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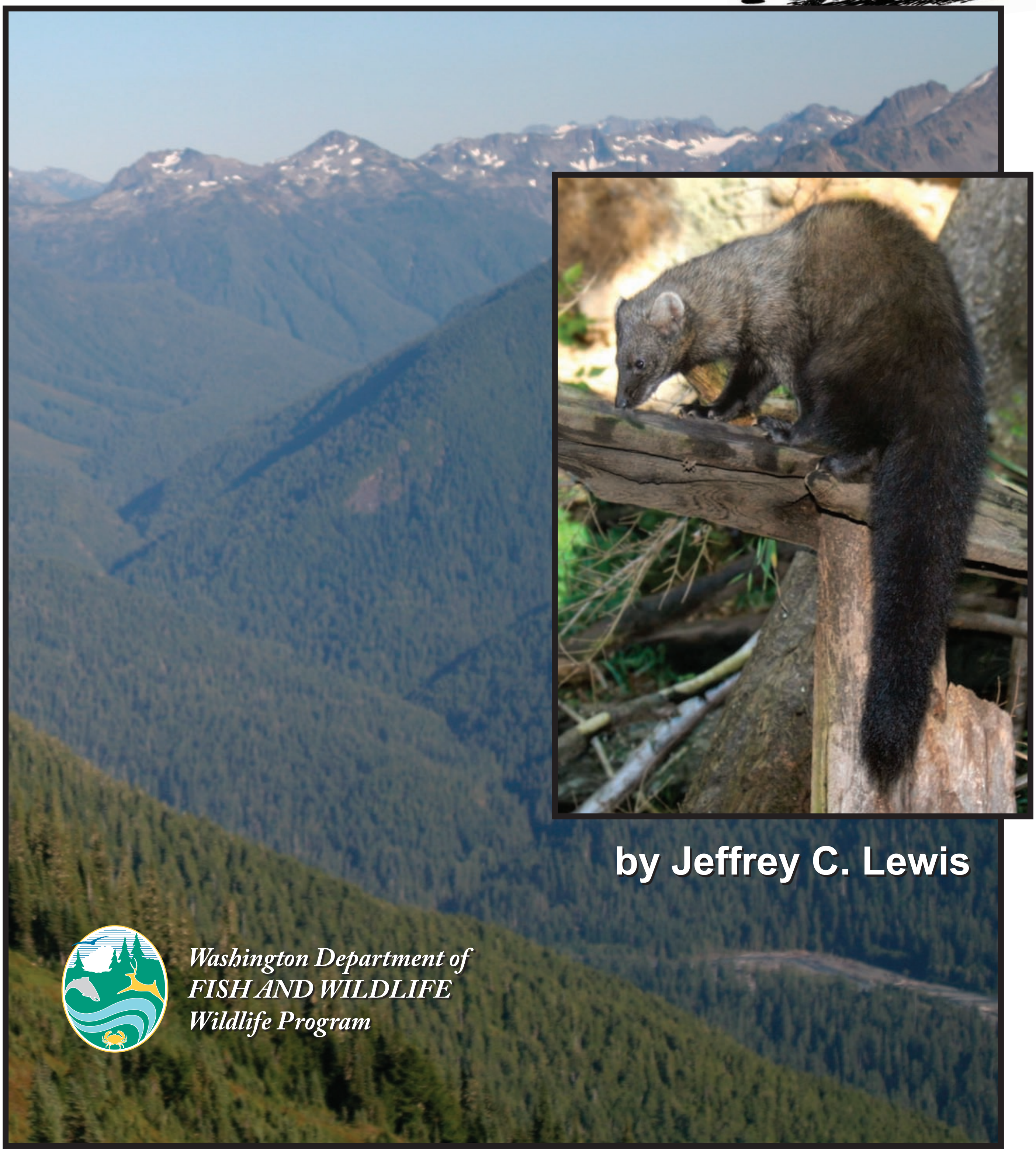
Implementation Plan for Reintroducing Fishers to Olympic National Park



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FISH AND WILDLIFE
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IMPLEMENTATION PLAN FOR REINTRODUCING FISHERS TO OLYMPIC NATIONAL PARK

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October 2006

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EXECUTIVE SUMMARY

Historically, fishers occurred throughout the forested areas of Washington State. They now appear to be extirpated, mainly as a result of overtrapping and habitat loss. A fisher status review completed in 1998 indicated that a reintroduction was the only way to recover fishers in the state. A feasibility assessment by Washington Department of Fish and Wildlife in 2004 concluded that a fisher reintroduction could be successful in western Washington and that the Olympic Peninsula was the most suitable location for the first reintroduction, followed by the southwestern Cascades, and then the northwestern Cascades. Feasibility of the reintroduction was based on the availability of suitable source populations (British Columbia or Alberta), a sufficient amount and configuration of suitable habitat, and a diverse prey base. A draft Washington State recovery plan for fishers identifies reintroductions on the Olympic Peninsula and in the Cascades and Selkirk Mountains as the main approach for recovery. This document describes the approach for implementing a reintroduction of fishers to Olympic National Park.

Fishers are native to the boreal and temperate forests of North America and have been translocated (i.e., reintroduced or augmented) throughout much of this range to restore populations that were extirpated through overtrapping and habitat loss. Fishers were translocated to reestablish a native species, a valuable furbearer, and a natural predator of porcupines. From 1947-2004, at least 35 fisher translocations were undertaken in 14 states and six Canadian provinces. Information from 29 of the 35 translocations was used to identify factors associated with translocation success. Twenty-three of the 29 (79%) were considered successful, including translocations in Oregon, Idaho, Montana, British Columbia and Alberta. Consequently, the fisher is considered one of the most successfully translocated carnivores.

Eight factors that could influence translocation success were compared using data from successful and unsuccessful translocations. These factors included the number of fishers released, sex ratio of released fishers, release type, release date(s), the number of consecutive years that fishers were released, the proximity of the source population, protection from commercial trapping, and protection from incidental capture. The number of fishers released and the number of consecutive years that fishers were released were significantly greater for successful translocations than for unsuccessful translocations. The other six factors were less significant in explaining translocation success.

Fisher populations in British Columbia and western Alberta are suitable source populations for a Washington translocation. Cooperation with provincial wildlife agencies and trapper's associations is necessary to effectively obtain fishers from either province. Obtaining fishers would require a provincial coordinator to oversee activities within the province; trapper cooperation in capturing fishers; a trapping coordinator to obtain fishers from trappers and transport them to a captive wildlife facility within the province; a captive wildlife facility to house fishers prior to transport to Washington; a captive wildlife specialist to provide care for fishers; and veterinary assistance for the examination, treatment, and health certification of fishers.

While in captivity, fishers will be examined, treated for injuries and parasites, given prophylactic vaccinations, and prepared for reintroduction. Individuals will be genotyped (a DNA sample will be taken), photographed, PIT-tagged, and equipped with a VHF radio-transmitter. Fishers will be fed to encourage weight gain before release.

Requirements for transporting fishers from a Canadian province to Washington include health certification by an accredited veterinarian, a possession and export permit from the provincial wildlife authority, an import permit from Washington Department of Agriculture, a U.S. Fish and Wildlife Service wildlife-importation declaration form, approved shipping containers, and inspections by U.S. Fish and Wildlife officials and Canadian and U.S. Customs officials.

As an action proposed on federal lands, a proposed fisher reintroduction on Olympic National Park would require public disclosure and an assessment of reasonable alternatives as outlined in the National Environmental Policy Act (NEPA). The NEPA analysis for a proposed fisher reintroduction in Olympic National Park was initiated in 2005 and a draft environmental assessment is currently being developed and is expected to be released to the public by December of 2006.

If approved, a minimum of 100 fishers are planned for release in Olympic National Park over a 3-year period. Approximately 35 fishers will be released each year within three reintroduction areas in Olympic National Park: the Sol Duc-Elwha area, the Hoh-Bogachiel area, and the Queets-Quinault area. Fishers will be released in the fall and winter months in male-female pairs or small groups. Release locations will include sites along roads, trails, and river corridors within Olympic National Park.

Olympic National Park regulations would protect fishers from commercial harvest and incidental capture within park boundaries. A ban on the use of body gripping traps in Washington has resulted in fewer people buying trapping licenses and actively trapping. This reduction in trapping effort and the ban on body gripping traps would likely reduce the prevalence of incidental fisher captures and their severity on captured fishers, as fishers incidentally captured in cage-type traps (i.e., non-body gripping) are less likely to suffer severe injuries. The effect that commercial trapping or incidental capture by tribal trappers outside the park may have on reintroduced fishers is unknown, but it is not expected to significantly affect reintroduction success.

The reintroduction will be considered a success when a reproductive population of fishers is established in $\geq$1 of the 3 reintroduction areas. Monitoring efforts will be used to evaluate reintroduction success and allow mid-course adjustments to the reintroduction to increase its likelihood of success. Movements, survival, and home range establishment of fishers will be monitored beginning immediately upon release. Confirming reproduction will become a focus of the monitoring program during the denning season (March to June). Fishers will be monitored predominantly through aerial and ground telemetry. If additional funding is available, monitoring efforts could be expanded to use remote hair traps, track-plate and camera stations, or live trapping. Intensive monitoring efforts will be conducted in years 1-3, but monitoring could continue until year 5 or year 10 if additional funding becomes available.

A successful reintroduction would allow important opportunities for research on fishers in Washington. Extirpation prevented any previous opportunities to investigate basic biological and ecological characteristics of fishers in Washington. With additional funding, monitoring efforts could be expanded to conduct research on multi-scale habitat selection, demographics, population genetics, food habits, and dispersal of reintroduced fishers. This research would provide important information for the conservation of fisher populations and habitats on the Olympic Peninsula. It would also help improve the likelihood of recovering fishers throughout their historical range in Washington, and may help guide potential reintroduction efforts elsewhere in the west (e.g., the northern Sierra Nevada and southern Cascades of California, or the Coast Range and Cascades of northern Oregon).

Public outreach and input regarding the proposed fisher reintroduction on Olympic National Park was initiated in 2006 as part of the reintroduction NEPA process. An outreach program associated with an approved reintroduction proposal would likely include presentations, fisher web pages on the Washington Department of Fish and Wildlife and Olympic National Park web sites, the availability of fisher conservation planning documents, and possibly an “adopt-a-fisher” program.

A timeline and budget have been developed for a fisher reintroduction to Olympic National Park. They outline the timing and costs for obtaining, transporting, releasing, and monitoring fishers over a 3-year period.

The cost of these activities over 3 years is estimated at approximately $200,000/year. The U.S. Geological Survey has provided funding to support a significant portion of the monitoring efforts. Additional sources of funding will be pursued if the proposed reintroduction is approved by the National Park Service.

INTRODUCTION

Background and Purpose

The fisher (*Martes pennanti*) once occurred throughout much of the forested area of Washington. Its range included most of western Washington, northeastern Washington, and the Blue Mountains of southeastern Washington. The population declined dramatically after the mid-1800s as a result of overtrapping, loss of older forest habitat at low to mid-elevations, predator and pest control campaigns, poaching, and incidental capture in traps set for other species (Lewis and Stinson 1998, Aubry and Lewis 2003). The decline in the population, as reflected in a declining harvest in Washington, prompted the newly established Washington Department of Game to close the trapping season for fishers in 1934. The season was closed to protect remaining individuals and promote fisher recovery.

Concern for the lack of fisher observations in the 1980s and 1990s prompted Washington Department of Fish and Wildlife (WDFW), the U.S. Forest Service (USFS), National Park Service (NPS), and other organizations to conduct surveys for fishers and other carnivores in Washington using camera and track-plate stations (Seaman and Houston 1984, Lewis and Stinson 1998, Christophersen et al. 2005, Happe et al. 2005). These types of surveys are effective at detecting fishers and other carnivores (Zielinski et al. 1997, Foresman and Pearson 1998), and were conducted throughout forested habitats in Washington from 1990-2003. While the surveys successfully detected many species, no fishers were detected.

