels could be exacerbated or minimized.

Impact Thresholds

The following thresholds for the impacts on soundscapes were defined as:

Negligible: Natural sounds would prevail; (activity) noise would be very infrequent or absent, mostly immeasurable.

Minor: Natural sounds would predominate in areas where management objectives call for natural processes to predominate, with (activity) noise infrequent at low levels. In areas where (activity) noise is consistent with Park purpose and objectives, natural sounds could be heard occasionally.

Moderate: In areas where management objectives call for natural processes to predominate, natural sounds would predominate, but (activity) noise could occasionally be present at low to moderate levels. In areas where (activity) noise is consistent with Park purpose and objectives, (activity) noise would predominate during daylight hours and would not be overly disruptive to noise-sensitive visitor activities in the area; in such areas, natural sounds could still be heard occasionally.

Major: In areas where management objectives call for natural processes to predominate, natural sounds would be impacted by (activity) noise sources frequently or for extended periods of time. In areas where (activity) noise is consistent with Park purpose and zoning, the natural soundscape would be impacted most of the day; noise would disrupt conversation for long periods of time; and/or make enjoyment of other activities in the area difficult; natural sounds would rarely be heard during the day.

Impairment: An impact on the natural soundscape would constitute impairment if the area of audibility is large; the sound level is at or above the natural soundscape level or it produces frequencies not heard in the natural setting; or the sound occurs frequently, continuously, or indefinitely over long periods of time.

Area of Analysis

The area of analysis (including cumulative impacts) is Olympic National Park and surrounding lands that could be impacted by noise from the use of motor vehicles, helicopters, and/or fixed-wing aircraft for fisher release and monitoring purposes.

IMPACTS OF THE ALTERNATIVES

Alternative A — No-Action Alternative

Analysis

Under alternative A, no action would be taken to reintroduce fishers in Olympic National Park. Therefore, there would be no effect to the existing soundscapes from the fisher reintroduction.

Cumulative Impacts

Other impacts to the Park's soundscapes would continue to occur, such as sounds from overflights, commercial airlines, military aircraft, and other NPS project-related noise. However, there would be no additional impacts since fishers would not be introduced.

Conclusion

There would be no impacts to soundscapes as there would be no increase to the natural or human caused sound levels above what currently exists, and there would be no cumulative impacts. No impairment to soundscapes would occur under this alternative.

Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation

Analysis

Under alternative B fishers would be reintroduced primarily in the north and western portions of Olympic National Park. Released fishers are expected to disperse primarily throughout those areas; however, they may use the east and south also. Specific locations would be selected based on access, habitat configuration, number of animals available, and timing of their availability. Fishers could be released from roads or in remote areas by foot, pack animals, or helicopter. Multiple releases could occur in a single year at some sites.

Fishers would preferably be released in late fall to early winter when visitation is low. A second choice would be to release them in January and February, when visitation is at the lowest. The last choice would be to release fishers in May and June, when visitation begins to increase again. After release, fishers would be monitored from the ground when possible, and from fixed-wing aircraft elsewhere. Helicopters would be used to recover dead animals if this could not occur by foot or pack stock. Helicopters would not be used from March 1 to September 15.

Releasing and monitoring fishers from roads would result in a slight increase in the amount of vehicular use of the Park's roads, particularly in the Elwha-Sol Duc release area (at least, during initial releases). However, the increase in vehicle use would be undetectable given background traffic levels. The primary human-caused sounds in the Park are confined to developed areas and major roads, and they vary depending on the location and time of year. The Elwha area is one of the most popular areas, with approximately 144,758 visitors per year (see table 6). If fishers were released in January and February, very few Park visitors would be affected, regardless of their location in the Park, since visitation is lowest at those times and the noise from the road- and trail-based release operations would not be above normal background levels. If fishers are released during the fall or spring, when there is more vehicle use in the Park, the vehicles used for the release efforts would not generate noise above existing ambient levels.

Using helicopters in the wilderness to release fishers or recover dead animals would temporarily increase noise levels in the short-term. Helicopters generally emit 90 dBA at 1,500 feet. Visitors and wildlife located near the takeoff and landing sites (for example, 750 feet away) could experience an increase of 6 dBA, which is a "clearly noticeable change." This sound level is loud enough to halt conversation and could disrupt normal wildlife behavior patterns. However, helicopters would be used only if fishers could not be released or recovered from roads, on foot, or by pack stock. In addition, helicopters would not be used from March 1 to September 15, which is when visitation is highest and during sensitive breeding seasons for wildlife. Therefore, helicopter use would be infrequent and short-term, and would affect very few visitors. Helicopter use may temporarily disturb wildlife for the duration of use.

Helicopters and aircraft would be staged from the local Port Angeles or Forks airports. Sweets Field and possibly Lewis Ranch (if permission was granted from the landowner) would be used as backup for helicopter staging during periods of inclement weather; both of these locations are near the Park boundary in

non-wilderness areas. Helicopter operations for fisher reintroduction efforts may affect visitors at the Elwha campground and the Madison Creek Falls trail, which are close to Sweets Field. Visitors staying at the Altaire campground, farther south, may also likely be affected by helicopter noise. Noise from helicopter use could also impact visitors in the west side of the Park, where fishers would be released. Noise from helicopters could adversely affect visitors in the short-term, but only during seasons of permitted helicopter use (September 16 through March 1).

Fixed-wing aircraft would be used to monitor fishers after release for up to 4 years. A small fixed-wing aircraft generally emits about 74 dBA at 1,500 feet. While the Federal Aviation Administration recommends that fixed-wing flights over Olympic National Park be at or above altitudes of 2,000 feet due to the wilderness resources in the Park, such aircraft are permitted to fly at 500 feet, which could increase the sound level to approximately 83 dBA. No seasonal use restrictions would apply to project-related fixed-wing aircraft since they would fly more than 120 yards above treeline. Fixed-wing aircraft use would occur three times per month for four years following fisher release. In addition, aircraft would not fly on weekends when visitation is highest.

Overall, noise impacts to visitors would vary based on the type of source, their proximity, and the likelihood of exposure. In general, natural sounds would prevail; noise related to fisher reintroduction would be very infrequent or absent and mostly immeasurable, resulting in adverse, short- to long-term, negligible impacts. Use of aircraft, which would emit the loudest noise, would be limited and temporary, therefore affecting wildlife and only very small percentage of visitors for a short period of time. Visitation in the Park is highest in the summer; aircraft telemetry monitoring would not be conducted in alpine and subalpine areas (as these are not fisher habitat areas) during the summer. In these cases such noise would be consistent with Park purpose and objectives for restoring an extirpated species (see "Chapter 1 – Purpose of and Need for Action"), and natural sounds would still be predominant, resulting in an adverse, short-term, moderate impact. In addition, several noise attenuation factors (particularly distance) would protect visitors from disturbance.

Cumulative Impacts

As discussed in alternative A, present sources of human-generated sound would continue under alternative B but under alternative B these existing impacts would combine with sounds from activities used to release and monitor fishers, particularly use of fixed-wing aircraft and helicopters. Helicopter and fixed-wing flights may be authorized in the Park for projects such as management of human waste in the backcountry, radio repeater maintenance, maintenance, wildlife and fisheries research, and firefighting.

Sweets Field, in the Elwha area, currently serves as a primary staging area for helicopter search-and-rescue flights and other types of aerial functions. It is also one of the few areas in the Park where multiple helicopters can be staged during larger operations. These aerial functions would continue indefinitely at this location. Potential helicopter use for fisher management efforts would be added to existing operations at Sweets Field.

In addition, increased noise is expected in the Elwha area from future removal of the Glines Canyon and Elwha dams, which would add to existing noise levels in this area. Future road maintenance would occur in preparation for the Elwha dam removal project. Heavy equipment related to this project work would create adverse impacts to the soundscape near the project area. Future efforts associated with dam removals, fish and ecosystem restoration, and continuing helicopter flights would result in increased noise Elwha project initiation for three to five years.

Noise generated by ongoing and future planned Park project, including flights and maintenance activities, can affect the natural soundscapes in both wilderness and non-wilderness areas. Trail maintenance occurs on approximately 20% of the Park's frontcountry and wilderness trails each year, representing an ongoing noise source. Other future projects include the rehabilitation of the Hurricane Ridge Road, which would add construction noise along approximately 17 miles of roadway.

Noise related to repairing road and trail damage from the 2006 storms would also occur in the future, diminishing as repairs are completed. Other existing and future noise sources include chainsaws from NPS work crews on trails, as well as noise generated by Park visitors. During winter, downhill ski facilities at Hurricane Ridge contribute to the human-generated noise at Hurricane Ridge.

The adverse, short- to long-term, negligible to minor impacts associated with fisher reintroduction efforts would combine with these current and expected future noise impacts, elevating the overall noise level in the Park, particularly in the Elwha area. This noise level is expected to increase into the future, as the Park implements additional planned activities. However, noise associated with fisher reintroduction would be short-term and localized, likely affecting few visitors. Therefore, depending on the season and location within the Park, cumulative impacts would be adverse, both long and short-term, and minor to moderate, as noise could occasionally be present at low to moderate levels. In areas where noise is consistent with Park purpose and objectives (such as removing Elwha River dams), noise would predominate during daylight hours; in such areas, natural sounds could still be heard occasionally.

Conclusion

Noise impacts from fisher reintroduction efforts would be adverse, short- to long-term, and negligible. These impacts would be localized, primarily resulting from the use of helicopters, but such use would be seasonally restricted and implemented only if release or monitoring activities could not be conducted from the ground. Cumulative impacts would be adverse, long- and short-term, and minor to moderate. No impairment to soundscapes would occur under this alternative.

Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding

Analysis

Under alternative C captive breeding would be used to produce fishers for reintroduction, which would then be translocated into Olympic National Park. Fishers would be bred at several facilities, such as zoos, outside the boundaries of the Park. After being successfully bred in captivity, fishers would be released as described under alternative B. Because alternative C would require approximately five more years to reestablish a self-sustaining fisher population and monitor fisher populations, alternative C would result in greater noise impacts as compared to alternative B. However, as discussed for alternative B, noise impacts from helicopters would be short-term, adverse, and negligible.

Cumulative Impacts

Cumulative impacts under alternative C would be the same as alternative B.

Conclusion

Additional noise impacts would occur within the area of analysis under alternative C as compared to alternative B because of the increased time required to release and monitor fishers under alternative C. These impacts would be adverse, short- to long-term, and negligible to minor. Cumulative impacts would also be the same as alternative B. There would be no impairment of the Park's soundscapes.

IMPACTS ON NEIGHBORING LANDOWNERS

GUIDING REGULATIONS AND POLICIES

In December 2000 the USFWS received a petition to list the west coast population of the fisher as an endangered species in Washington, Oregon, and California. The agency concluded that the west coast fisher population was a distinct population segment and was warranted for listing, but action was precluded by other higher priority listings, and the fisher was subsequently placed on the federal list of candidate species. The USFWS would begin conducting an annual review of the species status and may propose to list the species at a later date (USFWS 2004b).

In the unlikely event the fisher was federally listed in the future, neighboring federal, state, and tribal landowners could be affected by federal restrictions defined under the Endangered Species Act. Such restrictions could potentially include seasonal restrictions around den sites, requirements for biological assessments for proposed timber harvest, and other limiting measures. (The economic impacts of these activities are discussed under the "Impacts on Socioeconomic Conditions".) The following section describes for each type of neighboring landowner what could happen if the fisher (1) was delisted as a state endangered species, (2) remained a candidate for listing under the Endangered Species Act, (3) remained listed as a state endangered species, or (4) became listed as threatened or endangered under the Endangered Species Act.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The primary steps in assessing impacts to neighboring landowners were to determine:

- how federal listing of the fisher could affect various landowners; some landowners already have, or would implement, seasonal restrictions to protect fisher den sites
- how delisting of fisher in the State of Washington could affect various landowners
- methods available (such as development of a habitat conservation plan for adjacent landowners, which is a component of an incidental take permit application) to mitigate impacts resulting from federal listing of the fisher
- measures the NPS could take to help adjacent landowners implement such mitigation methods

Impact Thresholds

The following thresholds for the impacts on neighboring landowners were defined:

Negligible: Neighboring landowners would not be affected, or the effect would be at or below the lower levels of detection.

Minor: The effect would be detectable, but would be of a magnitude that would not have a measurable adverse or beneficial effect on neighboring landowners.

Moderate: The effect would be readily apparent, and it would result in a measurable adverse or beneficial change to neighboring landowners.

Major: The effect would be readily apparent, and it would result in a measurable adverse or beneficial change to neighboring landowners that would be markedly different from existing conditions.

Area of Analysis

The area of analysis (including cumulative impacts) is neighboring landowners that could be impacted by fishers dispersing from the Park onto their property.

IMPACTS OF THE ALTERNATIVES

Alternative A — No-Action Alternative

Analysis

Under alternative A, no action would be taken to reintroduce fishers to the Olympic Peninsula. Since the fisher is believed extirpated from Washington State, no impacts to neighboring landowners would occur if the fisher remained a candidate species or became listed under the Endangered Species Act.

Cumulative Impacts

Neighboring landowners would continue to be required to comply with the Endangered Species Act for other federally listed species. The USFS has already implemented timing restrictions on all ground-disturbing activities for other listed species, such as avoiding nesting periods of the spotted owl and the marbled murrelet; these actions have extended the amount of time required to complete projects. Because it is unlikely fishers would exist in the Olympic Peninsula within the life of this plan, cumulative impacts are expected to be long-term, negligible and beneficial, as neighboring landowners would not have to apply additional habitat protection for fishers.

Conclusion

Since the fisher is believed extirpated from Washington State, no impacts to neighboring landowners would occur if the fisher remained a candidate species or became listed under the Endangered Species Act. Cumulative impacts on neighboring landowners under alternative A would be long-term, negligible and beneficial.

Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation

Analysis

As noted in chapter 3, 25% of the Olympic Peninsula is considered suitable fisher habitat, and of this amount, approximately 93% is on public land (including NPS land). The USFS would be most likely affected by fisher reintroduction efforts, given that national forest lands surround most of Olympic National Park and constitute the majority of non-NPS landownership on the peninsula (33%). Lands managed by the WDNR also occur along the Park's western boundary, where fishers would likely be reintroduced. Only 8% of these WDNR lands are considered suitable fisher habitat. Therefore, these two agencies would likely be the most impacted, as described below.

U.S. Forest Service.

Fisher is Delisted in Washington State — Successful reintroductions on the Olympic Peninsula and in the Cascades would be the primary factors in determining if fisher would be downlisted to state threatened or eventually delisted (Hayes and Lewis 2006). If the fisher was to be state delisted in the future, which would be feasible under alternative B, current management under the *Northwest Forest Plan* would protect fisher because late successional reserves are currently protected on USFS land.

Fisher Remains a Candidate for Listing under the Endangered Species Act — As a candidate for listing under the Endangered Species Act, the fisher has no federal protection. However, the USFWS encourages

the formation of partnerships to conserve these species because, by definition, they may warrant future protection under the Endangered Species Act (USFWS 2005a).

USFS treats federal candidates and state listed species as "sensitive." By designating the fisher as a "sensitive" species on USFS lands, the USFS may apply seasonal restrictions on motorized, mechanized activities within 0.25 miles of known, active fisher denning sites from mid-March to the end of May (Montana Natural Heritage Program n.d.; Piper, pers. comm. October 13, 2006; Piper, pers. comm. July 10, 2007). This buffer would apply to activities that are long in duration such as timber harvest and associated activities (e.g., felling, yarding, and road building) and road construction. Seasonal restrictions would not be applied for hauling or general road traffic. Adjustments for the buffer would be based on local conditions, such as topography (Piper, pers. comm. July 10, 2007). After radio-collars have failed due to loss of battery life, locations of denning fishers would generally be unknown and USFS would be unlikely to place any seasonal restrictions on their land. Furthermore, because female fishers may move kits during the denning season and fishers do not use the same den site in consecutive years, seasonal restrictions may be limited as an effective management tool for fishers. The use of signs, gates, and other measures could also be used to prevent disturbance in the vicinity of a known den site. Along with the protections that would be afforded fishers on Park lands, these actions by the USFS would help ensure the success of fisher restoration efforts on the Olympic Peninsula, along with helping avoid the need to list the fisher as federally threatened or endangered in the future.

Fishers are closely associated with late-successional forests, which they use for denning, resting, and foraging. Much of the land allocation on the Olympic National Forest near the Park is late-successional reserve or other non-extractive allocation. Late-successional reserves are managed by the USFS with the goal of maintaining or developing forested landscapes with late-successional or "old-growth-like" conditions. Tree stands over 80 years of age are not available for harvest. Younger stands, which consist of plantations or young natural regeneration may be harvested by methods such as thinning, if that harvest is designed to speed up or enhance the areas late-successional qualities. Olympic National Forest has historically emphasized commercial thinning of young forest stands (USFS 2006), which is not the fisher's preferred habitat but may occasionally be used for travel or foraging. Forest managers also apply a pre-commercial thinning program of about 3,000 acres per year to attain both late-successional characteristics and to maximize the economic benefits of future commercial thinning activities (USFS 2006). By leaving late-successional forests in place, the USFS would be preserving fisher habitat, which could also help preclude the need to list fishers under the Endangered Species Act in the future.

Fisher Remains Listed as State Endangered — The fisher was listed as a state endangered species in October 1998; therefore, fishers cannot be legally trapped or killed in Washington State (Lewis and Hayes 2004). By designating the fisher as a "sensitive" species (as described above), the conservation measures that the USFS would undertake to protect fishers would also help protect them as a state endangered species.

Fisher Becomes Listed as Threatened or Endangered under the Endangered Species Act — As a federal agency, the USFS would be required to consult with the USFWS on all projects and proposals having potential impact on the fisher, if it became listed under the Endangered Species Act. The Endangered Species Act also requires federal agencies to carry out programs for the conservation of endangered and threatened species, and to ensure that any agency action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of designated critical habitat.

If the fisher was listed as threatened or endangered, the USFS would need to consult with the USFWS on all projects and proposals having potential impact on the fisher, which could impact that agency's management and operations by implementing additional mitigation measures. However, current management under the *Northwest Forest Plan* would protect fisher because late successional forest habitat is currently protected.

U.S. Forest Service Summary — Of all the neighboring landowners with suitable fisher habitat, the USFS would be the most affected, as it has jurisdiction over 33% of suitable fisher habitat, however these effects would be minimal. If the fisher remained a candidate species, impacts would be adverse and long-term, but negligible because the agency would either not be affected, or the effect would be at or below the lower levels of detection, due to the provisions that have already been taken to protect fishers. If the fisher was state delisted, fisher would still be protected on USFS lands as fisher habitat is protected by provisions in the *Northwest Forest Plan* and fishers are currently included on the Region 6 Sensitive Species List (Piper, pers. comm. July 10, 2007). If the fisher became listed under the Endangered Species Act, the USFS would be required to consult with the USFWS. However, as a federal agency, this task is part of the USFS's regular duties. Therefore, impacts to the USFS are expected be negligible to minor, as the effect may become readily apparent, and may result in a measurable adverse or beneficial effect on the agency.

Washington Department of Natural Resources.

Fisher is Delisted in Washington State —The primary factor in determining if fishers would be delisted in Washington would be successful reintroductions in the Olympic Peninsula and the Cascades. If the fisher population in the state of Washington recovered to the point that it met the state recovery objectives (Hayes and Lewis 2006), then the Washington Fish and Wildlife Commission could delist the species to state sensitive status and it would be managed as protected wildlife (WAC § 232-12-011) and could not be hunted or trapped. WDNR's multispecies habitat conservation plan, which includes conservation measures to protect the federally listed spotted owl and marbled murrelet, would not be modified if fisher were delisted.

Fisher Remains a Candidate for Listing under the Endangered Species Act — WDNR lands west of Olympic National Park could be affected by fisher restoration efforts, as fishers would be released on the western side of the Park. Like the USFS, the WDNR is also taking actions to prevent the listing of additional species as threatened or endangered. The WDNR's multispecies habitat conservation plan includes conservation measures to protect the federally listed spotted owl and marbled murrelet; these measures are expected to protect suitable habitat for fishers (WDNR 1997). The habitat conservation plan includes additional mitigation to ensure breeding success of fishers, including the prohibition of activities within 0.5 mile of a known active fisher den site between February 1 and July 31 (WDNR 1997). The actions already implemented to protect habitat for listed species would help ensure that a fisher restoration effort would be successful, potentially offsetting the need for the fisher to become listed as threatened or endangered.

Fisher Remains Listed as State Endangered — As mentioned above, the fisher is listed as a state endangered species; therefore, it cannot be legally trapped or killed in Washington (Lewis and Hayes 2004). However, as described in "Chapter 1 – Purpose of and Need for Action," there is currently no critical habitat rule (WAC 222-16-080) for the fisher under the State Forest Practices Act (RCW 76.09), and thus no restrictions of forest practice activities on state or private timberlands to protect fisher habitat (Lewis and Hayes 2004). Despite the lack of a critical habitat rule to protect fisher habitat, the conservation measures that the WDNR would apply under its habitat conservation plan (as described above) would help protect suitable habitat for fishers, as well as protecting fishers themselves.

Fisher Becomes Listed as Threatened or Endangered under the Endangered Species Act — Because it is not a federal agency, the WDNR would not be required to consult with the USFWS should the fisher become listed under the Endangered Species Act. However, the Endangered Species Act's regulations would still apply to state lands. Existence of the 1997 habitat conservation plan (described above) that includes provisions for protecting fishers would help ensure that few or no additional actions would need to be taken by the state should the fisher become listed in the future. As mentioned above, there is currently no critical habitat rule for the fisher under the State Forest Practices Act (WAC 222-16-080; RCW 76.09), and thus no restrictions of forest practice activities on state or private timberlands to protect fisher habitat

(Lewis and Hayes 2004). However, according to Washington Code 122-16-080, within 30 days of listing, the WDNR may consult with USFWS, prepare and submit a proposed list of critical habitats in the state for the species to the Forest Practices Board. Federal listing of fishers may make WDNR more likely to request a Forest Practices Rule for fisher.

Washington Department of Natural Resources Summary — The existence of a habitat conservation plan that protects multiple species, including fishers, would result in little or no impact on the WDNR, as it would not be required to implement additional plans or agreements with the USFWS, regardless of the fisher's status as a candidate or listed species. Actions the agency is already undertaking to protect species included in the habitat conservation plan would further protect fishers and their habitat. While a Forest Practice Rule for fishers has not been requested, federal listing of fishers may prompt WDNR to request a rule to increase protection of fishers. Therefore, impacts to the WDNR would be adverse and long-term but negligible to moderate, because the WDNR would either not be affected, the effect would be at or below the lower levels of detection, or the effect would be detectable and result in a measurable change.

Private Landowners.

Fisher is Delisted in Washington State — The primary factor in delisting of fishers in Washington would be successful reintroductions in the Olympic Peninsula and Cascade Mountains. Consistent with current practice, the state has no requirements for private landowners to protect fisher habitat whether listed or delisted. No actions would be required by private landowners to protect fishers if delisted.

*Fisher Remains a Candidate for Listing under the Endangered Species Act —*Private lands constitute only 5% of suitable fisher habitat on the Olympic Peninsula, and few private parcels directly border the Park, reducing the likelihood of fishers inhabiting private property. In addition, these privately owned parcels are fragmented and therefore mostly unsuitable for fishers. However, the provisions of the Endangered Species Act apply to private landowners, as well as to federal and state landowners. Therefore, individual landowners could decide to pursue implementation of a candidate conservation agreement with assurances while the fisher is a candidate species. Such an agreement would provide landowners who voluntarily provide protection to candidate species with assurances that their conservation efforts would not result in future regulatory obligations beyond those agreed to in the conservation agreement. In return for the landowner's voluntary management, the USFWS would authorize "incidental take," and issue an "enhancement of survival permit" that would enhance the survival of the fisher. Any take would be at a level consistent with the overall goal of precluding the need to list. The landowner's management activities included in the agreement must "significantly" contribute to eliminating the need to list the fisher (USFWS 2004c).

Conservation agreements are voluntary; landowners are not required to implement them. If a landowner decided to implement a conservation agreement, Olympic National Park could provide technical assistance in initiating and completing the process. However, the landowner would incur additional long-term responsibility for implementing habitat enhancement measures or management actions included in the agreement.

A private landowner could also create a habitat conservation plan to protect candidate species. This is described in more detail below under "Fisher Becomes Listed as Threatened or Endangered under the Endangered Species Act."

Fisher Remains Listed as State Endangered — The State of Washington recognizes the fisher as a state-listed endangered species, affording it protections from legal hunting or trapping under state law (WAC §232-12-014). In addition, purposefully capturing or harming a fisher by the public is prohibited under Washington's Regulatory Code (RCW), which governs the unlawful taking of wildlife under § 77.15.120. Despite being listed as a state endangered species, there is no critical habitat rule (WAC 222-16-080) for the fisher under the State Forest Practices Act (RCW 76.09), and thus no restrictions of forest practices activities on state or private timberlands to protect fisher habitat (Lewis and Hayes 2004). Private land-

owners are prohibited from hunting/trapping, possessing, or harm of a state endangered species, and knowingly cutting down or disturbing an occupied fisher den tree would be a violation of state law.

Trapping is permitted in the state of Washington, but only non-body gripping traps (e.g., box traps) are allowed since these traps are less likely to injure or kill an animal, unless a trapper has a special permit to use leg hold traps (permit for special situation of damage or threat; duration of permit is 30 days; RCW § 77.15.192). If a fisher is incidentally captured, it must be released unharmed. If the individual animal is injured by the trap and must be humanely euthanized or if a fisher is found dead in a trap, the trapper is required to report the capture to WDFW. The trapper does not have to produce the carcass of an incidentally captured animal to an enforcement officer. If fishers are reintroduced, WDFW is likely to modify trapping regulations to protect incidentally trapped fishers or require submission of carcasses of fishers killed incidentally by traps. WDFW may also initiate an agreement with the Washington State Trappers Association to limit potential impacts to fisher.

Fisher Becomes Listed as Threatened or Endangered under the Endangered Species Act — As described for the *Washington Department of Natural Resources* above, private landowners would not be required to consult with the USFWS should the fisher become listed under the Endangered Species Act, although the act's regulations would apply to private landowners. Private landowners could decide to pursue implementation of a safe harbor agreement should the fisher become listed.

Under a safe harbor agreement, the USFWS would define the baseline of the enrolled property in terms appropriate for the covered species, such as the number and location of fishers, if that could be determined. Using that as a baseline, the agency and the property owner would discuss land use objectives, assess habitat quality, and identify information needed to develop the agreement to meet the policy's standards. The agreement would include a monitoring program designed to assess the success of management practices. If a newly listed species occupied the enrolled lands, the agreement could be amended to add that species. There must be a "net conservation benefit" for the covered species as a result of management actions included in the agreement. Examples of such a benefit include reduction of habitat fragmentation, increase of population numbers or distribution, and restoration of habitat. Net conservation benefits must contribute, directly or indirectly, to the recovery of the covered species (USFWS 2004c).

