**Petition for a rule to designate fishers (*Martes pennanti*)
in the U.S. Northern Rocky Mountains
a Distinct Population Segment and
add them to the list of Endangered or Threatened wildlife
protected by the federal Endangered Species Act**

February __, 2009

Defenders of Wildlife
Rocky Mountain Region Office
109 S. Eighth Avenue
Bozeman, Montana 59715
406-586-3970

Center for Biological Diversity
P.O. Box 11374
Portland, OR 97211
503-484-7495

Friends of the Bitterroot
P.O. Box 442
Hamilton, MT 59840
406-821-3110

Friends of the Clearwater
P.O. Box 9241
Moscow, ID 83843
208-882-9755

Pacific Biodiversity Institute, www.pacificbio.org

Executive Summary

> *"Despite the fact that fisher records are found in a dozen mountain ranges in Montana, carnivore research conducted in many of these locales… has demonstrated that the species is one of the lowest density carnivores in the state. For example, during three winters (2001-2003) of fieldwork in the Cabinets and West Cabinets we collected only 11 verified records of fisher."*—Vinkey 2003, p. 61

The fisher (*Martes pennanti*)—a medium-sized forest carnivore associated with mature and old growth forests—has been so reduced in its range and numbers that it is probably the rarest carnivore in the U.S. northern Rocky Mountains ("Northern Rockies") today. Indeed, the total fisher population in the Northern Rockies is thought to number just a few hundred members. That the fisher continues to lack federal protection is striking in a region where several other more numerous carnivores, including the gray wolf, the grizzly bear, the Canada lynx and the wolverine, have been listed under the Endangered Species Act ("ESA"), some for decades.

The only significant fisher population still known to persist in the Northern Rockies is in the Clearwater area of north-central Idaho and the adjacent Bitterroot Mountains in Montana. Fishers still exist in other areas of Idaho and western Montana, but they are sparse in these areas and their population status is unknown. Fishers have also been sighted in the Greater Yellowstone area but their presence there has not been confirmed (see Figure 9 of this petition). By comparison, significant populations of lynx persist in Seeley/Swan and Yaak River Valleys of northwestern Montana, plus in and adjacent to Glacier National Park, and wolverines range throughout a much broader area, though at very low densities. And while lynx and wolverines have some connection with Canadian populations, fishers in the Northern Rockies are known to be isolated from other fisher populations in North America, which greatly increases their risk of extinction.

Fishers in the Northern Rockies are in immediate danger due to their small numbers and isolation alone, yet ongoing loss and fragmentation of their habitat and human-caused mortality puts them even more at risk. Logging, and outbreaks of fire, insects and disease have vastly reduced and isolated their habitat (see Figures 5, 8, and 9), and continue to consume approximately an additional 90,000 acres each year today (see Table 6). Mortality due to trapping and poisoning eliminated fishers from much of their range historically, and fishers continue to die each year from a legal trapping season that continues in Montana, and from traps set for other species throughout their range.

The status of fishers in the Northern Rockies is similar to their status in their West Coast range, where the U.S. Fish and Wildlife Service recently found that they are "warranted" for listing under the federal ESA (USDI 2004). Fisher populations have rebounded to healthy levels with the regrowth of forested areas in the Upper Midwest and northeastern U.S., but continue to struggle in the West where forests have been slow to regenerate from past and ongoing logging. For fishers to disappear from the Northern Rockies would be a serious loss for the species, because the Northern Rockies region is a vast area of the fisher's former range that contains unique habitat distinct from the fisher range in the West Coast, Midwest and Northeast regions, and because the Northern Rockies fisher population was recently found to contain original genetic material not found in other North American fisher populations (see Part IV of this petition).

To address the threats to fishers and their habitat sufficient to ensure their long-term survival and restoration in the Northern Rockies, Defenders of Wildlife, Center for Biological Diversity, Friends

of the Clearwater, and Friends of the Bitterroot submit this petition to list fishers in the Northern Rockies region as Threatened or Endangered under the federal Endangered Species Act ("ESA").

Summary of the Five ESA Listing Factors that threaten fishers in the Northern Rockies:
1. The present or threatened destruction, modification, or curtailment of habitat or range. Fishers depend on mature and old growth forests. Past and ongoing logging has greatly reduced these forests, as have outbreaks of fire, insects, and disease that are likely to increase due to climate change. Roads and other motorized access also degrade fisher habitat due to the access they provide trappers, plus highways reduce or eliminate the ability of fishers to travel safely between their populations and habitats.

2. Overutilization for commercial, recreational, scientific, or educational purposes. Montana continues to allow recreational trapping of seven fishers each winter, and in Idaho nearly the same number have been reported to be "incidentally" killed recently in traps set for other species. It is unknown how many additional fishers are incidentally or illegally hurt and killed in traps throughout their range without being reported.

3. Disease or predation. Fishers are preyed upon by mountain lions and other larger carnivores. The threat posed by disease in the Northern Rockies is unknown, but the remaining fisher populations are so small that they are vulnerable to even a low level of mortality from disease or predation.

4. The inadequacy of existing regulatory mechanisms. Regulations that govern the management of fishers and their habitat—including the standards governing management of the last remaining old-growth forests on federal, state and private lands, as well as regulations concerning trapping of fishers and other animals—have clearly been inadequate to prevent the decline of fishers to date, and continue to threaten their future survival. The current patchwork of regulations has failed to prevent or even address the fragmentation of fisher habitat and populations. Furthermore, the 2008 revisions to regulations governing national forest management have further weakened safeguards for fishers. Management of the national forests is no longer bound by mandatory standards—such as the long-standing requirement to maintain viable populations of native wildlife on national forests—and the national forests provide the vast majority of fisher habitat in the Northern Rockies.

5. Other natural or manmade factors affecting its continued existence. The fisher's low numbers, its low reproductive rate, the isolation of its small populations in the Northern Rockies, and its isolation from populations outside the Northern Rockies all threaten the fisher's continued existence in the Northern Rockies.

Petition purpose and scope. The intent of this petition is to gain ESA protections for fishers in the Northern Rockies in order to help ensure their survival and restoration across suitable habitat within this region. This includes maintaining both the native and translocated fisher populations in the area, with the ultimate goal of restoring a Northern Rockies metapopulation that is linked to fisher populations in Canada.

Table of Contents

List of Figures

List of Tables

Part I. Petition overview

Introduction

Defenders of Wildlife, Center for Biological Diversity, Friends of the Bitterroot, and Friends of the Clearwater hereby petition the U.S. Fish and Wildlife Service ("FWS" or "Service") to publish a rule to designate fishers in the U.S. northern Rocky Mountains a Distinct Population Segment and add the Northern Rocky Mountain Distinct Population Segment of fishers to the list of Endangered or Threatened wildlife under the Endangered Species Act. We also petition FWS to designate "critical habitat" under the Endangered Species Act within a reasonable period of time following the listing, 16 U.S.C. § 1531-1543 (1982). This petition is filed under 5 U.S.C. §553(e), 16 U.S.C. §1533(b)(3)(A) and 50 C.F.R. § 424.19 (1987), which give interested persons the right to petition for issuance of a rule.

The fisher (*Martes pennanti*) is a member of the weasel family closely related to the marten (*Martes americana*), but bigger, stronger and darker. It is the size of an average house cat, with a brown fur coat, and is one of the few animals that successfully hunt porcupines. This rare forest carnivore is prized by trappers for its thick, soft fur, and by timber companies for controlling porcupine populations that can damage valuable trees. Fishers need large and connected areas where the trees are left standing, since they depend on mature and old growth forests to hunt for their prey and to provide protected sites above the forest floor where they can be safe and raise their young.

As this petition will describe in detail, fishers are associated with closed canopy, mature and old growth forests across Canada and the northern and/or mountainous regions of the contiguous United States. Fisher populations have rebounded in the northeastern and midwestern United States with the regrowth of the deciduous forests in those areas (USDI 2004). Yet fishers in the Northern Rockies and far western United States remain imperiled, with their populations and habitats reduced and fragmented (see Part II of this petition). The FWS recently found that the West Coast fisher populations are warranted for listing under the Endangered Species Act, though the listing has been precluded by other priorities (USDI 2004). The conservation status of the Northern Rockies fisher population is very similar, thus we draw heavily on FWS's findings in its status review of the West Coast fisher in this Northern Rockies fisher listing petition (Attachment 1).

Background

This is the second petition to protect fishers in the Northern Rockies under Endangered Species Act, and there have been two additional petitions to protect the West Coast fisher populations.

In 1990, a petition was filed to list the Pacific fisher (*Martes pennanti pacifica*) as an endangered species in CA, OR, and WA by Eric Beckwitt of the Sierra Biodiversity Project. Co-sponsors included: National Audubon Society and seven of its local chapters, the California Wilderness Coalition, the Greater Ecosystem Alliance, the Northcoast Environmental Center, and the Oregon Natural Resources Council (Beckwitt. 1990). FWS ruled in 1991 that the listing was not warranted (56 Fed. Reg. 1159-1161).

In December 1994, the Biodiversity Legal Foundation ("BLF") petitioned to list two fisher (*Martes pennanti*) populations in the West (Pacific Coast and Northern Rockies) as "threatened" under the

Endangered Species Act. FWS failed to rule on the petition, so the BLF and another conservation group, the Predator Project, filed suit on September 29, 1995 to force a 90-day finding on the petition. FWS responded in 1996 with a "not warranted" finding (61 Fed. Reg. at 8016-8018). In its finding, FWS disagreed that the two fisher populations constitute distinct vertebrate population segments (citing 12/21/94 draft FWS/NMFS policy on distinct population segments), and claimed there was genetic exchange throughout North America.

The Center for Biological Diversity and Sierra Nevada Forest Protection Campaign filed a new petition to list the fisher as endangered in its West Coast range, which includes fishers in the western portions of Washington, Oregon and California, in November, 2000. In April 2004, FWS ruled that listing is "warranted" but "precluded" by other listing priorities (USDI 2004). FWS ruled that fishers in their West Coast range constitute a Distinct Population Segment under the ESA for the following reasons (USDI 2004 at 18777-18778):

> We conclude that loss of the species from the west coast range in the United States would represent (1) a significant gap in the species' range, (2) the loss of genetic differences from fisher in the central and eastern United States, and (3) the loss of the species from a unique ecological setting. Therefore, as the population segment meets both the discreteness and significance criteria of our DPS policy, it qualifies as an entity that may be considered for listing.

FWS then determined that listing the fisher is warranted but precluded by higher listing priorities, (See Attachment 1, pp 18791-18792).

FWS's 2004 "warranted but precluded" finding for the West Coast fisher cited substantial new evidence confirming the isolation of fisher populations in the Pacific Northwest and Northern Rockies from Canada (e.g., Aubry and Lewis 2003, Weir 2003). This represents a significant advancement in our knowledge since FWS's 1996 "not warranted" decision for fishers in the Northern Rockies and the West Coast. Another key advancement of our knowledge of fishers in the Northern Rockies is the recent discovery that fishers in north-central Idaho and west-central Montana are remnants of a native population with unique genetic material (Vinkey 2003, Vinkey et al. 2006, Schwartz 2007; see Part IV of this petition).

Given FWS's decision not to list fishers in the Northern Rockies, the species is presently without federal standing of any kind other than administrative designations for management purposes by the Forest Service and Bureau of Land Management. The fisher is listed as "Sensitive" in U.S. Forest Service Regions 1, 2, 4 and 5 (USDA 2008). The Forest Service defines Sensitive species as follows (USDA 2005):

> Those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by: (a) significant current or predicted downward trends in population numbers or density, and/or (b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

These designations and other regulations affecting the management of fishers and their habitats have failed to reverse the fragmentation and decline of the Northern Rockies fisher population to the point that it is in danger of extirpation and warrants protection under the Endangered Species Act. Furthermore, the Forest Service has eliminated the requirement that national forests maintain viable

populations of native wildlife, as discussed below, stripping away a critical protection for the fisher on federal lands.

Overview of the Endangered Species Act implementing regulations

Distinct Population Segment criteria

Fishers in the Northern Rockies region meet the criteria for listing as a distinct population segment (DPS) under the Endangered Species Act. FWS regulations define populations as listable entities if they are found to be discrete and significant in relation to the species to which they belong (61 Fed. Reg. at 4725).

FWS defines "discreteness" as follows (61 Fed Reg at 4725):

> Discreteness: A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions:
>
> 1. It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation.
> 2. It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

Fishers in the Northern Rockies region meet both criteria of a "discrete" population segment. Northern Rockies fishers are clearly geographically isolated from other fisher populations in the Pacific Northwest, Canada, and eastern North America. The recent discovery of unique genetic haplotytes in the Northern Rockies fisher population provides a "quantitative measure of genetic… discontinuity" described above (see Part IV of this petition for further details). Finally, the international boundary between the U.S. and Canada also results in significant differences in the management of fishers and their habitat in each of the criteria listed above: exploitation (trapping), habitat management, conservation status, and regulations. Regulatory mechanisms affecting fisher trapping and the management of their habitat are implemented and enforced by different means in each country, with no current or proposed coordination or connection between them. The population also qualifies as discrete because the conservation status of fishers is quite different between the U.S. Northern Rockies and western Canada, both biologically and legally.