Following the surveys in the 1990s, WDFW conducted a status review of the fisher in Washington in 1997-1998 (WAC 232-12-297). The status review concluded that fishers were extremely rare or extirpated from Washington and recommended that they be classified as endangered in the state (Lewis and Stinson 1998). Based on the findings of the fisher status review, the Washington Fish and Wildlife Commission listed the fisher as endangered in the State of Washington in 1998 (WAC 232-12-014). The status review noted that a reintroduction would be required to recover fishers in the state.

In 2002, WDFW, in partnership with Northwest Ecosystem Alliance (now Conservation Northwest; CNW), initiated a study to evaluate the feasibility of successfully reintroducing fishers in Washington. The assessment was limited to the Cascade Mountains and Olympic Peninsula of western Washington. The assessment followed IUCN (1995) recommendations for feasibility assessments, which included determining: 1) if the causes of the decline have been alleviated or no longer exist, 2) if suitable habitat, prey and source populations exist, and 3) if there is adequate support for a successful reintroduction. The feasibility assessment concluded that the reasons for the fisher decline in Washington either no longer existed (i.e., over trapping, mortality from predator and pest control campaigns) or had been alleviated (i.e., loss of older forest habitat, incidental or illegal capture) (Lewis and Hayes 2004). The most significant cause of the decline, overtrapping, is no longer an issue for fisher conservation in Washington because the fisher has protected status as a state-listed endangered species, and the use of body-gripping traps is prohibited in the state. The assessment also concluded that there was an adequate amount and configuration of suitable habitat to support fishers in three locations in western Washington: the Olympic Peninsula, the southwestern Cascades, and northwestern Cascades; that there was a diverse prey base; and that there were suitable and available source populations of fishers in British Columbia and western Alberta.

The feasibility assessment identified the Olympic Peninsula as the best location for the first reintroduction in Washington (Lewis and Hayes 2004). The Olympic Peninsula had the greatest amount of suitable habitat and included a large concentrated area of suitable habitat on the western side. Suitable habitat on the Olympic Peninsula was predominantly on lands managed by Olympic National Park and Olympic National Forest.

Vinkey et al. (2006) determined that fishers released in Montana and Idaho in 1959-1961 were unknowingly released into an area that supported a remnant population of native fishers. The findings of Vinkey et al. (2006) support comprehensive survey efforts to detect remnant fisher populations in a proposed reintroduction area to prevent unknowingly causing genomic extinction of native fisher genotypes as a result of reintroduction. Despite extensive survey efforts across much of the suitable fisher habitat on the Olympic Peninsula, the lack of any verifiable detections since 1969 does not prove that fishers are extirpated. However, if a remnant population exists on the Olympic Peninsula, it would not be expected to recover on its own and a fisher translocation would still be required to recover the species on the Olympic Peninsula. A fisher genetic study is underway which will evaluate genetic similarities among fishers from British Columbia or Alberta and those that historically occurred on the Olympic Peninsula. This study will address the likelihood of genomic extinction of a remnant population, if one still exists on the Olympic Peninsula.

Olympic National Park (ONP) has been interested in fisher conservation since the 1980s when park personnel became concerned about a lack of credible fisher observations and initiated surveys to detect fishers (Seaman and Houston 1984). This interest was heightened when the park was identified as having the largest amount of suitable habitat on the Olympic Peninsula (Lewis and Hayes 2004). Restoration of native plant and animal species is one of the management goals of the National Park Service (National Park Service 2006) and a fisher reintroduction on ONP is consistent with this goal. In 2004, ONP and WDFW proposed a fisher reintroduction in the park, based on the missions and goals of the two agencies, and the findings of the feasibility assessment (Lewis and Hayes 2004). As a federal agency proposing an action on federal lands, ONP and the National Park Service initiated a National Environmental Policy Act (NEPA) process in January 2005 to evaluate alternatives for a proposed fisher reintroduction in the park. The NEPA internal scoping process was completed in fall 2005 and the public scoping process was completed in January of 2006. The NEPA process is expected to be completed by early 2007. Once the NEPA process is completed, the NPS regional director is responsible for approving or rejecting the proposed reintroduction.

WDFW has developed a draft recovery plan for the fisher in Washington, which identifies the reintroduction of fishers to the Olympic Peninsula as the first step toward recovery in the state (Hayes and Lewis 2006). A successfully reintroduced population of fishers on the Olympic Peninsula could ultimately provide an additional source population for future reintroductions in the Washington Cascades. Down-listing from state endangered to threatened or sensitive is contingent upon the successful establishment of persistent populations in the Olympic Peninsula and Cascades recovery areas (Hayes and Lewis 2006).

If the proposed reintroduction to ONP is approved, WDFW and ONP will implement the reintroduction when financial and logistical support are in place. The purpose of this document is to provide the details and guidance needed to effectively implement and monitor the success of a fisher reintroduction on the Olympic Peninsula.

Support and Funding

If approved, WDFW and ONP will work with other cooperators to implement a fisher reintroduction in Olympic National Park. WDFW will be the state-wide lead in the fisher reintroduction program, and will provide overall project management. For implementation and monitoring on the Olympic Peninsula and, in particular on the park, ONP and WDFW will be joint leads. The agencies will work closely with the other major landowners in the area, including Olympic National Forest, Washington Department of Natural Resources (WDNR), native American tribes and private landowners. WDFW and ONP will seek funding and collaborative partnerships to conduct the reintroduction and monitoring programs. Support may also be available from the U. S. Fish and Wildlife Service (USFWS) and Washington Department of Natural Resources (WDNR), and coordination with these agencies would occur throughout a reintroduction. As the research branch of the Department of the

Interior, the U.S. Geological Survey (USGS) will participate with collaborating agencies in designing and implementing a research and monitoring program to evaluate the effectiveness of the reintroduction effort. Tribes, private landowners, the Washington Trapper's Association, the Washington Forest Protection Association, zoos, and non-governmental conservation organizations are also potential cooperators.

Cooperation will be required from agencies and individuals to obtain, house and transport fishers from Canada to Washington. These cooperators include officials from British Columbia or Alberta Provincial Governments, USFWS, U. S. Department of Agriculture, and Washington State Department of Agriculture, as well as provincial trapper associations, captive wildlife facility managers and caretakers, veterinarians, transport facilitators, and border-crossing inspectors.

WDFW has received State Wildlife Grants funding from USFWS to conduct the feasibility assessment, write the recovery plan, and to plan for a fisher reintroduction. The USFWS Yreka Fish and Wildlife Office provided funding to WDFW to develop this implementation plan. The National Park Service, ONP, and WDFW have provided funding and support to conduct the NEPA process for the proposed reintroduction in the park. The USGS has funded, at the request of the National Park Service, a 3-year project to evaluate and monitor effectiveness of the initial release efforts, if approved. Additional support for implementation will be required if the NPS approves the proposed reintroduction.

Project Management

WDFW will be the lead agency for the reintroduction and will provide project management. WDFW will work in close cooperation with Olympic National Park, which is the lead land management agency, as well as Olympic National Forest and Washington Department of Natural Resources. A fisher recovery team will be formed to provide advice and recommendations during the planning, implementation and monitoring phases of the reintroduction process.

AN EVALUATION OF FISHER TRANSLOCATIONS

The decline in the fisher population in the early 1900s prompted fisher translocations throughout much of its' historical range (Berg 1982, Powell 1993). Translocations are the intentional release of animals to the wild to reestablish, augment or establish a population (Griffith et al. 1989). A reintroduction is an attempt to reestablish a population where it no longer exists within its historical range; an introduction is an attempt to establish a population outside its historical range; and an augmentation is an attempt to add individuals to an existing population (IUCN 1987, Nielsen 1988).

Appendix A summarizes 35 documented translocations that occurred from 1947 to 2004. In Canada, fishers have been translocated into six provinces, and translocations were successful in each, including British Columbia and Alberta. In the United States, fisher translocations have been conducted in 14 states and have been successful in at least 10 of them, including Montana, Idaho and Oregon (Appendix A). A reintroduction in Tennessee is too recent to determine its outcome.

Documented translocations were evaluated to determine if factors could be identified that contributed to translocation success. Among the 35 documented translocations, 27 were reintroductions, 6 were augmentations, and 2 were introductions (Appendix A). In evaluating translocations, only reintroductions and augmentations were considered, and only the 29 reintroductions and augmentations for which the outcome (i.e., success or failure) could be determined were used (Appendix A). Twenty-three (79%) of the 29 translocations were considered successful.

The success or failure of a translocation was based on information available in the literature and from information obtained via personal communications with agency personnel or those involved in the translocations. Success was defined as the persistence of a fisher population $\geq$8 years after the completion of a reintroduction.

Eight years was chosen as the length of time to determine success because the success of two recent translocations (British Columbia from 1996-1998, and Pennsylvania from 1994-1998; Appendix A) could be determined within 8 years of their completion. For most successful translocations, success was obvious due to abundant sightings, road-kill mortalities, and incidental captures in traps set for other species. Failure was often harder to prove, as the complete loss of a reintroduced population may take many years, and absence of a fisher population can be difficult to confirm. Unfortunately, failed translocations frequently had the least documentation available to evaluate the factors associated with their outcome (Appendix A). The outcomes of a 1956 translocation in Ontario and a 1972 translocation in Maine were unknown, and were not included among the 29 evaluated translocations. In Ontario, a nearby existing population expanded into the area where fishers were reintroduced in 1956, and it was not known if the reintroduced population persisted and became incorporated into the expanding population, or if it died out prior to that expansion.

Using information available from the 29 translocations, eight factors were identified that could relate to translocation success:

- Number of fishers released
- Sex ratio of released fishers
- Months when released
- Number of consecutive years that releases occurred
- Proximity of the source population
- Hard vs. soft release (hard-released animals are immediately released upon delivery to a release site; soft-released animals are held in captivity for several days at the release site to acclimate them to the site and provided incentives (e.g., food, fisher scent) to encourage them to stay near the release site after being released (Davis 1983)
- Protection from recreational trapping for fishers, specifically
- Protection from incidental capture in traps legally set for other species

When evaluating factors that could relate to translocation success (Table 1), values for two factors–the mean number of fishers released and the mean number of consecutive years that fishers were released–were significantly greater (t-test: $t=2.789$, $p<0.01$; t-test: $t=2.974$, $p<0.005$, respectively) for successful translocations than for unsuccessful ones.

Values for several factors (sex ratio, seasons when fishers were released, hard vs. soft release, protection from recreational trapping, proximity of the source population) were similar for successful and unsuccessful translocations. Protection from incidental capture was available for a greater percentage of unsuccessful translocations than for successful translocations.

Protection from recreational trapping harvest may be important to the success of some translocations (Table 1). Protection from recreational trapping would be expected to benefit a translocated population; however, in some reintroductions, recreational trapping seasons for fishers did not prevent the reestablishment of a fisher population (e.g., West Virginia; Pack and Cromer 1981). Recreational trapping seasons that coincided with fisher translocations were regulated and were less likely to result in the overexploitation of fishers that occurred prior to the institution of trapping regulations (i.e., in the 1800s and early 1900s). Season and harvest restrictions limited the effect of the trapping season on some translocated populations (e.g., Montana, West Virginia; Appendix A), and also provided a means to monitor fisher persistence and population expansion (Pack and Cromer 1981).