Private landowners could also implement a habitat conservation plan. A habitat conservation plan is developed to help protect species from being harmed by activities on private lands while protecting private landowners from liability under the Endangered Species Act. Section 10 of the Endangered Species Act authorizes "incidental take" through habitat conservation plans for nonfederal property owners. Habitat conservation plans can also include conservation measures for candidate species, proposed species, and other species of concern. Therefore, the terms of the plan would not change over time with subsequent species listings; a habitat conservation plan only applies to those species covered under the plan (USFWS 1999, 2005b).

The purpose of a habitat conservation plan is to ensure the effects of the authorized incidental take would be adequately minimized and mitigated. The purpose of an incidental take permit is to authorize the incidental take of a listed species, not to authorize the activities that result in take (USFWS 1999, n.d.b). The private landowner would decide whether to pursue an incidental take permit (USFWS 1999, 2005b).

Should a private landowner decide to pursue a safe harbor agreement or a habitat conservation plan, Olympic National Park would provide information or technical expertise in initiating and completing the process by sharing existing data and research on fishers with the landowner. However, as with a candidate conservation agreement, the landowner would incur additional long-term responsibility for implementing habitat enhancement measures or management actions included in the agreement. If a private landowner already had a safe harbor agreement in place for other species (such as the spotted owl), the fisher could be added to that agreement, minimizing the level of impact to the landowner because management actions to enhance habitat for other species would already be underway.

Private landowners are not required to pursue development and implementation of a conservation agreement, safe harbor agreement, or habitat conservation plan; these actions are voluntary. Yet the provisions of the Endangered Species Act would still apply, and landowners would be prohibited from an "incidental take." As discussed in chapter 1, "take" is defined in the Endangered Species Act as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species. Harm may include substantial habitat modification where it would actually kill or injure a listed species through impairment of essential behavior. Therefore, conducting logging activities in the absence of these agreements could result in such habitat modification and may violate the Endangered Species Act. Potential economic impacts related to timber harvest and protections under the Endangered Species Act are discussed under "Impacts on Socioeconomic Conditions" in this chapter.

Private Landowners Summary — Private landowners would be subject to the provisions of the Endangered Species Act and state regulations regarding harm of listed species. Private landowners could implement a candidate conservation agreement with assurances, a safe harbor agreement, or a habitat conservation plan. Olympic National Park would provide information or technical expertise in initiating and completing these processes. However, the private landowner would incur additional long-term responsibility for implementing habitat enhancement measures or management actions defined under these agreements. Because only 5% of habitat identified as suitable for fishers on the Olympic Peninsula (as determined by Lewis and Hayes 2004) occurs on private land, and these parcels are highly fragmented, the likelihood of fishers inhabiting this land is low. Therefore, few, if any, private landowners would be affected. In addition, if a fisher occupied private land, it would likely inhabit only a small portion of property, given the location of suitable habitat as shown on figure 7. Should a private landowner choose to implement an agreement with the USFWS, that individual would likely perceive the impacts associated with completing the agreement and implementing long-term habitat enhancement measures or management actions as a moderate impact because they would be readily apparent and would result in a measurable adverse change to the landowner. Impacts would vary depending on the fisher's status as a candidate or a threatened or endangered species, as well as the type of agreement implemented, the amount of habitat that would require specific management, and the extent of those management actions.

Native American Tribes.

Fisher is Delisted in Washington State — The primary factor in delisting of fishers in Washington would be successful reintroductions in the Olympic Peninsula and Cascade Mountains. Delisting would not affect tribes as the species would not have status.

Fisher Remains a Candidate for Listing under the Endangered Species Act — As a candidate species, the fisher receives no federal protection, and tribes would not be required to take any action to protect fishers as a federal candidate species.

Fisher Remains listed as State Endangered — No impacts to tribes are expected as a result of the fisher being listed as a state endangered species, as state law would not apply to tribal lands. However, since trapping regulations do not apply to tribal lands or usual and customary lands, WDFW may initiate an agreement with the tribes to limit potential impacts to fisher from trapping.

Fisher Becomes Listed as Threatened or Endangered under the Endangered Species Act — As stated in the U.S. Department of the Interior's *Secretarial Order # 3206: American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act* (June 1997), Indian lands are not federal public lands or part of the public domain, and they are not subject to federal public land laws. While *Secretarial Order #3206* does not authorize "direct take" of listed species by tribes, and does not override the statutory provisions of the Endangered Species Act, the Department of the Interior recognizes that Indian tribes value and take responsibility for the management of their lands and resources. Therefore, should the fisher become listed under the Endangered Species Act, government-to-government consultation would occur to determine the appropriate action to take to promote species conservation — a negligible impact, as this action would be detectable, but would not have a measurable effect on the tribe. Should the tribe

develop a conservation plan, it would be given deference. Development of a conservation plan could result in a long-term, adverse, moderate impact, as the effect would be readily apparent and would result in a measurable change, depending on the provisions defined in the plan. In addition, critical habitat would not be designated on tribal land unless it was determined essential to conserve a listed species. Given the protections that would be afforded the fisher by surrounding federal and state lands, this possibility would be unlikely. Tribal information would be solicited not only on the fisher, but also on tribal cultural values and hunting rights related to the fisher.

As described in "Chapter 3 – Affected Environment," it is expected that the Quinault Indian Nation, would be the tribe most likely affected. Impacts to the Quinault Indian Nation would be negligible to moderate, as government-to-government consultation would occur, and the tribe may or may not choose to create a conservation plan; deference would be given to the tribe's plan. However, only 2% of suitable fisher habitat occurs on tribal land, reducing the likelihood of fishers becoming established there.

Tribal Lands Summary — Tribes would not be required to take action to protect fishers should they remain a federal candidate species or if fishers were delisted in the state of Washington. The fisher's status as a state endangered species would not apply to tribal lands. If the fisher became listed under the Endangered Species Act, the Quinault Nation would most likely be affected, given the location of suitable fisher habitat. Government-to-government consultation would occur to determine the appropriate action to take, which would result in an adverse, negligible impact. Should the tribe develop a conservation plan, it would be given deference, resulting in a long-term, adverse, moderate impact.

Cumulative Impacts

The actions taken by federal and state landowners, as described above, would have an additive effect when combined with the protection that would be afforded to fishers within the Park. Protection of the fisher as a state-listed species would also offer benefits. These combined actions, particularly those implemented by the USFS and those defined under the WDNR habitat conservation plan, would help offset the need to list the fisher. The resulting beneficial, long-term impact would be moderate if the fisher was removed from the list of candidate species, as the effect would be readily apparent, and would result in a measurable beneficial change to neighboring landowners (particularly private landowners), since the actions described above would not need to be undertaken.

Should the fisher become listed under the Endangered Species Act, neighboring landowners would be required to take actions to protect the fisher, in addition to actions already undertaken to protect other listed species. The USFS has already implemented timing restrictions on all ground-disturbing activities for other listed species, such as avoiding nesting periods of the spotted owl and the marbled murrelet; these actions have extended the amount of time required to complete projects. These two birds nest in the spring (Olympic National Park limits activity in spotted owl and marbled murrelet habitat from March 1 to September 15 to protect these species). Fisher denning is expected to occur from March 1 until June 31, which would fall within the same time frame as spotted owl and marbled murrelet nesting. Protections for den sites would not be needed outside this period. Therefore, it is expected that the USFS would not need to implement additional timing restrictions to protect the fisher.

With the exception of the WDNR, whose habitat conservation plan already includes the fisher, cumulative impacts would be adverse, long-term, and minor to moderate (a detectable or readily apparent impact that may or may not result in a measurable change), depending on the landowner.

When added to the adverse, long-term, negligible to moderate impacts expected under this alternative, overall cumulative impacts would be primarily beneficial, as removing the need to list the fisher would eliminate adverse impacts to all landowners.

Conclusion

If fisher were delisted by Washington State, impacts to neighboring landowners would be long-term, beneficial, and negligible as fisher habitat would be protected under existing plans (e.g., WDNR's habitat conservation plan and the *Northwest Forest Plan*) or neighboring landowners would not be required to take those conservation actions described above under "Fisher Remains listed as State Endangered" to protect fisher.

Impacts to neighboring landowners would be adverse and long-term if the fisher remained a federal candidate species or became listed under the Endangered Species Act. Should the fisher become listed, federal and state agencies would be the most affected, and impacts would be negligible to moderate. Although up to 5% of private land considered to be suitable fisher habitat on the Olympic Peninsula would be affected by formal listing of the fisher, impacts to private landowners would be moderate, as affected landowners would incur additional management tasks to protect the fisher on their lands. If the fisher became listed under the Endangered Species Act, the Quinault Indian Nation would most likely be the only tribe affected, given the location of suitable fisher habitat. Impacts to the Quinault Indian Nation would range from negligible to moderate, but only 2% of suitable fisher habitat occurs on all tribal land on the peninsula.

Some adverse cumulative impacts would occur, but overall cumulative impacts would be primarily beneficial, as combined protective actions by all landowners could preclude the need to list the fisher.

Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding

Analysis

Alternative C would be implemented if translocations (as under described under alternative B) were not effective or if source animals became unavailable for translocations. This could imply that fishers released under alternative B were not surviving, either as a result of translocation, or as a result of some other circumstance that was affecting the source population. If so, the possibility of the fisher becoming listed under the Endangered Species Act could be increased. Because fishers are a candidate species, the USFWS has sufficient information on fisher biological status and threats to propose it for listing as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Therefore, a decline in the fisher population could cause proposed listing of the fisher to become a higher priority.

Should the fisher become listed under the Endangered Species Act, impacts would be similar to alternative B to neighboring landowners.

Cumulative Impacts

The same adverse impacts expected under alternative B would also apply under alternative C. However, the beneficial impacts of fisher reintroduction described under alternative B may not be sufficient to preclude listing of the fisher when combined with the adverse impacts that could apply under alternative C. These adverse impacts under alternative C include the potential for reduced success rate of fisher translocations or a decline in the fisher source population that may make the restoration process longer or impossible. Therefore, cumulative impacts to neighboring landowners may be primarily adverse and related to additional actions landowners would have to take to protect fishers, particularly private and tribal landowners (since they may not already have plans in place to protect listed species). However, the combined protection efforts of all landowners would still provide some beneficial effects.

Conclusion

If translocated fishers were not surviving or there was a decline in the source population, the need to list the fisher under the Endangered Species Act might become more likely, resulting in adverse impacts to landowners that would be similar to alternative B and range from negligible to moderate. When combined with the higher possibility of listing, cumulative impacts might be primarily adverse and related to additional actions landowners would have to take to protect fishers, although the combined protection efforts of all landowners would still provide some beneficial effects.

IMPACTS ON SOCIOECONOMIC CONDITIONS

GUIDING REGULATIONS AND POLICIES

NEPA requires that economic and social impacts be analyzed when they are interrelated with natural or physical impacts. Economic impacts could potentially result from area actions considered under the alternatives; therefore, they are addressed in this document.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

Socioeconomic impacts related to timber harvesting could result from possible restrictions should the fisher become a federally listed under the Endangered Species Act. To determine impacts, areas where logging occurs adjacent to Olympic National Park were identified and compared to the likelihood of fisher occupation. Fishers are associated with late successional forests, which are not harvested by USFS. USFS harvests stands 40 to 60 years old to promote late successional characteristics. Therefore, tree harvest may not result in loss of potential habitat as the primary focus of the thinning on USFS lands is to promote the future development of late-successional habitat for species such as northern spotted owl and marbled murrelet, which would also benefit fishers. Although fishers may forage or travel through these younger, thinned tree stands, these stands are not used for denning. Seasonal restrictions to protect denning fishers in old growth stands adjacent to a thinned stand would potentially result in economic impacts on loggers on lands adjacent to Olympic National Park. However, because fisher females may move young frequently while denning, and radio collars would drop off relocated fishers in 18-months, locating active fisher dens would be difficult. Therefore seasonal restrictions on activities around active fisher dens would not likely be an effective management tool to protect fishers.

Fisher predation on pets and small livestock could affect local residents. The effect of fisher predation to livestock farmers and local residents would depend on the type of livestock owned and the location of the farm or residence (rural or urban).

Impact Thresholds

The following impact thresholds for evaluating socioeconomic conditions were defined:

Negligible: No effects would occur, or the impacts to socioeconomic conditions would be below or at the level of detection.

Minor: The impacts to socioeconomic conditions would be small but detectable and localized. The impact would not be detectable outside the neighboring lands and would affect only a few adjacent landowners. No impacts would be perceptible at the regional level, and local impacts would be limited.

Moderate: The effects to socioeconomic conditions would be readily apparent at the localized level. Changes would affect more than a few landowners. Any impacts would result in changes to socioeconomic conditions on a local scale and could

include changes to the operation and/or profitability of local businesses. Impacts at the regional level would be minor.

Major: The effects to socioeconomic conditions would be readily apparent. Changes in social or economic conditions would be substantial, extend beyond the local area, include potential large-scale changes to the operation and/or profitability of multiple businesses, and affect the majority of adjacent landowners.

Area of Analysis

The area of analysis includes landowners outside Olympic National Park who could be impacted by fisher restoration. On a local level, this would include Clallam and Jefferson counties. On a regional level, this would include all of the Olympic Peninsula.

IMPACTS OF THE ALTERNATIVES

Alternative A — No-Action Alternative

Analysis

Under alternative A, no action would be taken to reintroduce fishers to the Olympic Peninsula resulting in no impacts to timber harvesting activities. In addition, there would be no predation by fishers on domestic livestock or pets. Therefore, there would be no impacts to socioeconomic resources.

Cumulative Impacts

As described under "Impacts on Neighboring Landowners" in this chapter, the USFS already implements timing restrictions on some activities that may impact listed species including the spotted owl and the marbled murrelet, extending the amount of time required to complete timber-related projects. These timing restrictions can reduce the volume of timber harvesting that can be carried out, and they are expected to continue to affect project implementation (USFS 2006). When combined with the negligible impacts expected to the USFS under this alternative, cumulative socioeconomic impacts to the agency would remain adverse, long-term, and negligible.

Since the early 1990s, timber harvest activity has declined on the Olympic Peninsula with an average of 1,000 acres of harvest annually between 2000 and 2006. For Jefferson County this has represented a "significant" drop in employment, and for Clallam County, a "significant" loss of tax revenues, resulting in budget reductions and cuts in public services (Jefferson County 2004; Clallam County 2002). As described under the "Cumulative Impact Scenario" in this chapter, approximately $1.2 billion was paid to counties and communities in the spotted owl region between 1994 and 2000 under terms of Northwest Economic Adjustment Initiative. The Omnibus Budget Reconciliation Act also provided an alternative payment to 72 counties in Washington, Oregon, and northern California where timber harvest and revenues were affected by protections for the northern spotted owl. In 2000 Congress replaced the spotted owl safety net with the Secure Rural Schools and Community Self-Determination Act. These measures resulted in substantially higher payments to counties than they would have received through forest revenue sharing alone, in many cases more than doubling the revenues. Payments to counties under the Secure Rural Schools Act represented a "significant" amount of money to support local resource-related projects on and around the Olympic National Forest, providing funding for joint forest stewardship projects between the forest and the public. These payments are also an important source of new grant money to communities (USFS 2006). Since fisher reintroduction would not occur under alternative A or the impacts to socioeconomic conditions would be below or at the level of detection, the cumulative effects would remain beneficial and would result in negligible cumulative impacts to counties.

Private timber landowners have also experienced the effects of the decline in the timber industry, but they may have indirectly benefited from the payments to the counties described above. The adverse and beneficial impacts of the declining revenues offset by the government payments combined with no effects from fisher reintroduction under this alternative, would result in long-term, negligible impacts that would vary for individual landowners depending on the amount of habitat potentially affected.

The Quinault Indian Nation has used revenue from timber sales to purchase reservation land, which could be adversely affected by the recent declines in the timber industry. Cumulative impacts to the tribe would be adverse, long-term, and vary in intensity, depending economic conditions.

Conclusion

Because there would be no impacts to timber harvesting activities related to fisher reintroduction or predation by fishers, there would be no impacts to socioeconomic conditions under this alternative. Cumulative impacts would be beneficial to adverse, long-term, and vary in intensity depending on landowner.

Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation

Socioeconomic impacts are analyzed for Endangered Species Act restrictions and fisher predation.

Impacts Related to Endangered Species Act Restrictions

Analysis. Socioeconomic impacts related to timber harvesting could result from possible restrictions should the fisher become federally listed under the Endangered Species Act, and from possible seasonal restrictions on activity on non-NPS public lands to protect fisher denning sites.

Impacts on the U.S. Forest Service — As described under "Neighboring Landowners," the USFS has designated the fisher as a "sensitive species" in currently occupied forests. Conservation measures that have been applied in other national forests that have fishers would be applied in Olympic National Forest. If fisher retained its status as a federal candidate or state endangered, USFS would treat the species as "sensitive" and apply seasonal restrictions on project activities would be applied to known, active fisher denning sites, where such activities would appreciably reduce the likelihood of denning success between mid-March to the end of May. A 0.25-mile buffer would be applied around a known active den site during this season (Piper, pers. comm. July 10, 2007). The use of signs, gates, and other mechanisms could help prevent disturbance in the vicinity of a known den site. These activities are not expected to have more than negligible adverse socioeconomic impacts on the USFS, because either no effects would occur, or the impacts would be below or at the level of detection. Furthermore, the primary focus of the thinning on USFS lands is to promote the future development of late-successional habitat for species such as northern spotted owl and marbled murrelet, which would also benefit fisher.

Impacts on Private Landowners — Private landowners could implement a candidate conservation agreement, a safe harbor agreement, or a habitat conservation plan for their lands, depending on the fisher's Endangered Species Act status. The private landowner would incur long-term responsibility for implementing habitat enhancement measures or management actions defined under these agreements. Depending on the extent of the actions required, private landowners could incur costs related to implementation of these measures. Economic impacts would vary, depending on the fisher's status as a candidate or a threatened or endangered species, as well as the type of agreement implemented and the amount of habitat that would require specific management.

The agreements mentioned above are voluntary. If private landowners did not implement an agreement with the USFWS, they would be prohibited from an "incidental take" should a fisher occupy their property. As defined in the Endangered Species Act (see "Chapter 1 – Purpose of and Need for Action"), "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or

endangered species. Harm may include significant habitat modification where it would actually kill or injure a listed species through impairment of essential behavior. Therefore, conducting logging activities in the absence of these agreements could result in such habitat modification and would violate the Endangered Species Act. However, tree stands harvested on rapid rotation are not considered high quality fisher habitat due to the lack of structure and lack of prey. Fishers may use these stands to travel through and during foraging, but fishers would not den in these stands because they lack the characteristics of forests fishers use since the trees do not mature.

Following the reduction in fisher populations on much of the forested lands in the U.S., porcupine populations climbed to extremely high densities and were blamed for much timber damage (Powell and Zielinski 1994). Although it is difficult to quantify the damage caused by porcupines because they also beneficially prune trees, damage did occur in areas with very high porcupine populations (Powell and Zielinski 1994). The fisher is the only species that preys on porcupines using a unique hunting and killing behavior (Powell and Zielinski 1994). During the late 1950s and 1960s many states and provinces therefore reintroduced fishers to reduce high porcupine population densities, as well as reestablish a native mammal (Powell and Zielinski 1994). In the 1950s logging companies, with permission from each state, reintroduced fishers into northern New England to control porcupines, which were decimating seedlings planted by the timber companies to reestablish trees in logged areas. For these reasons, fishers may have a beneficial economic impact on timber harvesting that could offset adverse impacts described above, depending on the extent, if any, of porcupine damage on the Olympic Peninsula.

Because only 5% of suitable fisher habitat occurs on private land, the likelihood of fishers inhabiting this land is low; therefore, few, if any, private landowners would be affected. In addition, if a fisher occupied private land, it would likely inhabit only a small portion of property, given the location of suitable habitat as shown on figure 7. For these reasons, overall impacts to private landowners in general would be adverse, long-term, and minor, as the impacts to socioeconomic conditions would be small but detectable and localized, and only a few private landowners would be affected. No impacts would be perceptible at the regional level, and local impacts would be limited. However, an impact to an individual landowner would likely be perceived as greater by that individual.

Impacts to Counties — Timber harvesting is the dominant land use within the area of analysis. The affected counties recognize the economic importance of forestlands, and they have goals to retain commercial forestland use. The counties also recognize the importance of conserving forestlands, and they are working cooperatively to manage habitat and comply with environmental regulations. The dual goals of forest conservation and commercial use are underscored in the counties' comprehensive plans (see discussion in "Chapter 3 – Affected Environment").

Although timber extraction industries have declined substantially in recent years, they continue to provide living wage jobs for a small percentage of people in both counties. This industry faces many threats to its continued existence, one of which is compliance with environmental regulations. If the fisher was listed under the Endangered Species Act, landowners would be required to comply with the provisions of the act, as described under "Impacts on Neighboring Landowners" of this chapter, possibly resulting in the socioeconomic impacts mentioned above. Timber companies that harvest on WDNR lands would not be affected, because of the state's 1997 habitat conservation plan that is already in place. Because no additional economic impacts related to protection of fishers under the Endangered Species Act are expected to lands under the jurisdiction of the USFS and the WDNR, which together with the Olympic National Park constitute 93% of suitable fisher habitat on the peninsula, overall socioeconomic impacts to the counties are expected to be small but detectable and localized, given the small percentage of land that could be affected and the fact that fisher habitation would be unlikely. Impacts would not be detectable outside the counties and would affect only a few landowners. No impacts would be perceptible at the regional level, and local impacts would be limited. For these reasons, impacts to the counties would be adverse, long-term, minor.

Impacts to Tribes — The Quinault Indian Nation owns 31% of all its reservation lands, and tribal members own two logging companies. A large portion of tribal land is owned by large timber companies, which employ tribal members as loggers and mill workers. As the timber industry has declined in recent years, many of these workers have shifted to other types of work. About 80% of the tribe's lands are considered suitable for timber production, which has become an important source of revenue for the tribe, particularly for buying back reservation land. Therefore, impacts that could prevent timber harvesting could affect the tribe's ability to continue to purchase property. However, only 2% of suitable fisher habitat occurs on tribal lands, and if the fisher was listed under the Endangered Species Act, government-to-government consultation would occur to determine the appropriate action to take to promote species conservation, as described under "Impacts on Neighboring Landowners" of this chapter. For these reasons, socioeconomic impacts to tribal lands are expected to be minor, as they would be detectable and localized. No impacts would be perceptible at the regional level, and local impacts (within tribal lands) would be limited.

Cumulative Impacts. As described under cumulative impacts under alternative A, the USFS already implements timing restrictions on mechanized activities that may impact other listed species including the spotted owl and the marbled murrelet, extending the amount of time required to complete timber-related projects. These timing restrictions can reduce the volume of timber harvesting that can be carried out, and they are expected to continue to affect project implementation (USFS 2006). Fisher denning would likely occur within the same time frame as spotted owl and marbled murrelet nesting. Therefore, it is expected that the USFS would not need to implement additional timing restrictions to protect the fisher, and no additional reduction in the volume of timber harvesting specifically related to the fisher would occur. When combined with the negligible impacts expected to the USFS under this alternative, cumulative socioeconomic impacts to the agency would remain adverse, long-term, and negligible.

Since the early 1990s, timber harvest activity has declined on the Olympic Peninsula with an average of 1,000 acres of harvest annually between 2000 and 2006. For Jefferson County this has represented a "significant" drop in employment, and for Clallam County, a "significant" loss of tax revenues, resulting in budget reductions and cuts in public services (Jefferson County 2004; Clallam County 2002). As described under the "Cumulative Impact Scenario" of this chapter, approximately $1.2 billion was paid to counties and communities in the spotted owl region between 1994 and 2000 under terms of Northwest Economic Adjustment Initiative. The Omnibus Budget Reconciliation Act also provided an alternative payment to 72 counties in Washington, Oregon, and northern California where timber harvest and revenues were affected by protections for the northern spotted owl. In 2000 Congress replaced the spotted owl safety net with the Secure Rural Schools and Community Self-Determination Act. These measures resulted in substantially higher payments to counties than they would have received through forest revenue sharing alone, in many cases more than doubling the revenues. Payments to counties under the Secure Rural Schools Act represented a "significant" amount of money to support local resource-related projects on and around the Olympic National Forest, providing funding for joint forest stewardship projects between the forest and the public. These payments are also an important source of new grant money to communities (USFS 2006). When combined with the adverse effects that could result from fisher reintroduction, the beneficial effects of these combined efforts would result in negligible cumulative impacts to counties, as no effects would occur, or the impacts to socioeconomic conditions would be below or at the level of detection.

Private timber landowners have also experienced the effects of the decline in the timber industry, but they may have indirectly benefited from the payments to the counties described above. The adverse and beneficial impacts of the declining revenues offset by the government payments would combine with the adverse impacts expected under this alternative, resulting in a primarily adverse, long-term impact that would vary for individual landowners depending on the amount of habitat potentially affected.

The Quinault Indian Nation has used revenue from timber sales to purchase reservation land, which could be adversely affected by the recent declines in the timber industry. Adverse impacts expected under this

alternative could further affect the tribe's ability to continue purchasing land. However, only 2% of tribal land is considered suitable fisher habitat; it is more likely that other factors affecting timber harvest would play a more substantial role. Cumulative impacts would be adverse, long-term, and vary in intensity, depending on these other factors.

Conclusion. Socioeconomic impacts related to timber harvesting would vary by landowner, but are expected to be adverse, long-term, and range from negligible to minor. Cumulative impacts would be primarily related to declines in the timber harvesting industry and the ensuing government payments to affected areas, and would also be adverse, long-term, and vary in intensity, depending on how individuals had been affected by these actions.

Impacts Related to Fisher Predation

Analysis. Fisher predation on poultry and pets has occasionally occurred in other areas of the country where fishers occur. However, these instances primarily happen where there is a high degree of contact between people and animals, usually in the eastern U.S. Habitat at Olympic National Park is distributed differently from that in eastern areas, affecting fisher distribution and predation. Predation may still occur in areas around Olympic National Park, likely in isolated rural areas, although fishers tend to avoid humans, unlike coyotes, which are also predatory animals. In addition, fisher densities are not expected to be as high as typical coyote density. Pet and poultry owners who may be susceptible to loss of animals from fisher predation already need to protect their pets and poultry from cougars, coyotes, raccoons, skunks, bobcats and weasels. The reintroduction of fishers would therefore not require any changes to management and animal husbandry.

Individuals with a fisher complaint would be required to contact the WDFW before harming an animal because fishers are protected as a state endangered species. WDFW biologists or officers would provide advice to address the problem, or could visit the individual with the problem. It is expected that fisher damage could be effectively remedied. If the problem could not be resolved without intervention, an effort would be made to capture and relocate the problem fisher. Lethal means of resolving the issue would be avoided, and no compensation would be provided to individuals experiencing damage from fishers. Damage is expected to occur only occasionally at most, since fishers tend to avoid people and developed areas.