FWS defines "significance" as follows (61 Fed Reg at 4725):

> Significance: If a population segment is considered discrete under one or more of the above conditions, its biological and ecological significance will then be considered in light of Congressional guidance (see Senate Report 151, 96th Congress, 1st Session) that the authority to list DPS's be used "sparingly" while encouraging the conservation of genetic diversity. In carrying out this examination, the Services will consider available scientific evidence of the discrete population segment's importance to the taxon to which it belongs. This consideration may include, but is not limited to, the following:
>
> 1. Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon,

2. Evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon,
3. Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range, or
4. Evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

As the petition describes in detail below, the Northern Rockies population is a "significant" population segment because the Northern Rockies region represents an unusual, unique and significant portion of the fisher's former range (Points 1 and 2 above), the loss of which would result in a tremendous gap in fisher range between the eastern populations and the West Coast populations (Point 2), and due to the unique genetic signature of the remnant native population of fishers in the Northern Rockies (Point 4 above).

Under FWS regulations, any population that meets the criteria of "discrete" and "significant" must then go through a status review as described under Section 4 of the Endangered Species Act (61 Fed. Reg. at 4725).

ESA Definitions and Five Listing Factors

The Endangered Species Act sets forth the criteria for listing in 16 U.S.C. § 1533. A species should be listed as threatened or endangered if any one or a combination of the following factors is met:

1. The present or threatened destruction, modification, or curtailment of habitat or range;
2. Overutilization for commercial, recreational, scientific, or educational purposes;
3. Disease or predation;
4. The inadequacy of existing regulatory mechanisms; and
5. Other natural or manmade factors affecting its continued existence.

16 U.S.C. § 1533(a)(1)(A)-(E); *see also* 50 C.F.R § 424.11(c). The term "species" includes "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." 16 U.S.C. § 1532(16). An "endangered species" is a species that is "in danger of extinction throughout all or a significant portion of its range." 16 U.S.C. § 1532(6). A "threatened species" is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." 16 U.S.C. § 1532(20).

As described in greater detail below, four and possibly five of the ESA's listing factors jeopardize the ongoing survival of fishers in the Northern Rockies region. Based on the best scientific information available, the petitioners contend that the provisions of 16 U.S.C. § 1533 compel the expeditious listing of the fisher as "threatened" or "endangered" in the United States (U.S.) northern Rocky Mountains region. Additionally, petitioners request prompt designation of "critical habitat" for the species.

Petitioners

Defenders of Wildlife is a non-profit conservation organization that advocates for wildlife and its habitat. Defenders uses education, litigation, and research to protect wild animals and plants in their natural communities. Known for its effective leadership on endangered species issues, Defenders also advocates new approaches to wildlife conservation that protect species before they become endangered. Its programs reflect the conviction that saving the diversity of our planet's life requires protecting entire ecosystems and ensuring interconnected habitats. Founded in 1947, Defenders of Wildlife is a 501(c)(3) membership organization with more than 1,000,000 members and supporters nationwide. Headquartered in Washington, D.C., with field offices in Alaska, Arizona, California, Colorado, Florida, Idaho, Montana, Oregon, Canada, and Mexico, Defenders maintains a staff of wildlife biologists, attorneys, educators, research analysts and other conservationists.

The Center for Biological Diversity is a non-profit corporation with offices in Portland, Oregon; Phoenix and Tucson, Arizona; Silver City, New Mexico; San Diego, San Francisco, and Joshua Tree, California; and Washington, D.C. The Center is actively involved in species and habitat protection issues throughout North America, and has 180,000 members and online activists throughout North America, including in the Northern Rockies. The Center's members and staff include area residents with biological, health, educational, scientific research, moral, spiritual and aesthetic interests in the fisher and its habitat in the Northern Rockies. The Center authored the petition to list the West Coast population of the fisher and has actively worked to ensure conservation of the fisher in the western U.S.

Friends of the Bitterroot is a twenty-year old 501(c)(3) grassroots conservation organization with about seven hundred members dedicated to conserving wild land and wildlife, protecting forests and watersheds, and working toward a sustainable relationship with the environment. Friends of the Bitterroot works to protect habitat and gain science-based management decisions through public education, informed involvement in public processes, and contributions to scientific data. Its conservation work is local and regional, primarily involving the mountainous headlands of the Bitterroot, Selway, Salmon, and Big Hole Rivers as well as the Rock Creek tributary of the Clark Fork, east of the Bitterroot. Much of this area is occupied or recently occupied fisher habitat. Over the years, Friends of the Bitterroot has demonstrated a sustained commitment to the well being of wildlife, especially wild land dependent, far-ranging species like grizzly bears, wolverines and fishers. Furthermore, many of its members live and/or recreate in and adjacent to fisher habitat, and several have happily reported seeing tracks or the animal itself while out skiing or hunting.

Friends of the Clearwater is a 501(c)(3) grassroots conservation organization dedicated to preserving the wild lands and ecological integrity of the Clearwater River Basin in Idaho. Friends of the Clearwater is based in Moscow, Idaho and has been active in public processes where decisions are made that affect fisher habitat. It participates in public involvement processes through comments, public meetings, and open houses and also sponsors free public events, field trips to fisher habitat and seminars. Friends of the Clearwater's members, which number over 600 households, and supporters are also active in a variety of public processes that affect fishers and their habitat.

The interests in the fisher of each of the petitioners and their members would be harmed if the fisher in the Northern Rockies were allowed to go extinct.

Part II. Fisher description, distribution and status, and ecological limiting factors

Taxonomy

FWS's description of the taxonomy of the West Coast fisher (USDI 2004) applies equally well to fishers in the U.S. northern Rocky Mountains (Attachment 1, p. 18770). Consistent with Drew et al. (2003) cited in this description, the petitioners do not propose that fishers in the Northern Rockies necessarily comprise a distinct subspecies, but rather that they represent an isolated population subdivision, which can and should be listed as a Distinct Population Segment under the Endangered Species Act (see Part IV of this petition).

Description

FWS's description of the West Coast fisher applies equally well to fishers in the Northern Rockies (Attachment 1, p. 18770).

Distribution and status

Fishers and their habitat were once contiguous across the northern forests of the United States and Canada, but they became much reduced and fragmented across much of this range in response to logging and trapping. Fisher populations have rebounded in the northeastern and midwestern United States, but remain imperiled in the Rocky Mountains and Pacific Northwest regions. FWS describes this distribution and status (Attachment 1, pp. 18770-18771).

In the Northern Rockies, fishers historically ranged south from the U.S./Canada border throughout the forested areas of northern and central Idaho, western Montana, northwestern Wyoming and perhaps into northern Utah (see Figures 5-8 of this petition). Today, the only significant Northern Rockies fisher population still known to persist is in the Clearwater area of north-central Idaho and the adjacent Bitterroot Mountains in Montana. Fishers still exist in other areas of Idaho and western Montana, but they are known to be sparse in these areas and their population status is unknown. Fishers have also been sighted in the Greater Yellowstone area but their presence there has not been confirmed (see Figure 9 of this petition). Similar to the Pacific Northwest region referred to above, fishers are sparse and patchily distributed across much of their remaining range in the Northern Rockies region (See below; Douglas and Strickland 1987, IDFG 2006, IDFG 1995, Maj and Garton 1994, MDFWP 2005, MDFWP 1995, Powell and Zielinski 1994, Thier 2000, Vinkey 2003, Zielinski et al. 1995).

Historic distribution, additional information

See Attachment 2 of this petition for additional information on the historic distribution of fishers in the western U.S., presented in chronological order of their publication. These excerpts consistently attribute the decline of fishers to logging and trapping. The final excerpt (Vinkey 2003) reports that fishers in Montana have been isolated from Canadian populations for some time.

Idaho

Idaho contains the most significant fisher population in the Northern Rockies region. Fisher observations are concentrated in the Clearwater drainage of north-central Idaho, and while there are

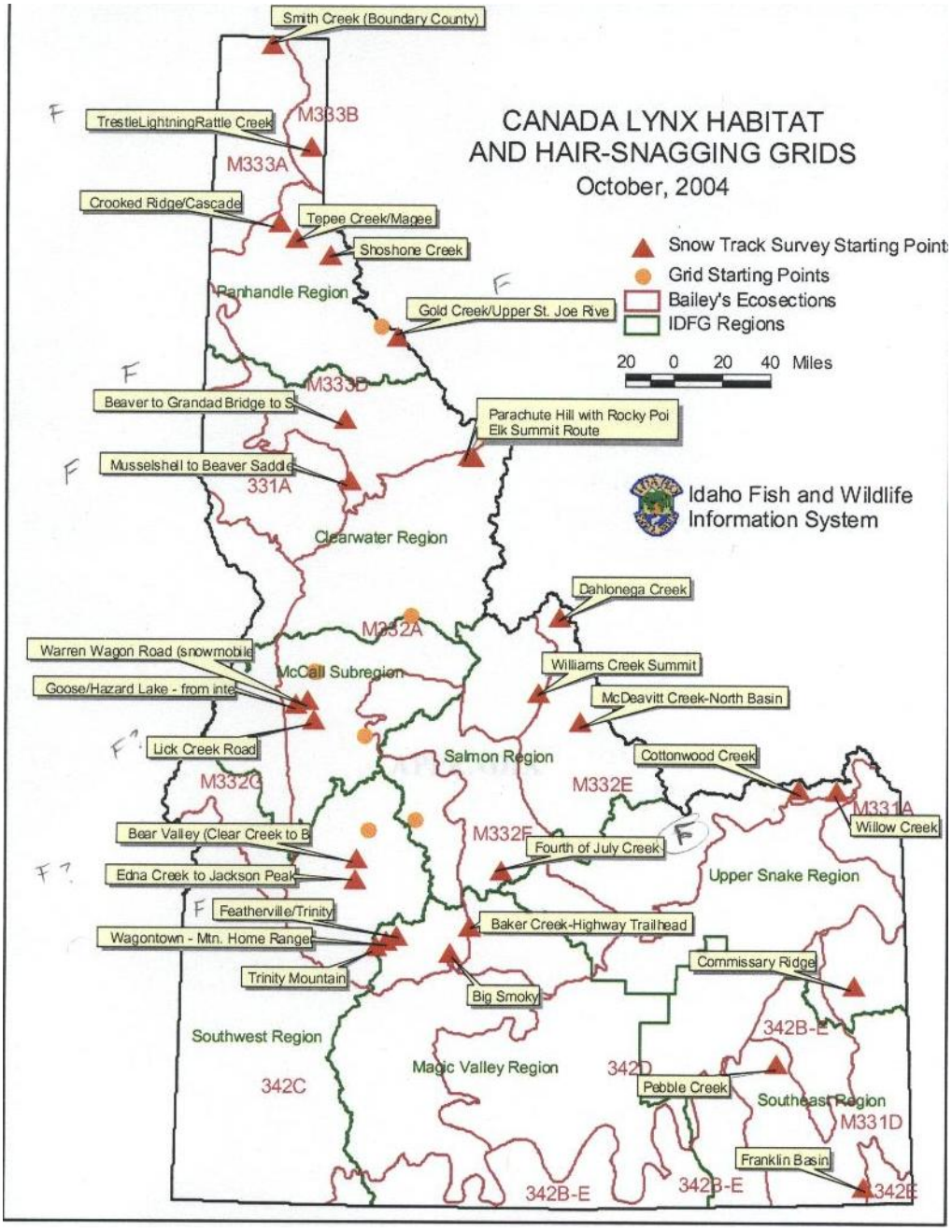
confirmed observations in south-central Idaho and north from the Clearwater throughout the Idaho Panhandle, they occur at very low densities throughout these areas and the fisher's population status is unknown (see below).

More than a decade ago, biologists under contract to the interagency Western Carnivore Committee compiled data on fisher sightings in Idaho (see Figures 6 and 7 below, excerpted from Maj and Garton 1994). A fisher habitat conservation assessment by Idaho Department of Fish and Game (1995) documents the distribution of fishers during the past century, which was boosted by reintroductions in the 1960's. It also affirms the paucity of fishers both south of the Salmon River and north of Interstate 90: "…fishers probably do not occur more than 20 miles south of the Salmon River, and few fishers are reported north of Wallace and Interstate 90." (IDFG 1995, p. 4).

Idaho Department of Fish and Game biologists started conducting snow-track surveys in 2003 (see Figure 1), and detected fisher tracks along two transects in the Idaho panhandle;[1] three transects in north-central Idaho;[2] one track in the Magic Valley region of southwestern Idaho;[3] and two "probable" fisher tracks in west/south-central Idaho[4] (IDFG 2006). While fisher tracks can be difficult to verify due to their similarity with marten tracks, hair samples obtained from the Salmon region tested positive for fisher DNA, "Two hair samples collected from Fourth of July Creek in Lemhi County (Salmon Region) were positively identified as fisher" (IDFG 2006, p. 3).

[1] Trestle/Lightning/Rattle Creek Route and Gold Creek/Upper St. Joe River Route
[2] Beaver/Grandad/Mussellshell Route, Elk Summit Route, and Parachute Hill Route
[3] Featherville-Trinity Route
[4] Edna Creek, Lick Creek Road

Figure 1. Distribution of forest carnivore snow-track survey routes in Idaho (IDFG 2004)



Two complementary fisher research projects are currently underway in the Clearwater area (M. Schwartz, pers. comm.; J. Sauder, pers. comm.), but other than reports in the popular media (e.g., Lucas 2006, Chadwick 2007), the results have not yet been published. Samples from one study were used in a genetics analysis published in the Journal of Mammalogy, which reports that "33 fishers were captured and ear punches collected" (Schwartz 2007, p. 922). One article offers a basic population estimate for the study area, "What they [the fisher researchers] do know is that there are probably 50 fishers in the 50-mile-by-10-mile Lochsa study corridor…" (Lucas 2006, p. 85).