Protection from incidental capture may also be important to reintroduction success (see Lewis and Zielinski 1996), but protection alone cannot ensure success, and in some cases protection is not necessary. For example, all land trapping was prohibited in an area where fishers were reintroduced in the southern Oregon Cascades in 1960 (Kebbe 1961a,b); but because only 11 were released, the population was especially vulnerable and died out. Alternatively, a land trapping closure was instituted in an area of northwestern Connecticut where most trapping was

Table 1. Comparison of eight factors used to evaluate the success of 29 fisher translocations in North America (1947-1998)

Factor	Successful Translocations (N=23)	Failed Translocations (N=6)
Mean number (±SE) of fishers released	60.3 ± 10.3; range 12-190	22.5 ± 8.4; range 4-60
Sex ratio of released fishers	54% females; 46% males	56.5% females; 43.5% males
Release dates	72% in fall and winter	83% in fall and winter
Mean number (± SE) of consecutive years that releases occurred	3.48 ± 0.44	1.67 ± 0.42
Proximity of source population	18 (78%) used the closest stock, 2 (9%) used the closest and a distant stock, 2 (9%) used a distant stock, 1 (4%) used unknown stock	6 (100%) used the closest stock
Hard vs. soft release[a]	17 (73%) used hard, 2 (9%) used hard and soft, 2 (9%) used soft only, and 2 (9%) release unknown	6 (100%) used hard
Protection from recreational trapping for fishers	17 (74%) protected, 4 (17%) unprotected, 2 (9%) unknown	4 (66.7%) protected, 1 (16.6%) unprotected, 1 (16.6%) unknown
Protection from incidental capture	5 (22%) protected, 16 (70%) unprotected, 2 (8%) unknown	4 (66.7%) protected, 2 (33.3%) unprotected

[a] Hard releases involve the immediate release of animals upon arrival at the release site. Soft releases involve temporarily housing animals at the release site to acclimate them to the site, and providing food and scent near the release site to encourage individuals to stay near the release site, post-release.

done for aquatic furbearers. While the closure did provide legal protection for fishers, the protection was provided in an area where trapping presented little threat to a fisher population. Consequently, while protection from trapping may be important for some reintroduced populations, it was not an important predictor of reintroduction success.

The degree to which adaptive management is a factor in success of a translocation is likely to be dependent upon how quickly or sufficiently a reintroduction program can respond to issues that could cause a translocation to fail. It is unknown if adaptive management resulted in mid-course adjustments in programs that would have otherwise failed.

Eliminating or reducing the original causes of extirpation, having an adequate base of suitable habitat, providing a large enough founding population, and protection from significant human-caused mortality are important baseline goals to be met before considering a fisher reintroduction. Data was not available to evaluate whether there was adequate suitable habitat available in reintroduction areas, and how that influenced reintroduction success or failure. Clearly, no translocation could succeed without an adequate amount and configuration of suitable habitat. However, lack of information on the availability of suitable habitat limits an understanding of which factors may have contributed to the failure of translocations in areas that had an adequate amount of suitable habitat.

OBTAINING FISHERS FOR REINTRODUCTION

A genetic assessment of potential source populations identified fishers from British Columbia, California, and Alberta as suitable for reintroduction in Washington (Warheit 2004). Because of their protected status, fishers from California are not available for translocation to Washington. Informal inquiries indicate that fishers are available from Alberta and may be available from British Columbia. Formal requests will be made by WDFW to ministry authorities in both provinces for their assistance in obtaining fishers for translocation to Washington.

Assistance from provincial authorities will include the designation of a provincial coordinator from the authorizing ministry to communicate and coordinate translocation activities within a province and to coordinate with a WDFW project leader. The provincial coordinator and WDFW project leader will provide oversight for the capture, holding, and transporting of fishers to Washington. The WDFW project leader will develop service contracts for project contractors and tasks. Protocols for capturing, handling, transporting, and captive care of fishers were developed by Evans (1996, 1997, 1998) for the 1996-1998 East Kootenay reintroduction in British Columbia (Fontana et al. 1999); these protocols will be used in the Olympic National Park reintroduction, and are outlined in the sections below.

Capture

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

Fisher trapping will be done by members of the provincial trapper associations. Similar to Colorado lynx reintroduction capture efforts (S. Waits, pers. comm.), a trapping coordinator would be hired in a province to coordinate and oversee fisher capture efforts. The trapping coordinator will explain the capture goals, techniques and equipment to interested trappers; assist and communicate with participating trappers as necessary; and obtain captured fishers from trappers for temporary placement in a captive facility. A payment schedule will be developed that provides sufficient financial incentive for trappers to provide fishers for the reintroduction. The WDFW project leader will be responsible for paying trappers for fishers deemed acceptable for translocation. The trapping coordinator will be responsible for obtaining or constructing holding boxes used for transporting and housing fishers. The trapping coordinator will also assist in the handling and care of fishers held in captivity, and will assist in the transport of fishers to Washington.

Fishers will be captured using box (cage-type) traps. A number of box traps will be available from provincial government agencies; additional box traps will be purchased, as necessary. Box traps will be used in one or more configurations. The most-simple configuration is a box trap with a wax-coated cardboard sleeve placed around the entire length of the trap to keep captured fishers dry and warm (R. Weir, pers. comm.). The second configuration is a box trap with a wooden box (61 x 31 x 25 cm) attached to the end of the trap to provide protection from the weather and to minimize disturbance (Seglund 1995). The attached wooden box is made of plywood but has an interior lining of formica to prevent the fisher from biting and clawing at the box and possibly injuring itself or escaping. A supply of traps with cardboard sleeves or attached wooden boxes will be provided to participating trappers. The trapping coordinator will also provide participating trappers with holding boxes (2'x 2'x 4' wooden holding boxes; Figure 1) to house fishers until they are delivered to the captive holding facility. During transport from a trap line to the holding facility, fishers will be provided food (e.g., meat scraps or cat food) and water inside their holding box.

Transfer and Holding in Captivity

Fishers are expected to spend two to three weeks in captivity. Length of time in captivity will be determined by how many animals have been captured and are available for transport to Washington. For example, fishers will not be transported until there are 15 or more that could be shipped at one time. Consequently, some individuals will spend more time in captivity until 15 or more are obtained, processed, and prepared for translocation according to veterinary protocol.

Housing. When a fisher is captured, the trapper and trapping coordinator will arrange a meeting place and time to transfer the fisher, then the coordinator will deliver it to the holding facility. The holding box will then be combined with a cage (Fig. 1) and become the temporary unit to house the fisher before transport to Washington. The combined holding box and cage are easily cleaned and manipulated to isolate the fisher in either the box or cage. Bedding of hay or wood-shavings can be provided in the box, and structures such as brush, logs and plastic buckets should be placed in the cage to allow for chewing and climbing, and to provide additional resting sites (LaBarge 1987, Evans 1996, Frost and Krohn 1994).

The WDFW project leader will be responsible for securing a facility to hold captured fishers in British Columbia or Alberta, and for employing captive wildlife specialists to staff the facility while fishers are in captivity. The facility used to house and care for fishers prior to transport to Washington will be centrally located in the area where most fisher captures are likely to occur. The captive facility will provide a secure, enclosed space (e.g., barn, outbuilding, zoo) suitable to quarantine individual fishers; it will have a capacity for up to 20 housing units and will be subject to minimal disturbance. The facility will be staffed by at least 1 on-site, captive wildlife specialist. The specialist(s) will be responsible for transferring captured animals to holding pens; providing food, water and medical care; handling fishers as necessary; coordinating with and assisting veterinarians with inspections, treatments and certifications; and assisting in preparing fishers for transport and release.

Care. Captive fishers are typically fed once a day, while water is provided ad libitum. Captive fishers can be fed a variety of foods, including venison, ground beef, mice, rabbits, mink or ferret chow, eggs, and nutritional supplements (Frost and Krohn 1994, Fontana et al. 1999, Mitchelltree et al. 1997). Evans (1996, 1997, 1998) provided captive fishers with salmon, eggs, and meat obtained from deer, beaver, rabbit, and squirrel carcasses that were donated by trappers and local biologists. Fishers will be provided generous daily portions (e.g., 400 g for females, 550 g for males) to encourage weight gain.

Health Evaluations, Medical Treatments, and Reintroduction Preparation

Evaluations of health and physical condition, medical treatments, and reintroduction preparations require that each fisher be chemically immobilized to protect the individual fisher and veterinarian. To minimize the stress and risk associated with chemical immobilization and handling, each individual fisher will only be immobilized once. All evaluation, treatment and preparation procedures will be conducted at that time (see protocol in Appendix C).

Photo by Irene Teske

Photo by Marg Evans

Figure 1. Two views of a fisher housing unit. The holding box is a 2’ x 2’ x 4’ plywood box that is attached to a wire cage (2’ x 4’ x 5’) and placed on a stand to serve as a housing unit. The holding box can also be used independently to transport fishers (Evans 1996, Teske 1996, Fontana et al. 1999).

Health and Physical Condition. Fishers brought to the captive facility will be examined to evaluate their health and physical condition. The evaluation will include confirming the individual's sex; obtaining weight and morphological measurements; and identifying wounds, deformities, and evidence of disease or ectoparasites. Age will be estimated for each individual through evidence of tooth wear, sagittal crest development, or enumerating cementum annuli of an extracted premolar. Female reproductive status is difficult to determine until active gestation begins (in February and March) or birthing has occurred (i.e., March and April). Because most releases will likely occur before active gestation begins, we will assume that adult females (i.e., those >1 year old) are potentially pregnant until post-release monitoring data indicate otherwise. Endoparasite infestation will be evaluated by testing fecal samples. Physiological condition and disease exposure will be assessed by evaluating blood chemistries and antibody titers.

Medical Treatments. Fishers will be kept separated to prevent disease transmission. They will be treated for wounds, injuries or infections, and will be vaccinated for rabies and distemper (Appendix C). Ivermectin and Droncit treatments will be provided for endoparasite infestations, and flea and tick treatments will be provided as necessary.

Preparing Fishers for Reintroduction. To monitor fishers after they are released, each individual will be genotyped, which requires DNA analysis of a tissue sample (i.e., hair sample or ear punch). Fishers will then be identified by their genotype if recaptured or if a hair sample is collected at a hair-trap station. Each individual will 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 captured or found dead). Each animal will also be photographed to allow identification of individuals by any unique pelage markings. Fishers will be equipped with a radio-collar (VHF transmitter) with an expected lifespan of ≥15 months.

Cooperating veterinarians will conduct examinations and medical treatments, and will be assisted by project biologists and captive wildlife specialists. Veterinary examinations are required to determine if individual fishers are suitable for reintroductions (i.e., healthy, no debilitating injuries, sound teeth and claws). An examination is also required before a veterinarian can issue a health certificate, which is required for each fisher being transported from Canada to Washington.

Requirements For Importation To Washington

A number of tasks are involved with successfully importing wild animals to Washington from British Columbia or Alberta. These serve to meet federal, state and provincial requirements and include completing health certifications, obtaining 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 holding boxes; no additional handling or chemical immobilization is expected.

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

Washington State Requirements. The Washington State Department of Agriculture (WSDA) requires that an accredited and licensed veterinarian inspect each animal. WSDA will 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 will 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 will provide an importation permit number over the phone, which is then written on the health certificate.

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

U. S. Federal Requirements. U. S. Customs agents will also require prior notification that a shipment of fishers is arriving in the U. S. Before entry into the U. S., agents will likely inspect fishers, their holding boxes and associated paperwork, and question personnel transporting the fishers. The U. S. Fish and Wildlife Service (USFWS) requires prior notification of the expected port of entry (by land or air) as well as a declaration of importation (completed USFWS form 3-177) for live animals and tissues being transported into the U. S. A USFWS agent will review paperwork and inspect fishers to confirm humane transport (M. Williams, pers. comm.). No CITES permits are required for fishers.

RELEASING FISHERS IN WASHINGTON

Founder Population

An objective for the Olympic National Park reintroduction will be to release a founder population of ≥100 fishers which is female-biased (60% females: 40% males), and adult-biased (higher percentage of adults than typically found in wild populations). This objective may be met if capture success is high enough; however, limited capture success may only allow for obtaining the target population size but not the desired sex- or age-ratio for founders.