Farm earnings for the three counties that could be affected by this plan were less than 1% of total earnings by place of work (0.3% for Clallam County, and 0.9% each for Jefferson and Grays Harbor counties). These earnings include both livestock and crops; therefore, earnings based solely on livestock would be less. In addition, fishers only prey on small livestock, such as chickens, ducks, geese, and rabbits, further reducing that percentage. Larger animals, such as cattle and sheep, would not be prey for fishers. Therefore, local owners of small livestock and small pets, particularly cats, could be adversely affected by this alternative over the long-term. Impacts would be negligible to minor, as they might or might not be detectable but would affect a small number of neighboring landowners. In addition, any landowner who contacted the WDFW about a problem fisher would receive assistance in treating the problem, potentially including capture and relocation.

Cumulative Impacts. Any predation by fishers would combine with past, present, and possible future predation by other species on the area's small livestock and pets. Combined predation activities by all species would still be small and possibly detectable by only a few adjacent landowners, resulting in adverse, long-term, negligible to minor cumulative impacts.

Conclusion. Local owners of poultry and small pets could be adversely affected by this alternative over the long-term by negligible to minor impacts. Cumulative impacts would also be adverse, long-term, and negligible to minor.

Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding

Analysis

No impacts related to captive breeding are expected to neighboring landowners; therefore, impacts would be similar to those expected under alternative B. However, alternative C would be implemented if translocations (as under described under alternative B) were not working or source animals became unavailable for translocations. This could imply that fishers were not surviving, either as a result of translocation, or as a result of some other circumstance that was affecting the source population. If so, the number of fishers on the Olympic Peninsula could possibly be less than expected under alternative B. For this reason, impacts could be slightly reduced compared to alternative B, but would remain adverse, long-term, and negligible to minor due to the difficulty of predicting the number of surviving fishers, as well as the potential seasonal restrictions on non-NPS lands to protect denning fishers.

Cumulative Impacts

Cumulative impacts would also be similar to alternative B. The impacts of current road closures undertaken by other landowners, as well as the unlikely possibility for fisher predation on domestic animals, would be added to the negligible impacts expected under this alternative. Cumulative impacts would be adverse, long-term, and negligible to minor.

Conclusion

No impacts specifically related to captive breeding are expected to neighboring landowners; therefore, impacts would be similar to those expected under alternative B — adverse, long-term and negligible to minor. Cumulative impacts would be adverse, long-term, and negligible.

IMPACTS ON PARK MANAGEMENT AND OPERATIONS

Direction for management and operations at Olympic National Park is set forth in the Park's enabling legislation and the draft general management plan (NPS 2006a). The draft general management plan includes the following specific management objectives for the Natural Resources Management, Resource and Visitor Protection, and Resource Education Divisions that would relate to fisher reintroduction:

- Complete inventory of the plants and animals in the Park. Regularly monitor the distribution and condition of selected species that indicate ecosystem condition and diversity.
- Restore native biological communities and habitats. Minimize human impacts on native species, ecosystems, and the processes that sustain them.
- Preserve genetic diversity by maintaining the abundance of unique populations at or above levels necessary for genetic variability.
- In cooperation with other agencies and tribal governments, preserve healthy populations and provide safe migratory corridors for wide-ranging wildlife populations.
- Protect the Park's biotic communities from impacts due to human activities and facilities while ensuring that visitors have ample opportunity to visit and enjoy these ecosystems.
- Support research that contributes to management knowledge of rare and protected species and their habitat. Incorporate findings in Park interpretive and education programs.
- Inventory rare or protected species in the Park and regularly monitor their distribution, condition, and population trends. Modify management plans to be more effective, based on the results of monitoring.

- Manage designated critical habitat, essential habitat, and recovery areas to maintain and enhance their value for listed species.
- Consult with the USFWS and NOAA Fisheries to ensure that NPS actions comply with the Endangered Species Act.
- Participate in the recovery planning process when appropriate. Cooperate with the USFWS and NOAA Fisheries to implement recovery plans approved by those agencies for listed species found in the Park.
- To the greatest extent possible, inventory, monitor, and manage state and locally listed species in a manner similar to federally listed species.
- Work with neighboring land and resource managers to obtain information on status and trends of little known, but potentially at-risk wildlife species, such as bats, marten, and pocket gophers.
- Provide information to Park visitors regarding listed species that occur in the Park and measures to promote their recovery.

The goal in the Park's *Strategic Plan 2007–2011* for wildlife includes reintroduction of extirpated species, and the annual work plans for 2007–2011 include beginning and continuing work on fisher reintroduction if a reintroduction plan is approved.

ASSUMPTIONS, METHODOLOGY, AND INTENSITY THRESHOLDS

The discussion of impacts to Park management and operations focuses on (1) the number of staff available to conduct fisher reintroduction and monitoring efforts, (2) the ability of Park staff to protect and preserve resources, and to provide for an effective visitor experience, and (3) the cooperative nature of the project, with all agencies/organizations involved contributing staff time. This includes an analysis of the projected need for staff time and materials in relation to fisher restoration under each alternative, as well as the various funding mechanisms available to implement the alternatives. The analysis also considers trade-offs for staff time or the budgetary needs required to accomplish the proposed alternatives, and it discusses each alternative in terms of its impacts to the affected divisions at the Park. Park resource, education, ranger, and compliance staff were members of the planning team, and were consulted regarding expected staffing and funding needs under each alternative. The impact analysis is based on the current description of Park operations presented in "Chapter 3 – Affected Environment."

The duration of impacts would be one to three fiscal years or budget cycles for short-term effects, and beyond three fiscal years or for the life of the plan (approximately 10 years) for long-term effects.

Impact Thresholds

The following thresholds for evaluating impacts on Park management and operations were defined:

Negligible: Park or agency operations would not be impacted or the impact would not have a noticeable or measurable impact on Park or agency operations.

Minor: Impacts would be noticeable and would result in a measurable, but small, change in Park or agency operations. Any required changes in Park staffing and funding could be accommodated within normal budget cycles and expected annual funding without appreciably affecting other operations within the Park.

Moderate: Impacts would be readily apparent, and would result in a substantial change in Park or agency operations that would be noticeable to staff and the public. Required changes in Park staffing and/or funding could not be accommodated within expected annual funding and would measurably affect other operations

within the Park by shifting staff and funding levels between operational divisions.

Major: Impacts would be readily apparent and would be markedly different from existing operations. These changes in Park staffing and/or funding could not be accommodated by expected annual funding and would require the Park to readdress its ability to sustain current Park operations.

Area of Analysis

The area of analysis, including cumulative analysis, is Olympic National Park.

IMPACTS OF THE ALTERNATIVES

Alternative A — No-Action Alternative

Analysis

Under alternative A, fishers would not be reintroduced to Olympic National Park. No additional time or resources would be required of Park staff for reintroduction efforts. Because the Park has no other plans to reintroduce fishers, no impacts related to releasing or monitoring fishers would be incurred.

Cumulative Impacts

Olympic's business plan for fiscal year 2001 shows a "significant shortfall in ongoing operations and management needs at Olympic" (NPS 2005d). The plan also states that many of the Park's most pressing operational needs are currently not being met. Such shortfalls would continue. However, no impacts related to alternative A would add to these effects, so there would be no cumulative impacts.

Conclusion

No impacts related to releasing or monitoring fishers would be incurred; therefore, there would be no impacts to Park management and operations. There would also be no cumulative impacts.

Alternative B — Reintroduce Fishers into Olympic National Park Using Translocation

Analysis

Under alternative B fishers would be released in Olympic National Park and monitored as described in "Chapter 2 – Alternatives." Subsequent management would be adaptively modified based on monitoring results. Education and interpretive measures would be implemented and could include brochures, publications, information on the Park website about the role of fishers. Should individual landowners decide to pursue implementation of a candidate conservation agreement or safe harbor agreement, Park staff would provide technical assistance in initiating and the process by sharing available data.

The activities described above would impact Park management and operations by adding new responsibilities for Park staff, with additional costs as well. The Natural Resources Management Division would likely be the most affected, as it would be responsible for preserving and managing the natural resources of the Park and coordinating scientific research. However, securing additional funds to evaluate the success of fisher restoration in the Park for FY 2008–2017 would help offset most adverse budgetary impacts to this division. Funding support for the project would come largely from project partners. The result would be an adverse, long-term, minor impact, which would be noticeable and would result in a measurable, but small, change in Park or agency operations. Any required changes in Park staffing and funding

could be accommodated within normal budget cycles and expected annual funding without appreciably affecting other operations within the Park.

The Resource Education Division would experience negligible impacts related to the creation of new educational and interpretive components of this alternative, potentially items such as websites and brochures, but these actions would not result in a measurable effect. An increase in the use of Park trails and roads for release and monitoring efforts could affect the Maintenance Division, which is responsible for maintaining Park infrastructure; the impacts would be adverse but negligible in effect, as the impacts would likely not be noticeable or measurable.

Because the Natural Resources Management Division, which would be the most affected by alternative B, could secure additional funds for fisher reintroduction efforts, and all other divisions would experience no more than negligible impacts, overall impacts to Park management and operations would be adverse, long-term, and negligible to minor.

In the event that fishers were federally listed as threatened or endangered, NPS would be required to carry out formal consultation with the USFWS if a proposed Park project would affect fishers. This would not require a substantial change in Park operations or staff because the park already consults for projects that have the potential to affect other listed species, and therefore would be a negligible to minor impact on Park operations.

Cumulative Impacts

As noted under alternative A, Olympic National Park's business plan for fiscal year 2001 shows a "significant shortfall in ongoing operations and management needs at Olympic," and states that many of the Park's most pressing operational needs are not currently being met (NPS 2005d). Over the past several years, a reduction of 30 additional full-time equivalents has also occurred in the Park, adversely affecting management and operations. In addition to routine activities such as trail maintenance, repairing the flood damage that occurred in 2006 would also affect the Park's staff time and budget, as would management of the Elwha River dam removals. When combined with the adverse, long-term, negligible to minor impacts expected under alternative B, cumulative impacts to Park management and operations would be adverse, long-term, and moderate, given the existing shortfall and reduced staff.

Conclusion

Because the Natural Resources Management Division might secure additional funds for fisher reintroduction efforts, and all other divisions would experience no more than negligible impacts, overall impacts to Park management and operations would be adverse, long-term, and negligible to minor. Cumulative impacts would be adverse, long-term, and moderate, given the existing operations and management shortfall and reduced staff.

Alternative C — Reintroduce Fishers into Olympic National Park Using Captive Breeding

Analysis

Under alternative C captive breeding would be used in addition to translocations (as described under alternative B) to produce fishers for reintroduction if translocations were not working or source animals became unavailable for translocations. Animals would be captively bred at several non-NPS facilities to provide a hedge against catastrophic events. It is expected that few, if any, additional efforts would be required on the part of Park staff to captively breed fishers. Funding would be sought from a variety of sources, and no impacts to Park budgets are expected above those that would occur under alternative B. Once enough fishers had been bred for release into the Park, impacts would be similar to those described under alternative B — adverse, long-term, and negligible to minor.

Cumulative Impacts

Cumulative impacts would be the same as those expected under alternative B and would be related to on-going shortfalls and reduced staff, resulting in adverse, long-term, and moderate effects.

Conclusion

Impacts would be the similar to alternative B — adverse, long-term, and negligible to minor. Cumulative impacts would be adverse, long-term, and moderate, given the existing shortfall and reduced staff.

Chapter 5
Consultation and Coordination

CHAPTER 5 — CONSULTATION AND COORDINATION

The intent of NEPA is to encourage the participation of federal and state agencies and affected citizens in the assessment procedure, as appropriate. This section describes the consultation that occurred during development of this *Draft Fisher Reintroduction Plan / Environmental Assessment,* including consultation with scientific experts, tribes, and other agencies. This chapter also describes the public involvement process and lists recipients of the draft document.

HISTORY OF PUBLIC INVOLVEMENT

The public involvement activities for this *Draft Fisher Reintroduction Plan / Environmental Assessment* fulfill the requirements of NEPA and NPS *Director's Order #12* (NPS 2001a).

THE SCOPING PROCESS

The NPS divides the scoping process into two parts: internal scoping and external or public scoping. Internal scoping involved discussions among NPS personnel regarding the purpose of and need for management actions, issues, management alternatives, mitigation measures, the analysis boundary, the appropriate level of documentation, available references and guidance, the purpose of and need for management actions, and other related topics.

Public scoping is the early involvement of the interested and affected public in the environmental analysis process. The public scoping process helps ensure that people have an opportunity to comment and contribute early in the decision-making process. For this planning process project information was distributed to individuals, agencies, tribes, and organizations early in the scoping process, and people were given opportunities to express concerns or views and to identify important issues or even other alternatives.

Taken together, internal and public scoping are essential elements of the NEPA planning process. The following sections describe the various ways scoping was conducted for this impact statement.

Internal Scoping

On April 8, 2005, a teleconference kicked off the planning process for reintroducing fishers in Olympic National Park. Agencies and organizations at the meeting included the Environmental Quality Division of the NPS, representatives from Olympic National Park, and various consultants with expertise in fisher biology and NEPA planning.

An internal scoping meeting at Olympic National Park on May 18 and 19, 2005, discussed the restoration of fishers to the Park and the Olympic Peninsula. Staff from NPS, WDFW, Olympic National Forest, as well as Native American tribal representatives, were present at the meeting. The goals of the meeting were to

- Determine the purpose, need and objectives of returning fishers to the Park ecosystem,
- Identify issues and concerns associated with restoring fishers and their impact on the Park's ecosystem, and
- Identify preliminary alternatives.

During the two-day meeting, NPS employees identified the purpose of and need for action, management objectives, issues, and impact topics. Various roles and responsibilities for developing the plan were also clarified. The results of the meetings were captured in an "Internal Scoping Report," now on file as part of the administrative record.

PUBLIC SCOPING

The *Olympic National Park Fisher Reintroduction Plan Draft Internal Scoping Report* was released for public review in January 2006, and a 30-day public comment period about the proposed reintroduction ran from January 9 to February 10, 2006, to help define the issues and alternatives to be addressed in this environmental assessment. A news release soliciting public input about reintroduction of fishers was published by the Park on January 9, 2006. The news release also invited the public to attend a program about fishers at Olympic National Park on January 10 by wildlife biologist Jeff Lewis of the WDFW, and it listed several ways the public could submit comments. During the public comment period, the Park received 142 comments on the proposed plan.

A total of 35 commenters supported fisher reintroduction, and 21 opposed it. Eighteen comments supported reintroduction to restore and promote healthy, balanced ecosystems. Some commenters supported reintroduction but expressed concerns, such as competition with other species or fishers preying on domestic animals. Two supporters felt that the NPS is mandated to reintroduce fishers.

People opposed fisher reintroduction due to concerns that the fisher would become listed under the Endangered Species Act, which would result in more restrictions on private property (5 comments), and that the fisher would compete with other species, such as the northern spotted owl (4 comments). Four people opposed reintroduction believing that the existing natural balance would be upset; two people were concerned about domestic pets. Five individuals felt that Park money would be better spent elsewhere.

Fourteen people had general questions about fishers. Of the remaining comments, 12 people were concerned about impacts to local economy and private property, and 9 people were concerned about impacts of fishers on other threatened and endangered species.

AGENCY CONSULTATION

Olympic National Park started informal consultation with the USFWS in May 2005, when agency representatives attended the internal scoping meeting held in the Park. USFWS representatives are also on the fisher restoration team. A biological assessment was submitted to the USFWS on July 24, 2007 requesting concurrence on "not likely to affect" determinations for marbled murrelets and northern spotted owls.

RECIPIENTS OF THE PLAN / ENVIRONMENTAL ASSESSMENT

This *Fisher Reintroduction Plan / Environmental Assessment* will be sent to the following agencies, organizations, and businesses, as well as to other entities and individuals who requested a copy.

FEDERAL AGENCIES

U.S. Fish and Wildlife Service
- Western Washington Fish and Wildlife Office
- Washington Islands National Wildlife Refuge

U.S. Forest Service (Olympic National Forest)

National Oceanic and Atmospheric Administration, Olympic Coast National Marine Sanctuary

U.S. SENATORS AND REPRESENTATIVES

U.S. Representative Norm Dicks

U.S. Senator Maria Cantwell

U.S. Senator Patty Murray

STATE OFFICIALS

Christine Gregoire, Washington State Governor
Former Representative Jim Buck, Washington State Legislature
Representative Kevin Van De Wege, Washington State Legislature
Representative Lynn Kessler, Washington State Legislature
Senator James Hargrove, Washington State Legislature

STATE AND PROVINCIAL GOVERNMENT

Washington Department of Fish and Wildlife
Washington Department of Natural Resources
Washington State Historic Preservation Officer
British Columbia Ministry of Water, Land and Air Protection
Alberta Sustainable Resource Development, Fish and Wildlife Division

REGIONAL, COUNTY, AND LOCAL GOVERNMENTS

City of Aberdeen, Mayor
City of Forks, Mayor
City of Hoquiam, Mayor
City of Port Angeles, Mayor
City of Sequim, Mayor
City of Shelton, Mayor
Clallam County Board of Commissioners
Grays Harbor County Board of Commissioners
Mason County Board of Commissioners
Jefferson County Board of Commissioners
Kitsap County Board of Commissioners
Olympic Region Clean Air Agency

INDIAN TRIBES

Jamestown S'Klallam Tribe
Hoh Tribal Business Council
Lower Elwha Klallam Tribe
Makah Indian Tribal Council
Port Gamble S'Klallam Tribe
Quileute Tribal Council
Quinault Indian Nation
Skokomish Tribal Council
Point No Point Treaty Council

ORGANIZATIONS, BUSINESSES, AND OTHER ENTITIES

Audubon Society
Backcountry Horsemen
Center for Biological Diversity
Clallam Bay-Sekiu Chamber of Commerce
Clallam County Economic Development Council
Conservation Northwest (formerly Northwest Ecosystem Alliance)
Defenders of Wildlife
Forks Chamber of Commerce

Friends of Lake Crescent
Green Crow Corporation
Local sportsmen
National Parks Conservation Association
National Wildlife Federation
The Nature Conservancy
North Cascades Conservation Council
North Olympic Timber Action Committee
Olympic Forest Coalition
Olympic Natural Resource Center
Olympic Park Associates
Olympic Peninsula Audubon Society
Olympic Peninsula Intertribal Cultural Advisory Committee
Olympic Region Clean Air Agency
Port Angeles Chamber of Commerce
Public Employees for Environmental Responsibility
Quinault Community Action Forum
Rocky Mountain Elk Foundation
Sierra Club
Society for Northwestern Vertebrate Biology
Sunnydell Shooting Grounds
Washington Environmental Council
The Wilderness Society
The Wildlife Society
Washington Environmental Council
Washington Forest Protection Association
Washington State Trappers Association
Washington's National Park Fund
Wilderness Watch

LIBRARIES

Daniel J. Evans Library, The Evergreen State College
Kitsap Regional Library, Bremerton Branch
North Olympic Library System
- Clallam Bay Branch
- Forks Branch
- Port Angeles Branch
- Sequim Branch

Peninsula College Library
Port Townsend Public Library
- Quilcene Branch

Seattle Public Library
Tacoma Public Library
Timberland Regional Library
- Aberdeen Branch
- Amanda Park Branch
- Hoodsport Branch
- Hoquiam Branch

University of Washington Library
William G. Reed Public Library

Wilson Library, Western Washington University

CONCESSIONERS AND IN-PARK BUSINESSES

ARAMARK
- Kalaloch Lodge
- Sol Duc Hot Springs Resort

Forever Resorts
- Fairholme Store
- Hurricane Ridge Cafe and Gift Shop
- Lake Crescent Lodge

Hurricane Ridge Public Development Authority
Hurricane Ridge Winter Sports Club
Log Cabin Resort
Olympic Park Institute
Olympic Raft and Kayak

MEDIA (NOTIFICATION ONLY)

Newspapers

Forks Forum, Forks, Washington
Kitsap Sun, Bremerton, Washington
Peninsula Daily News, Port Angeles, Washington
Seattle Post-Intelligencer, Seattle, Washington
Sequim Gazette, Sequim, Washington
The Daily World, Aberdeen, Washington
The Everett Herald, Everett, Washington
The Herald, Bellingham, Washington
The Leader, Port Townsend, Washington
The News Tribune, Tacoma, Washington
The Olympian, Olympia, Washington
The Oregonian, Portland, Oregon
The Seattle Times, Seattle, Washington
The Shelton-Mason Country Journal, Shelton, Washington
The Spokesman-Review, Spokane, Washington
The Vidette, Montesano, Washington

Radio Stations

KAYO, Aberdeen, Washington
KGY, Olympia, Washington
KIRO, Seattle, Washington
KMAS, Shelton, Washington
KOMO, Seattle, Washington
KONP, Port Angeles, Washington
KPLU, Tacoma/Seattle, Washington
KUOW, Seattle, Washington
KXRO/KDUX, Aberdeen, Washington
Northwest Public Radio, Pullman / Port Angeles, Washington

Television Stations

KCTS/Seattle, Seattle, Washington

KING-5 Television, Seattle, Washington
KIRO 7, Seattle, Washington
KOMO TV, Seattle, Washington
Peninsula News Network, Port Angeles, Washington
Q-13 Fox, KCPQ, Seattle, Washington
TVW, Olympia, Washington

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Appendix A
Minimum Requirement
Olympic National Park
Wilderness

APPENDIX A — MINIMUM REQUIREMENT

OLYMPIC NATIONAL PARK WILDERNESS

April 5, 2006 Version

The Wilderness Act, Section 4(c):

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

The NPS interprets this statutory provision in NPS Management Policies 6.3.5 as:

> All management decisions affecting wilderness must be consistent with a minimum requirement concept. ……When determining minimum requirement, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than economic efficiency and convenience. If a compromise of wilderness resource or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

The Wilderness Act directs that agencies administer wilderness so as to preserve its wilderness character. The purpose of the "minimum requirement concept" is to reduce the effects of management on wilderness character and values. The minimum requirement process provides a method for developing, evaluating, and selecting the actions that provide the least intrusion on wilderness character and values. The concept is to be applied to all management actions, programs and activities that have the possibility of affecting wilderness and potential wilderness additions. The minimum requirement process will be applied at Olympic through use of the "Minimum Requirement Worksheet."

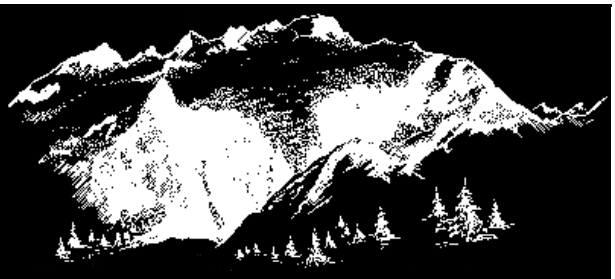
The process first involves a determination of whether a proposed management action is appropriate and necessary for the administration of the area as wilderness and does not pose a significant impact to its wilderness resources and character. If the project is found to be appropriate and necessary, the second step is to determine the management method (tool or technique) that would result in the least amount of impact to the biophysical resources and experiential qualities (character) of wilderness.

The Wilderness Act prohibits specific activities including motorized equipment use and aircraft landings, and structures or installations, when other reasonable alternatives are available. The Minimum Requirement Worksheet provides a formalized method for developing alternative ways to address an issue and evaluate and compare each alternative's effects on wilderness character. The impacts on wilderness resources (ecosystem processes and components) from implementing various alternatives must be considered. Also to be considered are effects on the experiential qualities of wildness such as the preservation of natural conditions (including the lack of man-made noises), outstanding opportunities for solitude; a primitive and unconfined type of recreational experience, and values such as the assurance that wilderness will be preserved and used in an unimpaired condition. Impacts on these elements are primary considera-

tions in selecting the minimum requirement and will be afforded significantly greater weight than cost or convenience.

Any proposed administrative activity that has the potential to affect designated wilderness or potential wilderness additions will be analyzed through the minimum requirement process. The process will be used to determine if the action will be implemented and if so, the tools or techniques that will be used. The analyses will clearly identify how minimum requirement decisions were developed and include reference to the applicable NEPA compliance documents (categorical exclusion, environmental assessment, or environmental impact statement). Approval will be documented with the superintendent's signature, and a permanent record of the analyses retained in park files.

Minimum Requirement Worksheet
Olympic National Park Wilderness



April 5, 2006 Version

Complete Part 1 of ONP Project Proposal Form before proceeding

Issue or problem to be solved

Restore Fishers to the Olympic Peninsula

Fishers are native to Washington State and Olympic National Park (OLYM). Fishers historically occurred throughout much of the low- to mid-elevation forested areas of Olympic National Park. They have been extirpated statewide and in the park. Two major factors contributed to the decline of fishers in Washington — over-exploitation from commercial trapping; and loss, degradation, and fragmentation of suitable habitat. Poisoning, predator control, and incidental capture in traps set for other wildlife are also considered contributing factors in the decline of fishers in the state (Lewis and Hayes 2004). Despite protection from legal harvest in Washington since 1934, fishers have not recovered in the state. Extensive surveys within and outside of Olympic National Park from 1990 to 2003 failed to detect any fishers.

Fishers are listed as state endangered and a federal candidate (warranted for listing but precluded due to higher priorities).

There are no adjacent fisher populations that will allow natural recolonization. In order to restore the species to the park, and recover the species in both the State and region, we need to conduct a reintroduction. Based on the Washington Department of Fish and Wildlife's *Feasibility Assessment for Reintroducing Fishers to Washington* (Lewis and Hayes 2004), the greatest amount of suitable fisher habitat in the state is in Olympic National Park, Olympic National Forest, and adjacent Washington Department of Natural Resources lands. Consequently, these lands are considered the most suitable location for the first reintroduction of fishers to the state.

We propose to release approximately 100 fishers over 3 years into the park. Following release we will monitor fisher survival, dispersal, home range establishment, reproductive success, and population growth. Monitoring will allow us to assess (1) restoration success, (2) guide adaptive management actions, and (3) inform future restoration efforts in other portions of formerly occupied fisher range.