Also, researchers with the U.S. Forest Service, Idaho Department of Fish and Game, Coeur d'Alene Tribe, Potlatch Corporation, and the U.S. Bureau of Land Management have conducted non-invasive hair-snagging surveys across most of northern Idaho from the Clearwater area to the Canada border, and in portions of south-central Idaho as well (M. Schwartz, J. Sauder, S. Knetter, D.E. Mack, N. Albrecht, S. Cushman, pers. comms.). Fisher surveys in the Idaho Panhandle began with baited box traps lined with barbed wire to collect hairs, and evolved there and elsewhere in the state to a triangular bated box with gun brushes to collect hairs (Schwartz et al. 2006). Preliminary results from the Panhandle indicate fishers are confirmed to be present in low densities within Idaho's portion of the Selkirk, Coeur d'Alene and Cabinet Mountain Ranges (S. Cushman, S. Knetter, pers. comms.). In 2006 and 2007, the Coeur d'Alene Tribe surveyed a large swath of the Tribe's ancestral lands north from the Clearwater across the St. Joe area, and across Interstate 90 into the Coeur d'Alene Mountains south of Lake Pend Oreille. Potlatch Corporation conducted a survey on its lands as well, and preliminary results confirm some fisher presence throughout this entire area, but at low densities and patchily distributed (N. Albrecht, pers. comm.). Forest Service and Idaho Fish and Game biologists have surveyed the Clearwater area and found relatively high densities of fishers within the Lochsa River Corridor, the Elk City area, and the Clearwater country in general north and west of these areas (M. Schwartz, J. Sauder, pers. comms.). Farther south, IDFG surveys in the Payette and Boise National Forests of west-central Idaho generated hair samples that contained three positive instances of fisher DNA (D.E. Mack, pers. comm.). Confirmation of fishers in the McCall and Salmon Regions of central Idaho are notable since these areas represent the southernmost known distribution of fishers in the Northern Rockies region.

The trapping season for fishers has been closed in Idaho since the 1930's. The fisher is listed as a Species of Greatest Conservation Need, and ranked "G5/S1" (IDFG 2005a). This means that it is globally secure, but within the State of Idaho it is: "Critically imperiled. At high risk because of extreme rarity (often 5 or fewer occurrences), rapidly declining numbers, or other factors that make it particularly vulnerable to rangewide extinction or extirpation" (*Ibid*).

Montana

The fisher is listed as a Species of Concern in Montana, and ranked "G5/S3" (MNHP and MDFWP 2006). This means that it is globally secure, but within Montana the fisher is: "Potentially at risk because of limited and/or declining numbers, range, and/or habitat, even though it may be abundant in some areas" (*Ibid*).

Montana is the only state in the western U.S. where fishers can still be legally trapped. There is a statewide annual quota of seven fishers total and approximately this number is taken every year from two trapping districts in western Montana. Given the low population numbers of fishers in increasingly isolated mountain ranges across western Montana, this amount of fisher mortality may not be sustainable. Trapping data indicate fishers still remain in the North and South Fork drainages of the Flathead River, the Swan River drainage, and the Kootenai and Bull River drainages (just east of the Idaho panhandle), though their status is unknown (Thier 2000).

Fishers were believed to be extirpated from Montana by 1920, and there were no observations recorded between 1920 and 1960. This was followed by several fisher translocations into Montana (see below) and the trapping season re-opened in 1983-1984 with a state-wide quota of 20 fishers. This quota was never met. The quota was reduced to ten fishers and then to seven fishers state-wide (Biodiversity Legal Foundation 1994, MDFWP 2007).

Fishers were transplanted into three areas of western Montana in 1959 and 1960,[5] and into the Cabinet Mountains of the Kootenai National Forest between 1988 and 1991 (see Attachment 3). Logging of national forest lands began in earnest in the 1960s and may be responsible for the lack of progress in recovering fisher populations since that time (USDA 2007).

Attachment 3 of this petition contains excerpts from the scientific literature that describe the history of fishers in Montana, describe their decline due to logging and trapping, and document several reintroductions, presented in chronological order of their publication. Vinkey (2003) provides the most current and comprehensive analysis of past and present fisher distribution in Montana. He documents that fishers are fairly widespread (see Figure 2), but their numbers are sparse throughout this range. Only in the Bitterroot region, which borders Idaho's population center in the Clearwater Drainage, are there regular observations of fishers. Vinkey also notes that the Bitterroot population descended in part from a native fisher population, which is affirmed in two subsequent studies (Vinkey et al. 2006, Schwartz 2007, see Part IV of this petition).

Figure 2. All fisher locations in the state of Montana, 1968-2003 (Vinkey 2003)

● = verified record ● = track locations ● = sightings

Wyoming

Fisher observations have been rare in Wyoming during recent years. A fisher was photographed by a remote camera in January 1995 within several miles of the northeast corner of Yellowstone National Park (Gehman 1995). The same researcher has documented several instances of fisher tracks and had a close personal observation of a fisher in Yellowstone between 1985 and 1995

[5] Pine Creek Drainage, Lincoln County; Holland Lake in Missoula County; and Moose Lake in Granite County

(Gehman 1995, Milstein 1995). Outside of Yellowstone, carnivore surveyors observed fisher tracks in two tributaries of the Gallatin River just northwest of Yellowstone and the Wyoming border, and there have been several other reliable observations of fishers in the Gallatin and Madison Ranges of southwestern Montana (Gehman and Robinson 2000). Also, a fisher was trapped in the open sage country near Ucross, Wyoming in 1964 (Brown 1965).

The Wyoming Natural Diversity Database lists fishers as an Animal Species of Concern ranked "G5/S1" meaning the fisher is secure at the global level, but "may be rare in parts of its range, especially at the periphery," and that within Wyoming the fisher is "Critically imperiled because of extreme rarity (often <5 extant occurrences) or because some factor makes it highly vulnerable to extinction" (Keinath et al. 2003).

Canada

Fishers are classified as an "S2/S3" species in British Columbia, meaning their status ranges from imperiled to vulnerable (2 = imperiled; 3 = special concern, vulnerable to extirpation or extinction; B.C. Conservation Data Centre 2007). They are also a "blue-listed" species in British Columbia.[6]

A recent status report from the B.C. Ministry of Environment (Weir 2003) estimates there are probably fewer than 2000 fishers remaining in the province, by extrapolating fisher population densities across the area of suitable habitat.[7]

Perhaps most relevant to this petition, the recent B.C. status report confirms that British Columbia fisher populations are no longer contiguous with fisher populations in the western U.S. The following figure indicates habitat quality is quite low until approximately 200 kilometers north of the U.S. border (see Figures 3 & 4).

The British Columbia Ministry of Environment, Lands and Parks conducted a fisher reintroduction project in the East Kootenay area beginning in 1994, of which a primary goal was to "connect northern US isolated populations with healthy, and increasing populations in central B.C." (Fontana et al. 1999, p. 1). A reintroduction was deemed necessary to restore fishers to this area, because there was no documented evidence of fishers in or near the Kootenay region since 1982, until wolverine researchers live-trapped one fisher in the vicinity of Revelstoke, B.C. in 1998 (*Ibid*, p. 11), which is about 150 miles (240 km) north of the U.S./Canada border. Between 1996 and 1998, a total of 61 fishers were transported from the Williams Lake area of B.C. to the East Kootenays, of

---

[6] "Blue: Includes any indigenous species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened." (B.C. Conservation Data Centre 2007)

[7] "[T]he late-winter population estimate for the province extrapolates to between 1113 and 2759 Fishers… These numbers may represent a very imprecise estimate of the total British Columbia Fisher population for several reasons. The density estimate for the Williston region may not be representative or transferable to other areas because of variability in habitat suitability, trapping pressure, or prey. Areas encompassed by the habitat capability map that were covered by water were not subtracted from the total area. An estimate based on habitat capability does not account for changes in broad habitat suitability, primarily through logging and land development, across these zones. Taking all of these sources of variation into consideration, the population of Fishers in British Columbia may be less than 2000 adults." (Weir 2003, p. 20)

which 37 were radio-collared to monitor their movements and status (*Ibid*, pp. 7, 12). An assessment of this project conducted in 2003 concluded that despite this effort, "a self-sustaining population of fishers does not likely occur within the assessment area" (Weir et al. 2003, p. 21). The assessment estimated between 4 and 6 fishers may still survive in the area (*Ibid*). Thus the project did not succeed at its goal to re-connect the U.S. and Canadian fisher populations, but it did provide important information on fisher habitat preferences, mortality, and movements, and begin important outreach and education to local trappers and schoolchildren in this portion of southeastern B.C., which someday could provide a vital "stepping stone" between U.S. and Canadian fisher populations.

Figure 3. Fisher Habitat Capability in British Columbia (Weir 2003, p. 14).

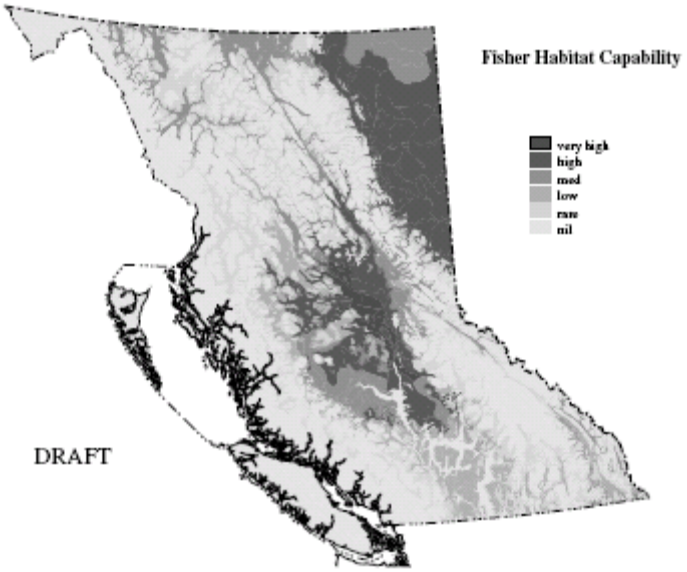


Figure 6. Estimated habitat capability for Fishers for British Columbia. Note that capability does not represent current habitat suitability.

The following text describes a decline of the fisher's range in B.C. (Weir 2003).

> …Fisher populations have likely disappeared from the Cascade and Okanagan mountain ranges of the southern interior and the Columbia and Rocky mountain ranges south of Kinbasket Reservoir… these areas have low habitat suitability and no consistent harvests of Fishers over the past 15 years (total of 13 Fishers in both regions combined) despite the harvest of 56,880 American Martens (data from Provincial Fur Harvest Database). (pp. 17-18)

The following figure illustrates this range decline in southern B.C.

Figure 4. Fisher Distribution in British Columbia (Weir 2003, p. 19).

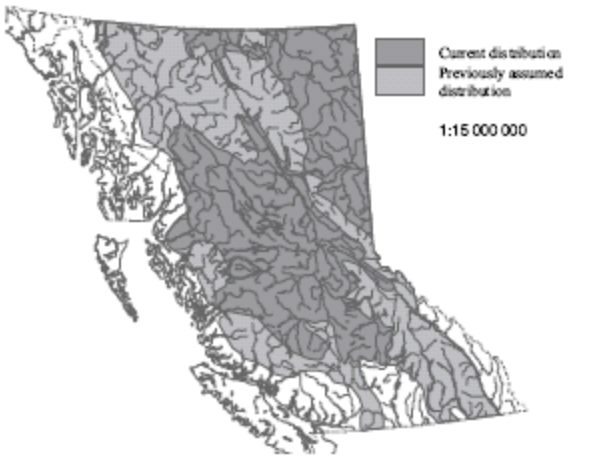


Figure 8. Current and previously assumed extent of occurrence of Fishers in British Columbia.