The target founder population size of ≥ 100 fishers is based on the success of previous translocations and the findings of population modeling. Nine of 10 translocations that released ≥60 fishers were successful, and all four that released >100 were successful (Appendix A). Population modeling for the Olympic Peninsula suggested that populations that started with 60 or 100 females resulted in larger resident population sizes and established them 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), and would total 107 fishers.

Observed sex ratios from successful translocations were slightly female biased, at 54% females and 46% males. Observed sex ratios for a trapped sample of fishers from British Columbia (Weir 2003) and Ontario (Douglas and Strickland 1987) were slightly more female biased, at 58% females and 42% males. When modeling reintroduced fisher populations, Powell and Zielinski (2005) demonstrated that founder populations with female-biased sex ratios (60-80% females) had the greatest likelihood of population persistence. However, heavily female-biased sex ratios (e.g., 80% females: 20% males) may result in reduced effective population sizes (M. Schwartz, pers. comm.). Consequently, the objective for the Olympic National Park reintroduction will be to release a female-biased founder population with approximately 60% females and 40% males.

The project will also seek a founder population that is adult-biased (i.e., fishers >1 year old) to increase productivity, survival and genetic diversity. In British Columbia, adults made up 42.7% of a sample of 325 harvested fishers, with the sample consisting of 26.4% adult females, 16.3% adult males, 31.1% juvenile females and 26.2% juvenile males (Weir 2003). With adults making up 42.7% of a trapped sample of the wild population, an adult-biased founder population could consist of ≥50% adults. 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 present in the founder population), thereby expanding the genetic diversity of the founder population.

Release Process

Most translocations have employed hard releases, i.e., releasing fishers immediately upon arriving at a release site. However, several translocations have used soft releases, where fishers are temporarily housed at the release site prior to release and provided incentives (e.g., food, fisher scent) to help them acclimate to the site and to encourage them to remain near the site after release (see Davis 1983). While two successful translocations used only soft releases (Alberta, Proulx et al. 1994; British Columbia, Weir 1995; Appendix A) and 2 others used soft and hard releases (Montana, Roy 1991, Heinemeyer 1993; Connecticut, Rego 1989; Appendix A), it is difficult to conclude that release method has a significant relationship to success. Proulx et al. (1994) concluded that soft releases did not help keep fishers close to the release site, but rather that the timing of a release, relative to breeding season and vegetative cover, was a more important factor affecting post-release movements. Weir (1995) similarly concluded that soft releases failed to prevent fishers from wandering extensively after being released. Because soft releases are more expensive and have not prevented extensive post-release movements, hard releases are the preferred choice for releases in Olympic National Park.

Fishers are generally solitary except during the breeding season or when mothers are with kits (Powell 1993). Given their solitary nature, there may be advantages in releasing them individually rather than in groups. Groups of fishers have been released simultaneously at a single site, where a number of males and females are in close proximity to each other after being released (e.g., Kebbe 1961a,b, Serfass et al. 2001). There is no information to suggest that group releases affect translocation success or result in aggressive interactions among released fishers. Releasing fishers in groups may make individuals aware that other fishers are in the vicinity and allow individuals to identify potential mates. Alternatively, Fontana et al. (1999) released fishers in male-female pairs during the breeding season, with individuals of the pair being separated by 2 km. They anticipated that males would tend to stay in the vicinity of the release site due to the presence of a female nearby. They found that the average distance between the release site and center of their home range was 14.6 km for females (n=13) and 26.0 km for males (n=4). The approach in Washington will vary depending on the number of fishers available to release at a given time and release site limitations, but will generally follow the male-female pair scenario used by Fontana et al. (1999). 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.

Many fisher translocations have released fishers during the fall and winter months (Table 1). The dates of releases were generally associated with the timing of trapping seasons (typically fall and early winter) or when fishers were most vulnerable to capture, in winter (see Berg 1982). Pre-release processing and transport was minimal (~24 hours) for some translocations (Dodge 1977), but could take several weeks or even months depending on the objectives of the program (Proulx et al. 1994, Fontana et al. 1999, Serfass et al. 2001). The goal for the Olympic National Park reintroduction is 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 accumulate deep snowpacks 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 are necessary, they are not anticipated to be a hardship for fishers.

Release Scenarios

It is expected that fishers will be released over a 3-year period. The timing, number, and locations of fishers released will 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 two of three reintroduction areas (see Reintroduction Areas below).

Year 2. Adapt release approach based on monitoring results from Year 1 and the availability of fishers from the source population. If no significant changes are required and fishers are 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 limits the number that can 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. Release approaches in Year 3 will follow successful release approaches developed in Years 1 and 2. Release 35 additional fishers in the fall and winter in reintroduction areas, or in alternative locations within the larger Olympic Recovery Area (Hayes and Lewis 2006).

Olympic Recovery Area

The reintroduction of fishers will occur on the Olympic Peninsula of Washington, within Olympic National Park. The draft Washington State fisher recovery plan identifies the Olympic Recovery Area as Olympic National Park (where fishers will be released) and Olympic National Forest (Hayes and Lewis 2006). The Olympic Peninsula is approximately 5000 square miles and is bordered by the Pacific Ocean to the west, the Strait of Juan de Fuca to the north, and the Puget Sound to the east. The center of the peninsula is dominated by the Olympic Mountains, glaciated headwaters, and steep drainages that radiate outward in all directions. Elevation ranges from sea level to 7923 feet at the top of Mt. Olympus near the center of Olympic National Park. The mountainous center slopes to a pronounced coastal plain to the west and smaller plains to the north and east.

The western portion of the Olympic Peninsula is classified as a temperate rainforest, where the maritime influence of the Pacific Ocean moderates temperatures (National Park Service 1998). Maximum temperatures are generally in the 70's, and minimum summer temperatures are in the 40's and lower 50's. Winter maximum temperatures at lower elevations range from 38 to 45 degrees F with minimums of 28 to 35 degrees F. Seldom do temperatures drop below 20 degrees F at lower elevations.

Eighty percent of annual precipitation falls from October through March. On the western slopes of the Olympic Mountains, annual precipitation ranges from 125 to 200 inches. Most winter precipitation falls as rain at elevations below 1,000 feet and as snow above 2,500 feet. Snow in the mountains generally arrives in October, and remains until June or July. Snowfall ranges from 8 to 30 inches at low elevations and up to 500 inches near the crest of the Olympic Mountains. Due to the rainshadow effect of the Olympic Mountains, annual precipitation in the northeastern portion of the Olympic Peninsula is often less than 20 inches.

The moist climate and broad range of elevation on the Olympic Peninsula support dense vegetation ranging from lowland hardwoods to sub-alpine species, however the majority of the peninsula is covered with conifer forests (National Park Service 2005). The forest zones occurring on the Olympic Peninsula include the sitka spruce zone (*Picea sitchensis*; <600 feet elevation), western hemlock zone (*Tsuga heterophylla*; 500–2000 feet on the west side, 0-4000 feet elevation on the east side), Pacific silver fir zone (*Abies amabilis*; mid elevations), mountain hemlock zone (*Tsuga mertensiana*; generally >3500 feet elevation) and the subalpine fir zone (*Abies lasiocarpa*; >4000 feet elevation). Timberline is approximately 5000-6000 feet in elevation.

Olympic National Park includes the mountainous center of the Olympic Peninsula as well as mid- and low-elevation forested river drainages (Fig. 2). The park interior (excluding the coastal strip and the Queets River corridor) contains about 704,139 acres of forested habitat and almost all (96%) of this area is managed as wilderness. Olympic National Park contains one of the largest areas of low- to mid-elevation, old-growth conifer forest in North America.

The park's circumference is bounded by the Olympic National Forest, which occupies mountainous terrain in the middle portions of drainages that originate in the park (Fig. 2). Outside the Olympic National Forest boundary are lower elevation lands that are owned and managed by the Washington Department of Natural Resources (WDNR), tribes, private timber companies and other private landowners, counties, and local municipalities. Landscapes dominated by low- to mid-elevation, late-successional forests occupy large areas of Olympic National Park and Olympic National Forest, and some areas on WDNR lands on the Olympic Peninsula. Collectively these landscapes are expected to provide enough suitable habitat to support a self-sustaining fisher population on the Olympic Peninsula (Lewis and Hayes 2004).

Intensive timber management has occurred on Olympic National Forest and WDNR lands since the 1950s; however, both ownerships have retained areas of unmanaged conifer forests. As part of the Northwest Forest Plan (USDA Forest Service and USDI Bureau of Land Management 1994), much of Olympic National Forest is now managed as late-successional forest reserves, where older forests are protected and younger forests are managed to accelerate the development of older forest characteristics. WDNR lands on the Olympic Peninsula are managed under the guidance of a habitat conservation plan (Washington Department of Natural Resources 1997), which targets the retention of older forests for spotted owls (*Strix occidentalis*) and marbled murrelets (*Brachyramphus marmoratus*) that would serve as suitable fisher habitat in the western Olympic Peninsula.

Private and tribal lands occur in the lower elevations at the periphery of the National Forest and WDNR lands. They are dominated by second growth forests as a result of intensive, short-rotation timber management, and are not expected to provide significant support for fisher reestablishment.

Reintroduction Areas

The fisher science team that assisted with the feasibility assessment (Lewis and Hayes 2004) evaluated the distribution of suitable habitat, landownership, habitat composition and climatic conditions on the Olympic Peninsula to identify suitable reintroduction areas (Fig. 2). These areas were chosen because they were large, easily defined areas of suitable habitat that are likely capable of supporting populations of fishers, and they are connected to each other by corridors of suitable habitat and travel cover. This habitat connectivity would allow fisher movement among reintroduction areas and to other National Park and National Forest lands on the Olympic Peninsula (Fig. 2).

Elwha-Sol Duc Area. The Elwha-Sol Duc area (Fig. 3) has a large amount of suitable habitat in federal ownership and has the driest forest conditions of the three reintroduction areas. The fisher science team visited the area and concluded that the Elwha-Sol Duc 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 the Elwha-Sol Duc area should be considered a priority area for release, but also noted that it's narrow, linear shape may 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. Within the Elwha-Sol Duc