For more project details, see the accompanying Environmental Assessment (EA)

Project Initiator(s): _Patti Happe_____
MRW Preparer(s): _Patti Happe_____ **Date:**__27June 2007

STEP ONE: Determine if action is necessary

1	Is the resolution of this issue covered by a Categorical Exclusion, Environmental Assessment/Finding of No Significant Impact, or an Environmental Impact Statement/Record of Decision that includes minimum requirement considerations?	Answer: Yes____ No_x__
	Yes → Implement action as approved No → Continue MRW and include in environmental analysis	If "Yes" provide name of document and approval date:

2	Is this an emergency?	Answer: Yes____ No_x__
	Yes → Follow approved emergency SOPs/management plans. If they do not exist or have not gone through MRW, continue MRW. No	Emergency: A situation that involves inescapable urgency and temporary need for speed beyond that available by primitive means (loss of human life or serious injury, staff safety, law enforcement efforts involving serious crime or fugitive pursuit, retrieval of the deceased, fire suppression).
3	Is resolution of this issue addressed in an approved Wilderness Plan? (or equivalent plan that included minimum requirement considerations?)	Answer: Yes____ No_x__
	Yes → Follow plan direction No	Cite Wilderness Plan or equivalent plan section/page:

4	List guidance provided in law and policy for resolution of the issue	See NPS *Management Policies 2006*, Chapter 6, Director's Order #41 and other applicable laws, policies and directives

Section 4 of the NPS *Management Policies 2006* addresses natural resource management:

> The National Park Service will strive to understand, maintain, restore, and protect the inherent integrity of the natural resources, processes, systems, and values of the parks while providing meaningful and appropriate opportunities to enjoy them. . . . Natural resources, processes, systems, and values found in parks include . . . biological resources such as native plants, animals, and communities [and] ecosystems (NPS 2006b).

Section 4.1 further defines general management concepts for natural resource management, stating, "The Service will . . . try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems" (NPS 2006b).

The restoration of natural systems is addressed in section 4.1.5, which states that "The Service will re-establish natural functions and processes in parks unless otherwise directed by Congress." The policies further state that:

> The Service will seek to return disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological community structure and function. Efforts may include restoration of native plants and animals (NPS 2006b).

Section 6.3.7 addresses the management of natural resources in wilderness areas, saying, "The National Park Service recognizes that wilderness is a composite resource with interrelated parts. Without natural resources, especially indigenous and endemic species, a wilderness experience would not be possible."

Section 4.4 addresses biological resource management, under which general principles for such management are defined. This section states that:

> The National Park Service will maintain as parts of the natural ecosystems of parks all native plants and animals native to park ecosystems. . . . The Service will successfully maintain native plants and animals by:
>
> - preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;
> - restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and
> - minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them (NPS 2006b, sec. 4.4.1).

When human disturbances have resulted in the extirpation of native species, the following policy statements guide parks in restoring them:

> The Service will strive to restore extirpated native plant and animal species to parks whenever all of the following criteria are met:
>
> - Adequate habitat to support the species either exists or can reasonably be restored in the park, and if necessary also on adjacent public lands and waters; once a natural population level is achieved, the population can be self-perpetuating.
> - The species does not, based on an effective management plan, pose a serious threat to the safety of people in parks, park resources, or persons or property within or outside park boundaries.
> - The genetic type used in restoration most nearly approximates the extirpated genetic type.
> - The species disappeared, or was substantially diminished, as a direct or indirect result of human-induced change to the species population or to the ecosystem.
> - Potential impacts upon park management and use have been carefully considered (NPS 2006b, sec. 4.4.2.2).

5	Is resolution of this issue necessary or appropriate to meet wilderness management objectives or the requirements of other laws, policies and directives? Yes No → Do not proceed with action	Answer: Yes_x___ No____ The resolution of this issue is needed to: (1) restore a natural component (indigenous wildlife species) that is missing from the parks' wilderness (2) Meet objective of NPS *Management Policies 2006* pertaining to ecosystem restoration and wilderness (3) Comply with the Washington State fisher recovery plan (4) Meet objectives of the federal ESA
6	Can the issue be resolved through visitor education? Yes → Carry out visitor education No	Answer: Yes____ No__X__ Explain: While visitor education is an important component of the restoration plan, education alone will not meet the project goals of restoring an extirpated species back to the park, and assess the success of the restoration program.
7	Can the issue be resolved through actions outside of wilderness? Yes → Conduct actions outside wilderness No	Answer: Yes____ No__x__ Explain: A thorough analysis conducted by WDFW concluded that the best place to restore fishers in the state (the place that has the highest likelihood of success) was to reintroduce fishers into the secure and contiguous block of suitable fisher habitat that exists within OLYM. The patches of suitable habitat outside the Park are not as secure, not as large, and therefore are not as likely to assure translocated fisher survival and restoration success. Furthermore, restoration efforts in those areas are less likely to meet NPS objectives of restoring a missing component of the Parks ecosystem.

At this point, if you have determined the action is necessary, contact the Planning and Compliance Office to schedule a presentation of your issue at a park Interdisciplinary Planning Team meeting

STEP TWO: Determine the minimum tools, techniques and actions that will effectively resolve the issue

8	Describe in detail alternative ways to resolve the issue (include use of primitive tools and skills) Note: Alternatives described in other compliance documents that address this issue may be referenced. . . . If minimum requirement considerations were not included, develop below.	Questions to answer for each alternative: – What is proposed? – Would the project involve ground disturbance? – Where would the action take place? – When would the action take place? – What design and standards would apply? – What methods, tools and techniques would be used? – How long would it take to complete the action? – Why is it being proposed in this manner? – What mitigation would be taken to minimize action impacts on wilderness resources and character?

Alternative 1: EA Alternative A (no action) Do not restore fisher to OLYM.

Fishers would not be restored to OLYM ecosystem, parkwide. Fishers would not naturally repopulate the park or the Olympic Peninsula, as no fisher populations occur in areas proximate to the peninsula. Given that it is unlikely that fishers exist on the Olympic Peninsula, NPS personnel would not continue surveying for fishers. However, park staff would continue conducting forest carnivore inventory and monitoring efforts, which could detect a fisher if one does exist in the park. Due to the absence of an adjacent fisher population, fisher may never be restored to the OLYM ecosystem, compromising the wilderness character of the park in perpetuity.

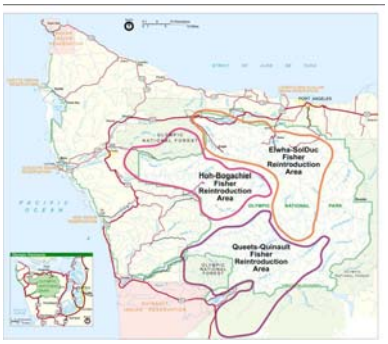
For more details on this alternative, see the accompanying EA.

Alternative 2: EA Alternative B: Reintroduce fishers into OLYM using translocation, minimizing impacts on Wilderness.

-Approximately 100 fishers (about 33 annually) would be reintroduced into OLYM over a period of three years. Fishers would be obtained from genetically similar stock in Canada (British Columbia), and released as soon as possible after capture.

-Reintroductions would take place off of park roads and trails via vehicle, foot, and packstock access. Occasionally helicopters may be used in the park backcountry along low elevation meadows and gravel bars via helicopter access if it is determined that fisher survival may be enhanced by releasing them further from the park boundary.

-The three primary reintroduction areas are Elwha-Sol Duc, Hoh-Bogachiel, and Queets-Quinault; however locations may change following observed fisher dispersal and home range establishment patterns observed in year 1.



- All releases will occur in low elevations (generally below 2000 ft) during the fall and winter months.

- Released fishers would be equipped with radio-transmitter and their fates and movement patterns would be monitored for up to 18 months via ground and aerial telemetry (using fixed wing aircraft). Because fisher a cryptic, move large distances, and inhabit forested habitats, this is the only method we can use to assess the restoration program. The monitoring phase is anticipated to last up to 4 years (after each release).

-We will attempt to promptly recover dead fishers to determine cause of death (to aid in the adaptive management process). From March 1 through September 15 all carcass retrieval access will be on foot. Carcass recovery during winter may use helicopter access if safe foot access is not possible and if safe and nearby landing helispots are present.

Mitigation measures include:

-No ground disturbance

-No helicopter access during March 1-September 15.

-Fixed wing flights limited to no more than once per week (on average), conducted during weekdays, and at flight elevations greater than 120 yards above the tree canopy (most often it will be much higher).

-We will assess the efficacy of satellite radio telemetry, to see if it will work with this species in the OLYM environment. If successful, it will greatly reduce the number of flights needed to assess fisher status. However, due to the small size of the species, the fact that is lives in forests and rest in or on trees, we do not anticipate that this method will be successful.

The following elements would be common to alternatives 2 and 3.

• The best available science would be used to determine appropriate management actions.

• The management plan would be adaptive, allowing for incorporation of new information over time to affect management actions.

• A monitoring plan would be developed by the park to monitor the status of the reintroduction efforts. Data gathered as a result of such monitoring would be used to adaptively manage ensuing reintroduction efforts.

• Education and interpretive measures would be implemented and could include brochures, publications, information on the park website about the role of fishers.

• Post-planning communication with park neighbors would inform them about the status of reintroduction efforts, report on the success of the plan, and provide a forum to hear neighbors' concerns.

• The National Park Service and the Washington Department of Fish and Wildlife would seek opportunities and support to involve citizen science in the fisher reintroduction process. Opportunities would focus on fisher monitoring efforts and would include, but would not be limited to, assisting staff with monitoring camera stations, deploying and checking hair snare sites, assisting field crews in locating fishers from the ground, identifying the location of den sites, and conducting follow-up measurements of den site characteristics after females have left the site. As the reintroduction program developed, opportunities could be expanded to include working with the NPS and WDFW outreach and education coordinators.

Alternative 3: EA Alternative C: Reintroduce fishers into OLYM using captive breeding

This is very similar to Alternative 2 (EA Alt B); however the fishers used in the release would be raised in captivity. This alternative would use captive breeding in addition to translocations (as described under alternative B) to produce fishers for reintroduction if translocations were not working or source animals became unavailable for translocations. After being successfully bred in captivity, fishers would be released as described under alternative B. Captive breeding would provide an opportunity to re-establish populations where direct translocation might risk the persistence of the donor population or where no animals were available for translocation. Breeding stock would be obtained from a source population in British Columbia or Alberta. This alternative would apply if a limited number of animals were available for reintroduction, and might reduce the number of fishers needed from the source population.

The goal of the captive breeding program would be to produce about 100 offspring for reintroduction.

This could take several years to achieve. Numbers of young produced in the first years of the program would likely be lower than those in future years. Ideally, the program might produce from 20 to 50 offspring per year (equal to what the translocation target would be). The number of females needed at multiple facilities would be determined by survival of breeding animals, lifespan, productivity of females, and survival of young. A mean litter size of two is common among wild fisher females, but can be higher in females in captivity. A 50% mortality rate in offspring is expected, which was experienced by the Northwest Trek Wildlife Park. A science team with expertise in fishers, husbandry, and genetics would assist the Washington Department of Fish and Wildlife in overseeing the breeding and release program. If the fisher became federally listed, provisions of the Endangered Species Act could also influence a captive breeding program. This would require permits and consultation with the U.S. Fish and Wildlife Service.

Due to lower survival rates of captive reared animals, it is anticipated that this method would require more years of both releases and monitoring.

9	Evaluate the impacts of each alternative	Potential impacts to evaluate under <u>each</u> alternative: – Wilderness character effects – Effects on natural resources – Cultural resources considerations – Social/recreational/experiential effects – Societal/political effects – Health/safety concerns – Economic/timing/sustainability considerations

Alternative 1:
<u>Wilderness character effects:</u> *negative effect* By continuing to have a native species missing from the ecosystem, the natural conditions of the wilderness will continue to be diminished.
<u>Effects on natural resources:</u> *negative effect* Biological species diversity continues to be lessened. Natural predator-prey balance continues to be altered.
<u>Cultural resources:</u> *no effect*
<u>Social/ recreational/ experiential effects:</u> *no effect* Few visitors will be affected by this alternative: only those who are aware of fisher extirpation will be adversely affected by the knowledge that no attempt has been made to return fishers to the ecosystem.
<u>Societal/ political effects:</u> *negative effect* This alternative hampers Washington State's approved recovery plan for the fisher (a state-listed endangered species). It also does not improve the conservation status of the fisher, which is a federal candidate species, thereby not mitigating some of the threats to the species and potentially contributing to it being federally listed at a later date
<u>Health/ safety concerns:</u> *no effect*
<u>Economic/ timing/ sustainability considerations</u>: *no effect*

Alternative 2:
<u>Wilderness character effects:</u> *positive effect* Wilderness character will be improved by the restoration of a missing species to the park ecosystem.
<u>Effects on natural resources:</u> *positive effect* Biological species diversity will be increased and natural predator-prey balance will be partially restored.
<u>Cultural resources:</u> *no effect*
<u>Social/ recreational/ experiential effects:</u> *mixed effects*: Those visitors that are aware of the restoration project will have their experience enhanced by the knowledge that a missing species has been restored. Those that see a fisher will have a greatly enhanced experience. Those that are present in the wilderness when helicopters are used to release fishers will have their solitude and quite disturbed, however those activities are planned for low visitor use periods. Those visitors that are present during fixed wing telemetry flights will have their quiet and solitude temporarily affected.

Societal/ political effects: *positive effect* We will be cooperating with state and other federal agencies, NGOs and other partners in restoring an extirpated species.
Health/ safety concerns: *slight negative:* All helicopter and fixed wing operations contain some risk, but risks will be minimized by adhering to the aviation safety plans and using only OAS approved contractors.
Economic/ timing/ sustainability considerations: *slight negative* There are some costs to the Park associated with this project, however those costs are minimized due to the contributions of the multiple partners (State, USFS, USGS, etc.). In addition, this alternative completes the project in the quickest time frame (3 years), and has the minimal amount of radio telemetry monitoring (18 months following each animals release, or up to 4 years of monitoring). If the reintroduction is successful, the fishers will become a self sustaining population.

Alternative 3:
Wilderness character effects: *positive effect* Wilderness character will be improved by the restoration of a missing species to the park ecosystem
Effects on natural resources: *positive effect* Biological species diversity will be increased and natural predator-prey balance will be partially restored.
Cultural resources: *no effect*
Social/ recreational/ experiential effects: *slight negative effects*: Those visitors that are aware of the restoration project will have their experience enhanced by the knowledge that a missing species has been restored. Those that see a fisher will have a greatly enhanced experience. Those that are present in the wilderness when helicopters are used to release fishers will have their solitude and quite disturbed, however those activities are planned for low visitor use periods. Those visitors that are present during fixed wing telemetry flights will have their quiet and solitude temporarily affected. Because using captivity raised animals is expected to take longer (more years) the effects of release operations and monitoring are slightly larger with this alternative.
Societal/ political effects: *positive effect* We will be cooperating with state and other federal agencies, NGOs and other partners in restoring and endangered species.
Health/ safety concerns: *slight negative:* All helicopter and fixed wing operations contain some risk, but risks will be minimized by adhering to the aviation safety plans and using only OAS approved contractors.
Economic/ timing/ sustainability considerations: *slight negative* There are some costs to the Park associated with this project, however those costs are minimized due to the contributions of the multiple partners (State, USFS, USGS, etc.). However, EA Alternative C costs more than EA Alternative B. In addition, this alternative takes longer to complete the project. If the reintroduction is successful, the fishers will become a self sustaining population.

10	Select the alternative that will most effectively resolve the issue while having the least overall adverse impact on wilderness resources, character and the visitor experience		*Note:* When selecting the preferred alternative the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness resources or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

Preferred alternative: #____2 (Alt B in EA)_____

Describe rationale for selecting this alternative including how it meets minimum requirement guidelines and how impacts to wilderness will be minimized, and mitigated (if needed):

Alternative 1 does not meet project objectives or NPS policies as it would not result in the restoration of a previously extirpated species into Olympic National Park and the State of Washington. Alternative 2 and 3 are very similar except that Alternative 3 would take longer to implement due to the need for a captive breeding program for fishers.

Both alternatives 2 and 3 would restore a missing species to the park's wilderness, resulting in a long-term beneficial effect to the wilderness character and the natural resources of the park. However, alternative 2, when compared to alternative 3, has the least overall impact on wilderness values as it will take a shorter duration to implement, reducing the adverse effects to wilderness.

Mitigation measures include:

-No ground disturbance.

-No helicopter access during March 1 through September 15.

-Fixed wing flights limited to no more than once per week (on average), conducted during week-days, and at flight elevations greater than 120 yards above the tree canopy (most often it will be much higher).

11	**After review by Division Chief, provide an electronic copy of MRW to the Planning and Compliance Office and the Wilderness Specialist to initiate park internal review and comment. Schedule a time to present findings at a park** Interdisciplinary Planning Team meeting (held twice a month).

Comments: Added text and made some editorial corrections to the MRW.

Comments by: ___Nancy Hendricks_____ Date_6/28/2007_____

Comments:

Comments by: _____ Date_____

Comments:

Comments by: _____
Date_____

Comments:

Comments by: _____
Date_____

Recommended by:	Patricia J. Happe	6/27/2007
	Division Chief (acting)	Date
Reviewed by:		
	Wilderness Specialist	Date
Approved by:		
	Superintendent	Date

Appendix B
Biological Assessment

APPENDIX B — BIOLOGICAL ASSESSMENT

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United States Department of the Interior

NATIONAL PARK SERVICE

Olympic National Park
600 East Park Avenue
Port Angeles, Washington 98362-6798

IN REPLY REFER TO:

L7615 (OLYM-PC)

July 24, 2007

Ken Berg, Manager
Western Washington Fish and Wildlife Office
United States Fish and Wildlife Service, Pacific Region
510 Desmond Drive, SE
Lacey, Washington 98503

Dear Mr. Berg:

The purpose of this letter is to initiate informal consultation under section 7 of the Endangered Species Act of 1973, as amended. The National Park Service (NPS) is joint lead with the Washington Department of Fish and Wildlife (WDFW) in the plan to restore fishers (*Martes pennanti*) to the Olympic Peninsula.

The NPS and WDFW propose that fishers would be captured from a source population that is most closely related to that which historically occurred in the state (preferably from British Columbia) and reintroduce fishers into Olympic National Park (ONP). A founder population of approximately 100 fishers would be released over a three-year period, with a bias for adults and females. Fishers would be released in male-female pairs or in groups, depending on the number available. The timing, number, and locations of releases would vary depending on fisher availability, available funding, and the findings of monitoring efforts of previously released fishers. Specific project information is included in the attached biological assessment.

Potential impacts to the listed northern spotted owl (*Strix occidentalis caurina*), the marbled murrelet (*Brachyramphus marmoratus marmoratus*), and the bald eagle (*Haliaeetus leucocephalus*), are evaluated within the biological assessment. In addition, we have included an evaluation on the Mazama pocket gopher (*Thomomys mazama*) which is a federal candidate species. These species were evaluated for both adverse and beneficial effects, short- and long-term effects, direct and indirect effects, impact intensity, context, and cumulative effects.

Based on the attached biological assessment, we are requesting your concurrence for "may affect, but not likely to adversely affect" determinations for these species.

If you need additional information, please contact Dr. Patti Happe, Wildlife Biologist, at (360) 565-3065.

Sincerely,

William G. Laitner

Attachment

cc: Jodi Bush, USFWS

bcc:
Patti Happe, OLYM
Sally Hamilton, NPS EQD
Susan Piper, USFS Olympia
Jeff Lewis, WDFW
Harriet Allen, WDFW
Rocky Beach, WDFW

Chron files, OLYM
Central files, OLYM

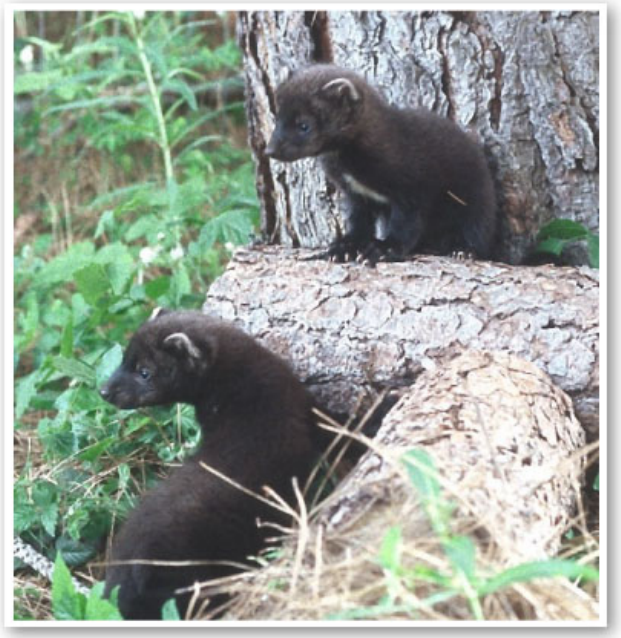
nhendricks:pad

Olympic National Park

Biological Assessment

Restoration of Fishers to Olympic National Park and the Olympic Peninsula

July 2007



Fisher Kits on a Log.
Photo by C. Raley, USDA Forest Service, Pacific Northwest Research Station

US Department of the Interior, National Park Service

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Biological Assessment
for the Restoration of Fishers
to Olympic National Park and the Olympic Peninsula

Introduction

The National Park Service (NPS) is joint lead with the Washington Department of Fish and Wildlife (WDFW) in a Fisher Restoration Plan and Environmental Assessment that proposes to restore fishers (*Martes pennanti*) to the Olympic Peninsula in Washington State. The proposed release sites are within Olympic National Park (ONP). If successful, it is expected that the restored fisher population would expand to suitable habitats in adjacent national forest lands; consequently, the U.S. Forest Service (USFS) is a cooperating agency for the proposed project. In compliance with section 7 of the Endangered Species Act (ESA), this Biological Assessment (BA) has been prepared to address potential effects of the proposed fisher restoration project (as described in the EA alternative B) to federally listed threatened, endangered, and candidate species and to help make the determination of whether the proposed project is likely to adversely affect listed species or critical habitat.

Included in this BA is a brief description of the proposed project and project area. This BA focuses on an analysis of the potential impacts of the proposed project on listed species previously identified in informal consultation discussions with the U.S. Fish and Wildlife Service (USFWS) as needing detailed evaluation in the BA.

Federal Action

The ESA requires federal agencies to consult with the USFWS on actions that have the potential to affect federally listed species or their designated critical habitat. The federal action that necessitates consultation with the USFWS is the proposed release of fishers into ONP and the subsequent re-establishment of a viable, self-sustaining fisher population on federal lands on the Olympic Peninsula. The NPS is the lead federal agency for the project; however it has cooperation and support from the U.S. Forest Service.

Background Information

Olympic National Park is located on the Olympic Peninsula in northwest Washington State (Figure 1). The park consists of 922, 651 acres (373,397 ha), of which 755,846 acres (305,880 ha) are forested. There is a marked precipitation gradient from rainforest valleys in the southwest to rain-shadow areas in the northeast. Drier, east-side forests tend to be younger and are dominated by Douglas-fir (*Pseudotsuga menziesii*). West-side forests have a lower frequency of fire and contain more shade-tolerant species, such as western red-cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*) and Pacific silver fir (*Abies amabilis*), with varying amounts of Douglas-fir. Lower elevations (<182 m) on the west side of the park support the Sitka spruce (*Picea sitchensis*) zone. The subalpine fir (*Abies lasiocarpa*) zone begins at approximately > 1,220m, and timberline is at 1,524 to 1,830 m.

Figure 1. Location of Olympic National Park and Olympic National Forest.

An estimated 289 birds, 77 mammals, 13 amphibians, 29 freshwater fish, and 4 reptiles inhabit ONP (NPS 2006a), occupying habitats ranging from intertidal marine to alpine. A key wildlife resource in the park is the assemblage of species that depend on old-growth coniferous forests for all or some of their habitat requirements. These forests are also the habitat historically occupied by fishers on the Olympic Peninsula. Therefore, this section focuses on those birds, mammals, and reptiles that occur in these habitats and that may be affected by fisher restoration at ONP. Amphibians, fish, and fish habitat are not discussed because they are unlikely to be effected by fisher restoration.

Birds that are prevalent in ONP include the American crow (*Corvus corvus*), common raven (*Corvus corax*), varied thrush (*Ixoreus naevius*), American robin (*Turdus migratorius*), winter wren (*Troglodytes troglodytes*), Steller's jay (*Cyanocitta stelleri*), gray jay (*Perisoreus canadensis*), ruffed grouse (*Bonasa umbellus*), blue grouse (*Dendragapus obscurus*), belted kingfisher (*Ceryle alcyon*), and a variety of warblers, woodpeckers, kinglets (*Regulus* spp.), and sparrows (NPS 2006a). The sharp-shinned hawk (*Accipiter striatus*) and Cooper's hawk (*Accipiter cooperii*) are two common raptors that occur in the forests of ONP and may compete with fishers. Other less common raptors, include the goshawk (*Accipiter gentilis*), bald eagle (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos),* and northern spotted owls (*Strix occidentalis caurina*). The park also contains barred owl (*Strix varia*) which has recently expanded its geographic range to include the Pacific Northwest.

ONP was originally established, in part, to protect the peninsula's population of Roosevelt elk (*Cervus canadensis roosevelti*). It is estimated that 3,000 to 5,000 elk now inhabit the park (NPS 2006a). In addition to the Roosevelt elk, other common mammals in the park include black-tailed deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), shrews, squirrels , voles (*Microtus/Clethrionomys* spp.), bushy tailed woodrats (*Neotoma cinerea*), mice, mountain beaver (*Aplodontia rufa*), and snowshoe hares (*Lepus americanus*). More elusive mammals include the

mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), river otter (*Lutra canadensis*), mink (*Mustela vison*), and striped and spotted skunks (*Mephitis mephitis* and *Spilogale gracilis*) (NPS 2006a).

One lizard species, the northern alligator lizard (*Elgaria coerulea*), and three species of snakes, the common garter (*Thamnophis sirtalis*), northwestern garter (*Thamnophis ordinoides*), and rubber boa (*Charina bottae*) are reptiles found in ONP (NPS 2006a).

Two species have been lost from the ecosystem supported at Olympic National Park: the gray wolf (*Canis lupus*) and the fisher.

The park, of which approximately 95% is designated wilderness, is surrounded by a complex network of lands managed by federal and state agencies, American Indian tribes, and private landowners (Figure 2). Olympic National Forest (ONF) contains approximately 655,917 acres (265,440 ha), and borders the park primarily on the east, south, and northwest.