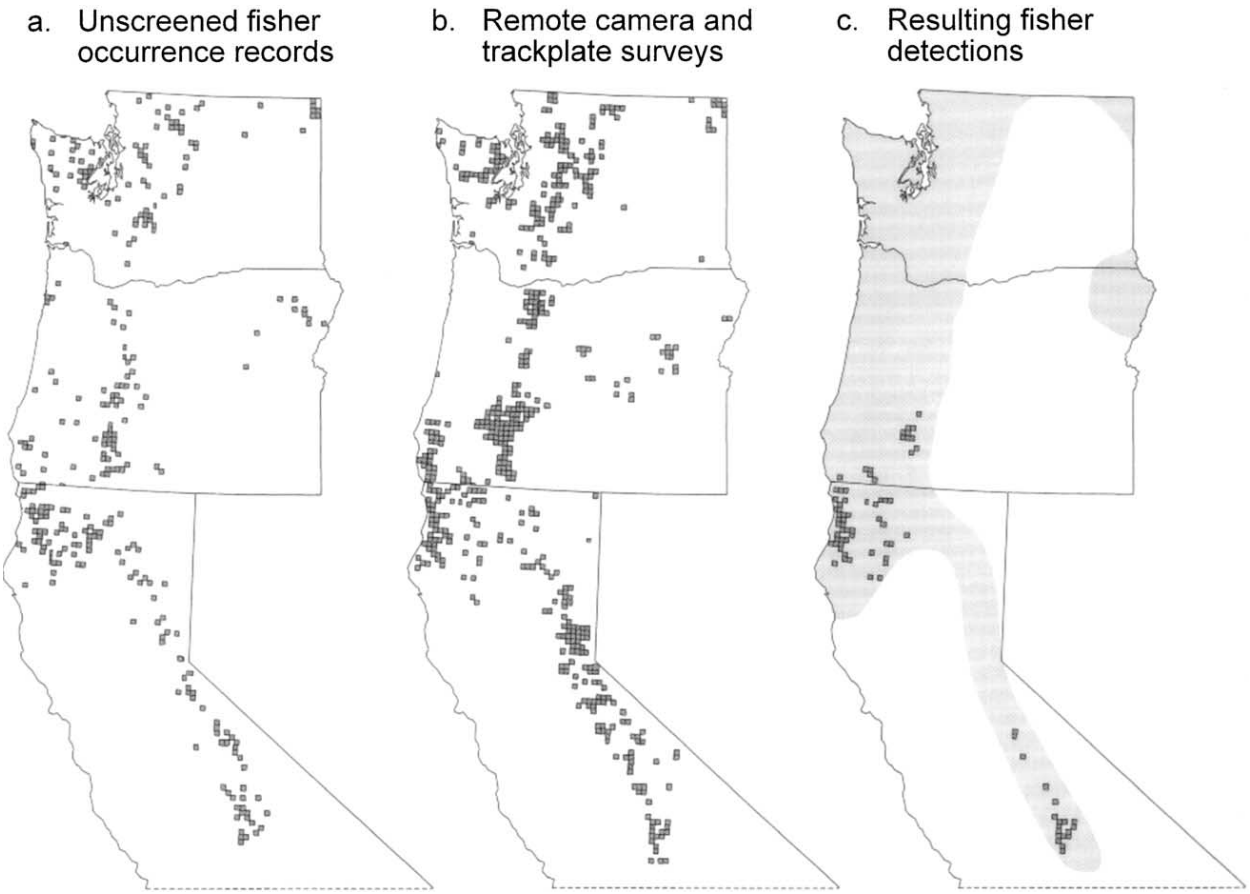
The B.C. status review (Weir 2003) concludes that fisher recovery and re-connection with western U.S. populations is unlikely to occur any time soon.[8]

Fisher distribution and status in the western U.S., Conclusion

The following figures represent the best available information on fisher distribution over time. The maps of historic range are consistent in that fishers were connected throughout North America through Canada. Maps of current range differ in both how much area is considered to be current fisher range, and how contiguous this range is in the western U.S. and Canada. Generally speaking, the more recent information indicates that current fisher range encompasses less area and is more fragmented than previous information. Perhaps the clearest example of this is illustrated in the following figure from Aubry and Lewis (2003) regarding the current range of the West Coast fisher, which indicates that what was previously believed to be a contiguous fisher population from Washington to southern California is in fact just three small, disjunct populations in California and southwestern Oregon.

[8] "Several Fisher populations (Omineca/Skeena, Peace, East Kootenay) in British Columbia appear to be at risk because of threats to their habitats and continued exploitation through fur harvesting activities. In the Cariboo region, where Fisher populations may be stable or expanding, Fishers are still susceptible to continued habitat alterations. Insufficient information on the relative health and status of these populations hinders an accurate estimate of trends in their populations. However, a low total population size, continued exploitation, and continued degradation of the habitats that they seem to require, all probably contribute to their vulnerability. Therefore, it is recommended that Fisher populations in British Columbia be ranked as S2/S3." (Weir 2003, p. 34, emphasis added)

Figure 5. West Coast fisher distribution, excerpted from Aubry and Lewis 2003



Similar to fishers in their West Coast range, fishers in the Northern Rockies are far more sparse and patchily distributed than their overall range would suggest. As discussed in detail above, although fishers are known to be relatively widespread in Idaho and western Montana (Figure 9), the only known, sizeable population within this large area is in the Clearwater Drainage of Idaho and the neighboring Bitterroot region of Montana.

Figure 6. Historical and current distribution of fishers in western North America (Gibilisco 1994)

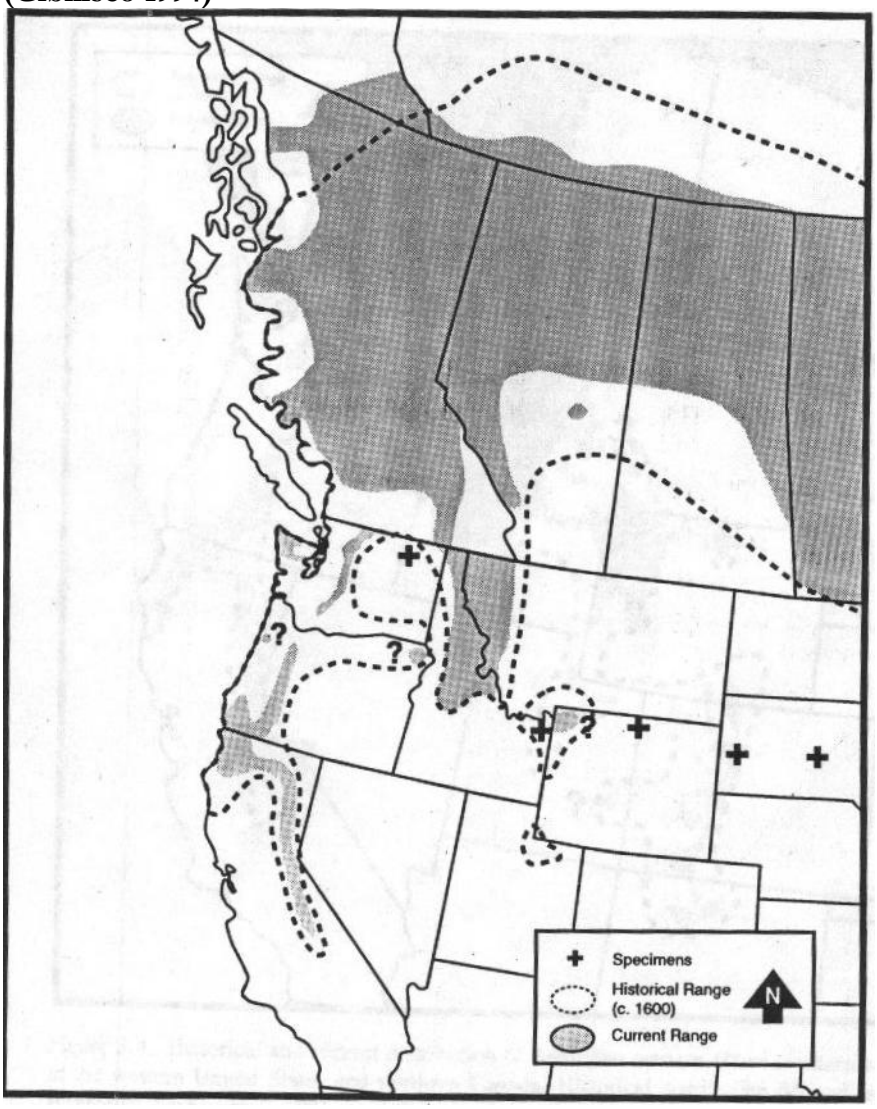
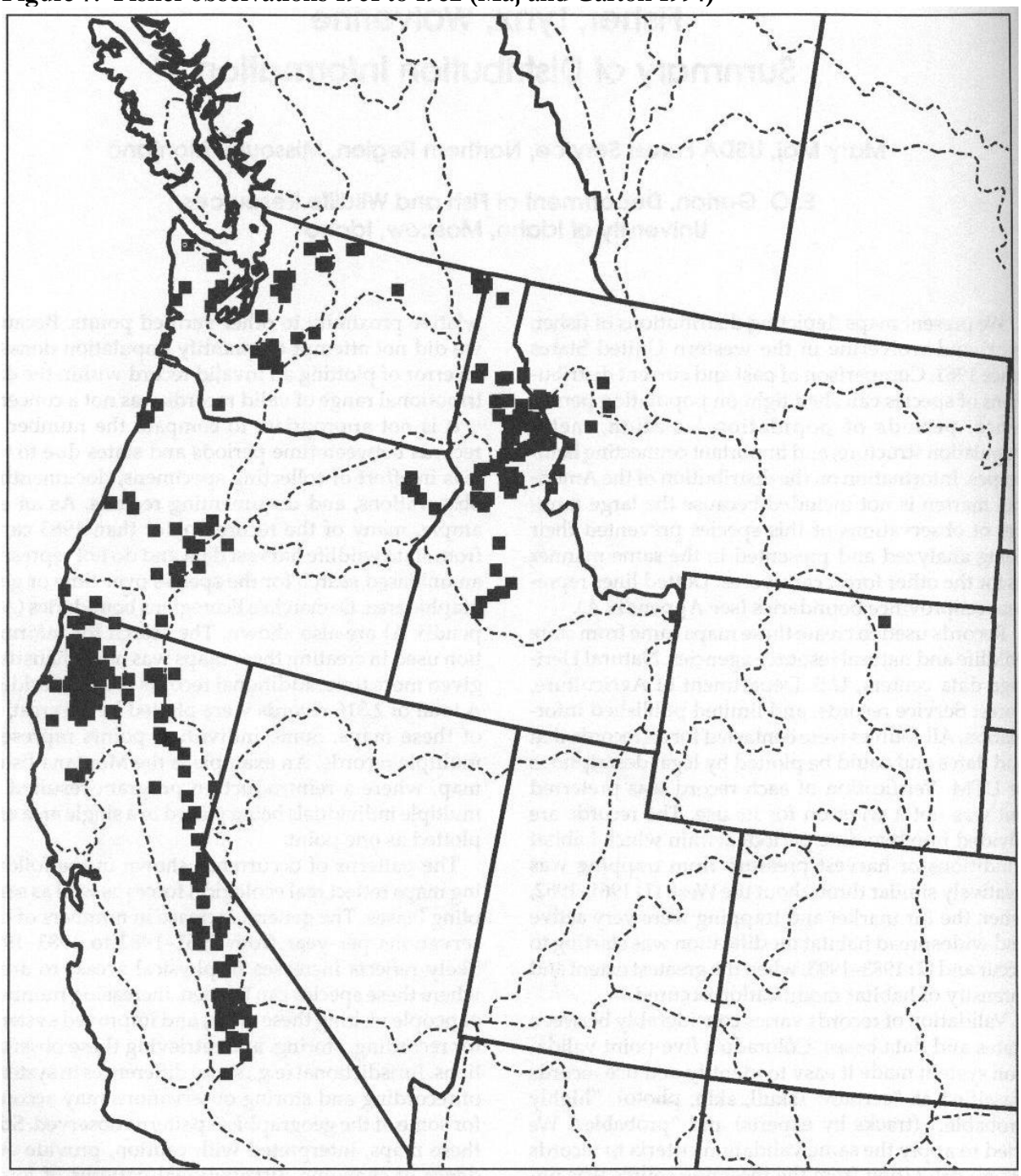
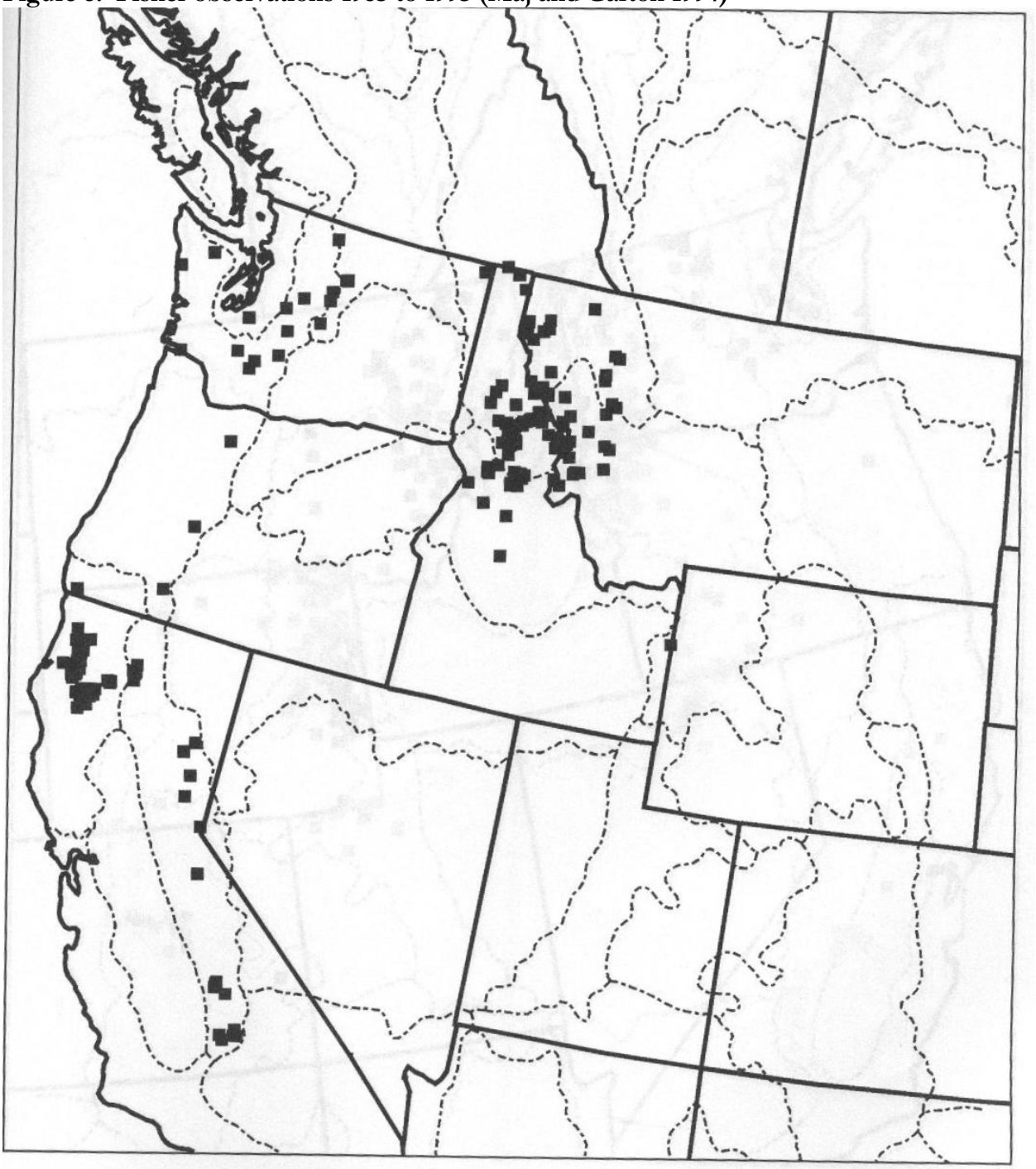


Figure 7. Fisher observations 1961 to 1982 (Maj and Garton 1994)



Fisher observations 1961 to 1982.