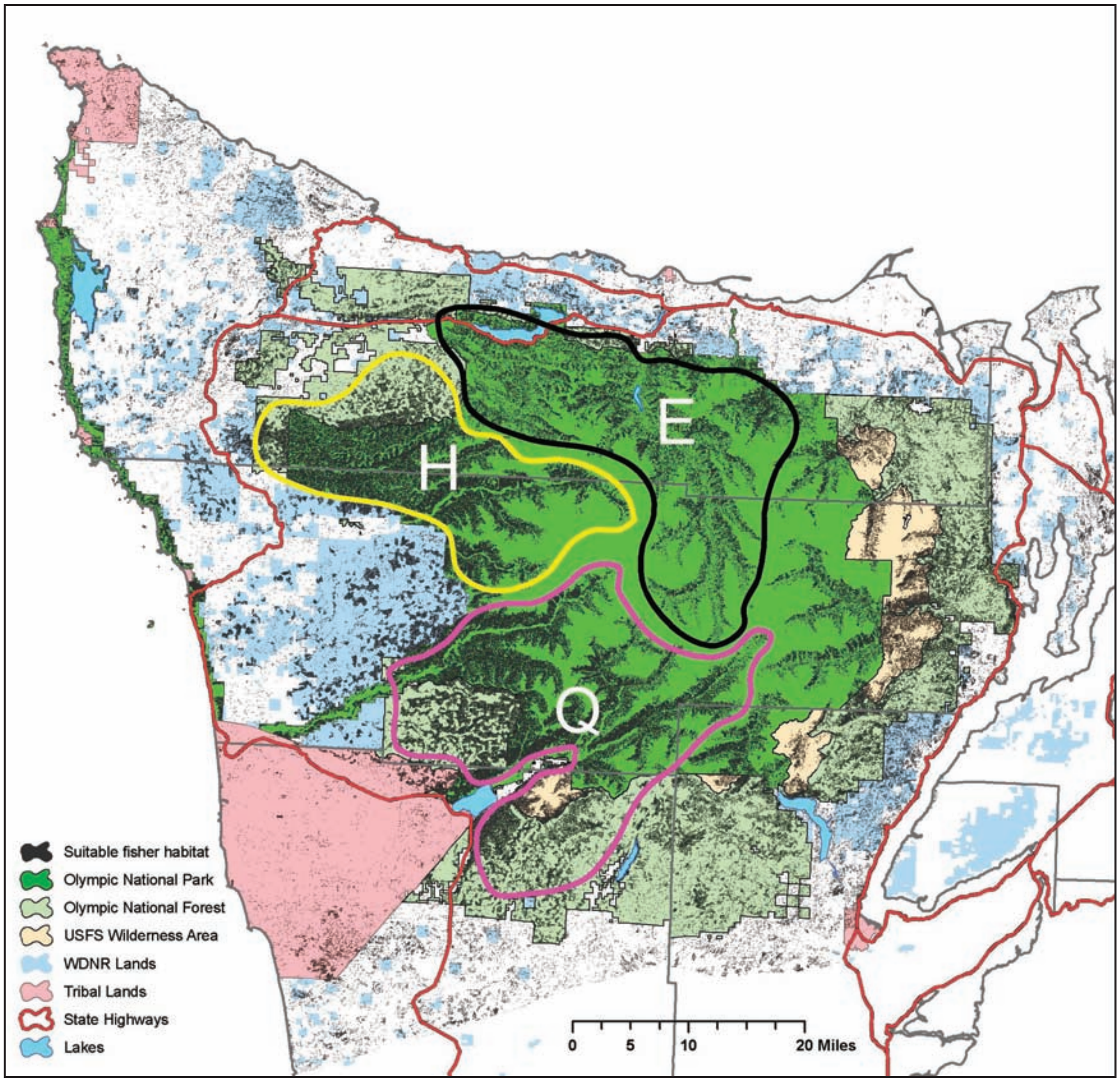

Figure 2. Three initial reintroduction areas for fishers on the Olympic Peninsula. The Elwha-Sol Duc area (E) is outlined in black, the Hoh-Bogachiel area (H) is outlined in yellow, and the Queets-Quinault area (Q) is outlined in magenta.

area, fishers would likely be released along park roads in the Sol Duc and Elwha River drainages, at locations along the Hurricane Ridge Road in the northeastern corner of the reintroduction area, and along park trails (Fig. 3). Scattered clearings and gravel bars along the Elwha River would also provide helicopter access to release sites (Fig. 3).

Hoh-Bogachiel Area. The Hoh-Bogachiel area (Fig. 4) contains a large amount of suitable fisher habitat in federal ownerships and is characterized by wet forest conditions. This large area of suitable habitat is centrally located between the two other reintroduction areas. Consequently, the Hoh-Bogachiel area provides a large area of habitat for released fishers and also provides 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 and Hoh drainages (Fig. 4). Fishers could also be released near clearings and gravel bars along the Bogachiel and Hoh Rivers that were accessible by helicopter (Fig. 4).

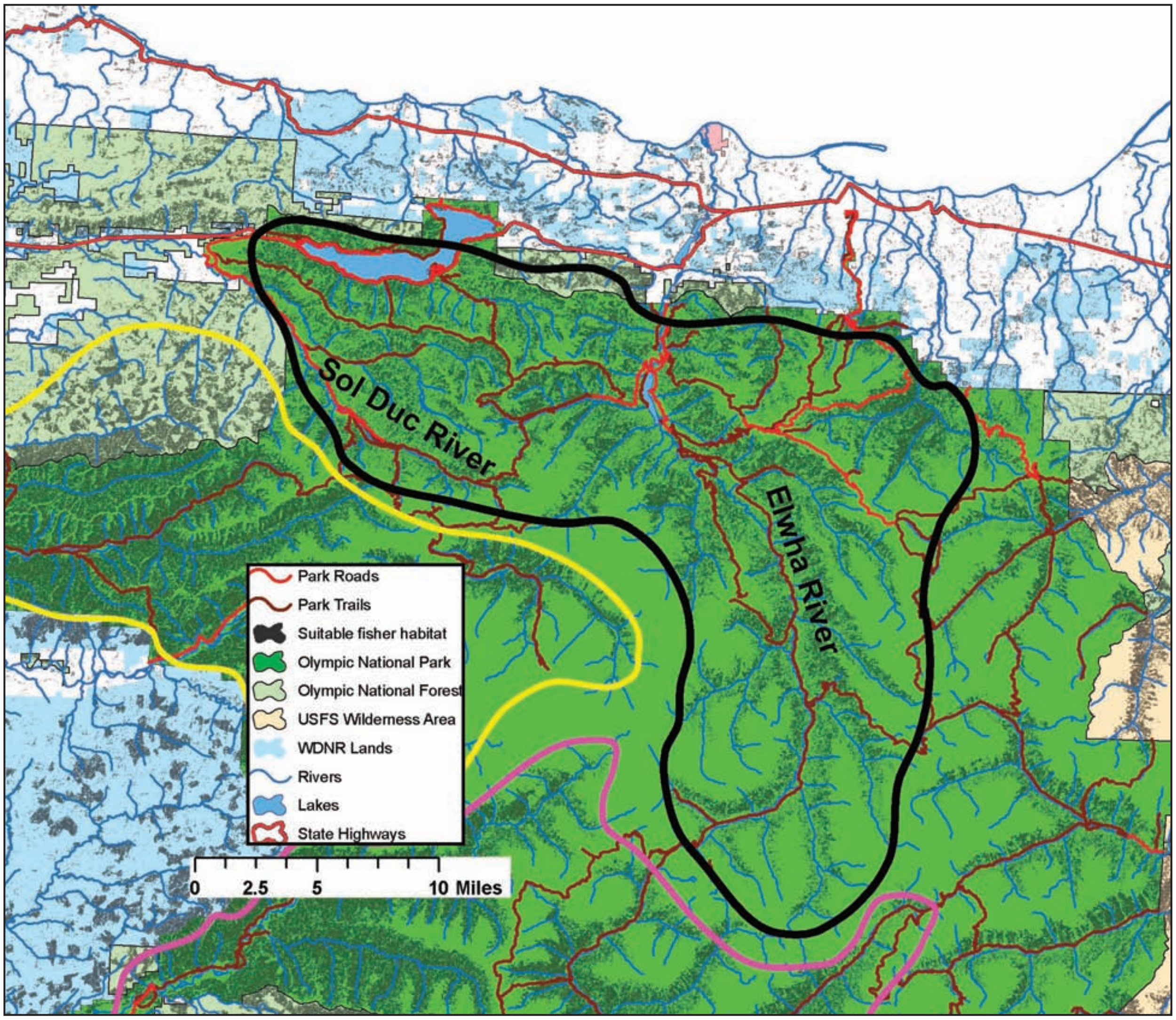

Figure 3. The Elwha-Sol Duc reintroduction area, located on the northern side of Olympic National Park and Olympic National Forest.

Queets-Quinault Area. The Queets-Quinault area (Fig. 5) is located 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 of this area are unlike any other areas where fishers currently exist in western North America, anecodotal 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). These accounts suggest that the Queets-Quinault area 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 are less suitable. The first releases in the Queets-Quinault area would occur in Year 2 of the reintroduction. Within the Queets-Quinault area, fishers would be released along the Queets River trail, or along the roads and trails on the Quinault River (Fig. 5). Fishers could also be released near clearings and gravel bars along the Queets or Quinault Rivers that were accessible by helicopter (Fig. 5).

Fisher releases are likely to occur in each of the three reintroduction areas. Park roads, park trails,

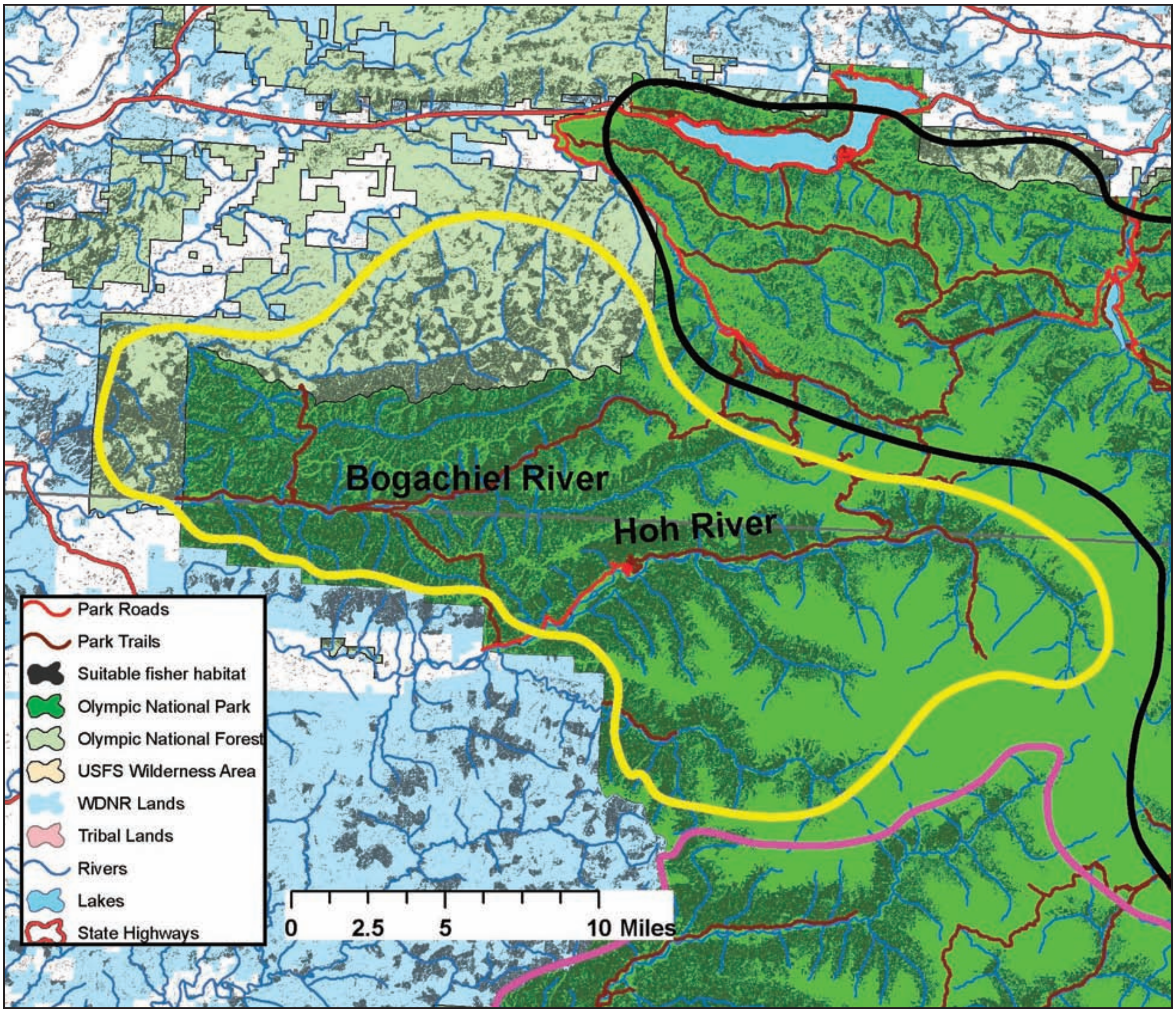

Figure 4. The Hoh-Bogachiel reintroduction area, located in the northwestern corner of Olympic National Park and Olympic National Forest.

and river corridors are available to access release sites in each reintroduction area (Figs. 3, 4, and 5). Access by park roads and trails can be intermittent depending on various weather conditions, river flow levels, and maintenance factors. Gravel bars and other clearings within each reintroduction area can be accessed by helicopter (from September 15th to March 1st) and these locations will be used as release locations when road and trail access is limited or impractical. Some areas of the Park may be more easily accessed though the road network on Olympic National Forest, and these areas could also serve as release sites. Male-female pairs would be released along park roads, park trails and river corridors throughout reintroduction areas to saturate suitable habitat.