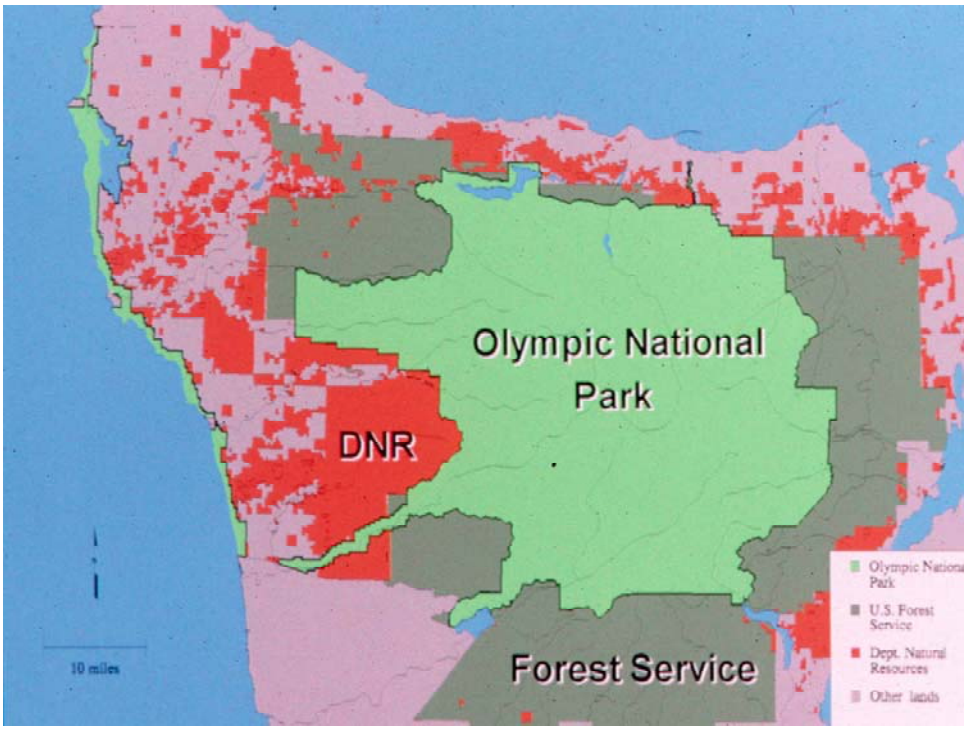

Figure 2. Land ownership on the Olympic Peninsula

Project Information

The fisher was listed by the state of Washington as an endangered species in 1998 (Lewis and Stinson 1998) and by the federal government as warranted but precluded under the Endangered Species Act in 2004 (USFWS 2004). Two major factors contributed to the decline of fishers in Washington — over-exploitation from commercial trapping; and loss, degradation, and fragmentation of suitable habitat. Poisoning, predator control, and incidental capture in traps set for other wildlife are also considered contributing factors in the decline of fishers in the state (Lewis and Hayes 2004). Despite protection from legal harvest in Washington since 1934, fishers have not recovered in the state. Extensive surveys within and outside of ONP from 1990 to 2003 failed to detect any fishers (Hayes and Lewis 2006). Although some people have reported seeing

a fisher in the state, no formal scientific surveys have detected them and no verifiable evidence (e.g., photo or specimen) is available to confirm their presence. Fishers are therefore considered extirpated from Washington (Aubry and Lewis 2003).

A fisher recovery plan for Washington State was completed in December 2006 (Hayes and Lewis 2006). This plan states that fishers will be down-listed from "state endangered" to "state threatened" when self-sustaining populations of fishers are established in multiple locations both on the Olympic Peninsula and either the southern or northern Cascades. Fishers will be further down-listed to "state sensitive" status when an additional population is established in the Cascades and habitat management plans are in place to provide for the continued viability of fishers.

Reintroduction is considered the key strategy to restore fishers in Washington because of the absence of nearby populations to recolonize the state (Hayes and Lewis 2006). Fishers have been successfully reintroduced in 10 states and five provinces in North America, including Oregon, Montana, Idaho, and British Columbia. Based on the WDFW's *Feasibility Assessment for Reintroducing Fishers to Washington* (Lewis and Hayes 2004), the greatest amount of suitable fisher habitat in the state is in ONP, ONF, and adjacent Washington Department of Natural Resources (DNR) lands. Consequently, these lands are considered the most suitable location for the first reintroduction of fishers to the state.

Because reintroductions require the translocation of individuals from a source population, action is needed at this time because opportunities for obtaining fishers from genetically similar source populations are available now, but might decrease in the near future.

The following further define the need for taking action:

1. Fishers are native to Washington State, including ONP, but have been extirpated.
2. Washington State has a stewardship responsibility to protect, restore, and enhance native wildlife populations and their habitats (WDFW 2003).
3. The National Park Service *Management Policies 2006* (sec. 4.1.5 and 4.4.2.2) provide, under certain criteria, for the restoration of the biological and physical components of natural systems within parks, including the restoration of native plants and animals.
4. ONP is 95% designated wilderness. It is the policy of the NPS (*Management Policies 2006*, sec. 6.3.7) to recognize wilderness as a composite resource with interrelated parts. Indigenous species are an essential component of wilderness and a wilderness experience.
5. ONP was established in part to provide permanent protection to indigenous wildlife (*House Report 2247*).
6. Recent analyses identified the Olympic Peninsula as the best place to initiate fisher restoration in Washington State.
7. Restoring fishers to the Olympic Recovery area is the first step called for in Washington State's fisher recovery plan.
8. Restoring a population of fisher to Washington State would improve the conservation status of the fisher in the west coast DPS, and may preclude a federal listing.

The following objectives related to fisher restoration at ONP were developed for this proposed plan:

1. Establish a fisher population as genetically similar as possible to the population that originally occupied the Olympic Peninsula (NPS *Management Policies 2006*, sec. 4.4.1.2).

2. Promote the occupation of suitable habitat throughout the park.
3. Maintain a fisher population that would persist for an extended time (at least 8 to 10 generations).
4. Maintain a fisher population that could be a possible source for reintroductions to restore fishers in other areas of the state, including other suitable NPS units.
5. Gather information about habitat use, movement, reproduction, and survival that would be used to guide and define future conservation efforts for fishers.
6. Contribute to meeting the state recovery plan objectives.
7. Improve the conservation status of fishers in the western distinct population segment (DPS).

The ONP Fisher Restoration Plan would be based on the best available science and would be adaptively managed to allow the incorporation of new information over time to affect management actions. A monitoring plan has been developed by ONP and WDFW to monitor the status of the reintroduction efforts (Lewis 2006). Data gathered as a result of this monitoring would be used to adaptively manage ensuing reintroduction efforts.

Release actions

The NPS and WDFW propose that fishers would be captured from a source population that is most closely related to that which historically occurred in the state (preferably from British Columbia) and would be reintroduced into ONP. The proposed fisher restoration plan is based on the WDFW "Implementation Plan for Reintroducing Fishers to Olympic National Park" (Lewis 2006).

A founder population of approximately 100 fishers would be released over a 3-year period, with a bias for adults and females. Fishers would be released in male-female pairs or in groups, depending on the number available. The timing, number, and locations of releases would vary depending on fisher availability, funding, and the findings of monitoring efforts of previously released fishers. Preference would be to obtain and release fishers in the fall, if possible. Fall releases would allow fishers to acclimate to the reintroduction area before winter, establish home ranges and locate suitable den sites prior to the birthing and mating season (March-April), and become aware of potential mates before the mating season. Areas of suitable fisher habitat on the Olympic Peninsula are unlikely to receive excessive accumulations of snow and should allow released fishers access to large landscapes that are free of snow for much of the winter (Lewis and Hayes 2004). If winter releases were necessary, they are not anticipated to be a hardship for fishers.

Likely release scenarios are as follows:

- ***Year 1*** — Release approximately 35 fishers in the fall and winter months, in at least two of three reintroduction areas (described below).
- ***Year 2*** — Adapt the release approach based on monitoring results from year 1 and the availability of fishers from the source population. If no substantial changes were required and fishers were available, release 35 additional fishers in the fall and winter, and release fishers in two or all three reintroduction areas to maximize survival, occupancy, and population expansion. If fisher availability limited the number that could be released, use monitoring results to determine if releases should occur in a reintroduction area that did not receive fishers in year 1, or if releases should occur in the same locations as in year 1. Similarly, releases may be shifted to a new reintroduction area if initial survival is low in a reintroduction area used in year 1, or if it is otherwise deemed unsuitable.

- ***Year 3 —*** Follow successful release approaches developed in years 1 and 2. Release 35 additional fishers in the fall and winter in reintroduction areas or alternative locations within the larger Olympic recovery area (Hayes and Lewis 2006).

A target founder population size of at least 100 fishers was based on the success of previous translocations (Lewis 2006) and the findings of population modeling. Population modeling for the Olympic Peninsula suggested that populations that started with 60 or 100 females would result in larger resident population sizes and would become established more quickly than populations that started with 30 females (Lewis and Hayes 2004). A captured population of 60 females would likely be accompanied by a captured population of approximately 47 males, based on sex ratio data (58% females, 42% males) from fisher harvest data from British Columbia (Weir 2003) and Ontario (Douglas and Strickland 1987), totaling 107 fishers. This approach would vary depending on the number of fishers available for release at a given time and release site limitations. It is expected that fishers released in male-female pairs throughout a large reintroduction area should have sufficient opportunity to find a mate and sufficient suitable habitat to establish a home range.

Reintroduction Locations

The fisher science team evaluated the distribution of suitable habitat, landownership, habitat composition and climatic conditions to identify suitable reintroduction areas on the Olympic Peninsula. Three areas were chosen (Figure 3) because they included large, easily defined areas of suitable habitat that would likely be capable of supporting populations of fishers, and they are connected to each other by corridors of suitable habitat and travel cover (Lewis 2006). This habitat connectivity would allow fisher movement among reintroduction areas and to other national park and national forest lands on the Olympic Peninsula. The three initial fisher reintroduction areas described below.

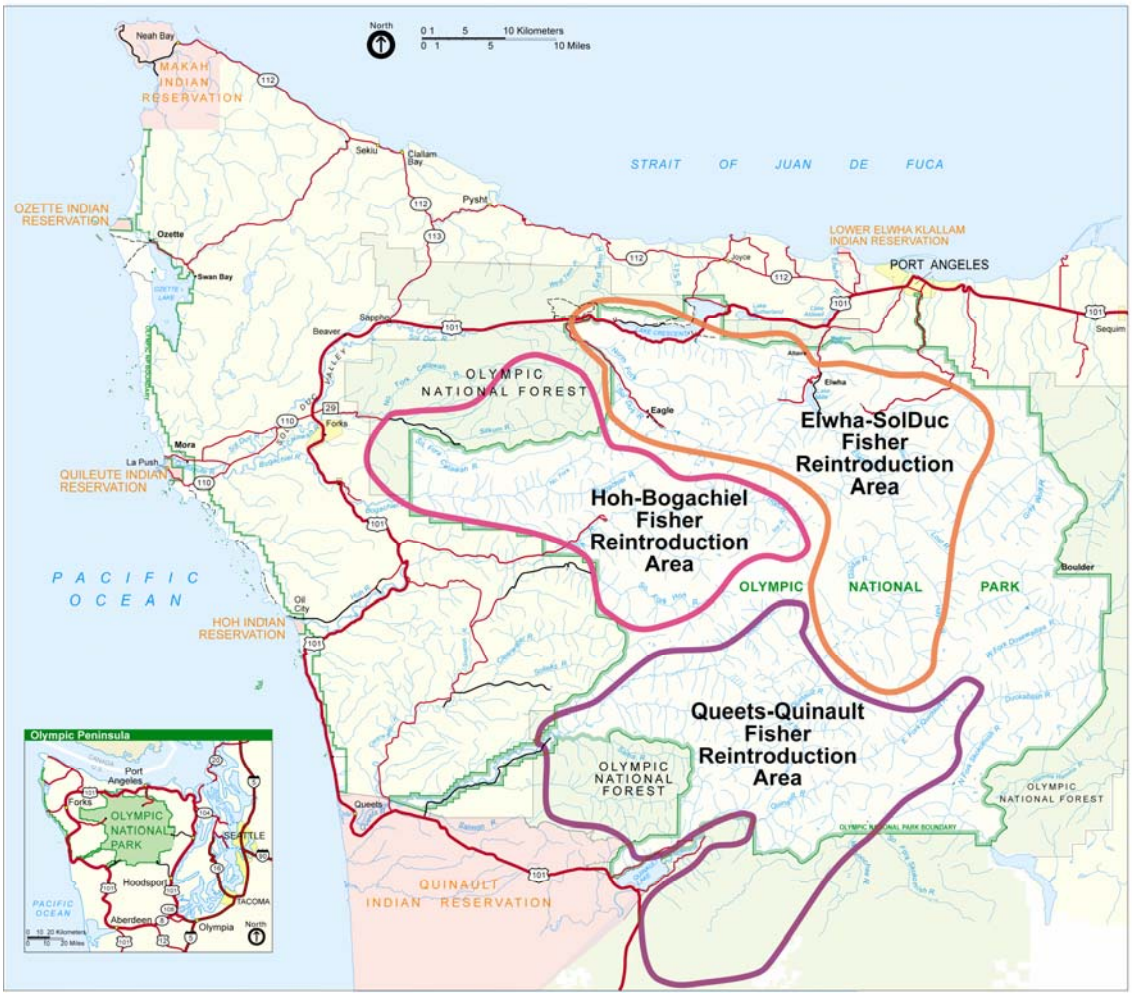

Figure 3. Potential fisher reintroduction locations.

Elwha-Sol Duc Area. The Elwha-Sol Duc area has a large amount of suitable habitat in federal ownership and has the driest forest conditions of the three areas. The fisher science team visited the area and concluded that it has habitat characteristics that are consistent with forests occupied by fishers in Oregon, northern California, and British Columbia, in part because of the drier conditions found in the Elwha-Sol Duc area. The science team concluded that this area should be considered a priority area for release, but also noted that its narrow, linear shape might limit its carrying capacity for released fishers. The team therefore recommended that the first year's releases occur within at least two reintroduction areas, with one of the areas being the Elwha-Sol Duc. Fishers would likely be released along park roads in the Morse, Elwha, and Sol Duc drainages and along park trails. Scattered clearings and gravel bars along the Elwha River would also provide helicopter access to remote release sites.

Hoh-Bogachiel Area. The Hoh-Bogachiel area contains a large amount of suitable fisher habitat in federal ownership and is characterized by wet forest conditions. This large area is centrally located between the two other reintroduction areas, providing habitat connectivity among the three reintroduction areas. Because it is adjacent to the Elwha-Sol Duc area, which is considered a priority release area, the science team recommended that fishers also be released in the Hoh-Bogachiel area in the first year of the reintroduction. Within the Hoh-Bogachiel area fishers would likely be released along the Hoh River Road or along park trails in the Bogachiel River

and Hoh River drainages. Fishers could also be released near clearings and gravel bars along the Bogachiel and Hoh rivers that were accessible by helicopter.

Queets/Quinault Area. The Queets-Quinault area is in the southwestern corner of ONP and ONF, adjacent to Quinault Lake. It is the largest reintroduction area and also has the wettest forest conditions. While the wet forest conditions are unlike any other areas where fishers currently exist in western North America, anecdotal accounts indicate fishers were present in this area as late as 1938 (Scheffer 1995), and that 37 and 20 fishers were trapped from portions of this area in 1920 and 1921 respectively (Scheffer 1995). Depending on the number of animals available, fishers could be released in the Queets-Quinault area in the first or second year of the reintroduction. Within the Queets-Quinault area, fishers would be released along roads and trails adjacent to the Quinault River. Fishers could also be released near remote clearings and gravel bars along the Queets or Quinault rivers that are accessible by helicopter.

Over the three years of the release phase of the project, fisher releases would likely occur in each of the three reintroduction areas. Park roads, trails, and river corridors are accessible as release sites in each reintroduction area. Male-female pairs would be released throughout the reintroduction areas to saturate suitable habitat. Access by park roads and trails would be intermittent depending on various weather conditions, river flows, and road and trail conditions. Access to gravel bars and low elevation meadows within the backcountry in each reintroduction area could be obtained by helicopter. Helicopters would be used infrequently (around 1-3 times a year) and only during the non-nesting season for marbled murrelets and northern spotted owls (September 15 to March 1). Some areas of the park may be more easily accessed through the road network on ONR and these park areas could also serve as release sites.

Monitoring

The goal of restoration monitoring is to determine the success of the effort, and guide the adaptive management process. Monitoring would involve tracking as many released individuals as possible and would start at the time of their release. Monitoring would continue until it is clearly demonstrated that a self-sustaining population has been established, until it is determined that no further monitoring is needed because the reintroduction has failed, or until it is no longer possible due to a lack of support or funding.

At present, funding has been secured to equip all released fishers with radio-transmitters and monitor their fates and movement patterns for 3 years (pending approval of the proposed project). If additional funding becomes available, monitoring efforts could be extended up to 10 years.

A number of tools and levels of monitoring intensity could be employed at various stages in the monitoring program. An interagency fisher recovery team would be involved in implementation planning and would be available to evaluate project success throughout the monitoring phase of the project. Release and monitoring approaches would likely be modified throughout the course of the reintroduction based on the findings of monitoring and available funding. The team would provide recommendations for adaptively managing the reintroduction based on ongoing monitoring efforts.

At present, several tools and methodologies are planned to be used to monitor released fishers and their offspring in ONP.

> ***Radio-telemetry*** (funded for 3 years post release)—Telemetry would be the main tool to monitor fishers during the reintroduction. Due to logistical constraints (e.g., few roads,

wilderness, and dissected topography) the majority of relocations of released animals would be gathered via aerial telemetry using small fixed-winged aircraft (flying > 120 yards above the tree canopy). Animals would be relocated from the air approximately three times per month, weather permitting. If some animals establish territories in areas containing roads or trails, more frequent relocations may be gathered from the ground. Analyses anticipated include: fisher survival rates, dispersal distances, home range establishment, landscape selection patterns, and where possible, habitat selection patterns.

Beginning in February the emphasis would be on tracking reproductive-age (or known pregnant) females until their reproductive status was determined. Where access allowed, den sites would be investigated by foot access to confirm reproduction.

If a mortality signal is received, attempts would be made to promptly retrieve the animal to determine cause of death. Carcass retrievals would be primarily via foot access, however helicopters may be used to access carcasses deep in the backcountry, if safe accessible landing zones can be found, and if the mortality occurs between 15 September and 1 March.

Diet analysis: For animals that can be radio-tracked on the ground, scats at den and rest sites would be gathered for subsequent food habits analysis.

Genetic sampling: Prior to release, tissue and blood samples would be collected from all fishers to obtain genotype information. After release, an array of hair snaring devices would be deployed to 1) monitor the dispersal and habitat occupancy patterns of the recovering fisher population, 2) confirm live status of released animals after the batteries on the radio transmitters expire, and 3) detect reproduction and the recruitment of young into the population. In years 3 to 10 of the project, genetic sampling would detect successful breeding and recruitment, and also provide an estimate of population size. Genetic sampling has been successfully employed in fisher studies in Idaho (M. Schwartz, USFS, pers. comm.) and California (M. Higley, Hoopa Tribal Forestry, pers. comm., Zielinski et al. 2006). Genetic sampling efforts would require access to portions of the reintroduction areas by car, foot and pack-stock (this portion of the monitoring program is not yet funded).

Fisher Biology and Projections for the Olympic Peninsula

Fisher Biology: The fisher is a large, stocky, dark brown member of the weasel family, about the same size as a house cat. Males weigh about twice as much as females (adult males: 3.5-5.5 kg; adult females: 2.0-2.5 kg) and males are about 20% longer than females (females: 70-95 cm; males: 90-120 cm; total length) (Douglas and Strickland 1987). Fishers at the northern extent of their range in western North America are larger (mean weights are 2.6 kg for females and 4.8kg for males in British Columbia; Weir 2003) than those at the southern extent of the range (mean weights are 1.9 kg for females and 3.2 kg for males in southern Sierra Nevada; Truex et al. 1998). Fishers have partially retractable claws that allow them to climb and move through trees, and descend in a head-first position (Powell 1980; 1993).

Fishers are solitary animals (Powell 1993). They interact with other fishers during breeding, kit rearing and defense of territory. Most studies report that fishers exhibit intrasexual territoriality: male home ranges typically overlap with multiple female home ranges (Powell 1993, Powell and Zielinski 1994, Weir 2003). Based on nine radio-telemetry studies conducted in the west coast,

male fishers have an average annual home range of approximately 26.3 square miles (42.3 square kilometers). Female fishers' home range is smaller, at 15.5 square miles (25 square kilometers) (Lewis and Hayes 2004). On the west coast, fisher home range size is greater in the northern extent of the range than in the southern extent (Lewis and Hayes 2004).

Fishers breed during late winter or early spring but, due to delayed implantation, do not give birth until approximately one year later in late March and April (Powell 1993, Frost and Krohn 1997, Frost et al. 1997). Female fishers mate within about 10 days following parturition, thus adult females are pregnant most of the time (Hodgson 1937, Hall 1942, Powell 1993).

Fishers have relatively low reproductive rates. Litter size of female fishers in captivity ranges from 1 to 4 kits with an average of 2.7 per litter (Truex et al. 1998, York 1996, Aubry and Raley 2006). In wild fisher populations, litter size appears to be smaller (typically 1 to 3 kits with an average of about 2.2 kits per litter) (Lewis and Hayes 2004). Female fishers can breed at one year of age (Hall 1942, Wright and Coulter 1967, Powell 1993) but due to delayed implantation will not give birth to kits until they are two years old. Additionally, not all adult females ($\geq$2 years in age) in a given population give birth to kits every year. Except for recent data from a fisher study in northern California, most studies have found that the average annual reproductive rate of adult females was 46 – 68% (Lewis and Hayes 2004). Furthermore, there is evidence to indicate male fishers may not become effective breeders until 2 years of age. (Wright and Coulter 1967, Douglas and Strickland 1987, Frost et al. 1997).

Female fishers give birth to kits in tree cavities (Leonard 1980, Paragi 1990, Paragi et al. 1996) that tend to be elevated well above the ground (Buck et al. 1983, Weir 1995, Truex et al. 1998, Higley and Matthews 2006). Average den heights have been reported as 10.6 m above the ground in California (Buck et al. 1983) and 16.2 m in Oregon (Aubry and Raley 2006). Fisher kits are altricial (Hall 1942, Coulter 1966, Powell 1993). Their eyes and ear canals open at about 7 to 8 weeks, and shortly thereafter the mother begins bringing them solid food (Coulter 1966, Powell 1993). In the wild, fisher kits at 3 to 4 months of age were observed to be still learning to climb trees and handle prey that the adult female had captured (Aubry and Raley 2006). Fisher kits appear to stay within their mother's home range through their first fall and early winter before dispersing (Paragi 1990, Aubry and Raley 2006).

The primary fisher denning period (from birth to weaning) lasts about 10 weeks and researchers have found that females with kits may use more than one tree cavity during that time (Arthur and Krohn 1991, Paragi et al. 1996, Truex et al. 1998, Aubry and Raley 2006, Higley and Matthews 2006). After the primary denning period, adult females with kits become more mobile but may still use cavities in various types of structures (e.g., live and dead trees, hollow logs) for prolonged periods of time ($\geq$2 days; Truex et al. 1998, Aubry and Raley 2006, Higley and Matthews 2006, Weir 2006).

The upper limit of life expectancy for fishers is generally believed to be about 10 years of age (Powell 1993), however a fisher in British Columbia was 12 years old when trapped (Weir 2003). Limited data indicate that even though trapping is light or non-existent in west coast populations, fisher survival rates are lower in west coast populations than in the east coast populations. In California, survival of adult male and female fishers from untrapped populations ranged from 61.2 to 83.8% for adult females, and 73.3 to 85.5% for adult males (Truex et al. 1998). Survival estimates from recently reported studies in the southern Oregon Cascades and northern California are consistent with those from Truex et al. (1998) (Aubry and Raley 2006, Higley and Mathews 2006). In Williston, British Columbia where light trapping pressure continues, non-juvenile fisher survival averaged 71.1% over four years of study (Weir 2005). Although predation on fishers is

recorded as a cause of death in the east (York 1996, Krohn et al. 1997), it appears to be a less significant source of mortality in east coast versus (Douglas and Strickland 1987) west coast populations. Predation of wild fishers is generally determined through necropsies that evaluate puncture wounds, wounding patterns and other evidence found at the site. Predation on fisher by cougar, coyotes, lynx (*Lynx canadensis*), bobcat, wolverine (*Gulo gulo*), and raptors (Buck et al. 1983, Truex et al. 1998, Higley and Mathews 2006, Weir 2006) have been reported. Weir et al. (2005) found fisher hair, claws and bone in fisher stomach contents during analysis but did not conclude whether or not this was due to predation or scavenging. On the Olympic Peninsula, cougars, bobcats, coyotes, and large raptors are potential predators of reintroduced fishers.

Distribution and Habitat Use Patterns: The best historical account of fishers on the Olympic Peninsula comes from Scheffer's (1995) *Mammals of the Olympic National Park and Vicinity*. Scheffer compiled this information in the late 1930s and early 1940s when he worked on a survey of mammals of Washington, and focused on furbearers such as wolverines and fishers. Scheffer spent considerable time interviewing trappers and long time residents on the Olympic Peninsula. He determined that at one time fishers inhabited coniferous forest habitats, from the coast to timberline, but by the late 1940s they were restricted to the central wilderness (which is now ONP) and absent, or rare, in the lowlands. Aubry and Houston (1992) compiled all fisher records in Washington gathered from 1884 to 1991. The most reliable reports are collected specimens or reports from trappers. They recorded 20 specimens or trapping reports from 1894 to 1925, none from 1926 to 1954, three from 1955 to 1979, and two from1980 to 1991. The last verified fisher on the Olympic Peninsula was a two year old female trapped on the east side of the Olympics in 1969.

There are verified fisher records from all sides of the Olympic Peninsula (Aubry and Houston 1992, Scheffer 1995); however the most numerous accounts are from the western lowlands. Scheffer recorded that two trappers took 37 fishers in the winter of 1920 in the lower Queets River drainage, and that two other trappers took 20 fishers in the East Fork drainage of the Quinault River, between 1,500 and 5,000 feet.

On the west coast, fishers remain in only four areas: northern and central British Columbia, the southern Oregon Cascades, northwestern California (this population extends a bit into southwestern Oregon), and the southern Sierra Nevada of California. The information from Scheffer (1995) and Aubry and Houston (1992) is consistent with data gathered in recent studies conducted in extant west coast fisher populations. Throughout the west coast, fishers are associated with low to mid elevations coniferous or mixed deciduous-coniferous forests (Aubry and Raley 2006, Zielinski et al 2006, Weir 2007). Fishers are generally confined to areas that do not have deep, soft snow, and therefore tend not to inhabit alpine areas, especially when the ground is snow covered. In California, Krohn et al. (1995) determined that fishers were primarily limited to areas with less than 9 inches of snow per winter month. Fishers may travel through alpine areas during the mating season, when dispersing or during summer, but in general their activities are concentrated in lower-elevation forests, which provide sufficient cover, rest and den sites, and food sources (R. Weir, Artemis Wildlife Consultants, pers. comm., July 27, 2005).