Figure 8. Fisher observations 1983 to 1993 (Maj and Garton 1994)



Fisher observations 1983 to 1993.

Figure 9. Historical and current range of the fisher in North America (Lewis and Stinson 1998)

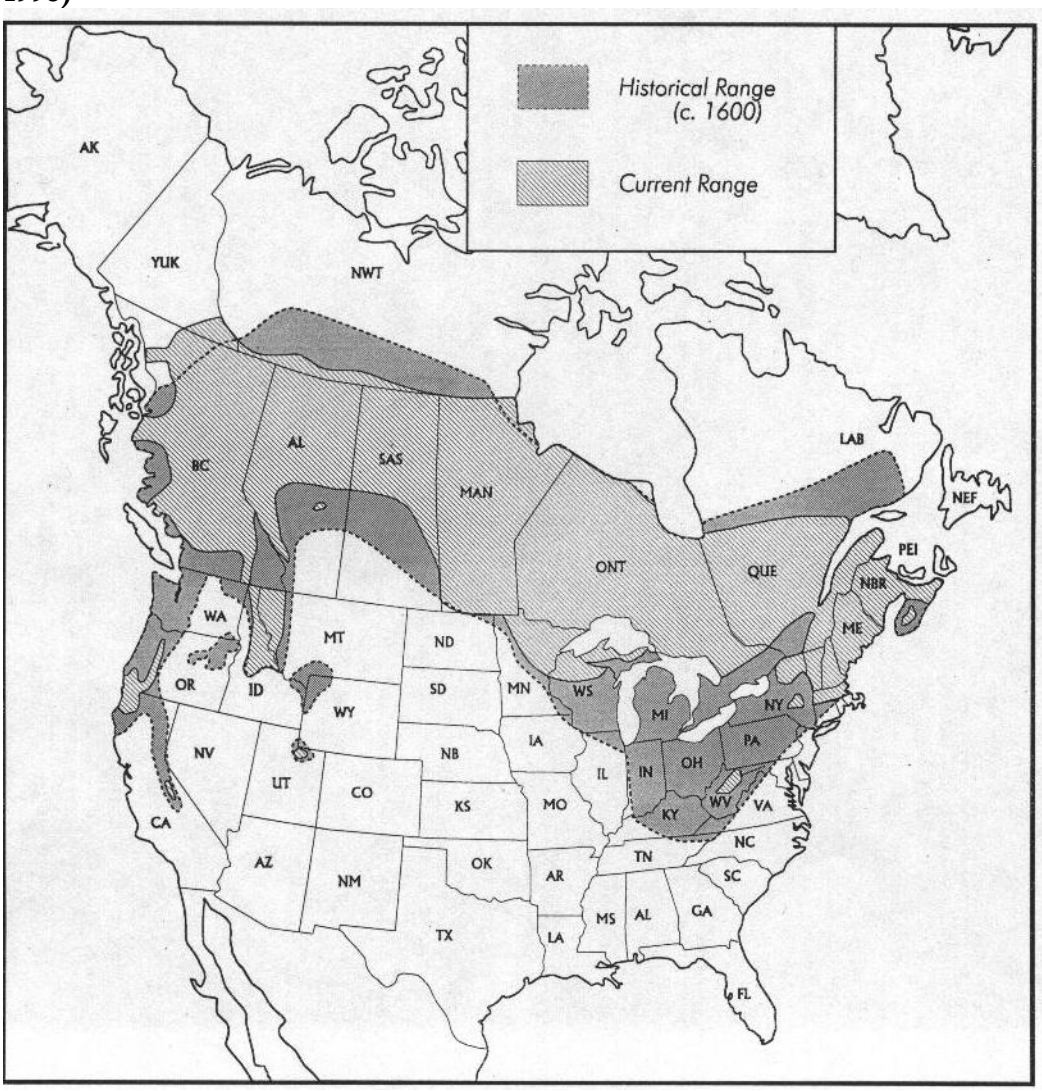
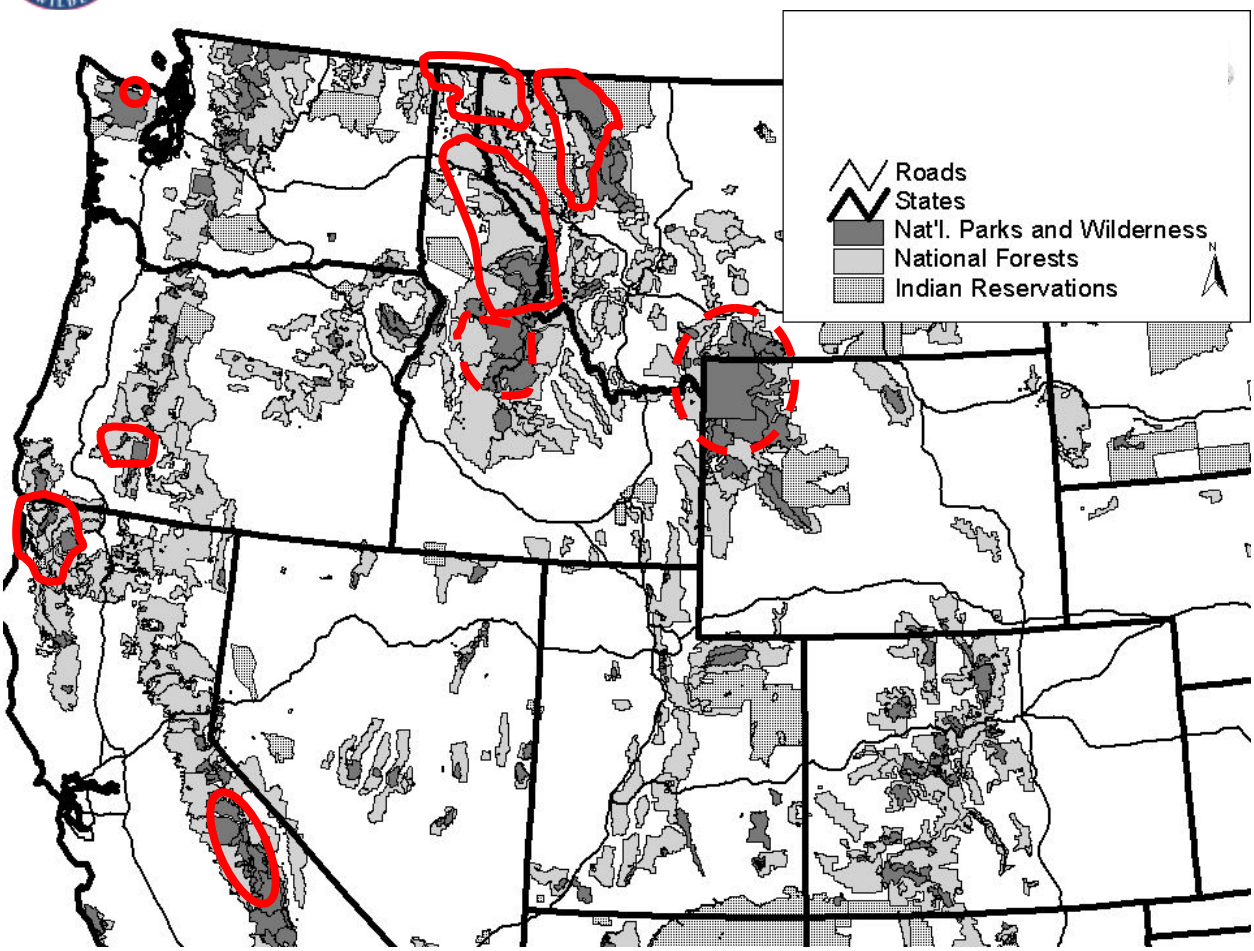


Figure 10. Current known distribution of fishers in the western United States*
(dotted boundaries indicate possible range)



*Map created by Defenders of Wildlife from the following source data: Aubry and Lewis 2003, Vinkey 2003, IDFG 2006, Thier 2000, USDI 2008, Gehman 2000, N. Albrecht, pers. comm., S. Cushman, pers. comm., S. Knetter, pers. comm., D. E. Mack, pers. comm., J. Sauder, pers. comm., M. Schwartz, pers. comm.

Part III. Ecological factors affecting the survival and recovery of fishers in North America

A variety of ecological factors at work in the Northern Rockies region make fishers especially vulnerable to extirpation. This section of the petition is devoted to these factors, which include the following: low population sizes and densities, diet, low reproductive rate, mortality, large home range sizes, short effective dispersal distances, fragmentation of fisher populations and habitats, and specialized habitat needs for resting sites, den sites, and foraging. Weir (2003) provides a brief introduction to some of these in his status review of fishers in British Columbia, where they are far more secure than the U.S. Northern Rockies:

> Several characteristics of Fisher ecology make the species susceptible to anthropogenic disturbance... Fishers have a short lifespan with low reproductive output and, as a result, small changes in survival rates can have considerable effect on the persistence of both individuals and populations… The primary threats to Fisher populations in British Columbia are likely anthropogenic, which occur through changes to habitats from development of forested land (i.e., logging, hydroelectric developments, and land clearing) and changes in survival rates caused by trapping. (p. 25)

Low Population Sizes and Densities

Fisher populations in the Northern Rockies are very small, as evidenced by the rarity of fishers found in the field studies, observation and trapping data (see excerpts from the scientific literature below and in Attachment 4 of this petition). A FWS conclusion regarding the West Coast fisher populations applies equally well to fishers in the Northern Rockies (USDI 2004 at 18772):

> Despite the lack of precise empirical data on fisher numbers in the western states, the relative reduction in the range of the fisher… the lack of detections or sightings over much of its historical distribution, and the high degree of genetic relatedness within some populations… indicate that it is likely extant fisher populations are small.

Fishers are rare in Montana according to the trapping and observation data that follow. These tables show that fewer fishers are trapped than any other animal with a legal trapping season in Montana, including wolverines and lynx (before 1990, when the statewide lynx quota was reduced to 2 lynx per season, and then closed in 2000).

Table 1. Trapping data for the four rarest species in Montana by year, plus martens for comparison, 1985 — 2007 (MDFWP 1995, MDFWP 2005; MDFWP unpublished data 2008)

Spp.	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	Sum
Fisher	--	15	14	10	13	9	1	4	5	7	8	2	6	7	8	5	7	7	7	8	7	9	7	166
Wolv.	25	16	10	8	9	10	6	9	6	9	9	12	12	15	9	4	14	10	15	10	11	11	9	249
Lynx	64	37	23	15	22	15	2	3	2	3	3	5	2	3	6	3	0	0	0	0	0	0	0	208
Otter	40	50	62	38	30	45	26	35	35	51	62	61	65	84	67	64	48	96	83	80	88	94	77	1381
Marten	2392	2444	2366	2393	2426	1283	736	996	603	822	1323	802	830	900	716	653	1064	845	1053	1062	1248	944	855	28756

The following three tables illustrate that fewer fishers are observed in Montana according to winter track survey results and hunter/trapper logbooks than wolverines or lynx, making fishers the rarest furbearer in Montana monitored by the Montana Department of Fish, Wildife and Parks (MDFWP, emphasis added).

Table 2. Montana statewide summary of winter track survey results for selected species, 1990—2007 (NW & SW Montane ecoregions; MDFWP 1995, MDFWP unpublished data 1998, 2008)

Year	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Sum
Routes	12	7	24	18	25	23	24	25	29	30	30	27	29	29	23	26	22	
Replicates	1-3	1-3	1-3	1-3	1-3	2-3	1-3	1-4	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	
Miles	297.0	173.0	527.0	432.4	550.3	896.6	1019.7	901.0	1080.7	1232.7	1260.0	1042.9	966.7	922.9	544.6	718.5	637.4	
Marten	221	60	424	245	509	581	425	674	641	557	777	696	363	556	173	246	262	7410
Fisher	0	0	1	4	4	3	14	2	11	11	10	6	0	3	3	1	0	73
Wolverine	1	0	5	4	13	28	56	55	81	45	19	49	15	54	5	21	22	473
Lynx	31	11	21	53	10	55	107	133	149	115	313	237	321	287	98	204	223	2368

Table 3. Montana statewide indices of track detection rates (detection/100 miles) for selected species, 1990—2007 (NW & SW Montane ecoregions; MDFWP 1995, MDFWP unpublished data 1998, 2008).