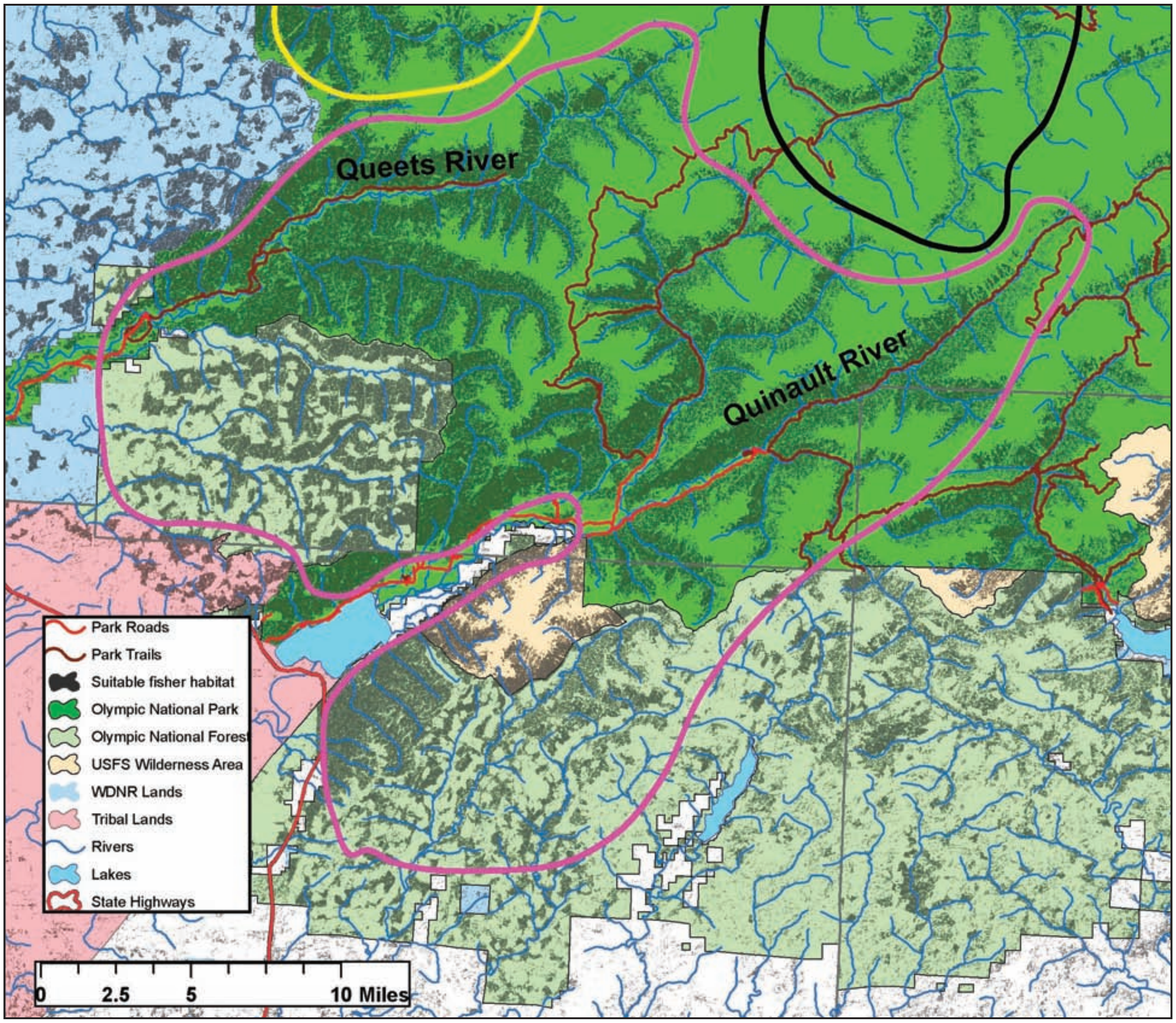

Figure 5. The Queets-Quinault reintroduction area, located in the southwestern corner of Olympic National Park and Olympic National Forest.

MONITORING

The goal of reintroduction monitoring is to determine if a reintroduction is successful. Many of the earliest translocations used incidental observations (e.g., incidental captures, road kills) to detect success, or evaluated success retrospectively by releasing fishers and checking back in a few years to see if the population persisted. However, more intensive monitoring can indicate when a reintroduction is not succeeding before it is 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, monitoring efforts could be increased in that area, or subsequent releases could emphasize placement of adult females in alternative reintroduction areas. Monitoring should involve the tracking of as many released individuals as possible and should commence at the time of their release. It should continue until it can be clearly demonstrated that a self-sustaining population has been established, or until it is determined that monitoring is no longer needed due to reintroduction failure, or is no longer possible due to a lack of support or funding. Because monitoring efforts are constrained by available funding, the first measure of reintroduction success will be based upon the 3-year period when fishers will be reintroduced and actively monitored. Over this 3-year period, the reintroduction will be considered a success if there is evidence of a reproductive population in ≥1 of the three reintroduction areas. If additional funding is available, monitoring efforts could extend to Years 4 and 5, and Years 6-10.

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

Monitoring Objectives

Monitoring of reintroduced fishers, and the population as a whole, will focus on obtaining information on four biological measures: survival, movements, home range establishment, and reproduction. These measures will determine if a reproductive population has become established in ≥1 reintroduction area. If additional funding becomes available, monitoring efforts will be expanded to track recruitment and population expansion.

Survival and Movements. The first step in monitoring will be to determine if released fishers, especially females, survive to establish a home range and reproduce. Radio-telemetry will be used to relocate fishers to track movements and survival. Newly released fishers may wander extensively as they explore the reintroduction area, and maintaining frequent contact with fishers will make it easier to relocate those that travel extensively. A mortality signal function will be incorporated into each VHF transmitter to efficiently identify mortality events and allow a prompt investigation of the cause of mortality. Post-release movement patterns and use of habitats and landscapes will be determined. This information will be used to evaluate and modify release and monitoring approaches.

Home Range Establishment. After a period of exploration, individual fishers may establish a home range, which will 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 is a measure of success as it can indicate that the area is meeting the needs of that individual and is 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-December).

Reproduction. Confirming successful reproduction is an important milestone for a reintroduced population and is a measure of reintroduction success. In previous studies (e.g., Aubry and Raley 2006), reproduction was documented by tracking the movements of adult females to den sites and observing behaviors consistent with birthing and kit rearing. Once a suspected den site is found, kits can 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 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 will be used to monitor released fishers and their offspring in the Olympic Recovery Area.

Radio-telemetry. While telemetry is expected to be the main tool to monitor fishers during the reintroduction, it is anticipated to be complicated in Olympic National Park and in portions of Olympic

National Forest due to access limitations for ground telemetry (e.g., few roads in the park, numerous road closures on ONF), and weather limitations for aerial telemetry. The number of telemetry locations obtained for fishers that occur within the Park or in Olympic National Forest wilderness areas may be limited, whereas the number of locations for fishers in more accessible areas could be much greater. Given the potential limitations on data collection, the objective will be to get ≥2 locations per week for individual fishers. Where access is limited, it may only be possible to obtain ≥2 locations per month for fishers via walk-ins or aerial telemetry. Beginning in March, emphasis will be placed on tracking adult females until their reproductive status is determined. Where access allows, den sites will be investigated on foot to confirm reproduction.

Genetic Sampling. All released and captured fishers will be genotyped through the collection of DNA via ear punches and hair samples. Released individuals can then be identified and confirmed as alive through the use of hair traps (Mowat and Paetkau 2002). The traps can 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 study area could be used to extensively sample the existing population of fishers. In a laboratory, DNA can be extracted 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 (R. Weir, pers. comm.; Mowat and Paetkau 2002), which is a useful measure of reintroduction success. Genetic sampling may be used as an additional monitoring technique if funding allows, or genetic sampling could be used as the main monitoring approach if telemetry proves ineffective.

Capture and Tagging. Released animals may 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 can also provide data for estimates of survival and population size, and allows the collection of hair samples for genotyping individuals that have been born in the study area. When a fisher is captured or recovered it can be scanned with a PIT tag reader to determine the identity of the individual. Capture and tagging may 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. These devices will be useful for determining if fishers have become established in an area of interest. Camera and video stations can be used to identify marked or unmarked individuals, but the identification of unmarked individuals is valuable for indicating successful reproduction in the study area. These stations may be employed for monitoring if additional funding is available or genetic sampling proves 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, 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 cannot be structured into an active monitoring program. Incidental observations are likely to provide important information in the Olympic Recovery Area. Incidental observations can be followed up with more intensive monitoring efforts.

Contingency Planning/Adaptive Management

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. The fisher recovery team will be regularly updated on the status of the reintroduction, and can be convened at any time to address emerging issues related to the reintroduction process, the monitoring program, or reintroduction success. The recovery team can 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.

Monitoring Scenarios

Depending on the level of funding available, monitoring scenarios can involve a number of approaches employed over 3-10 years. The monitoring program will involve radio-telemetry for the first three years to track survival, movements, home range establishment and reproduction of released animals, unless it is proven ineffective. Monitoring efforts after Year 3 will be dependent upon available funding and monitoring results of Years 1-3.

Year 1. Using telemetry, track individuals to determine survival, movements, home range establishment and reproduction. Beginning in March, emphasis will be placed on monitoring adult females for reproduction. When possible, den sites will be located and kits will be documented. If kits can be captured at a den site, each kit will be PIT tagged and a tissue sample will be obtained to genotype each kit. If additional funding is available, the effectiveness of a hair trap monitoring approach will 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 significant changes are required and fishers are available:

- Individuals will be tracked to determine survival, movements, home range establishment and reproductive success. Beginning in March, emphasis will be placed on monitoring all surviving females released in Year 1 and all adult females released in Year 2. When possible, den sites will be located and kits will be documented. If kits can be captured at a den site, each kit will be PIT tagged and a tissue sample will be obtained to genotype each kit.

- If additional funding is available and a hair trap monitoring approach is feasible, a grid of hair traps will be deployed throughout used habitats in reintroduction areas to detect surviving founders and their offspring.

If significant changes are required for the monitoring protocol because of the inability to adequately monitor the majority of fishers using telemetry:

- A grid of hair traps will be deployed throughout suitable and used habitats in reintroduction areas to detect surviving founders and their offspring if this technique is feasible. If a hair-trap grid is not feasible, camera and track plate stations will be deployed in the same way to detect surviving founders and their offspring.

- Capture and tagging efforts will be undertaken within easily accessible portions of reintroduction areas.

If significant changes to monitoring protocols are required for other reasons, then the recovery team and project staff will consult and devise alternative approaches.

Years 4 and 5. If funding is available, monitoring previously released fishers and their offspring may continue in Years 4 and 5. Monitoring occupancy and reproduction within reintroduction areas may still be the highest priority in Years 4 and 5; and could indicate if additional releases are needed to boost a failing population, if an established population appears to be stable, or if population expansion has occurred beyond the reintroduction areas. If population expansion is observed, monitoring efforts could be applied more broadly in the Olympic Recovery Area.

Years 6-10. Depending on funding levels and perceived monitoring needs, additional efforts may be required 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.