Fishers use rest sites between periods of activity. Rest sites are generally used for only a single resting or a sleeping bout; however, the same site may be used for many days when weather is severe or a large food item has been cached nearby. Rest structures used by west coast fishers include mistletoe and rust brooms, large lateral limbs and limb clusters in the canopies of live trees, rodent or raptor nests, ground burrows, or beneath piles of cull logs, or cavities in snags, live trees or logs (Buck et al. 1983, Jones 1991, Seglund 1995, Aubry and Raley 2002, Weir and Harestad 2003, Zielinksi et al. 2004). Rest sites are often in large diameter trees that are usually

the largest and tallest in the immediate area (Buck et al. 1983, Zielinski et al. 2004, Seglund 1995, Weir 1995). During six years of study in the southern Oregon Cascades, Aubry and Raley (2006) located 641 fisher rest structures. Of the female and male rest sites, 60% and 71%, respectively, were in live trees, 20% and 6 % were in snags, and 20% and 23% were on logs, cull piles or other ground sites. Over 65% of the rest site structures in live trees were in mistletoe brooms. Few researchers report height of rest sites, however in that study fishers rest site heights in live trees were observed in 172 times; mean rest site height was 12.2 m (K. Raley, U.S. Forest Service, pers. comm). In northern California mean fisher rest site height were 10 m (range 1-26) in hardwoods and 17 m (range 2-43) in conifers, while mean tree height was 17 m (range 3-35m) for hardwoods and 34 m (range 5-61m) for conifers (M. Higgley, Hoopa Tribal Forestry and S. Yaeger, USFWS, pers. comm.).

Because forest associations vary widely throughout the region, there is no single forest type that fishers are associated with. Instead, it appears that they can inhabit a variety of forest types, with the caveat that those forests provide key habitat features that fishers require: canopy cover (usually >50%), large trees with cavities sufficiently large enough to provide denning sites, and large limbs, snags, and logs for resting sites (Seglund 1995, Dark 1997, Higley and Mathews 2006, Zielinski et al. 2006, Weir 2007). Because it takes time for those structures to develop, fishers are most often associated with late-successional forests. In many parts of their range, fishers use deciduous trees for denning and resting; however these trees are not required as fishers occur in areas where deciduous trees are absent. Deciduous trees may be used more frequently because they have a higher incidence of suitable cavities than the surrounding conifers.

Fisher food habits and foraging strategy: Although they are agile climbers, and occasionally hunt in trees, extensive snow tracking bouts have revealed that fishers primarily forage on the ground (Coulter 1966, Powell 1980, 1981, 1993, Raine 1987). Fishers are opportunistic, solitary hunters, often hunting in zig-zig patterns (Powell 1993).

In western North America, the fisher is a dietary generalist in that it will eat a variety of prey and food items (Table 1). Fishers consume a variety of small and mid-sized mammals and birds, insects, reptiles, and plant materials, although they rarely eat amphibians. Their consumption of ungulate carrion is widely reported, especially in winter (Table 2). The majority of food items consumed by fishers are ground-dwelling species (Table 1, Appendix 1). The proportion of these foods in the diet varies across study areas (Tables 1 and 2), and can vary across seasons within a study area, presumably in response to availability (Zielinski et al. 1999). Although fishers can use a variety of prey, small and mid-sized mammals are the dominant components of the diet in the Pacific states, exceeding 70% frequency of occurrence across studies in the Pacific states (Table 2). Winter studies conducted in Idaho (Jones 1991), Montana (Roy 1991) and British Columbia (Weir et al. 2005) reported almost exclusive use of mammals by fishers (Table 2).

Table 1. Percent frequency of occurrence of major taxa groups and prey items in the fisher diet based on three food habits studies conducted in the west coast.

Prey	**Southern Oregon Cascades**[1]	**Northern California**[2]	**Southern Sierra Nevada**[3]
Mammals	82.6	93.0	78.6
Insectivora (shrews, moles)	5.2	20.9	4.5
Lagomorpha (rabbits, hares)	22.7	4.1	0.5
Rodentia (squirrels, mice, voles)	40.8	49.7	47.8
Carnivora (mustelids, canids)	2.6	22.4	21.4
Artiodactyla (deer, elk)	8.5	20.9	4.0
Birds	28.2	26.0	39.8
Reptiles	6.5	24.5	20.4
Amphibians		2.1	
Insects	25.6	55.2	55.7

[1] Aubry and Raley (2006), analysis of n = 387 fisher scats from males and females combined, across all seasons.
[2] Golightly et al (2006), analysis of n = 388 fisher scats from males and females combined, across all seasons. Fisher scats were collected from four study areas within the Klamath bioregion of northwestern California.
[3] Zielinski et al. (1999), analysis of n = 201 fisher scats from males and females combined, across all seasons.

Table 2. Dominant prey/food items identified in the fisher diet in western North America.

Study	**Study Location**	**Dominant Prey Items Identified (percent frequency of occurrence)**
Weir et al. (2005) (analysis of 215 stomachs)	British Columbia	Snowshoe hare (39.1), red squirrel (33.5), red-backed vole (23.3), porcupine (19.5)
Roy (1991) (analysis of 80 scats)	Northwestern Montana	Snowshoe hare (49), *Peromyscus* spp. (14), woodrat (7), *Martes* spp. (7)
Jones (1991) (analysis of 7 G-I tracts)	Northcentral Idaho	Ungulate (>30) snowshoe hare (28.6), red-backed vole (28.6), beaver (28.6)
Jones (1991) (analysis of 18 scats)	Northcentral Idaho	Snowshoe hare (50.0), ungulate (>30), voles (27.7), red squirrel (22.2), insects (22.2)
Aubry and Raley (2006) (analysis of 387 scats)	Southern Oregon Cascades	Squirrels (33.9), birds (28.2), insects (25.6), hares and rabbits (22.5)
Golightly et al. (2006) (analysis of 388 scats)	Northwestern California	Insects (55.2), seeds/fruit (33.8), squirrels (26.8), birds (26.0), reptiles (24.5)
Grenfell and Fasenfast (1979) (analysis of 8 stomachs)	Northwestern California	Fungi (50), plant material (50.0), beetles (25.0), deer (25.0), *Peromyscus* spp. (25.0),
Zielsinski et al. (1999) (analysis of 201 scats)	Southern Sierra Nevada, Calif.	Insects (55.7), birds (39.8), *Martes* spp. (20.4), reptiles (20.4), squirrels (20.4), seeds/fruit (20.4)

Food habits studies infrequently report results to species for birds, however the birds that are reported are almost exclusively diurnally-active species (e.g., passerines, jays, grouse, and woodpeckers (Appendix 1)), and are thought to be caught most often while on the ground (Powell 1993), or scavenged (Raine 1987). Powell (1993) for example, believed that jays were consumed while foraging on carrion that fishers were also feeding on.

Although there has been no formal diet analyses conducted on fishers in Washington, Scheffer (1995) did report information gathered by trappers and naturalists who examined fisher stomach contents or observed fisher foraging. It was believed that on the Olympic Peninsula, fisher diets consisted of mountain beaver, squirrels, and snowshoe hares. Fisher scats were also observed to contain huckleberries and salal berries (Scheffer 1995).

Existing Conditions in the Project Area

Habitat conditions: For analysis purposes, in the habitat assessment conducted as part of the Washington State feasibility study (Lewis and Hayes 2004), suitable fisher habitat was defined as low- and mid-elevation, late-successional forest. It was predicted that there is 299,376 ha of suitable fisher habitat in the project area: 52% is within Olympic National Park, 33% in Olympic National Forest, 8% on state lands, and 7% is owned by a city, county, or other public entities (Figure 4). There is an additional 148,362 ha of mid seral habitat that fishers could use for travel and foraging (Lewis and Hayes 2004).

The greatest density of suitable habitat, and where fisher population density is expected to be greatest, is on the west side of the Olympic Peninsula (Figure 5) (Lewis and Hayes 2004).

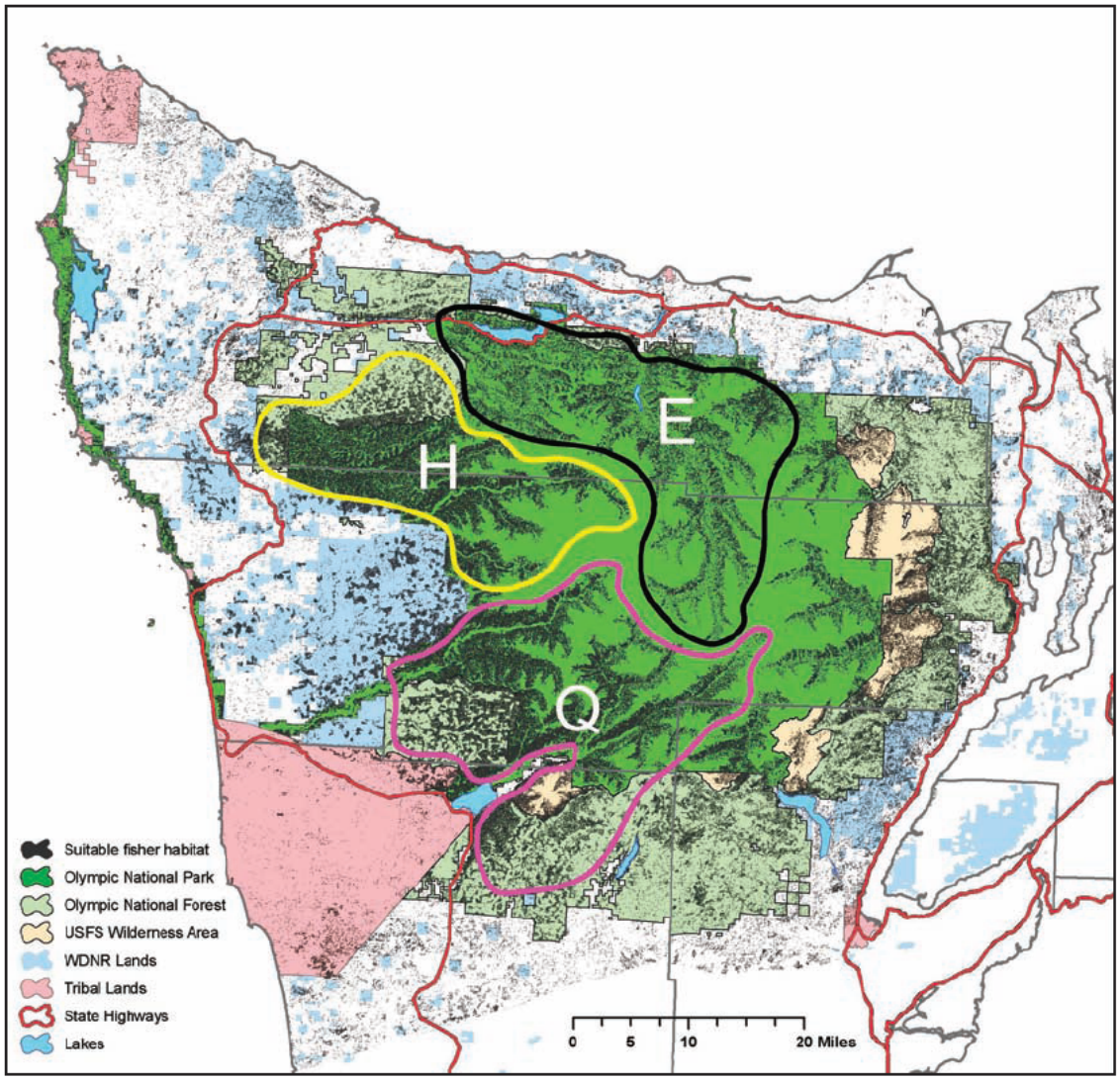

Figure 4. Three initial reintroduction areas for fishers on the Olympic Peninsula: Elwha-Sol Duc (E, outlined in black), Hoh-Bogachiel (H, outlined in yellow), and Queets-Quinault (Q, outlined in magenta) (from Lewis 2006).

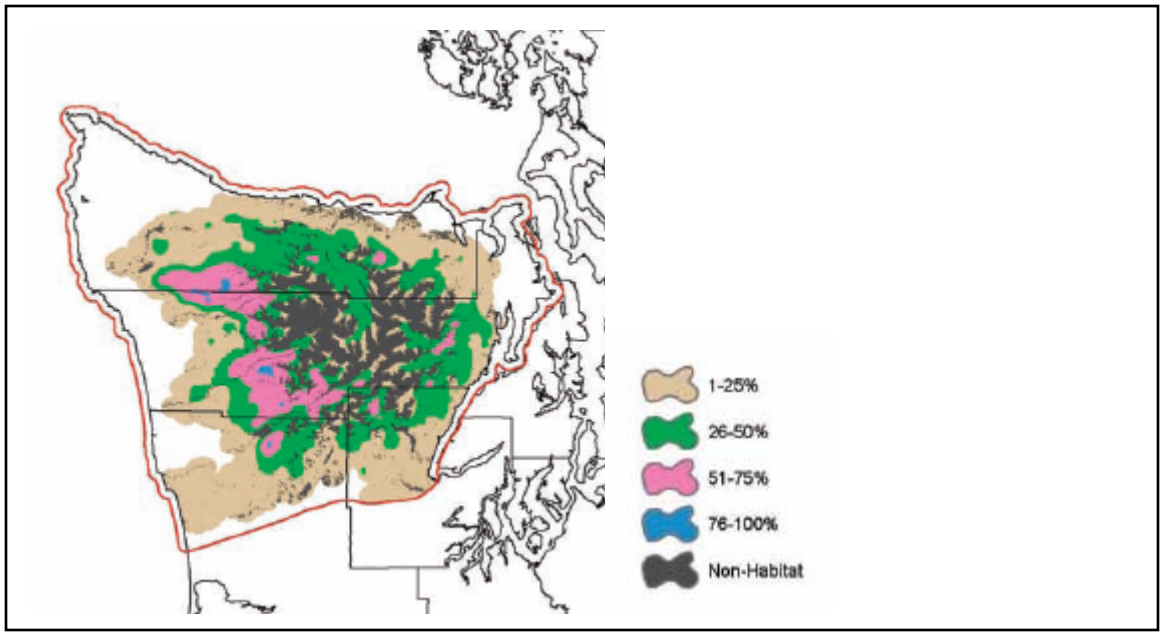

Figure 5. Percent concentrations of suitable fisher habitat within potential fisher reintroduction areas on the Olympic Peninsula (from Lewis and Hayes 2004).

Projected population size: Lewis and Hayes (2004) used the spatially explicit population model PATCH (Schumaker 1998) to estimate the carrying capacity for the Olympic recovery area. Variables integrated into the model included existing habitats, home range size, dispersal ability, survival, and fecundity. Data inputs were derived from west coast populations wherever possible (Lewis and Hayes 2004). Using various release scenarios and input variables, the projected populations for the Olympic recovery area ranged from 50 to 102 females (Lewis and Hayes 2004), 20 and 40 years post release. The population estimates varied considerably in the first 5 to 15 years of a simulation, but stabilized by 20 years.

If one assumes a slightly biased female sex ratio (58:42; Lewis 2006), it is estimated that the Olympic Peninsula would support 86 to 175 fishers. If all of the 3,300 km^2 of suitable fisher habitat within the >26% suitable habitat contours (Lewis and Hayes 2004; Table 12) is ultimately occupied by fishers, this would result in estimated fisher densities of 0.026 to 0.053 fishers per km^2. This is considerably lower than reported fisher densities in the eastern U.S. (0.385 fishers/km^2 in Ontario (deVos (1952); 0.385-0.086 fishers/km^2 in Maine (Coulter 1996), 0.112-0.1087 fishers/km^2 in New Hampshire (Kelley (1977)) or in California (0.312 fishers/km^2 Buck et al. 1983, 0.45-0.16 fisher/km^2 M. Higley, Hoopa Tribal Forestry, S. Matthews, Wildlife Conservation Society, and M. Yaeger, USFWS, pers. comm.).

Effects of the Proposed Project on Federally Listed Species

This section includes the evaluation of the effects of the proposed fisher restoration project on federally listed species in the project area. Tree aspects of the proposed project are included:
1) The direct effects of the implementation process, whereby fishers would be released;
2) the direct effects of up to 10 years of post-release monitoring; and
3) the indirect effects of a restored fisher population (into perpetuity).

Analysis is limited to those species that live in or near predicted fisher habitat. The information in this analysis was obtained through best professional judgment of staff from the NPS, WDFW,

USFS, USFWS, fisher and spotted owl experts, and available literature. This project is unlike most evaluated through this process because it is not a major construction activity, as discussed in the ESA consultation handbook (USFWS 1998), and it is not a short-, or even moderate-term duration, but must be evaluated in perpetuity.

Impacts on species listed as either threatened or endangered under ESA include any activity that would be considered a "take" which is defined under the ESA §3(19) as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." "Harm" is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. "Harass" is defined by the USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. (50 CFR §17.3). In determining whether the proposed action is **reasonably likely** to be the direct or indirect cause of incidental take, the USFWS's use of the simple causation principle; i.e., "but for" the implementation of the proposed action and its direct or indirect degradation of habitat would actual injury or mortality to individuals of a listed wildlife species be **reasonably likely** to occur?" (USFWS 1998).

For the analysis, the following guidance from the consultation handbook was used to determine if incidental take is likely to occur (USFWS 1998), using the following terminology to assess impacts to federally-listed species:

No Effect: This is the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat. (USFWS 1998).

Is not likely to adversely affect: This is the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. *Beneficial effects* are contemporaneous positive effects without any adverse effects to the species. *Insignificant effects* relate to the size of the impact and should never reach the scale where take occurs. *Discountable effects* are those **extremely unlikely to occur**. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect or evaluate insignificant effects; or (2) expect discountable effects to occur" (USFWS 1998).

Is likely to adversely affect: This is the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. An "is likely to adversely affect" determination requires the initiation of formal section 7 consultation" (USFWS 1998).

Bald Eagle (Federal Threatened)

Background: The bald eagle has a distinctive white head and white tail offset against a dark brown body and wings in adult birds. Bald eagles nest in large trees near open water that is not subjected to intense human activity (Stinson et al. 2001). The breeding season lasts from January 1 through August 15. In Washington 99% of known nests are within 1 mile of a lake, river, or marine shoreline. The breeding range of the bald eagle in North America is associated with

aquatic habitats (coastal areas, rivers, lakes, and reservoirs) with forested shorelines or cliffs. Throughout their range, they select large, emergent, canopy trees (mostly conifers) that are open and accessible for roosting. Bald eagles winter primarily in coastal estuaries and river systems of the lower 48 states and Alaska (USFWS 2006a). Although bald eagles may range over great distances, they usually return to nest within 100 miles of where they were raised (USFWS 1995). Bald eagles are opportunistic foragers, and their diet varies based on prey species available. They prefer fish, but will eat a great variety of mammals, amphibians, crustaceans, and birds, including many species of waterfowl (USFWS 2006a). They will feed on almost anything they can catch, such as ducks, rodents, snakes, and carrion. In winter, northern birds migrate south and gather in large numbers near open water areas where fish or other prey are plentiful (USFWS 1995).

Bald eagles are resident throughout much of ONP. More than 50 nest territories exist on the parks' coastal strip. The number of territories and the number of fledglings produced have increased significantly since 1980. In the interior of the park, eagles are mainly observed foraging or as winter migrants, although several nests are known along inland lakes and rivers. Wintering habitat in the park is typically along the Pacific coast and some inland rivers (NPS 2006a).

ONP is within two of Washington State's bald eagle recovery zones — the Washington coast and the interior Olympic Peninsula. The coastal zone is well above the goal of 74 occupied sites (151 sites were occupied in 1998), but usually below the target of more than one young fledged per occupied site (0.69 for 1993 to 1997). The Olympic Peninsula interior zone had 15 occupied sites in 1998, which was below the target of 17. However, nest search efforts in the interior have been limited (NPS 2006a).

Critical habitat for the bald eagle has not been designated within the park, on USFS lands, or on WDNR lands.

Effects of the proposed fisher restoration project on bald eagles:

Release Actions: There would be limited potential for fisher restoration efforts to affect bald eagles. The use of helicopters during release efforts could cause the temporary and intermittent disturbance or dispersal of bald eagles; however, helicopters are anticipated to be used no more than three times a year, and only during the period between September 15 and March 1.

Post-Release Monitoring: Factors affecting bald eagles during monitoring activities would be primarily associated with the use of helicopters to retrieve dead fishers, and the use of fixed-wing aircraft during the gathering of radio-telemetry. However, the use of fixed-wing aircraft would be limited to elevations greater than 120 yards above tree canopy, and would be in the park interior where few eagles nest. Known nests would be avoided in flight paths. The use of helicopters for retrieving dead animals would be precluded from March 1 to September 15.

Indirect effects of a restored fisher population: The establishment of a self-sustaining population of fishers is not expected to affect bald eagles, as these two species do not have similar habitat requirements, and there is very little overlap in prey. Bald eagles generally nest, forage, and roost near open water, and their primary prey include fish (NPS 2006a). As a result, there would be no impact on bald eagles' habitat or prey species from fisher reintroduction, and fishers are not expected to prey on bald eagles. On the contrary, bald eagles may prey on fishers.

Because the effects of all phases of the project are expected to be discountable and insignificant, the determination of effect for bald eagles from fisher restoration is "not likely to adversely affect."

Mazama Pocket Gopher (Federal Candidate)

Background: Mazama pocket gophers (*Thomomys mazama*) are small fossorial mammals that spend a large portion of their life underground. Pocket gophers forage on plant roots and above ground plant parts; however above ground vegetation is quickly transported to their burrows for consumption (Maser et al. 1981). On the Olympic Peninsula, Mazama pocket gophers inhabit high elevation subalpine meadows (Steinberg 1999).

Effect of the proposed fisher restoration project: No fisher restoration and monitoring activities would take place in Mazama pocket gopher habitat. Fishers forage primarily in forested habitats, inhabit low and mid elevation forests, and make little use of fossorial mammals in their diets (Appendix 1). Fisher predation on pocket gophers is expected to be extremely unlikely to occur.

Given these considerations, the determination of effect for Mazama pocket gophers is "not likely to adversely affect."

Marbled Murrelet (Federal Threatened, State Threatened)

Background: The marbled murrelet is a pigeon-sized seabird that lives primarily in the nearshore marine environment but nests in old-growth forests. Most murrelets nest within 37 miles of the coast, although some may go as far as 52 miles inland (Nelson et al. 2006). Murrelets belong to the Alcidae family, whose species are sometimes referred to as the black-and-white "penguins of the north." Based on surveys completed in 1995, it is estimated that 5,000 to 6,500 murrelets occur in Washington State (USFWS 2006b).

Murrelets begin laying their single egg in late March. Chicks hatch after about a 30 days' incubation period, and remain in the nest for 27 to 40 days after hatching. Murrelets are solitary nesters; both adults share incubation duty and they exchange incubation duties every 24 hours. The single chick is brooded only for a couple days, after which they sit alone on the nest while the adults forage at sea. Adults bring food to the chick at dawn and dusk. When ready to fledge, the chicks fly alone, at dusk, directly to sea (Nelson et al. 2006). Because murrelets are asynchronous breeders, and can re-nest after an early nest failure, murrelets nesting season is up to 182 days (Nelson et al. 2006). Early breeding season lasts from April 1 through August 5, and late breeding season from August 6 though September 15.

Suitable nesting habitat for murrelets consists of multilayered, old-growth coniferous stands with moderate to high canopy closure and within approximately 50 miles of saltwater feeding areas (NPS 2006a). Murrelets feed on small ocean fish, such as anchovy (*Engraulis mordax*), herring (*Clupea pallasii*), and sardine (*Sardinops sagax*) (USFWS 2006c). From March to mid-July marbled murrelets nest on naturally occurring platforms in large-diameter (greater than 6 inches) conifer limbs at heights of 50 feet or more above the ground. They more commonly occupy larger stands (greater than 500 acres) that support trees with large branches or deformities for nest platforms (USFWS 2006c). The nest platforms are created by normal growth, disease, mistletoe, or deformed branching. In the Pacific Northwest, most nests are located on a large branch with a moss substrate and canopy cover over the nest. Murrelets will nest in younger stands with remnant large trees or deformities that provide nesting opportunities (NPS 2006a).

ONP contains the largest contiguous area of marbled murrelet nesting habitat remaining in the lower 48 states. Murrelets occur within all the major drainages below about 3,000 feet in elevation within the park. Habitat considered suitable for murrelet occupation includes forested

areas to 3,500 feet on the east side of the park, and to 3,000 feet on the west side of the park, including the Sol Duc and Skokomish River drainages. Considering these areas, approximately 183,330 ha of forested area within the park are considered suitable marbled murrelet habitat, overlapping most of the suitable habitat for northern spotted owls (NPS 2006a; see 6).

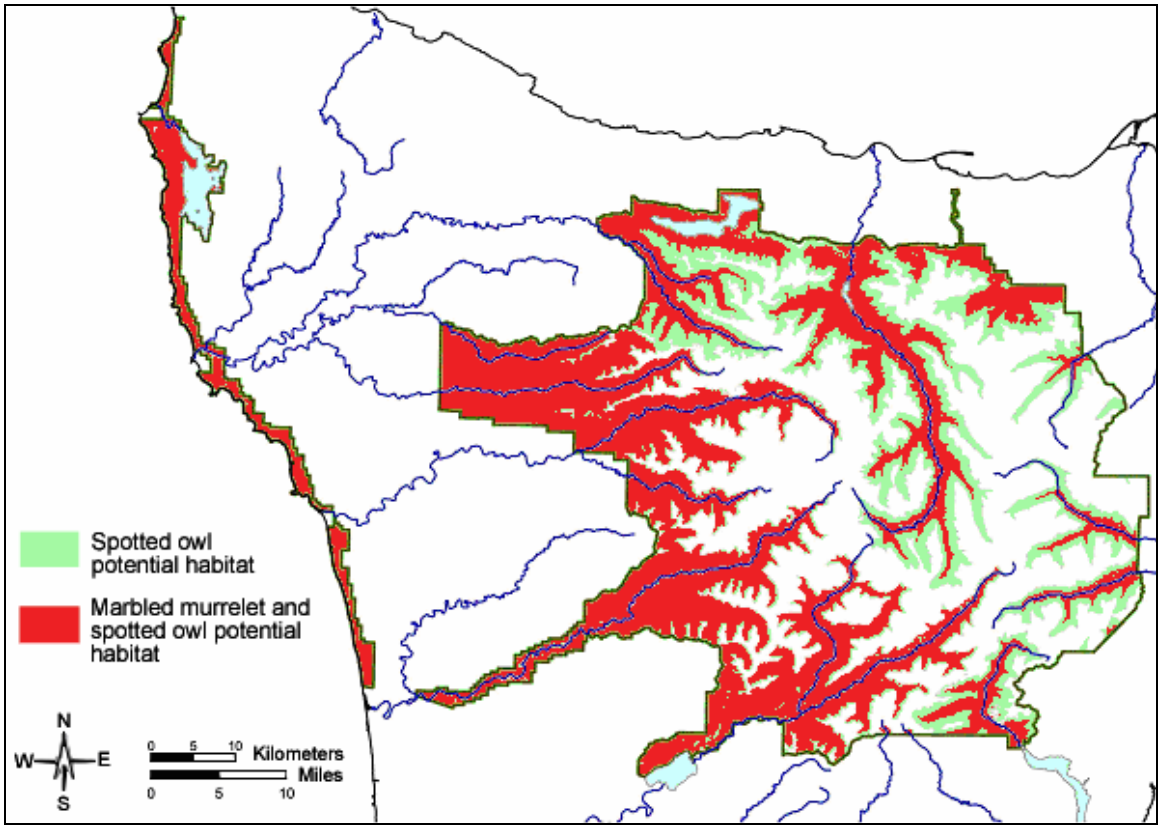

Figure 6: Spotted Owl and Marbled Murrelet Potential Habitat in Olympic National Park

Murrelet surveys have been conducted in all developed areas of the park, as well as in 18 randomly selected backcountry locations in eight drainage areas during the 1990s. Murrelet use of nesting habitat (as indicated by rates of presence and occupancy) within the park is significantly greater than use of suitable habitat on the peninsula outside the park (Hall 2000). Nine sites where murrelets are known to nest (signs of nests, chicks, or eggshells) were documented within the park between 1986 and 1999. Following the Pacific Seabird Group protocols, park biologists documented murrelet presence at 100% of survey sites throughout the park, with occupancy documented at 83% of those sites (NPS 2006a). In general, the park staff considers any suitable marbled murrelet nesting habitat in ONP as occupied. Currently no active NPS research or monitoring program is in place, although an ongoing telemetry study is being conducted by the USFS throughout the Peninsula (Raphael 2007).