Year	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Sum
Marten	74.4	34.6	80.4	56.6	92.4	64.8	41.6	74.8	59.3	45.2	61.7	66.7	37.5	60.2	31.7	34.2	41.1	957.2
Fisher	0.0	0.0	0.2	0.9	0.7	0.3	1.3	0.2	1.0	0.9	0.8	0.6	0.0	0.3	0.5	0.1	0.0	7.8
Wolverine	0.3	0.0	0.9	0.9	2.3	3.1	5.5	6.1	7.5	3.6	1.5	4.7	1.5	5.8	0.9	2.9	3.4	50.9
Lynx	10.4	6.3	4.0	12.2	1.8	6.1	10.4	14.7	13.8	9.3	24.8	22.7	33.2	31.1	18.0	28.4	34.9	282.1

Table 4. Montana statewide summary of trapper and houndsman logbook reports for selected species, 1990—1994 (and # of counties; MDFWP 1995, emphasis added).

Year	1990-91	1991-92	1992-93	1993-94
Number of logbooks	--	6	8	15
Fisher	--	1 (1)	3(2)	8(4)
Wolverine	--	4(2)	9(2)	6(4)
Lynx	--	8(1)	16(4)	13(6)

Table 5. Montana statewide summary of FWP occurrence/distribution reports for selected species, 1990—1994 (and # of counties, MDFWP 1995).

Year	1990-91	1991-92	1992-93	1993-94
Number of logbooks	--	10	8	22
Fisher	--	4(1)	2(1)	4(1)
Wolverine	--	2(2)	4(2)	4(3)
Lynx	--	4(3)	2(2)	18(7)

Additional data indicating the rarity of fishers are found in Vinkey's recent field work (2003) and review of fisher records in Montana.[9] Subsequent genetics work by Vinkey et al. (2006) and Schwartz (2007) verifies that extant fisher populations are isolated from each other and from outside fisher populations as well (see Part IV, Distinct Population Segment criteria, of this petition).

Fisher population densities in Idaho are lower than in northern California (where fishers are now candidates for listing) according to Jones (1991), who used live-trapping effort as an index of population density and compared his trapping success rate to four other studies. He also found that Idaho fishers have larger home range sizes than in other areas.[10] Furthermore, he concludes that

[9] "Although we can not estimate population size based on this research, fishers are by no means abundant in the study area. In fact, two of three fishers harvested in the Cabinets, during this study, were animals that we had marked (n= 4). While this limited sample does not represent a statistically valid mark recapture effort, the high proportion of recaptures in concert with a paucity of detections (28 in 25 survey weeks with 4957 trap/track plate nights and 740 kilometers of track transects) suggests that the population is small and limited in distribution. Over the long-term small populations may or may not persist, but it is unlikely that this population will expand greatly." (Vinkey 2003, p. 33, emphasis added)

"Presence is not an appropriate index to population density, but data on a species' distribution is fundamental to our understanding of its status. Our distribution map includes records gathered over 35 years and consequently may not reflect current occupied habitat. Despite the fact that fisher records are found in a dozen mountain ranges in Montana, carnivore research conducted in many of these locales (Gehman and Robinson 2000, Giddings 2000, Hahr 2001, Parker 2003) has demonstrated that the species is one of the lowest density carnivores in the state. For example, during three winters (2001-2003) of fieldwork in the Cabinets and West Cabinets we collected only 11 verified records of fisher (Chapter 1, this thesis)." (*Ibid*, p. 61, emphasis added)

[10] "In my study, a total of 13,269 trap-nights (TN) resulted in 42 captures of 25 fishers. Capture rates from October through July, and October through December averaged 0.32 and 0.17 captures/100 NT,

fishers are sparse and have a low reproductive rate in Idaho,[11] inferring a low population density from his analysis of placental scars.[12]

Weir (2003) found significantly lower densities than fisher populations in eastern North America, a situation that appears to hold true in the western U.S.[13] Attachment 4 of this petition contains excerpts from the scientific literature that document the low density of fisher populations in general, and how this threatens the viability of small populations.

Diet

Fishers prey on a variety of small mammals, carrion, birds, insects, and vegetation, as described in the FWS 12-month finding on the West Coast fisher petition (Attachment 1, p. 18772). Information specific to the northern Rockies is described in the 1994 Biodiversity Legal Foundation's petition, which notes the importance of several prey items in particular: snowshoe hares, porcupines, red squirrels, voles and carrion. The latter makes fishers vulnerable to traps.[14]

---

respectively. It appeared that fisher density in northcentral Idaho may be similar to New Hampshire (Kelly 1977), substantially lower than northern California (Buck 1982, Mullis 1985) and Maine (Arthur 1988), and slightly greater than Manitoba (Raine 1981). These other studies also reported substantially smaller home-range sizes than I found in Idaho." (Jones 1991, p. 108, emphasis added)

[11] "Circumstantial evidence suggest that only a sparse population of fishers exist within my study area; home-range sizes were generally larger and live-trapping success rates generally lower than most other studies, and 1 of 4 sampled adult females was barren." (*Ibid*, p. 117)

[12] "Further evidence that my study area may have a lower fisher density is that 1 of 5 adult females examined for placental scars was apparently barren the year prior to examination, although she had been bred previously. The frequency of barren females may indicate: 1) an inadequate population density to ensure the insemination of all females (Leonard 1980), or 2) that overharvesting (or some natural mortality agent) has depressed the number of breeding males (Powell 1982, Strickland et al. 1982)." (*Ibid*, p. 108)

[13] "Densities of Fishers in British Columbia are likely considerably lower than in eastern regions. The recorded home ranges of Fishers in British Columbia were larger than those in studies from eastern North America by factors of 7.9 for males and 3.9 for females, based on means of 18.5 km2 for males and 8.9 km2 for females… It is unclear why the density of Fishers in British Columbia is so much lower than elsewhere in their range, but it may be the result of variable resource densities (e.g., prey or snow difference) or some limiting factor that is not found elsewhere." (Weir 2003, p. 20, emphasis added)

[14] "Although fishers are opportunistic feeders, they commonly are associated with snowshoe hares and are the primary predator of porcupines (Douglas and Strickland 1987). Snowshoe hares, voles, and red squirrels were reported as the primary prey for fisher in an Idaho study (Jones 1991). Fishers also consume carrion and fruits, nuts, and berries. Because they eat carrion, fishers are susceptible to baited traps.

Jones (1991) discusses habitat relationships between fisher and their prey:

> [I]t appeared that fisher habitat use reflected prey habitat relationships reported in the literature. Summer habitat preferences of fishers suggested that fishers may select habitat that would be expected to have high densities of voles and possibly snowshoe hares (i.e., forested riparian habitats). Further, the relative abundance of Pacific yew in the understory of summer use sites would seem to provide optimal snowshoe hare escape and thermal cover. Similarly, the fishers' preference for spruce in the understory may be associated with optimal red squirrel habitat…

During winter, fishers also seemed to prefer old-growth grand fir stands having a relatively high understory cover of Pacific yew. Snowshoe hares are likely to be found in areas with high habitat interspersion (Conroy

Roy (1991) describes the diet of fishers translocated from Minnesota to the Cabinet Mountains, which indicates deer carrion and porcupines are especially important, and red squirrels may be consumed less than their availability.[15]

Low Reproductive Rate

FWS describes how fisher reproductive rates are low and variable in its 12-month finding on the West Coast fisher petition (Attachment 1, p. 18772).

Jones (1991) reports that in the Northern Rockies, fisher litter sizes averaged 1.5 kits per female based on counts of placental scars, or between two and three based on blastocyst counts. Both estimates assume no *in utero* or resorption losses.[16] Note that his specimens were five female fishers incidentally killed in traps set for martens, a significant source of fisher mortality in Idaho (see Part IV(B) of this petition).

Powell and Zielinski (1994) provide documentation that a limiting factor for fisher restoration may be their low reproductive rate. The causes of low reproduction may include low nutrition during periods of high snowfall, and the failure of yearling males to successfully breed, especially in trapped populations.[17]

---

et al. 1979) and areas with dense understories (Dolbeer and Clark 1975, Winn 1976, Wolfe et al. 1982, Litvaitis et al. 1985, Koehler 1988, Arthur et al. 1989a)." (Biodiversity Legal Foundation 1994, p. 22)

[15] "From scat analysis, snowshoe hares comprised the majority of fisher diets, followed by other assorted small mammals… However, the importance of deer carrion may be under-represented by the scat analysis; fishers used deer carcasses extensively on 8 known occasions, and scats were not collected in those areas." (Roy 1991, p. 29)

"Curiously, no squirrel remains appeared during scat analysis, even though squirrels appeared to be fairly abundant… The importance of porcupines and deer carrion in the scat analysis may be under-represented. Small predators eating chiefly muscle tissue from a porcupine or deer carcass pass fewer hairs in proportion to the mass eaten than for smaller prey species (O'Gara 1986)." (*Ibid*, pp. 48-49)

[16] "Assuming no resorption of fetuses, counts of placental scars suggested that litter sizes of fishers in northcentral Idaho averaged 1.5 kits per female (range 0-3). However, Coulter (1966) noted difficulty in detecting implantation sites when uteri were not fresh. Thus, the estimate of litter size using placental scar counts from frozen carcasses may be biased low. Blastocyst counts indicated that potential litter sizes of fishers in northcentral Idaho ranged between 2 and 3, assuming no <u>in utero</u> loss." (Jones 1991, p. 84)

[17] "Female fishers are usually sexually mature and breed for the first time at 1 year of age... Implantation is delayed approximately ten months, and, therefore, female fishers can produce their first litters at age two. Females breed again approximately a week following parturation… Why some females that have bred fail to produce litters is unknown, but nutritional deficiency related to stressful snow conditions is suspected because reproductive indices are higher in some areas of low snowfall… [T]he mean litter sizes for fishers from seven studies... ranged from 2.00 to 2.90… <u>The recovery of fisher populations will be slow because fishers have small litters and do not produce their first litters until two year of age</u>. Reproductive output of populations biased toward young fishers is limited by the inability of yearling males to breed effectively. <u>Over-trapping may also bias the population toward young animals, further delaying recovery</u>." (Powell and Zielinski 1994, pp. 46-48, emphasis added)

Mortality

In addition to reproduction, mortality is a key component of species viability. Predation from other animals, trapping and roadkill are the chief causes of fisher mortality described by Biodiversity Legal Foundation in its 1994 petition.[18] The petitioners are not aware of recent research into fisher mortality specific to the Northern Rockies.

Home range size

Fishers' spatial requirements are described as "enormous" — from 50 square miles in the western U.S. — and increase as habitat quality declines. An Idaho Department of Fish and Game publication notes that fisher home ranges in the Northern Rockies are 2-11 times greater than in other regions. This and other information on fisher home range sizes is found in Attachment 5 of this petition.

Specific to the Northern Rockies, Jones (1991) found female home ranges even larger than Weir reports from British Columbia (Attachment 5), but not as great a difference with male home ranges, which he found to be about double that of females.[19] More details are found in the "results" and "discussion" sections of his thesis, which indicates his sample size is too small for the difference between male and female home ranges to be significant. Yet he also quantifies that fisher home ranges in Idaho are more than one-half (57%) larger than in Maine.[20]

---

[18] "Although not a common occurrence, hawks, great horned owls, red foxes, bobcats, lynx, and black bears may prey on fishers (Douglas and Strickland 1987, Powell and Zielinski 1994). Trapping and habitat destruction are the most likely threats to the fisher (Douglas and Strickland 1987). In some areas of Maine, roadkills may equal the legal harvest of fishers (A. Clark, pers. comm. in Douglas and Strickland 1987). Douglas and Strickland (1987) report: "Trapping is a significant mortality factor in populations. Fishers are attracted to baits and are easily trapped. They are also frequently caught in traps set for other furbearers. Males may be more likely to encounter traps than females because of their larger home ranges (Yeager 1950, Quick 1953).

Fisher in the western United States may be more vulnerable to trapping pressures due to lower densities (resulting in larger home ranges and thus an increased likelihood of encountering traps), lower productivity (increasing the species' sensitivity to additional mortality, even if minimal), and lack of refugia (roads have increased the accessibility of poachers and furbearer trappers into previously remote fisher habitat). These threats further decrease the chance for long-term survival of the species in the western states." (Biodiversity Legal Foundation 1994, p. 18)

[19] "Median year-long home-range sizes were 82.6 square kilometers and 40.8 square kilometers for males and females, respectively (range = 28.8-119.5 and 6.0-75.4 square kilometers, respectively); the medians were not statistically different (U=19, P=0.20)." (Jones 1991, Abstract)

[20] "Although male fishers appeared to have home ranges nearly twice as large as females… results of the Mann-Whitney U tests indicated that differences between sexes were not significant for either the year-long (U = 19, P = 0.20) or summer (U = 12, P > 0.20) periods. Estimates were made for winter home ranges for only 2 fishers (animals 92 and 112) due to either sample size limitations or too short of a time interval in which animals were monitored. The male (animal 092) and female (animal 112) had estimated winter home range of 64.7 km2 and 39.3 km2, respectively. Sample sizes were not adequate to compare differences between summer and winter home range estimates." (Jones 1991, pp. 80-81)

"Median yearly ranges for male (82.6 km2) and female (40.8 km2) fishers in my study were approximately 3-5 times and 2-15 times larger than previous reports, respectively… Similarly, median summer ranges for my

Heinemeyer (1993) investigated the home range sizes for the fishers she released into Montana's Cabinet Mountains using a different method, and found smaller ranges similar to fisher populations in Maine.[21] She speculates the reasons for the smaller home ranges in Montana compared to Idaho. One possible explanation is that her fishers released in the Cabinets stayed within relatively small patches of high-quality habitat.[22] She also suggests that the small home range sizes she found may be an artifact of a newly transplanted population.[23] In sum, it is clear that the tremendous spatial requirements of fishers present a significant conservation challenge, especially in the Northern Rockies where their habitat appears to be less productive than in the West Coast and eastern forests.