RESEARCH OPPORTUNITIES

Reintroductions provide unique and valuable research opportunities. Fisher demography and ecological relationships in Washington are not understood due the current absence of fishers in the state. With additional funding, reintroduction monitoring efforts can be expanded to investigate these and other fundamental research questions. Answers to these questions will be important for managing and conserving fisher populations and fisher habitat in Washington.

Multi-Scale Habitat Relationships

Fishers have been shown to select habitats at several scales (Weir and Harestad 2003). A research priority is to investigate fisher habitat use and selection at landscape, home range, stand, within-stand, and rest site scales in Washington. Telemetry monitoring to evaluate movements, survival, and home range establishment can be expanded to identify used and available habitats for an evaluation of habitat selection. An investigation of habitat selection will be particularly important for fishers that use the habitat mosaics outside Olympic National Park. This research could help us understand the suitability of habitats in the Washington Cascades, where the landscape is dominated by habitat mosaics as a result of past forest management and where fishers may be reintroduced in the future.

The establishment of home ranges is an important behavior to monitor during the reintroduction and could be expanded to comprehensively evaluate sex-specific characteristics of home ranges of reestablished fishers. This information is a necessary precursor for investigating multi-scale habitat selection and developing an understanding of fisher densities and the carrying capacity of the Olympic Recovery Area. Because obtaining location data for fishers can be logistically difficult and expensive, additional research funding may be required to obtain an adequate number of locations to credibly evaluate home ranges and habitat selection.

Demography

Evaluating critical measures of the reintroduced population will be important for determining the success of the reintroduction and the status of a reintroduced population. Mark-recapture and genetic sampling techniques could be used to estimate population sizes at various times throughout the recovery process. Monitoring efforts to track survival of released animals is valuable and would contribute to a larger investigation of sex- and age-specific survival rates. Monitoring efforts could also be expanded to determine fecundity, including rates of pregnancy of reproductive-age females, and the size and gender composition of litters. This information would be used to determine the population's rate of change (lambda) and indicate if the reintroduction is likely to establish a self-sustaining population. This information would also indicate when a reestablished population was large enough and stable enough to support the removal of individuals for reintroduction into the Cascades.

Population Genetics

While monitoring efforts may include genetic techniques (hair traps) to track survival and reproduction, these efforts can be expanded to thoroughly evaluate genetic diversity of a reintroduced population that is likely to be genetically and demographically isolated on the Olympic Peninsula. An expanded investigation would include evaluations of individual contributions to the genetic characteristics of succeeding generations, individual reproductive success, likelihood of inbreeding depression or genetic drift, and the necessity of bringing in new genotypes to increase genetic diversity. Although no verifiable evidence of fisher presence has been detected on the Olympic Peninsula since 1969 and they are believed extirpated, this investigation could determine if any native fishers remained on the Olympic Peninsula through the identification of unique genotypes (Vinkey et al. 2006).

Food Habits

Any ecological investigation of a carnivore is incomplete without basic study of the prey it uses, and the Olympic Recovery Area presents unique habitats and a unique prey assemblage for fishers. Monitoring efforts to track individuals to rest sites and den sites will allow the collection of fisher scats and the identification of prey remains that can be used in describing food habits. Stomach contents from recovered fishers can also be used to describe food habits. These data would identify important prey species used across seasons and regions within the study area.

Dispersal

Little is known about fisher dispersal and how it is influenced by terrain, availability of suitable habitat, and potential barriers (e.g., rivers, developed areas, highway corridors). Dispersal is a critical behavior to investigate because of its importance in the colonization of unoccupied regions in the recovery area and the subsequent establishment of a reproductive population. A dispersal investigation would evaluate a number of sex- and age-specific characteristics of dispersal events including distance, timing, duration, direction, characteristics of the path of dispersal and habitats used, and dispersal success. This information will be important for implementing future fisher reintroductions in the Cascades and elsewhere.

Research Techniques

Fisher researchers in British Columbia have reported good success with using abdominally implanted radio-transmitters. However, the study areas where these implants were used did not include steep river drainages that can make telemetry more difficult. Transmitters may be implanted in two male fishers to determine if they will work well within the reintroduction areas. GPS collars have been used for species that used remote habitats and those that are difficult to track, however GPS collars that are small enough to use on fishers have not been fully tested. If a fisher GPS collar is proven to work in mountainous areas, its' use may be tested on several male fishers that are released during the project.

PUBLIC OUTREACH

In proposing a fisher reintroduction in Olympic National Park, WDFW and ONP personnel had the opportunity to give presentations to members of the public at Olympic National Park headquarters in Port Angeles, Washington (January 10^{th}, 2006) and at the Washington Department of Natural Resources in Forks, Washington (February 1^{st}, 2006). These presentations summarized the history of fishers in Washington; fisher biology, management and conservation; and also explained the proposal to reintroduce fishers to Olympic National Park. These public presentations also allowed members of the public to ask questions and provide valuable input for the fisher reintroduction NEPA process. While a public outreach program will include additional public presentations about fisher natural history and the proposed reintroduction, the program may also include fisher reintroduction web pages on the WDFW and ONP web sites, special presentations for grade schools on the Olympic Peninsula and elsewhere, and possibly, an "adopt-a-fisher" program. Reports that document the status, reintroduction feasibility, recovery planning, NEPA analysis, and reintroduction planning for fishers in Washington will continue to be made available to the public through the WDFW web site, mail, or WDFW Olympia office.

BUDGET AND TIMELINE

An estimated budget for the reintroduction has been developed which outlines the costs for obtaining, transporting, releasing, and monitoring fishers over a 3-year period (Appendix B). The cost of these activities over 3 years has been estimated at approximately \$200,000/year. USGS has provided \$210,000 in funding to support a significant portion of the reintroduction monitoring efforts. ONP and WDFW personnel will be providing in-kind contributions of staff time, telemetry equipment, and field and camping supplies for the reintroduction that are not included in the budget. If the reintroduction proposal is approved by the National Park Service, additional sources of funding will be pursued when the NEPA process is completed.

Proceeding with a fisher reintroduction is contingent upon approval of the reintroduction by the National Park Service, assistance from British Columbia or Alberta in obtaining fishers, and available funding. If all of these requirements are met, a reintroduction of fishers to Olympic National Park could begin as soon as the fall of 2007. As the trapping season for fishers extends from November 1st to January 31st (Alberta) or February 15th (British Columbia), fishers could be obtained and released in Washington as soon as late November or December. An outline that summarizes the timing of the events associated with the reintroduction is shown below, however additional monitoring and research activities, and years, may be added to this timeline as additional funds become available.

Year 1

- November 2007 to February 2008 – capture, hold, transport fishers
- December 2007 to February 2008 – release fishers in Olympic National Park
- December 2007 to December 2008 – monitor released fishers (research, if funded)
- March 2008 to June 2008 – focus monitoring efforts on confirming reproduction

Year 2

- November 2008 to February 2009 – capture, hold, transport fishers
- December 2008 to February 2009 – release fishers in Olympic National Park
- December 2008 to December 2009 – monitor released fishers (research, if funded)
- March 2009 to June 2009 – focus monitoring efforts on confirming reproduction

Year 3

- November 2009 to February 2010 – capture, hold, transport fishers
- December 2009 to February 2010 – release fishers in Olympic National Park
- December 2009 to December 2010 – monitor released fishers (research, if funded)
- March 2010 to June 2010 – focus monitoring efforts on confirming reproduction

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APPENDIX A. Characteristics of 35 fisher translocations conducted in North America, 1947-2004.

No.	Release location[a]	Source location[a]	Year(s)	Type[b]	No. released	Sex ratio M, F	Result[c]	Purpose[d]	Months releases occurred[e]	Consec. years released
1	NS	Unk.	1947-48	R	12	6, 6	S	RS	7	2
2	WI	NY, MN	1956-63	R	60	36, 24	S	PC	Winter	8
3	ON	ON	1956	R	25	Unk.	U	RS	Unk	1
4	ON	ON	1956-63	R	97	37, 60	S	RS	Unk	8
5	MT	BC	1959-60	A	36	16, 20	S	RF, PC, RS	1, 2, 3, 4	2
6	VT	ME	1959-67	R	124	Unk.	S	PC	Spring	8
7	OR	BC	1960	R	11	5, 6	F	PC	1	1
8	OR	BC	1960	R	13	5, 8	F	PC	3	1
9	MI	MN	1961-63	R	61	42, 19	S	PC	Fall, Winter	3
10	ID	BC	1962-63	A	39	20, 19	S	RS	2, 3, 12	2
11	NS	ME	1963-66	R	80	29, 51	S	PC, RF	Unk	3
12	WI	MN	1966-67	R	60	30, 30	S	PC	1, 2, 3, 4, 11,12	2
13	NB	NB	1966-68	R	25	10, 15	S	RS, PC	2, 3, 4	3
14	WV	NH	1969	R	23	Unk.	S	RS, RF	1, 2	1
15	MN	MN	1968	R	15	Unk.	F	PC	Fall, Winter	1
16	ME	ME	1972	R	7	4,3	U	RS	3	1
17	MB	MB	1972	R	4	Unk.	F	RS	1, 2	1
18	NY	NY	1976-79	R	43	19, 24	S	RS	9, 10, 11	3
19	OR	BC, MN	1977-81	R	30	15, 15	S	PC	1, 2, 3, 4, 10, 11	5
20	CO	Unk.	1978 or 1979	I	2	1, 1	F	Unk	Unk	1
21	ON	ON	1979-81	R	55	23, 32	S	RF	1, 11, 12	3
22	ON	ON	1979-82	R	29	15, 14	S	RF	1, 2, 3, 11, 12	3
23	AB	AB	1981-83	R	32	16, 16	F	RS	Fall	3
24	BC	BC	1990-91	I	16	11, 4	F	PC	1, 2, 3, 6, 12	1
25	MT	MN, WI	1988-91	R	110	47, 63	S	RS	1, 3, 10, 11	4
26	MI	MI	1988-92	R	189	88, 101	S	RS, RF	1, 2, 3	5
27	CT	NH, VT	1989-90	R	32	13, 19	S	RS	1, 3	2
28	AB	ON, MB	1990	R	17	6, 11	S	RS	3, 6	1
29	BC	BC	1990-92	A	15	2, 13	S	RS	1, 2, 3, 11, 12	2
30	NS	NS	1993-95	A	14	8, 6	S	RS	2, 3	3
31	MB	MB	1994-95	R	45	24, 21	S	RS	9, 10, 11	2
32	PA	NY, NH	1994-98	R	190	87, 97	S	RS		5
33	BC	BC	1996-98	R	60	24, 36	F	RS, RF	3, 4, 6, 7	3
34	NS	NS	1999-2004	A	Unk.	Unk.	URC	RS	Unk.	4
35	TN	WI	2001-03	R	40	20, 20	URC	RS	10	2

[a]AB = Alberta, BC = British Columbia, CO = Colorado, CT = Connecticut, ID = Idaho, MB = Manitoba, ME = Maine, MI = Michigan, MN = Minnesota, MT = Montana, NB = New Brunswick, NH = New Hampshire, NS = Nova Scotia, NY = New York, ON = Ontario, OR = Oregon, PA = Pennsylvania, TN = Tennessee, Unk. = unknown, VT = Vermont, WI = Wisconsin, WV = West Virginia.

[b]R = reintroduction, A = augmentation, and I = introduction.

[c]S = successful, F = failed, U = unknown, URC = undetermined, recently completed.

[d]RS = reestablish species, RF = reestablish furbearer, PC = porcupine control.

[e]1 = January, 2 = February, to 12 = December; Winter = the months of January, February and March; Spring = April, May and June; Fall = October, November and December.

APPENDIX A. Characteristics of 35 fisher translocations (continued).