As with fishers, suitable habitat for marbled murrelets occurs in the ONF (105,109 ha), much of which is managed as late-successional forest reserves. DNR lands adjacent to the park also provide 51,236 ha of suitable habitat in the three planning units covered by the *Habitat Conservation Plan* (WDNR 1997).

Although the USFWS has not officially designated critical habitat for the marbled murrelet within ONP, much of the park contains high quality nesting habitat that is managed and safeguarded by

virtue of inclusion in the national park system. Critical habitat has been designated on lands on the Olympic Peninsula, although the USFWS is reviewing the designation of a large portion of the critical habitat to reduce redundancy with other plans, such as the Northwest Forest Plan, that already protect those lands.

Effects of the proposed fisher restoration project:

Release Actions: Fisher releases would not take place during murrelet nesting season. Consequently, fisher release actions would have no effect on marbled murrelets.

Post Release Monitoring: Post release monitoring would be conducted via road and foot access in front country areas, and through the use of small fixed-wing aircraft in the backcountry areas of the park and forest. Carcass retrievals would be conducted primarily via foot access, however helicopters may be used occasionally to access remote sites, but only between September 15 and March 1. The use of vehicles on park roads and foot access on trails during monitoring efforts would not disturb murrelets that inhabit the surrounding areas as it would not produce noise above existing ambient levels. The level of monitoring traffic would not be above background use of the areas, and murrelets that inhabit areas near roads and trails have probably adapted to some levels of noise and human presence associated with the roads. All fixed-wing flights would be flown at elevations greater than 120 yards above the tree canopy which is the distance greater than the threshold distance that could adversely affect murrelets through disturbance (USFWS 2003). Helicopters would not be used during murrelet nesting season. Consequently, fisher monitoring actions are not likely to adversely affect marbled murrelets.

Indirect effects of a restored fisher population: Because a restored fisher population would inhabit the same forests used by marbled murrelets for nesting, there is a potential for fishers and murrelets to interact. However, fishers and marbled murrelets coexisted on the Olympic Peninsula for millennia prior to the extirpation of the fishers only 38 years ago. Because the habitat in the park is largely intact, it is expected that these species will co-exist as they did prior to fisher extirpation. Fishers may use some of the same types of structures for resting (large limbs) that murrelets use for nesting; however fishers are likely to use these structures lower in the canopy than those used by murrelets. Currently, extensive suitable habitat and habitat structures for both species exists throughout the park. Habitat use, demographic and behavioral characteristics of fishers and murrelets make interactions between the two species extremely unlikely to occur. Habitat is not limiting for either species and therefore neither species would be concentrated in certain locations. Both species occur in low densities, further limiting the likelihood of interactions. Fishers predominantly seek prey on the forest floor and tend to use rest and den sites below the canopy, and therefore do not use the same microhabitats as murrelets.

Because fishers forage occasionally in trees, and consume birds, they may be a potential predator of incubating adult murrelets, eggs, or chicks. However, fisher predation on marbled murrelets is expected to be extremely unlikely to occur, for several reasons:

- Nesting murrelets occur in the Olympic Peninsula in very low densities. Restored fishers are also expected to occur at low densities. These two factors combined make it extremely unlikely that a fisher would encounter a murrelet, and predate it.
- Murrelets and fishers use different parts of the tree canopy: murrelets nests are in the upper canopy, and fishers tend to use rest sites and den sites on the bole below the canopy (Aubry and Raley 2006, K. Raley, USFS-PNW, pers comm, M. Higley, Hoopa Tribal Forestry and S. Yager. USFWS, pers. comm.), further diminishing the chances for a fisher/ murrelet encounter.

- The majority of fisher foraging activities occur on the ground (Powell 1993), not in the upper canopy where murrelets nest, further diminishing the chances of fisher predation on murrelets.
- Although birds may occur in fisher scats with up to 25% frequency, the majority of fishers' prey is small and medium sized mammals (Tables 1 and 2). Most fisher studies report birds as unidentifiable to the species level, however in studies where birds were identified to species, the birds identified were primarily diurnal species, and it is thought that most were captured while foraging on the ground (Powell 1993) further decreasing the likelihood that fishers would prey on murrelets.
- While marbled murrelet nest failure is often caused by predation, the primary nest predators are corvids (e.g. ravens and jays). Corvids and squirrels were observed to be key predators of artificial nests (Nelson et al. 2006).
- Recent studies of radio-telemetered murrelets on the Olympic Peninsula have not detected any nest failures due to predation. Instead, the cause appears to be related to poor ocean conditions resulting in chick starvation or nest abandonment by adults (Raphael 2007).
- Fledgling murrelets could become vulnerable to fishers if they became grounded during flights from the nest to the ocean; however, the fledging strategy for murrelets is for the chick to fly directly from the limb to the sea. Grounded nestlings are either sick, or fell out prematurely, and are not expected to survive in the wild.
- Fishers and murrelets co-exist in portions of northwest California and there is no documentation of fishers preying on murrelets.

Finally, fishers prey on mice and squirrels, which are documented predators of decoy marbled murrelet eggs.

In summary, the effects of all three phases of the proposed fisher restoration are expected to either have no effect, or to be extremely unlikely to occur (discountable). Given these considerations, the determination of effect on marbled murrelets from the proposed fisher restoration project is "not likely to adversely affect."

Critical Habitat

No critical habitat has been formally designated with ONP for marbled murrelets, although much of the park contains high-quality habitat that is important to the species. Critical habitat was not designated because habitat in ONP does not require special management consideration or protection by virtue of its national park status. Therefore, there would be no effect to critical habitat for marbled murrelets.

Northern Spotted Owl (Federal Threatened)

Background: The northern spotted owl is a medium-sized owl with dark eyes, dark-to-chestnut brown coloring, and whitish spots on the head and neck, with white mottling on the abdomen and breast (USFWS 2006d). Northern spotted owls nest, roost, and forage in late-successional forests characterized by high canopy cover and complex structure (Forsman et al. 1984, Gutierrez et al. 1995, Hershey et al. 1998). Suitable habitat is characterized by moderate to high canopy closure (60%–80%); a multilayered, multispecies canopy with large overstory trees (greater than 30-inch diameter at breast height); a high incidence of large trees with various deformities, cavities, broken tops, or mistletoe infestation; large snags; large accumulations of down trees, and other woody debris on the ground; and sufficient open space below the canopy for flying (Thomas et al. 1990, USFWS 2006c). On the Olympic Peninsula, mean spotted owl nest height was 23.2 m; all were in coniferous trees and 90.5 % of nests were in cavities in the top or side cavities, and only 9.5% were on platforms (Forsman and Giese 1997).

ONP contains the largest contiguous area of spotted owl nesting and roosting habitat remaining in the lower 48 states. Extensive suitable habitat for spotted owls occurs throughout ONP, primarily in lower elevations of major drainages. Spotted owl habitat is similar to that for marbled murrelets but extends to higher elevations in the park: up to 3,000 ft in elevation on the west and 4,000 ft on the east (Figure 6). The park interior (exclusive of the Pacific coastal section and the Queets River corridor) contains about 199,921 ha of forested area considered potential spotted owl habitat (NPS 2006a). On the Olympic Peninsula, ONF provides and additional 105,109 ha of suitable and 26,439 ha of dispersal habitat.

In Washington, the northern spotted owl specializes on nocturnal arboreal prey; 93.7% of observed prey items on the Olympic Peninsula were nocturnally-active prey (Forsman et al. 2001). On the Olympic Peninsula, spotted owl diets are dominated by flying squirrels (*Glaucomus sabrinus*) (Table 3, Forsman et al. 2001), however they also consume juvenile snowshoe hares, bushy-tailed wood rats (*Neotoma cinerea*), and Douglas squirrels (*Tamiasciurus douglasii*). Diet composition varies somewhat regionally - owls on the drier, eastern side of the Olympics consume more red-backed voles (10.3%) and woodrats (9.6%) and fewer flying squirrels that those on the west (Table 4, Forsman et al. 2001).

Table 3. Diet composition of northern spotted owls on the Olympic Peninsula[1].

Species	**% frequency in diet**	**% weight in diet**
Flying Squirrels	54.3	58.6%;
Snowshoe Hares (juv)	6.3	16.3%,
Wood Rats	5.3	9.8%,
Douglas Squirrels	2.3	4.1%,
Peromyscus	11.3	2.5%

[1]Data from Forsman et al. 2001. Consists of prey items identified from 151 owl territories over 13 years.

Table 4. Diet composition of spotted owls on western and eastern Olympics

Species	**Western Olympics**	**Eastern Olympics**
Flying Squirrels	63.3	45.2
Snowshoe Hares (juv)	1.2	10.3
Voles	1.1	9.6
Douglas Squirrels	0.9	2.5
Peromyscus	15.6	7.0

[1]Data from Forsman et al. 2001. Consists of prey items identified from 32 territories in each sample.

Northern spotted owls have large home ranges containing significant acreage of old-growth forest to meet their habitat needs. On the Olympic Peninsula, the mean home range size of spotted owls on ONF was 2,290 ha (MCP method) (Forsman et al. 2005). There are no data for owl home ranges in ONP, however due to the lack of fragmented habitat, they are expected to be smaller than those on ONF (Seaman et al. 1996).

Research and monitoring of spotted owls in the park started in the late 1980s. During an inventory completed in 1995, 229 pairs (730 individuals) were estimated to inhabit the park (Seaman et al. 1996). Owl densities were found to be greater on the east side of the park (0.297 pairs / km^2) than on the west (0.166 pairs/ km^2), and greater than owl densities observed in the fragmented habitat found on ONF (Seaman et al. 1996).

Demographic rates of northern spotted owls have been monitored since 1987, starting first in ONF, and later in ONP in 1992. The data from both agencies are combined and, together, ONP and ONF comprise the Olympic Study Area - one of eight official effectiveness monitoring study areas for the Northwest Forest Plan. At one point over 130 territories were monitored on the peninsula, including several in DNR lands, 80 in the national forest and 52 in the park. However, in recent years the study has been scaled back; currently 40 sites are monitored in the national forest and 54 are monitored in the park (the NPS has picked up two sites formerly monitored by USFS).

Early nesting season for spotted owls occurs from March 1 though July 15, and late nesting season runs though September 30; almost all young fledge and disperse from the nest site area prior to July 15 (ONP files). On the Olympic Peninsula, spotted owls tend to nest every other year (Table 5). The fecundity rate (number of females fledged per adult female) has remained stable over the years (Anthony et al. 2006); however site occupancy rate (Figure 7; Gremel 2006) and adult survival (Anthony et al. 2006) have declined. Overall, the population of spotted owls on the Olympic Peninsula (ONP and ONF data combined) has declined at an annual rate of approximately 4.4% (Anthony et al. 2006). This was slightly higher than the range-wide rate of decline of 4.1%, but is the lowest rate of decline in Washington State (Anthony et al. 2006). This decline in spotted owls on the Olympic Peninsula is driven by declining adult survival rates, not fecundity (Anthony et al. 2006). Given this rate of population decline, it is estimated that there are approximately 30% fewer owls in the park now than was observed in 1995; the current parkwide density estimate for spotted owls is approximately 0.256 owls/ km^2.

Table 5. Nesting status and success rate of female spotted owls of all age classes, at monitored sites in Olympic National Park, 1992-2006.

Year	Non-nesting	Nesting	Unknown status	Total	% known status	% females nesting	Nest success[1]
1992	1	15	7	23	0.70	0.94	0.93
1993	16		5	21	0.76	0	*
1994	3	24	7	34	0.79	0.89	0.92
1995	15		6	21	0.71	0	*
1996	5	28	3	36	0.92	0.85	0.92
1997	15	8	6	29	0.79	0.35	0.75
1998	1	24	5	30	0.83	0.96	0.91
1999	9		5	14	0.64	0	*
2000	17	10	5	32	0.84	0.37	0.56
2001	16	9	4	29	0.86	0.36	1.00
2002	3	27		30	1.00	0.90	0.92
2003	23		3	26	0.88	0	*
2004	2	23	4	29	0.86	0.92	0.96
2005	22	1	1	24	0.96	0.04	1.00
2006	2	16	2	20	0.90	0.89	0.94
Total	150	185	63	398	0.84	0.55	0.88

[1] Proportion of nest attempts that result in at least one fledgling, calculated for nests with known outcomes
* No nesting attempts

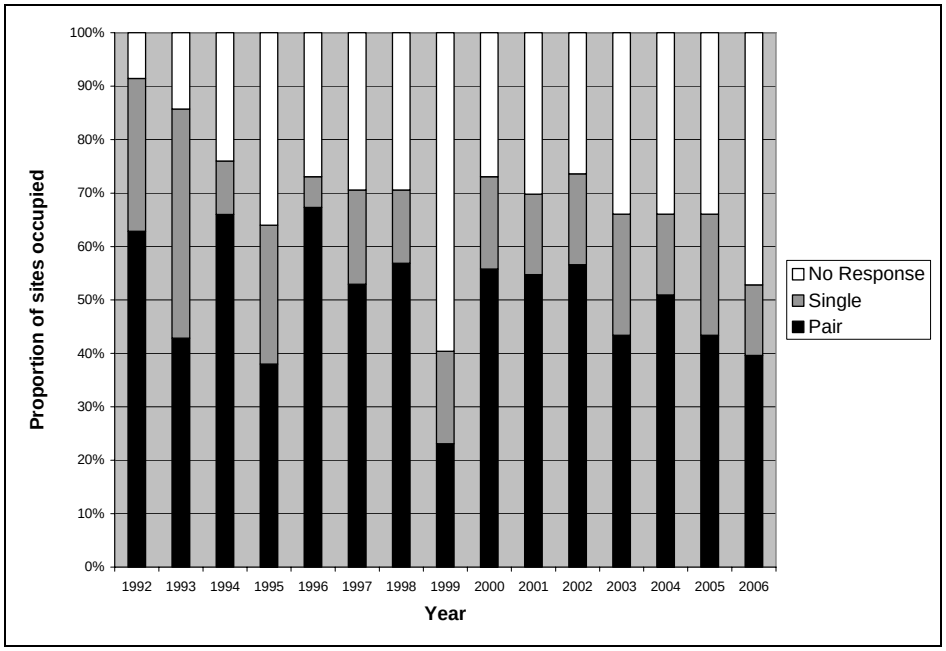

Figure 7. Percent monitored spotted owl sites occupied by single or paired owls, annually.

A suspected factor behind the decline in spotted owls, particularly in the park where habitat has remained stable, has been the invasion of barred owls. Barred owls recently expanded their geographic range into the Pacific Northwest. The first documented occurrence on the Olympic Peninsula was on the west side of ONP in 1985 (Sharpe, 1989), and the number of sightings continues to increase (Figure 8). Barred owls are dominant in competitive interactions with

spotted owls and evidence from many areas suggests that barred owls displace spotted owls from otherwise suitable habitat (Dark et al., 1998; Hamer, 1988; Kelly, 2001).

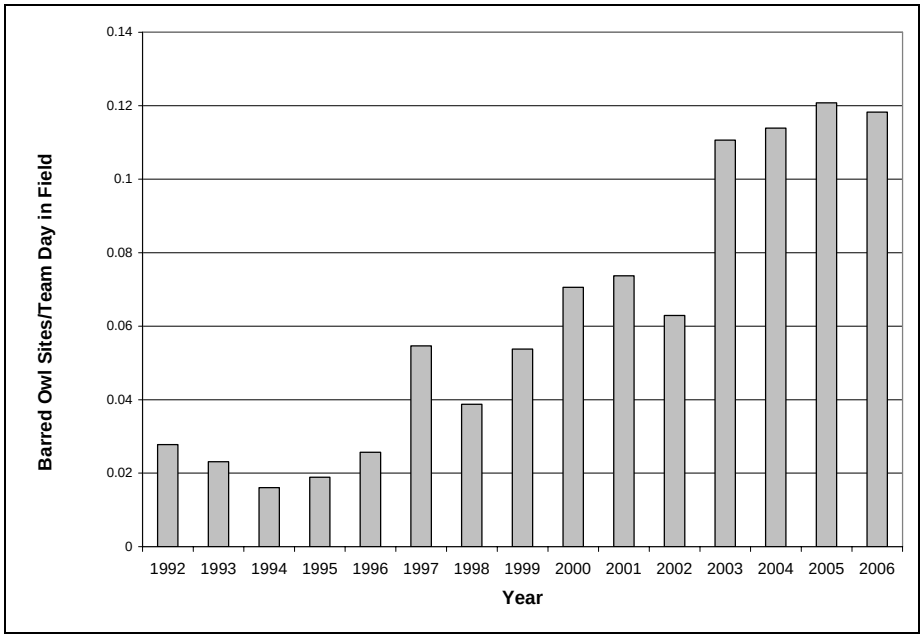

Figure 8. Number of occupied barred owl sites standardized by survey effort, Olympic National Park, 1992-2006**.**

At sites where spotted owls are not displaced from their territory, the spotted owls have moved significantly upslope within their territories (Table 6). The mean elevation for all occupied spotted owl sites in 2006 was 2,698 feet, an increase of over 700 feet from the first year of monitoring in 1992, and the highest yet recorded. In 2006 the mean elevation of monitored spotted owls on the park's drier eastside was 2,914 feet (range 1,850 feet to 4,250 feet); west-side sites averaged 1,908 feet (range 1,000 feet to 2,400 feet) in elevation.

Table 6. 2006 rates of spotted owl site movement, elevation change, and pair occupancy, at sites with and without prior barred owl activity within 800 m of any years' site center. Each pair of columns presents the mean and sample size for spotted owl sites with and without prior barred owl detections.

Mean SO pair occupancy rate		**Mean SO movement (m)[1]**		**Mean SO elevation change (ft)[1]**	
Barred present	Barred absent	Barred present	Barred absent	Barred present	Barred absent
.34 (41)	.54 (11)	1521 (18)*	816 (9)*	+492 (18)	+212 (9)

[1] Movement and elevation change since 1992 or first year monitored, for sites with any spotted owl detections in 2005.

* $p < 0.05$, for *t* test of equal means for site movement and elevation change and chi^2 with continuity correction for pair occupancy.

Critical habitat for the northern spotted owl has not been officially designated in the park or on adjacent DNR lands. However, much of the park contains high quality northern spotted owl habitat that is managed and safeguarded by virtue of inclusion in the national park. Critical habitat has been designated for this species on USFS lands adjacent to the park.

Effects of the proposed fisher restoration project:

Release Actions: Fisher releases would not occur during spotted owl nesting seasons. Consequently, fisher release actions would have no effect on northern spotted owls.

Post Release Monitoring: Post release monitoring would be conducted via road and foot access in front country areas, and through the use of small fixed-wing aircraft in the backcountry areas of the park and the national forest. Carcass retrievals would be conducted primarily via foot access, however helicopters may be used occasionally to access remote sites, but only between September 15 and March 1. The use of vehicles on park roads, and foot access on trails during monitoring efforts would not likely disturb spotted owls that inhabit the surrounding areas. The level of monitoring traffic would not be above background use of the areas, and spotted owls that inhabit areas near roads and trails have probably adapted to some levels of noise and human presence associated with the roads. All fixed-wing flights would be flown at elevations greater than 120 yards above the tree canopy, the distance greater than the threshold distance that could adversely affect spotted owls through disturbance (USFWS 2003). Helicopters would not be used during spotted owl nesting seasons. Consequently, fisher monitoring actions are not likely to adversely affect northern spotted owls.

Indirect effects of a restored fisher population: Because a restored fisher population would inhabit the same forests used by spotted owls for nesting, roosting and foraging, there is a potential for fishers and spotted owls to interact. However, fishers and northern spotted owls coexisted on the Olympic Peninsula for millennia prior to the extirpation of the fisher only 38 years ago. Because the habitat in the park is largely intact, it is expected that these two species would co-exist as they did prior to the extirpation of the fisher.

Fishers use the same structures for denning (tree cavities) that spotted owls often use for nesting. However, extensive suitable habitat and habitat structures for both species exists throughout the Park. Because both species would exist at low densities and suitable habitat is not limiting, competition for denning structures is not expected to occur. In addition, fishers are expected to make some use of deciduous trees for denning, however on the Olympic Peninsula, spotted owls nest exclusively in coniferous trees (Forsman and Giese 1987).

Although fishers and spotted owls both prey on some of the same animals, the effect of fisher reintroduction on spotted owls through competition for food resources is expected to be insignificant and discountable, for the following reasons:

- Although they feed on a variety of species, spotted owls are prey specialists and target nocturnally-active, arboreal small mammals, in particular the northern flying squirrel. Fishers are prey generalists, with flexible diet selection patterns throughout their range. Fishers prey on a variety of species, and target ground dwelling species and diurnally-active species. In addition, fishers prey on flying squirrels infrequently (Powell 1993, Powell and Zielinski 1994). The diversity of small mammals on the Olympic Peninsula and the flexibility in the fishers' diet would limit their effects on the prey base for northern spotted owls (Lewis and Hayes 2004).
- Prey habitat conditions in the park have not been affected by human land management practices; the park supports a diverse (Jenkins et al. 2005) and, in all probability, adequate prey base for both species. Recent work by the Pacific Northwest Research Station supports this observation. In ONP, Wilson (2007) found high flying squirrel densities on four of the eight stands he sampled equal to high densities found elsewhere within the range of the northern spotted owl. One stand sampled had one of the highest

numbers of individuals ever reported for a 13-ha trapping array. In addition, he had 48 captures of 10 bushy-tailed woodrats, and recorded 111 captures of western spotted skunk, 292 captures of 96 Townsend's chipmunks, 204 captures of 83 Douglas' squirrels, 2 captures of ermine (short-tailed weasels), and 7 captures of Steller's jays.

- Fisher use carrion extensively, particularly ungulate carrion, in the winter and early spring months (Zielinski et al. 1999, Weir et al. 2005, Aubry and Raley 2006). ONP supports high densities of Roosevelt elk (8.0 to 11.6 elk/km2 on western winter ranges; Houston et al. 1987) and lesser numbers of black tailed deer (Jenkins et al. 1997). Both ungulates winter in low elevation areas within the park, with elk concentrating in floodplains of the west side drainages (Jenkins et al. 1999), in what is predicted to be the heart of the restored fisher habitat. Ungulate populations in ONP are at ecological carrying capacity, which is typified by low reproductive rates and greater proportions of older age individuals in the population (Houston et al. 1990). A major source of mortality for cervids in the park is winter kill, due to the under nutrition of older aged individuals (Houston et al. 1990). Consequently, fishers will likely make extensive use of ungulate carrion in winter months, further decreasing potential competition with spotted owls.

Because fishers forage occasionally in trees, and occasionally consume birds, they may be a potential predator of incubating adult spotted owls, chicks, or eggs. However, for several reasons (listed below), fisher predation on northern spotted owls is expected to be extremely unlikely to occur:

- As noted in the text above, both species are expected to occur in the park at low densities; the chance of their encountering each other would be extremely low.
- As stated above, fisher rest and den sites are in lower to mid canopy (12.2 to 17 m high) whereas spotted owls nest higher in the canopy (Forman and Giese 1997, M. Higley, Hoopa Tribal Forestry and S. Yaeger, USFWS, pers. comm), further decreasing a chance for an encounter or predation.
- Based on foraging habits data derived from tracking fisher foraging bouts (Coulter 1966, Powell 1993), and an examination of prey consumed by fishers (e.g. snowshoe hares), it is evident that the majority of fisher foraging activities occur on the ground, further diminishing the chance that a fisher would encounter a nesting spotted owl.
- The highest density spotted owl populations are on the eastern side of the Olympics (Seaman et al. 2006); predicted suitable habitat for fishers, based on the best available data, is on the western side of the Peninsula, lessening their chances for encounters.
- Due to the effects of barred owls, spotted owls on the Olympic Peninsula have moved to nesting and roosting at higher elevations. Fishers are expected to make greater use of lower elevations, further lessening their chance of encounters.
- Spotted owls on the Olympic Peninsula nest every other year, decreasing even further the chance of predation on nesting birds and nestlings.
- Although birds may occur in fisher scats with up to 25% frequency, birds do not comprise a major component of fisher diets, anywhere. The majority of fishers' prey is small and medium sized mammals (Tables 1 and 2). Most fisher studies report birds as unidentifiable to the species level; however in studies where birds were identified to species, the birds identified were primarily diurnal species. In addition, many researchers felt that birds were caught while on the ground (Powell 1993) or were scavenged (Raine 1987). In the only studies where owls were reported in fisher diets, they were either miscellaneous Strigiformes (Coulter 1966: study was done in Maine), and the other was a much smaller western screech owl which was recovered at a den or rest site and may or may not have been killed by the resident fisher (Aubry and Raley 2006).

- Fishers' range overlaps extensively with Northern and California spotted owls in Oregon and California. Although there are a few anecdotal accounts of fishers being seen in proximity of owl nests (P. Carlson, Colorado State University, pers. comm., L. Diller, Green Diamond Resource Company, pers. comm., and M. Higley, Hoopa Tribal Forestry, pers. comm..) there is no documentation of a fisher preying on a spotted owl, either adults, chicks, or eggs. This is despite the fact that there has been decades of extensive research on both species and the fact that in these study areas fisher occur at much higher densities that expected fisher density on the Olympic Peninsula. In the Hoopa study area, for example, estimated fisher densities from 1997 to 2005 ranged from 0.16 to 0.45 fisher per km^2 (M. Higley, Hoopa Tribal Forestry, S. Matthews, Wildlife Conservation Society, and S. Yaeger, USFWS, pers. comm.). By comparison predicted fisher densities for the Olympic Peninsula are 0.026-0.053 fisher/ km^2.