Dispersal

While fishers are capable of making long-distance movements, recent genetics work described in the "fragmentation" section that follows indicates that despite elements of fisher physiology and behavior that provide hope for maintaining and restoring connectivity, fisher populations in the western U.S. exhibit the high genetic structure, limited gene flow, and low genetic diversity associated with small, isolated populations.

FWS's review indicates fisher dispersal distances can be relatively short in areas of high mortality and low density of fishers (USDI 2004). FWS also notes the tendency of males to disperse, while females tend to stay in one place (Attachment 1, pp. 18772-18773).

Weir (2003) provides additional data from British Columbia that indicate fishers may not disperse well despite their ability to travel long distances, and even within what is often assumed to be contiguous fisher habitat in Canada.[24] He concludes this discussion by emphasizing the importance of dispersal to the persistence of fisher populations.[25]

---

male (49.1 km2) and female (28.7 km2) fishers were 2-3 times and 1-11 times larger than other male and females, respectively… Since my estimates may have been biased low, it appears that home ranges of northcentral Idaho fishers may be at least 57% larger than fisher home ranges in Maine. (*Ibid*, pp. 103-104, emphasis added).

[21] "Fisher homeranges in Idaho were 2 to 11 times larger than other reported fisher homerange estimates when analyzed using the harmonic mean method (Jones 1991). The same data of females, reanalyzed using the adaptive kernel method, was still more than twice as large (median 25.2 km2 with a range of 5.1 – 41.0) as adaptive kernel estimates for female homeranges in Maine (median of 11.1 km2 with a range of 8.2 – 31.6). In contrast to Idaho fishers the reintroduced female fishers in Montana appeared to have homeranges similar to Maine females, with a median of 14.4 km2 and a range of 10.8 – 41.8 km2." (Heinemeyer 1993, p. 93)

[22] "According to optimal selection theory, initial colonizers should select the most optimal habitats, while later immigrants select less optimal habitats… Such a process is supported by the small size of the Montana homeranges in comparison to Idaho homeranges and the clustering of fisher residencies along a narrow band of habitats. The habitat selection that occurred in the reintroduced fishers may represent optimal habitat selection within a generally poor habitat, resulting in small homeranges relative to expected homeranges in western habitats." (*Ibid*, pp. 95-96)

[23] "A third possibility for explaining the relatively small homerange sizes directly implicates the recolonization process. Research recently completed on recolonizing European lynx (*Lynx lynx*) indicates that homerange sizes are approximately 3 times smaller on the leading front of the recolonizing population than in the established center (Breitenmoser and Haller 1993)." (*Ibid*, p. 96)

Jones (1991) recorded male fisher movements from 10.7 to 39.7 kilometers, which were "frequently associated with the breeding season." Only one of his four females dispersed a significant distance (10 km).[26] Roy (1991) provides additional data from the Cabinet Mountains, where he documents a female traveling 30 km and a male traveling 71 km.[27] He concludes that fishers are prone to long movements during the breeding season, though their breeding success following these movements is unknown.[28] Thus, despite the fisher's ability to travel, their limited dispersal is well documented, and has contributed to fragmented fisher populations and habitats.

Fragmentation

Analysis of fisher genetics provides evidence that fisher populations are prone to isolation due to behavioral traits and/or anthropogenic barriers to their movement, despite their physiological ability to travel long distances (see Attachment 6 of this petition). The threat posed to fishers due to fragmentation of their populations and habitats in the Northern Rockies is further discussed in Part IV of this petition, under Listing Factor D: the inadequacy of existing regulatory mechanisms.

Habitat needs

More than any other factor, protecting forested habitat is the most important fisher conservation need. The scientific literature is replete with data that indicate that habitat degradation is a driving

---

[24] "Some evidence suggests that Fishers may have poor dispersal capability… The low degree of relatedness among Fisher populations across Canada… supports this hypothesis of low dispersal capability... The apparent contradiction between short successful dispersal distances and the considerable movement potential of Fishers may be because effective dispersal is dependent upon many factors in addition to the ability to move through the landscape. Suitable habitat and prey, avoidance of predators and other mortality agents, and the presence of conspecifics can all act in concert to affect successful dispersal." (Weir 2003, pp. 7-8)

[25] "The process of dispersal is integral to the persistence of Fisher populations, because Fisher populations are inherently unstable (Powell 1994a) and are probably characterized by periods of local extinction and recolonization (Powell 1993). Thus, the ability of individuals to successfully disperse to unoccupied habitats is important for population persistence." (*Ibid*, p. 8)

[26] "Fishers (particularly males) seemed quite capable of travelling long distances over short periods of time. Only one of four radio collared females (Fisher 282) was observed to travel a distance resembling long distances covered by males. She travelled about 10 km within a 10 day period in early July. Males appeared to be particularly prone to making long distance travels, especially just prior to, or immediately after the breeding season… Some males made only one relatively long movement and then remained in that general vicinity for the duration that their transmitters were monitored, whereas other males made several lengthy excursions." (Jones 1991, pp. 77-78)

[27] "In general, the fishers did not immediately disperse from the study area… During the breeding season, late March and April, fishers of both sexes moved long distances between standard relocations and abandoned areas of previous use… In an extreme example, one female (1076) travelled >30 km over extremely rugged terrain in 2 days during April… The furthest radio location from the release site for a male (M1) was 71 km away." (Roy 1991, pp. 39, 42)

[28] "Both males and females moved long distances into unknown areas in the breeding season, often into areas that contained few if any other fishers. Long breeding movements occurred despite the stresses of a new environment and completely unfamiliar terrain." (*Ibid*, p. 65)

factor behind fisher population declines, particularly the loss of mature and old growth forests (see Attachment 7 of this petition).

Fisher habitat in the Northern Rockies

Results from fisher research within the Northern Rockies generally support these findings: "My observations of fisher locations concurred with other studies… in that fishers did not use non-forested habitats…" (Jones 1991). Yet the same study found fishers, while exhibiting a strong reliance on mature or old growth forests, use young forest stages and open areas as well.[29]

Fishers prefer mixed conifer stands and avoid open areas due to logging or above treeline, according to Roy (1991), who briefly describes the habitat used by fishers in the Cabinet Mountains imported from Minnesota. Yet he also found that fishers preferred young-to-medium aged stands, which he suggests may provide more prey. He also acknowledges that he lacks nighttime location data, when fishers may find refuge in older forests.[30]

---

[29] "A broader range of habitats was used for hunting relative to resting activities. During summer, mature or old growth forests occupied 92% and 74% of resting and hunting sites, respectively. Fewer differences between resting and hunting observations were evident in winter. Fishers had a strong affinity for forested riparian habitats during summer and winter; stream courses also appeared to be used for travel." (Jones 1991, Abstract, p. iii, emphasis added)

"However, the evidence of microtines, yellow-bellied marmot, and ground squirrels in the diet of fishers in my study suggested that fishers may have made forays into non-forested, or sparsely forested habitats for hunting. Mature to old-growth coniferous forests have commonly been described as optimal or preferred fisher habitat… especially in areas with deep snows… However, my observations of fishers suggest that although old-growth forests seem to be preferred during summer and winter, young forests were the most preferred cover type in winter." (*Ibid*, p. 88, emphasis added)

[30] "In the following presentation of habitat use data, the term "prefer" indicates selection of habitat types in significantly greater proportion than availability, and the term "avoid" indicates selection of habitat types in significantly lower proportions than availability.

The majority of radio locations occurred in mixed conifer stands… in which no single tree species comprised >50% of the trees in the stand. Fishers preferred mixed conifer ($p<0.01$) and cedar/hemlock stands ($p<0.001$), and avoided subalpine fir ($p<0.001$) and hardwood ($p<0.01$) stands.

Dense, well stocked stands of pole and medium sawtimber size class contained the majority of locations, although habitats used by the fishers were similar to the proportions available… Poorly stocked stands (recent or unregenerated clear cuts and alpine zones) were generally avoided, except for an adult female that utilized a deer carcass in an old but unregenerated clear cut during February-April 1989." (Roy 1991, pp. 42, 47, emphasis added)

[caveat that precedes this discussion]

"…generalizations about fisher habitat use based on the available data are limited mainly to daylight, lowland habitat use.

Fishers in the present study preferred dense mixed conifer and cedar-hemlock stands of young to medium age. Most authors… have found that fishers prefer dense, mature conifer stands rather than young to medium age stands. However, in the only other detailed fisher study in the Northwest, Jones (in press) found that fishers used young to medium age stands to hunt during winter… Dense, young to medium age conifer stands in the Cabinets may provide better fisher foraging opportunities than mature stands, especially for snowshoe hares (Dolbeer and Clark 1975). However, few radio locations were obtained at night during the times of most severe thermal stress, and fishers may have retreated to mature areas and used the more abundant snags and deadfalls for thermal cover at night. (*Ibid*, pp. 60-61, emphasis added)

Fishers prefer low-elevation, slightly north-facing riparian zones according to Heinemeyer (1993), who also describes the habitat used by transplanted fishers, yet focuses on the physical aspects of fisher habitat (elevation, slope, distance to water…) rather than biotic (vegetation types, age, structure…).[31]

Idaho Department of Fish and Game (1995) makes an additional point that fishers may be more vulnerable to predation in poor habitats, compiling the results from these and other studies in its Habitat Conservation Assessment for the fisher.[32]

Fisher habitat was typically old conifer forests, but also included deciduous forest with a low level of overhead cover according to Hahr (2001), who reported on the habitat where she found fisher tracks in Glacier National Park (Hahr's records are consider "unverified" since she collected no genetic material or other verifiable evidence during her snow track surveys).[33]

Habitat is not the focus of Vinkey's more recent study of fishers in the Cabinet Mountains (2003), and he does not describe its use.

Resting sites

Fishers typically use various features of large, old trees for their resting sites, and occasionally use features on the ground (see Attachment 1, p. 18774).

Jones (1991) provides some data on fisher resting sites specific to the Northern Rockies. He found that large trees comprised the majority of rest sites in Idaho, though downed logs comprised a

---

[31] "The zone of preferred habitats became more defined in the late spring and summer months, with only the lowest elevation, flat areas being selected. The mid and upper slopes were rarely used by these fishers. Although there were numerous drainages opening in the Bull River Valley, only the wide mouths were used, and rarely did an animal venture deep into drainages. These slopes and drainages do not appear to support fishers, based on this study." (Heinemeyer 1993, p. 90, emphasis added)

"Based on the strong selection found in this study for low elevation, north facing slopes of shallow gradient, and the strong selection for areas within 200 m of water, it seems reasonable to assume that the reintroduced fishers are selecting wet forested habitats, consistent with the habitat selection found in other studies. (*Ibid*, p. 92, emphasis added)

[32] "Preferred habitats in Idaho were closed canopy, late-seral, mesic forests, in close proximity to water. These habitats were frequently used as rest sites, probably due to high occurrence of large-diameter trees, logs and snags... Large-diameter logs were used by Idaho fishers for resting, particularly in winter when these ground level sites would provide increased thermal protection. Snags also provided resting sites for fisher in Idaho. (Jones 1991, Jones and Garton 1994)." (IDFG 1995, p. 11)
Predation susceptibility is likely increased to animals traveling through (dispersing) or residing in habitats of reduced quality." (*Ibid*, p. 14, emphasis added)

[33] "Fishers detected along transects in GNP [Glacier National Park] occurred in old forests significantly more than expected by chance which is similar to the findings of Jones (1991) and Roy (1991). Fishers in the study area were never detected in habitats lacking canopy cover; however, 19% of fisher detections occurred in deciduous forests where overhead cover was low in winter. Possibly, the horizontal cover in stands of aspen and cottonwoods is sufficiently complex to provide fishers with the thermal and escape cover they require for resting, travelling, and foraging." (Hahr 2001, p. 70, emphasis added)

significant portion of resting sites in winter (27%).[34] He describes the sizes of the trees in detail: large diameter trees, logs and snags especially, and two thirds of the live trees have witches brooms.[35]

Den sites

FWS describes fisher den sites as well, which are similar to resting sites, but the trees need to be larger, with cavities at heights typically at greater than 20 feet, or an average of 100 feet in Canada (Attachment 1, p. 18774). See Attachment 8 for excerpts from the scientific literature that affirm the need to protect large trees, snags and logs from logging in fisher denning habitat. The petitioners are unaware of supplemental data on fisher dens sites specific to the Northern Rockies.

Foraging habitat

FWS describes fisher foraging sites in its response to the West Coast fisher petition, using examples from the literature specific to the Northern Rockies region. Similar to resting sites, older forests are important, but fishers also hunt in young forests, provided they can find large trees, snags and logs, and debris on the forest floor. Fishers also prefer a shrub layer for food and cover (Attachment 1, pp. 18774-18775). Additional evidence of the importance of maintaining habitat for snowshoe hares, porcupines, and other small mammals, plus birds and other prey are found in Attachment 8 of this petition.

Fisher habitat conclusion

FWS's description of habitat characteristics of the West Coast fisher population provides an excellent summary of fisher habitat needs, which applies equally well to the Northern Rockies fisher population, so we excerpt it here (USDI 2004, p. 18775).