No.	Release type[f]	Closest genetic stock[g]	Monitoring[h]	Fisher trapping season	All land trapping	Source
1	Hard	Unk.	Passive	Closed	Open	Benson 1959; Dodds and Martell 1971
2	Hard	Yes, No	Active	Closed	Closed	Bradle 1957, Peterson et al. 1977, Irvine et al. 1964, Kohn et al. 1993; Dodge 1977
3	Hard	Yes	Passive	Closed	Open	Berg 1982; M. Novak pers comm.
4	Hard	Yes	Passive	Closed	Open	Berg 1982; M. Novak pers comm.
5	Hard	Yes	Passive	Closed	Closed	Weckworth & Wright 1968; Roy 1991, Heinemeyer 1993, Vinkey 2003, Vinkey et al. 2006
6	Hard	Yes	Passive	Closed	Open	K. Royar, pers. comm., Berg 1982
7	Hard	Yes	Passive	Closed	Closed	Kebbe 1961a,b, Aubry & Lewis 2003
8	Hard	Yes	Passive	Closed	Closed	Kebbe 1961a,b, Aubry & Lewis 2003
9	Unk.	Yes	Passive	Closed	Unk.	Irvine et al. 1964, Brander and Books 1973; R. Earle, pers. comm.
10	Hard	Yes	Passive	Closed	Open	Williams 1962, 1963, Berg 1982, Luque 1984
11	Unk.	Yes	Passive	Closed	Open	Dodds & Martell 1971
12	Hard	Yes	Passive	Closed	Closed	Petersen et al. 1977, Kohn et al. 1993; Dodge 1977
13	Hard	Yes	Passive	Closed	Open	Drew et al. 2003, Dilworth 1974; T. Dilworth, pers comm.
14	Hard	Yes	Passive	Open	Open	Pack & Cromer 1981; Wood 1977
15	Hard	Yes	Passive	Closed	Closed	Berg 1982; W. Berg, pers. comm .
16	Unk.	Yes	Passive	Open	Open	Berg 1982; Maine F&W unpubl. Data
17	Hard	Yes	Passive	Closed	Closed	Berg 1982; R. Baird pers. comm.
18	Hard	Yes	Active	Closed	Open	Wallace & Henry 1985; R. Henry, pers. comm
19	Hard	Yes, No	Passive	Closed	Open	Aubry & Lewis 2003
20	Hard	Unk.	Passive	Closed	Open	J. Apker, pers. comm.
21	Hard	Yes	Active	Closed	Open	Kyle et al. 2001; J. Baker, pers. comm..; M. Novak pers. comm..
22	Hard	Yes	Active	Closed	Open	Kyle et al. 2001; J. Baker, pers. comm.; M. Novak pers. comm.
23	Hard	Yes	Active	Unk.	Open	Davie 1984, J. Jorgenson, pers. comm., Proulx et al. 1994
24	Hard	Yes	Active	Open	Open	R. Weir, pers. comm. E. Lofroth, pers. comm.
25	Both	No	Active	Open	Open	Roy 1991; Heinemeyer 1993
26	Hard	Yes	Passive	Open	Open	R. Earle, pers. comm.
27	Both	Yes	Active	Closed	Closed	Rego 1989, 1990, 1991, pers. comm.
28	Soft	No	Active	Closed	Open	Proulx et al. 1994, Proulx 2005
29	Soft	Yes	Active	Open	Open	Weir 1995
30	Hard	Yes	Active	Closed	Closed	Potter 2002**;** D. Potter, pers. comm.; M. Boudreau pers. comm.; J. Mills, pers. comm.
31	Hard	Yes	Active	Closed	Open	Baird & Frey 2000; Baird pers. comm.
32	Hard	Yes	Active	Closed	Open	Serfass et al. 2001
33	Hard	Yes	Active	Open	Open	Fontana et al. 1999, Weir et al. 2003
34	Hard	Yes	Active	Closed	Open	D. Potter, pers. comm.; M. Boudreau pers. comm.
35	Hard	Yes	Active	Closed	Open	Anderson 2002

[f] Hard = hard release, Soft = soft release, Both = both hard and soft releases were used.
[g] Yes = closest genetic stock used for release; No = genetic stock other than closest native stock was used.
[h] Active = radio-telemetry, remote track-plate and remote camera stations, and track surveys; Passive = incidental capture reports, reported road-kill mortalities, and incidental observations.

APPENDIX B. Estimated Budget for the Olympic National Park Fisher Reintroduction, Years 1-3.

	Year 1		Year 2		Year 3	
	Amount	Cost	Amount	Cost	Amount	Cost
Canadian Coordinator ($27/hr)						
Trapper coordination and preparation	65	$1,755	60	$1,620	60	$1,620
Fisher transfers	165	$4,455	165	$4,455	165	$4,455
Set up of facility and take down	40	$1,080	40	$1,080	40	$1,080
Husbandry: feeding, care, maintenance	360	$9,720	360	$9,720	360	$9,720
Documentation and Final report	40	$1,080	40	$1,080	40	$1,080
Transportation of fishers to Washington	40	$1,080	40	$1,080	40	$1,080
Subtotal		**$19,170**		**$19,035**		**$19,035**
Fisher Housing Expenses						
Equipment (boxes, runs, stands)	35 sets	$10,755		$1,800		$1,800
Fisher transfer travel costs ($0.64/mi.)	6200 mi.	$4,000	6200 mi.	$4,000	6200 mi.	$4,000
Supplies (i.e., food, litter, bedding)		$180		$180		$180
Facility rental - 3 months @ $450/month		$1,350		$1,350		$1,350
Liability Ins. for housing facility (1 yr min.)		$1,150		$1,000		$1,000
Subtotal		**$17,435**		**$8,330**		**$8,330**
Other Provincial Expenses						
Trapper payments: @ $360/fisher	35	$12,600	35	$12,600	35	$12,600
Veterinarian: time, travel, supplies		$1,000		$1,000		$1,000
Ministry permit and processing (Year 1)		$100		--		--
Office expenses		$200		$200		$200
Transport to Washington						
Mileage ($0.64/mi.)	1600 mi.	$1,025	1600 mi.	$1,025	1600 mi.	$1,025
Trailer rental		$450		$450		$450
Travel expenses		$450		$450		$450
Subtotal		**$15,825**		**$15,725**		**$15,725**
Transport in Washington						
WA/CA border to Port Angles or Forks						
Mileage ($0.445/mile)	2200 mi.	$979	2200 mi.	$979	2200 mi.	$979
Lodging & Per diem ($120)	16 days	$1,920	16 days	$1,920	16 days	$1,920
Salary ($33/hr)	16 days	$4,224	16 days	$4,224	16 days	$4,224
Trailer rental ($80/day)	6 days	$480	6 days	$480	6 days	$480
Transport to Release sites						
Helicopter ($750/hr, 6 hrs)		$4,500		$4,500		$4,500
Mileage ($0.445/mile)	1000	$450	1000	$450	1000	$450
Salary ($33/hr)	4 days	$132	4 days	$132	4 days	$132
Subtotal		**$12,685**		**$12,685**		**$12,685**
Monitoring Equipment						
Transmitters - Holohil MI-2 collar	35	$9,450	35	$9,450	35	$9,450
Pit tags - Pocket reader with 100 tags	100	$1,252	--	--	--	--
Radio receivers, antennas, cables (3 sets)	available	$0	available	$0	available	$0
Field gear- tents, portable radios, etc	available	$0	available	$0	available	$0
Subtotal		**$10,702**		**$9,450**		**$9,450**
Monitoring Expenses						
Personnel						
NPS GS-7 Term Wildlife Biologist	10.5 mo.	$34,200	12 mo.	$44,000	12 mo.	$42,700
WDFW Wildlife Biologist 3 ($5812/mo)	12 mo.	$69,744	12 mo.	$69,744	12 mo.	$69,744
GSA vehicle rental (12 months)	2	$8,400	2	$8,400	2	$8,400
Aerial telemetry flights ($115/hr; 3hrs/wk)	156 hrs	$17,940	156 hrs	$17,940	156 hrs	$17,940
Interim GIS analysis		$2,000		$2,000		$2,000
Genetic analysis of founders - (~$50/fisher)	35	$1,750	35	$1,750	35	$1,750
Subtotal		**$134,034**		**$143,834**		**$142,534**
Total		**$209,851**		**$207,759**		**$209,059**

APPENDIX C. Veterinary Tasks and Documentation During Fisher Processing.

1) Date, time, location, names of vets and assistants
2) Identify individual fisher with a letter/number code (e.g., F01, M02)
3) Chemical immobilization
    a. Drugs and dosages used will be determined based on published literature and expert opinion.
    b. Times for injection, induction, reversal, recovery will be recorded as possible
4) Monitor pulse, temperature, respiration, and capillary refill time
5) Determine sex and estimate age based on tooth wear patterns
6) Morphological measurements – weight, length of tail, hind foot, ear, total, and neck circumference
7) Conduct complete physical examination
8) Determination of Suitability for reintroduction – individuals meet following minimum criteria:
    a. no broken bones
    b. ≥ 3 intact canines
    c. no debilitating wounds or injuries
    d. no missing limbs
    e. no feet with >1 missing toe
    f. no apparent disabilities
    g. no fishers that appear in poor condition
    h. no diarrhea
    i. no ocular or nasal discharge
    j. no significant unexplained hair loss
    k. no excessive tooth wear indicative of advanced age
    l. no heavy external parasite infestations
9) Photograph individuals – front, back, sides, face, teeth, abdominal/chest markings, wounds, injuries, abnormalities
10) Treatment of minor injuries and wounds
11) DNA sample(s) – ear punch and hair sample
12) Blood sample
    a. Clot tube for serum
    b. EDTA or heparin tube for whole blood
13) Fecal sample – refrigerate
14) Ectoparasites – collect and place in alcohol
15) PIT tagging
16) Rabies vaccination – Imrab-3
17) Distemper vaccination – Purevax ferret vaccine
18) Endoparasite treatment – Ivermectin and Droncit
19) Ectoparasite treatment – Frontline or Revolution, if necessary
20) Radio-collar individuals
21) Give reversal, if indicated
22) Monitor recovery and reactions to vaccinations
23) List suitable individuals as certified

Washington State Status Reports and Recovery Plans

Status Reports

2005	Mazama Pocket Gopher, Streaked Horned Lark, and Taylor's Checkerspot	√
2005	Aleutian Canada Goose	√
2004	Killer Whale	√
2002	Peregrine Falcon	√
2001	Bald Eagle	√
2000	Common Loon	√
1999	Northern Leopard Frog	√
1999	Olympic Mudminnow	√
1999	Mardon Skipper	√
1999	Lynx Update	
1998	Fisher	√
1998	Margined Sculpin	√
1998	Pygmy Whitefish	√
1998	Sharp-tailed Grouse	√
1998	Sage-grouse	√
1997	Aleutian Canada Goose	√
1997	Gray Whale	√
1997	Olive Ridley Sea Turtle	√
1997	Oregon Spotted Frog	√
1993	Larch Mountain Salamander	
1993	Lynx	
1993	Marbled Murrelet	
1993	Oregon Silverspot Butterfly	
1993	Pygmy Rabbit	
1993	Steller Sea Lion	
1993	Western Gray Squirrel	
1993	Western Pond Turtle	

Recovery Plans

2006	Draft Western Gray Squirrel	√
2006	Draft Fisher	√
2004	Sea Otter	√
2004	Greater Sage-Grouse	√
2003	Pygmy Rabbit: Addendum	√
2002	Sandhill Crane	√
2001	Pygmy Rabbit: Addendum	√
2001	Lynx	√
1999	Western Pond Turtle	√
1996	Ferruginous Hawk	√
1995	Pygmy Rabbit	√
1995	Upland Sandpiper	
1995	Snowy Plover	

√ These reports are available in pdf format on the Department of Fish and Wildlife's web site: http://wdfw.wa.gov/wlm/diversty/soc/concern.htm.

To request a printed copy of reports, send an e-mail to wildthing@dfw.wa.gov or call 360-902-2515