In summary, the effects of all three phases of the proposed fisher restoration are expected to either have no effect, or to be extremely unlikely to occur. Given these considerations, the determination of effect on northern spotted owls from the proposed fisher restoration project is "not likely to adversely affect."

Critical Habitat

No critical habitat has been formally designated with ONP for northern spotted owls, although much of the park contains high-quality habitat that is important to the species. Critical habitat was not designated because habitat in ONP does not require special management consideration or protection by virtue of its national park status. Therefore, there would be no effect to critical habitat for northern spotted owls.

Interrelated and Interdependent Actions:

Interrelated actions are part of the larger action and depend upon the larger action for their justification. Interdependent actions are actions having no independent utility apart from the proposed federal action. The effects of interrelated and interdependent actions must be considered with the proposed federal action (50 CFR §402.02).

All related projects are evaluated with the proposed activities. There are no additional interdependent or interrelated actions.

Cumulative Effects

Cumulative effects may result from future state, local, or private actions that are reasonably certain to occur in the project area and that may destroy, degrade, or fragment the habitat of threatened, endangered, and candidate species. Future federal actions that are unrelated to the proposed project are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

ONP assumes that future private and state actions will occur at similar intensities as in recent years. The actions that may potentially affect listed species are continuing flight operations by non-federal entities, and other non-federal activities such as development and forest management.

Tribal governments in the region periodically conduct aerial operations over Olympic NP for wildlife and fish monitoring activities. The Quinault Indian Nation conducts salmon surveys in the park and land three times per year (two in the spring and one in the fall). WDFW conduct

operations outside and several miles into the park for fisheries research. They utilize a Type III light helicopter once per month between 2/1 and 6/15 yearly through 2009 to conduct steelhead redd surveys in the Bogachiel River basin. Between 3 to 4 hours of this flight time occurs within the park, and flights can be below 500 feet in elevation. No landing occurs in the park. Olympic NP is not aware of any other aerial activities over the park that would be flown at altitudes that would affect federally listed species.

Future non-federal activities could occur outside ONP, but within the action area of the project (e.g. flight corridors outside the park). The general types and amounts of potential actions which may occur are largely unknown, but could include non-federal forest management and other non-federal management actions (such as recreation and development) within suitable habitat.

Another non-federal activity that should be evaluated is the cumulative effects from barred owls. At present, the decline in spotted owls is driven by the continuing effects of past habitat loss, and the ongoing effects of barred owl invasion (USFWS 2007). Although spotted owl populations are still declining on the Olympic Peninsula, the proposed restoration of fishers to the ecosystem is not expected to have a detectible or measurable effect on northern spotted owl populations and would not add to the cumulative effect. If fishers would have any effect on owls, it would be the extremely unlikely predation of a spotted owl nestling or fledgling. However, spotted owl fecundity is high on the peninsula, and the population trend is driven by adult female survival (Anthony et al. 2006). Fishers would have no effect on this demographic parameter.

The recently released *Northern Spotted Owl Recovery Plan* (USFWS 2007) states that "Known predators of spotted owls are limited to great horned owls (*Bubo virginianus*) (Forsman et al. 1984), and, apparently, barred owls (Leskiw and Gutiérrez 1998)." Other suspected predators include northern goshawks (*Accipiter gentiles*), red-tailed hawks (*Buteo jamaicensis*), and other raptors (Courtney et al. 2004). Occasional predation of spotted owls by these raptors is not considered to be a threat to spotted owls, so no criteria or actions are identified, including monitoring. If known predators are not considered a threat to existing spotted owl populations, then the fisher (a species that is not recognized as a threat to spotted owls) is unlikely to have an adverse effect on spotted owls.

Conclusion and Determinations

Common Name	Scientific Name	Effect Determination
Bald eagle	*Haliaeetus leucocephalus*	May affect, not likely to adversely affect
Mazama pocket gopher	*Thomomys mazama melanops*	May affect, not likely to adversely affect
Marbled murrelet	*Brachyramphus marmoratus*	May affect, not likely to adversely affect
Northern Spotted Owl	*Strix occidentalis caurina*	May affect, not likely to adversely affect

Conservation Measures

- Fishers would not be released during marbled murrelet and northern spotted owl nesting seasons.
- Helicopters would not be used for carcass retrievals from March 1 to September 15.

- All fixed wing radio telemetry flights would be at flight elevations greater than 120 yards above tree canopy (most will be much greater).
- All known bald eagle territories would be avoided during telemetry flights.
- Fisher food habits will be evaluated to test assumptions about 1) competition with spotted owls, and 2) consumption of owls and murrelets
- Landscapes selected by fishers would be mapped and evaluated to assess assumptions made on predicted elevation and habitat selection patterns of restored fisher population, and the degree of overlap with northern spotted owls.
- If funding becomes available, and if it is logistically possible, additional data would be gathered to evaluate assumptions made on site selection and structural use patterns of restored fishers, and their possibility to interact with spotted owls and murrelets.
- Crews working on the spotted owl monitoring project would record data on signs of fisher presence and activity at all monitored owl site centers and nests.

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Appendix 1. Percent frequency of occurrence of taxa groups and prey items identified in fisher scats and gastrointestinal tracts in western North America

	Annual			Seasonal										
	So. Oregon	NW	So. Sierra	Winter						Spring	Summer	Fall
Prey	**Cascades[1]**	**Calif.[2]**	**Nevada[3]**	**BC[4]**	**MT[5]**	**ID[6]**	**ID[7]**	**CA[8]**	**CA[3]**	**CA[3]**	**CA[3]**	**CA[3]**
Mammals	82.6	93.0	78.6						91.7	73.6	78.6	76.9
Insectivora	5.2	20.9	4.5							5.7	5.1	3.8
Soricidae (*Sorex* spp.)	0.8	1.5	2.5	14.9						1.9	3.1	3.8
Talpidae	1.3	19.8										
Scapanus latimanus			2.0					12.5		3.8	2.0	
Unident. Scapanus spp.		14.7										
Neurotrichus gibbsii	2.1	5.7										
Chiroptera		0.8										
Vespertillionidae (*Myotis* spp.)		0.5										
Lagomorpha	22.7	4.1	0.5				50.0			1.9		
Leporidae	22.5	4.1	0.5							1.9		
Lepus americana				39.1	49	28.6	50.0					
Sylvilagus bachmani								12.5				

Prey	Annual			Seasonal											
	So. Oregon	NW	So. Sierra	Winter						Spring	Summer	Fall			
	Cascades[1]	Calif.[2]	Nevada[3]	BC[4]	MT[5]	ID[6]	ID[7]	CA[8]	CA[3]	CA[3]	CA[3]	CA[3]			
Ochotonidae *(Ochotona princeps)*	0.2														
Rodentia	40.8	49.7	47.8						58.3	39.6	54.1	30.8			
Sciuridae	33.9	26.8	20.4						20.8	24.5	19.4	15.4			
Marmota flaviventris						14.3	5.5								
Tamiasciurus hudsonicus				33.5		14.3	22.2								
Tamiasciurus douglasii	2.6	3.4	7.5						3.8	11.3	6.1	3.8			
Unident. Tamius spp.	2.8	11.3	1.5		3		5.5				1.0	7.7			
Glaucomys sabrinus	1.8	4.1	0.5	8.4							1.0				
Sciurus griseus	0.2	4.9	4.0					12.5	8.3	1.9	4.1	3.8			
Spermophylus beecheyi	11.1		4.0							5.7	4.1	3.8			
Spermophylus lateralis	2.6														
Unident. Spermophylus spp.	2.3	1.0					5.5								
Unident. Sciuridae spp.	6.2	0.8													
Geomyidae (*Thomomys* spp.)	0.5	1.3	5.0				5.5			5.7	6.1	3.8			
Thomomys bottae			5.0							5.7	6.1	3.8			
Castoridae *(Castor canadensis)*				18.6		28.6	5.5								
Muridae		20.1	22.4						41.7	15.1	26.1	7.7			

Prey	Annual			Seasonal											
	So. Oregon Cascades[1]	NW Calif.[2]	So. Sierra Nevada[3]	Winter						Spring		Summer		Fall	
				BC[4]	MT[5]	ID[6]	ID[7]	CA[8]	CA[3]	CA[3]		CA[3]		CA[3]	
Peromyscus maniculatus				15.8											
Peromyscus leucopus						14.3									
Peromyscus spp.	0.5	2.8	10.4		14			25.0	8.3	5.7		16.3			
Clethrionomys gapperi				23.3		28.6	5.5								
Clethrionomys spp.	0.2	0.5													
Unident. Voles		1.5					27.7								
Microtus spp.	0.5	3.4	5.5	7.9	3				12.5	5.7		5.1			
Arborimus sp.		3.9													
Reithrodontomys megalotis								12.5							
Neotoma cinerea			0.5	1.9											3.8
Neotoma spp.	0.2		5.2		7										
Ondatra zibethicus	2.3			17.2											
Dipodidae (*Zapus* spp.)	0.2						5.5								
Zapus princeps							5.5								
Erethizontidae *(Erethizon dorsatum)*	1.8			19.5	6		5.5								
Unident. Rodentia					6										
Carnivora	2.6	22.4	21.4												

Prey	Annual			Seasonal											
	So. Oregon	NW	So. Sierra	Winter						Spring		Summer		Fall	
	Cascades[1]	Calif.[2]	Nevada[3]	BC[4]	MT[5]	ID[6]	ID[7]	CA[8]	CA[3]	CA[3]		CA[3]		CA[3]	
Canidae *(Urocyon cinereoargenteus)*		2.1													
Mustelidae	2.6	7.7	21.4						8.3	30.2		15.3		38.5	
Martes spp.			20.4		7				8.3	28.3		15.3		34.6	
Martes pennanti				9.8											
Martes Americana				10.7											
Unident. Mustelids		7.7		0.5	6		5.5			1.9					
Spilogale putorius			0.5											3.8	
Mephitis mephitis		1.0													
Unidentified skunks	2.6	2.9													
Procyonidae (*Procyon lotor*)		1.0													
Felidae *(Felis silvesteris)*							5.5								
Artiodactyla	8.5	20.9	4.0												
Odocoileus spp.			4.0	9.8	3	14.3	11.1	25.0	25.0	3.8					
Cervus elaphus						28.6	5.5								
Alces alces				14.9		14.3	11.1								
Domestic cattle				1.9			5.5	12.5							
Unidentified ungulate						28.6	22.2								

Prey	Annual			Seasonal											
	So. Oregon Cascades[1]	NW Calif.[2]	So. Sierra Nevada[3]	Winter						Spring		Summer		Fall	
				BC[4]	MT[5]	ID[6]	ID[7]	CA[8]	CA[3]	CA[3]		CA[3]		CA[3]	
Mammals, unknown	15.0							12.5							
Birds	28.2	26.0	39.8						25.0	32.1		51.0		26.9	
Galliformes				8.8											
Piciformes		1.0													
Passeriformes		0.3													
Unident. birds	28.2	24.7	39.8			14.3	16.6		25.0	32.1		51.0		26.9	
Reptiles	6.5	24.5	20.4							37.7		20.4		3.8	
Squamata		24.2	15.4							30.2		15.3			
Sauria (lizards)		14.4	13.4												
Serpentes (snakes)		3.6	2.0							7.5					
Amphibians		2.1													
Unknown vertebrate		10.3													
Insects	25.6	55.2	55.7				22.2	25.0	41.7	52.8		62.2		50.0	
Orthoptera		4.9	2.5							1.9		3.1		3.8	
Hymenoptera	15.0	33.0	22.4				22.2		16.6	15.1		23.5		38.5	
Coleoptera		20.9	18.4					25.0	8.3	22.6		22.4		3.8	
Lepidoptera	6.0								4.2	1.9					
Plants	13.7								20.8	11.3		16.3		53.8	
Seeds/Fruit		33.8	20.4				16.6								
Leaves and bark		82.5						50.0							
Fungi								50.0							

Prey	Annual			Seasonal										
	So. Oregon Cascades[1]	NW Calif.[2]	So. Sierra Nevada[3]	Winter						Spring	Summer		Fall	
				BC[4]	MT[5]	ID[6]	ID[7]	CA[8]	CA[3]	CA[3]	CA[3]		CA[3]	
Other Items														
Egg Shell		3.9	5.0							5.7	6.1		3.8	
Woody debris			16.4							13.2	12.2		23.1	
Rock		33.2	6.5					62.5		5.7	5.1		7.7	
Artificial (man-made)		14.2												

[1] Aubry and Raley (2006), analysis of n = 387 fisher scats from males and females combined, across all seasons. Study was conducted in the southern Cascades of Oregon.
[2] Golightly et al (2006), analysis of n = 388 fisher scats from males and females combined, across all seasons. Fisher scats were collected from four study areas within the Klamath bioregion of northwestern California.
[3] Zielinski et al. (1999), analysis of n = 201 fisher scats from males and females combined, across all seasons and broken down by season. Study was conducted in the southern Sierra Nevada of California.
[4] Weir et al. (2005), analysis of n = 551 prey items from n = 215 stomachs, from male and female fishers collected in winter from south-central to northern British Columbia.
[5] Roy (1991), analysis of n = 80 fisher scats collected during winter and spring in northwestern Montana.
[6] Jones (1991), analysis of n = 7 gastrointestinal tracts of fishers collected during winter in northcentral Idaho.
[7] Jones (1991), analysis of n = 18 fisher scats collected during winter in northcentral Idaho.
[8] Grenfell and Fasenfast (1979), analysis of n = 8 fisher stomachs collected during winter in northwestern California

Appendix C
Cumulative Actions Table

APPENDIX C — CUMULATIVE ACTIONS TABLE

Topic	Past Actions	Current Actions	Reasonably Foreseeable Future Actions	Alternative A Actions	Alternative B Actions	Alternative C Actions
Fisher	Listed as a state endangered species in 1998; listed as a federal candidate species in 2004. Likely extirpated from state for various reasons, including overexploitation from commercial trapping and habitat fragmentation. Trapping for fishers closed in 1934. Protected from commercial harvest since 1934 but has not recovered. Total area of old-growth forest in Washington has declined by 70% from early 1930s to the early 1990s. Poisoning and trapping of gray wolf in early 1900s likely contributed to local extirpations of fishers.	WDFW conducted a feasibility study for reintroducing fishers in 2004. WDFW completed a state fisher recovery plan in 2006. Olympic National Park has plans for managing and monitoring other species, such as the northern spotted owl, which could affect fishers. The park's *Fire Management Plan* could affect fisher habitat. Some thinning to accelerate old-growth forests is occurring on USFS land. Conservation strategies for the Olympic Experimental State Forest Unit, in the northwest corner of the peninsula, would likely result in some increase in older age tree stands after 80 years.	Fishers could become federally listed; reintroduction would reduce or eliminate the need to list fishers. Elwha dam removal, fish and ecosystem restoration, removal of barrier to dispersal; helicopter flights; increase in habitat and prey availability, more carrion (deer, elk). Delisting of the fisher as endangered by the state could after several decades lead to reopening the trapping season outside park. After delisting, fisher would have sensitive status, so would still be protected by state law. Completion of Fisher Conservation Assessment and Strategy; which can be used as a guide for fisher management throughout the DPS Introducing fishers into the Cascades could connect subpopulations on a regional scale. No predator population increases expected. Changes in status of British Columbia population related to mountain pine bark beetle, and resultant timber salvage could affect the BC source population. Climate change (elevation of treeline, more prey, more productive summers) could all affect fishers. No effect to fishers expected from increased visitation. *Northwest Forest Plan* and other plans are expected to increase habitat for fishers.	With no action to reintroduce fishers, the species would remain extirpated from the Olympic Peninsula. Impedes recovery of fishers in Washington. Fishers would not be removed from the Washington State endangered list (as outlined in the state recovery plan) Increases probability of fisher remaining a federal candidate.	With reintroduction, increases number of fishers over time. Increases probability of delisting fishers in Washington. Decreases probability of federal listing. Adaptive management applied to manage reintroduced fishers, particularly release locations, methods, and timing, based on monitoring results. Number of fishers needed from source population would decrease.	Same as alternative B, plus captive breeding of fishers at off-site locations (such as zoos) to supplement natural supplies.

Topic	Past Actions	Current Actions	Reasonably Foreseeable Future Actions	Alternative A Actions	Alternative B Actions	Alternative C Actions
Species of Special Concern (based on USFS 2004)	Establishment of Olympic National Park provided large block of contiguous habitat. Olympic Experimental State Forest Act contributed to the conservation of the northern spotted owl and the protection of old-growth resources. The WDNR habitat conservation plan covers the marbled murrelet, spotted owl, and bald eagle. The *Northwest Forest Plan* covers habitat for northern spotted owl and marbled murrelet. Also see actions under "Wildlife," below.	The WDNR habitat conservation plan covers the marbled murrelet, spotted owl, and bald eagle. The park's hazard tree management program could remove habitat trees for northern spotted owls, bald eagles, and marbled murrelets. Forest thinning projects, habitat enhancement activities, harvest of forest greens, treatment of invasive species, and other USFS activities as described in chapter 1. Ongoing park maintenance and repair projects and minor construction.	The WDNR habitat conservation plan will continue to cover the marbled murrelet, spotted owl, and bald eagle. Future actions same as under "Wildlife," below. Fisher kits could be vulnerable to raptors.	Take no action to reintroduce fishers.	Introduce potential competition for prey and/or predation by restoring fishers.	Same as alternative B.
Marbled Murrelet	The marbled murrelet was federally listed as threatened in 1992. The main cause of population decline has been the loss of older forests and associated nest sites as a result of commercial timber harvest, with additional losses from natural causes, such as fire and windthrow. Olympic National Park has surveyed for murrelets in the past. A 1999 USFS report evaluated the success of the *Northwest Forest Plan* in maintaining and restoring nesting habitat and populations (USFS 1999a).	The current range is Washington, Oregon, and California where they use older forest stands near the coastline for nesting. Major current threats include logging or habitat modification, entanglement in gill-nets, and oil spills and other pollution. Other factors include prey base fluctuations from ocean changes, predation of eggs by Steller's jays and common ravens, and predation of adults by raptors. Critical habitat is designated. Olympic National Park currently has no active research or monitoring program, but manages and safeguards nesting habitat. A USFS telemetry study is ongoing.	Federal delisting as threatened.	Same as above.	Same as above.	Same as above.

Topic	Past Actions	Current Actions	Reasonably Foreseeable Future Actions	Alternative A Actions	Alternative B Actions	Alternative C Actions
Northern Spotted Owl	Federally listed as threatened in 1990 due to extensive loss of habitat in old-growth and late-successional forest. The park established a 14-year monitoring plan in 1992. Competition with barred owls (which first appeared in Olympic National Park in 1985) has been implicated in the decline of the spotted owl population on the Olympic Peninsula. A 1999 USFS report assessed trends in spotted owl populations and habitat. Monitoring data used to evaluate the success of the *Northwest Forest Plan* in arresting the downward trends in spotted owl populations and in maintaining and restoring habitat (USFS 1999b).	Draft recovery plan released in 2007. Critical habitat is being re-evaluated. Olympic National Park monitors spotted owls, but fewer spotted owls now in the park because of competition from barred owls.	Barred owls are increasing. Threats from West Nile virus (not yet found in park, but a monitoring program is ongoing), habitat, predation, and hybridization are primary issues in the park. Climate change could be positive if cold, wet springs decreased. Lands set aside if USFS increases habitat. Final recovery plan will be completed.	Same as above.	Same as above.	Same as above.
Bald Eagle	Federally listed as threatened in 1967, the bald eagle's decline coincided with the introduction DDT in 1947. Other causes of decline included shooting, trapping, and poisoning. A substantial population increase resulted in a proposed rule in 1999 to delist as threatened in the lower 48 states.	Current threats include loss of nesting habitat due to development along the coast and near inland rivers and waterways. Federally delisted.	Bald eagles are continuing to increase, but do not hunt in forested habitat. Federally delisted.	Same as above.	Introduce potential predation on fishers by bald eagles from restoring fishers.	Same as alternative B.
Northern Goshawk	WDFW surveys in the early 1990s had relatively low detection rates.	No current management program exists.	No management program.	Same as above.	Introduce potential competition for prey and/or predation by restoring fishers.	Same as alternative B.
Wildlife and Wildlife Habitat	Wildlife and habitat affected by past timber and forest thinning projects on adjacent lands, past development and agricultural land uses, habitat fragmentation from roads and trails. Timber industry began declining in the late 1980s and early 1990s due to increased automation and reduced timber supply. Hunting and trapping on adjacent lands and prior to establishment of the park affected wildlife species. Some predator species (wolf and	Effects are continuing from forest fragmentation, thinning projects, habitat enhancement activities, harvest of forest greens, treatment of invasive species, and other USFS activities as described in chapter 1 would improve habitat. Ongoing park maintenance and repair projects and minor construction within the park could disturb wildlife.	Proposed future activities, such as forest thinning projects and habitat enhancement activities as described in chapter 1 would improve habitat. Increase in old-growth forest from *Northwest Forest Plan* promoting habitat for forest species. WDNR habitat conservation plan would allow more logging, which would eliminate habitat for some wildlife.	Take no action to reintroduce fishers.	Reintroduce fishers using vehicles on park roads and pack animals on trails, some helicopter in remote areas of the park. Monitor fisher via radio-telemetry for 3-4 years with vehicles on roads, foot on and off trails, fixed wing aircraft in remote sites. Monitor fishers via non-invasive sampling 4-10 years post release us-	Same as alternative B.

Topic	Past Actions	Current Actions	Reasonably Foreseeable Future Actions	Alternative A Actions	Alternative B Actions	Alternative C Actions
	fisher) extirpated. Elk and cougar depleted.				ing vehicle access on road and foot access on and off trail.	
Visitor Use and Experience	In 1988 Congress designated 95% of Olympic National Park as wilderness. Flooding in fall 2006 did at least $3 million damage to roads in Olympic National Park.	Several wilderness restoration project sites occur throughout the park. Annual trail maintenance occurs on approximately 20% of park trails. Activities are underway to restore areas damaged by flooding benefiting visitors. Road maintenance activities occur throughout the park, restricting access and causing road delays and closures affect visitor experience.	Visitation is expected to increase proportional to the regional population. Continued road and trail improvements benefit visitors.	Take no action to reintroduce fishers.	Increased wilderness values from reintroduction of an extirpated species. Trails and roads used to release and monitor fishers. Release, monitor, and retrieve dead fishers using fixed-wing aircraft or helicopters. Opportunities to involve citizens in scientific monitoring efforts.	Same as alternative B.
Soundscapes		Continued commercial and military flights, with more so in some areas. Some sightseeing flights, which are hindered by weather. Chainsaws in wilderness trails, helicopters in wilderness, if needed as the minimum tool when they are used. Helicopter operations from local airfields, Sweets Field, and other areas throughout the park. Noise from visitors and employees conducting park maintenance and operations activities (vehicles, generators, human voices). Downhill ski area on park land. Logging operations near NPS boundaries.	Park wilderness plan scheduled for completion in the foreseeable future, providing more detailed management direction to enhance wilderness values and characteristics. Elwha dam removal, fish and ecosystem restoration, helicopter flights. Increased noise for 3-5 years. Park flights and trail maintenance in wilderness will increase. Fire management activities, such as mechanized fuel reduction around park facilities. Rehabilitation of Hurricane Ridge Road. Repair of damage from 2006 flood. Continued noise from current sources.	Take no action to reintroduce fishers.	Reintroduce fishers using vehicles on roads, foot and pack animals on trails, some helicopter in remote sites. Monitoring fisher vial radio-telemetry for 3-4 years with vehicles on roads, foot on and off trails, fixed wing aircraft in remote sites. Up to 3 flights per month for monitoring.	Same as alternative B.

Topic	Past Actions	Current Actions	Reasonably Foreseeable Future Actions	Alternative A Actions	Alternative B Actions	Alternative C Actions
Neighboring Landowners	USFS signed a memorandum of understanding for the *Northwest Forest Plan*, which guides management of the Olympic National Forest. Goal of 1992 WDNR Forest Resource Plan includes sustainable, even-flow timber harvest. WDNR habitat conservation plan protects habitat for listed species.	Several projects are underway or planned for adjacent national forest lands (see chapter 1). Continued habitat protection for listed species under the WDNR habitat conservation plan.	Increase in old-growth forest resulting from *Northwest Forest Plan*. WDNR habitat conservation plan will allow more logging, but road closures will continue on WDNR-managed lands. WDNR's multispecies WDNR habitat conservation plan includes the fisher.	Take no action to reintroduce fishers.	Potential delisting of the fisher in the state of Washington. Potential listing of the fisher under the Endangered Species Act, or removal as a federal candidate. Fisher is currently state listed as endangered. No state critical habitat rule for the fisher now exists or is expected, and no restrictions of forest practices activities on state or private timber lands to protect fisher habitat.	Same as alternative B.
Socioeconomic Conditions	Flooding in fall 2006 damaged roads and resulted in road closures. Some predation of pets and livestock by other wildlife. Decline in timber harvest activities from an average of 250 mmbf per year in the 1980s to an average of 10 mmbf per year since 1990. Approximately $1.2 billion was awarded to counties and communities in the spotted owl region between 1994 and 2000 (USFS 2006). In 1993 the Omnibus Budget Reconciliation Act provided payment to Washington counties affected by the drop in federal timber harvest and associated timber revenues; payments expired in 2003 (USFS 2006). In 2000 the Secure Rural Schools and Community Self-Determination Act paid counties each year equal to the average payments received during the three highest years between 1986 and 1999, resulting in substantially higher payments to counties than under forest revenue sharing alone (USFS 2006).	Continued road closures and harvest prohibitions. The Dosewallips Road remains closed, with NPS/USFS plans to reopen the road to vehicular access. County land use designations as forestry, agricultural, or rural residential will help maintain the rural character of the communities adjacent to the park.	Implementation of options to reopen Dosewallips Road to vehicular access.	Take no action to reintroduce fishers.	Possible restrictions to mechanized activity on USFS land requiring a 0.25-acre buffer around known active fisher den sites from February 1 through July 31.	Same as alternative B.

Topic	Past Actions	Current Actions	Reasonably Foreseeable Future Actions	Alternative A Actions	Alternative B Actions	Alternative C Actions
Park Management and Operations	Flooding in fall 2006 did at least $3 million damage to roads in the national park. Reduction of 30 additional full-time equivalents.	Olympic National Park's 2005 business plan shows a shortfall in ongoing operations and management needs. Many of the park's most pressing operational needs are currently not being met. Activities are underway to restore areas damaged by flooding.	Continued shortfall in ongoing operations and management needs. Manage the removal of the Elwha River dams.	Take no action to reintroduce fishers.	Take actions to release and monitor fishers. Implement adaptive management over life of the plan, and education and interpretive measures. Provide assistance to interested landowners pursuing a conservation or safe harbor agreement.	Same as alternative B.

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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