> The key aspects of fisher habitat are best expressed in forest stands with late-successional characteristics. Fishers use habitat with high canopy closure, large trees and snags, large woody debris, large hardwoods, multiple canopy layers, and avoidance of areas lacking overhead canopy cover... It is unlikely that early and mid-successional forests, especially those that have resulted from timber harvest, will provide the same prey resources, rest sites and den sites as more mature forests...

---

[34] "Fishers were observed resting in live trees, snags, and logs. A slipped collar was found in a small cavity amongst large boulders, but it was not known if the animal actually used the opening as a temporary den. One subnivean rest site was also observed, but it appeared that the fisher was using logs beneath the snow. No natal dens were found.

Fishers most commonly rested in the canopies of live trees during summer and winter seasons… Snags were rarely used in either season. Logs were rarely used as rest sites in summer, but represented 27% of winter rest sites.

A shift in the use of rest site types occurred between summer and winter… Logs represented 8% of summer rest sites, whereas winter logs represented 27% of rest sites. Differences in seasonal use of logs was significant…" (Jones 1991, p. 74)

[35] "Tree diameters averaged 56.1 cm… Clumps of witches broom were used as resting substrates in 67.9% of all observations of fishers resting in live trees… All but one of the snags had a broken top… Snags used as rest sites had a median diameter of 86.4 cm... Median diameter at the small end of the logs [used for rest sites] was 53.3 cm…" (*Ibid*, pp. 75-76)

Part IV. The case for DPS designation and ESA listing

Distinct Population Segment ("DPS") justification

In Part I of this petition we describe the criteria by which species or populations are assessed for listing as Distinct Population Segments under the Endangered Species Act: they must be discrete, significant, and threatened or endangered according to the five ESA listing crititeria. The U.S. Fish and Wildlife Service (FWS) also describes these criteria in its 12-month finding on the petition to list the West Coast fisher populations as follows (USDI 2004 at 18775).

> The DPS policy specifies that we are to use three elements to assess whether a population segment under consideration for listing may be recognized as a DPS: (1) the population segment's discreteness from the remainder of the species to which it belongs and (2) the significance of the population segment to the species to which it belongs… If we determine that a population segment meets the discreteness and significance standards, then the level of threat to that population segment is evaluated based on the five listing factors established by the Act to determine whether listing the DPS as either threatened or endangered is warranted.

Similar to the West Coast fisher populations, the Northern Rockies fisher populations meet these same criteria as described in detail below.

Discreteness

FWS describes two conditions necessary to fit its definition of "discrete" under its DPS policy: separation from other populations, or an international border resulting in significant differences in conservation status or management on either side (USDI 2004 at 18775).

> Under our DPS policy, a population segment of a vertebrate species may be considered discrete if it satisfies either one of the following two conditions: (1) it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors (quantitative measures of genetic or morphological discontinuity may provide evidence of this separation); or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant with regard to conservation of the taxon in light of section 4(a)(1)(D) of the Act.

Fisher populations in the Northern Rockies meet both of the "discreteness" criteria described above: (1) they are geographically separated from the West Coast fisher populations in California and Oregon to the west, Canadian fisher populations in British Columbia and Alberta to the north, and eastern North American fisher populations to the east due to both physical and behavioral factors (and recent genetic research provides a "quantitative measure" that confirms this); and (2) there is an international boundary between fishers in the U.S. northern Rockies and the nearest outside fisher populations in British Columbia, which means there are differences in conservation status, trapping regulations (control of exploitation), and other regulatory mechanisms, such as those that govern the management of fisher habitat.

There is no question that fishers in the Northern Rockies are "markedly separated" from other fisher populations. In 1996, FWS rejected the previous petition to list fishers in the Northern Rockies based in part on the claim that fisher populations were connected across all of North

America through Canada (USDI 1996). We now know this to be false. Fishers currently occupy small, isolated "islands" within a vast area of their historic range across the northwestern U.S. and southwestern Canada, as we introduced in Part II of this petition and describe in more detail in the following discussion.

Current, reliable data on known fisher populations indicates that fishers in the Northern Rockies are separated from northeastern extremity of the West Coast fisher DPS by the Okanagan Valley, which is at least 90 miles across, well beyond the distance fishers will disperse (USDI 2004). This is the area of closest proximity to the West Coast fisher DPS, since southern Washington, Oregon and California are separated from the Northern Rockies by hundreds of miles and the unforested high desert of the Great Basin in Nevada and eastern Oregon (USDI 2004). A recent status report of fishers in British Columbia verifies that fishers have receded from their historic range northward to about 200 kilometers north of the U.S. border, again well beyond their ability to disperse (Weir 2003, USDI 2004, see Figure 4 of this petition). To the east, the nearest fisher populations occur in the Great Lakes region, about one thousand miles of unforested high plains that is clearly beyond the ability of fishers to traverse.

Recent genetic analysis provides a quantitative measure of the isolation of fishers in the Northern Rockies. Fishers in northwestern Montana were found to carry evidence of artificial connectivity to fisher populations in BC and the Midwestern U.S., due to fisher translocations from these areas within the past couple decades, but fishers in west-central Montana were found to carry a unique genetic signature, indicating they are descendents of an isolated, native population (Vinkey 2003, Vinkey et al. 2006,[36] Schwartz 2007[37]).

For evidence of the significant differences in the management of fishers and their habitat due to the international boundary between the U.S. and Canada, see the discussion of ESA Listing Factors A and B below.

---

[36] "…in west-central Montana, we detected haplotypes found in British Columbia samples, but also detected a control region and cytochrome-b haplotype not found in source populations. Based on the unique haplotypes found in west-central Montana, we propose that individuals with these haplotypes are descended from a relic population." (Vinkey et al. 2006, Abstract, emphasis added)

"Importantly, almost half of the samples in west-central Montana have control-region haplotype 12, which is novel to this area and not found in any source population or documented elsewhere in North America… Although we cannot eliminate the possibility of control-region haplotype 12 being present in British Columbia introductions, based on our samples from the source populations, we can state that if present it is very rare… The alternate, and more parsimonious, explanation is that fishers were not extirpated from west-central Montana, that the original population contained unique haplotypes, and that these have persisted… we feel that the persistence of a native refugium population is the more likely scenario… We conclude that fishers with haplotype 12 are likely descended from a maternal lineage unique to Montana and adjacent areas in Idaho, and therefore translocations of fishers into west-central Montana were augmentations and not reintroductions. Fishers may have been locally extirpated in Montana, but the Selway–Bitterroot Mountains of Montana and Idaho likely functioned as refuge for native fishers." (*Ibid*, p. 269, emphasis added)

[37] "… fishers in north-central Idaho and west-central Montana are the only confirmed native fishers in the Rocky Mountains, and 1 of a few populations in the West that have maintained native genes." (Schwartz 2007, Abstract)

"This study demonstrates that both north-central Idaho and west-central Montana contained a unique haplotype that represents the native fisher population… these data show that fishers in northcentral Idaho and west-central Montana are not simply descendants of translocated individuals, but are also the descendants of fishers that persisted despite early 20th century trapping." (*Ibid*, p. 924, emphasis added)

Finally, the international boundary between the U.S. and Canada also results in significant differences in the management of fishers and their habitat in each of the criteria listed above: exploitation (trapping), habitat management, conservation status, and regulations. Regulatory mechanisms affecting fisher trapping and the management of their habitat are implemented and enforced by different means in each country, with no current or proposed coordination or connection between them. The conservation status of fishers (which FWS has traditionally interpreted to mean the number of fishers as well as differences in applicable regulations) is quite different between the U.S. Northern Rockies and western Canada, both biologically and legally. For all of these reasons the Northern Rockies population is discrete under the DPS Policy.

Significance

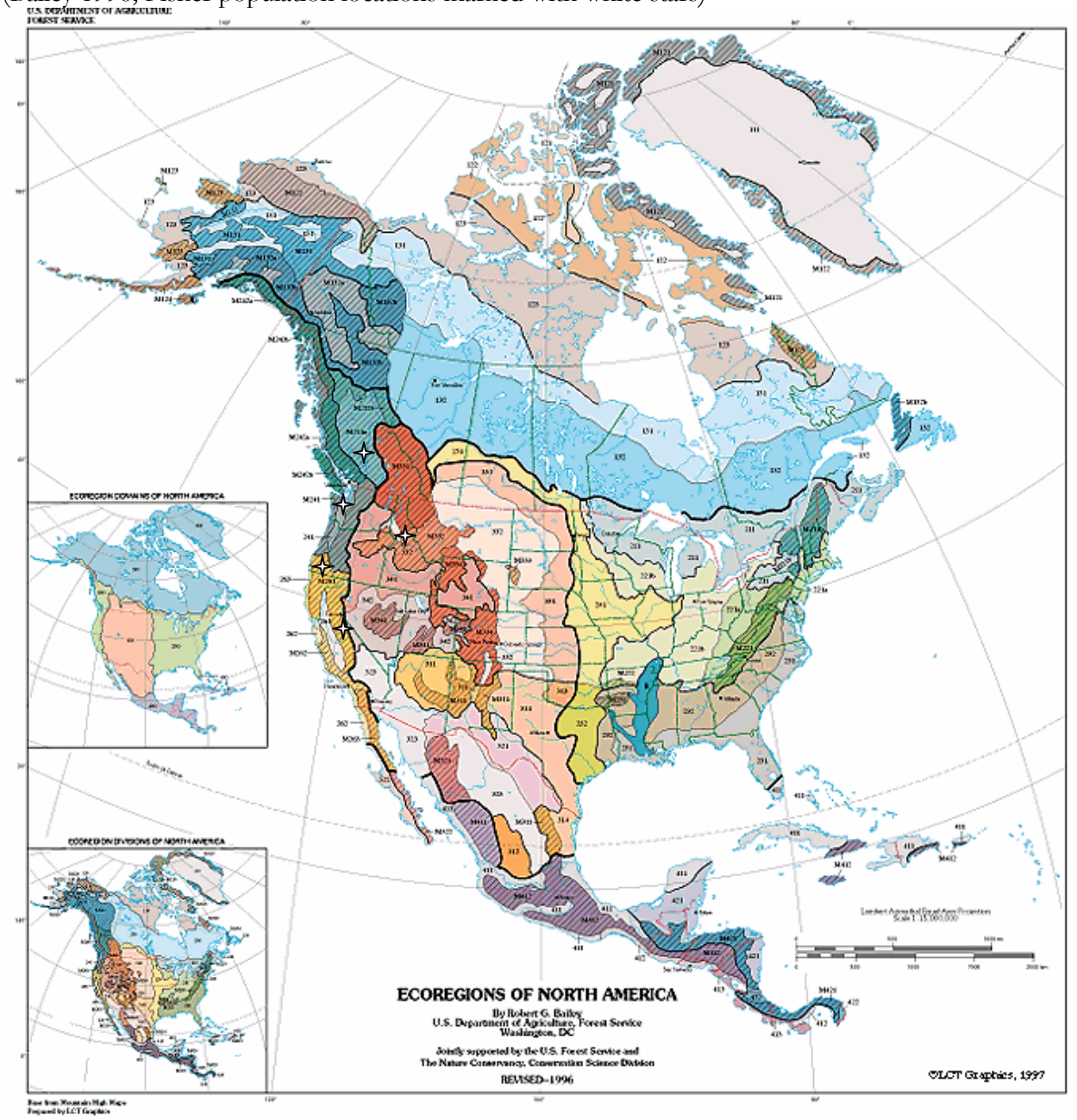
FWS describes four factors necessary for a population to fit its definition of "significant" under its DPS policy: (1) a unique ecological setting, (2) its area is a significant portion of its range, (3) if it is the only natural remnant population, or (4) it is genetically distinct (USDI 2004 at 18776-18777).

> Under our DPS policy, once we have determined that a population segment is discrete, we consider its biological and ecological significance to the larger taxon to which it belongs. This consideration may include, but is not limited to, the following factors: (1) Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon; (2) evidence that loss of the discrete population segment would result in a significant gap in the range of the taxon; (3) evidence that the population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historical range; and (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics. Significance is not determined by a quantitative analysis, but instead by a qualitative finding.

Fishers in the Northern Rockies meet three of the four "significance" criteria described above: (a) the Northern Rockies region is ecologically unique in North America; (b) loss of fishers in the Northern Rockies would result in a significant gap in its range; and (c) the recent discovery of a unique genetic haplotyte indicates a native fisher population still survives in the Northern Rockies, and that this population is not just the descendents of fishers translocated from other areas.

The Northern Rockies region of the United States is ecologically unique due to its combination of vegetation, topography, soils, climate, and overall forest ecosystems that occur nowhere else in North America or the world. Southeastern British Columbia and southwestern Alberta resemble the U.S. Northern Rockies more than any other areas because of their geographic proximity, similar geology and many shared plant and animal species, but climate differences and different weather patterns in the more northerly latitudes, and significant management differences affecting both forests and wildlife combine to clearly differentiate these areas. As mentioned above, current fisher range does not begin until 200 kilometers (125 miles) north of the U.S. border, which is far enough for significant changes in the ecological setting. Furthermore, the distance between "core" fisher populations in the western U.S. (Clearwater River subbasin in Idaho) and Canada (Williams Lake, BC) is approximately 800 kilometers (500 miles). These two areas are different enough ecologically that they fall into separate ecoregion "divisions" and "domains" as defined by Bailey (1996). The vicinity of Williams Lake, BC is classified as part of the "Warm Continental" Division within the "Humid Temperate" Domain, and the Clearwater and Bitterroot areas of Idaho and Montana are classified as part of the "Temperate Steppe" Division within the "Dry" Domain (see Figure 11). More details of the significant ecological differences between these two areas can be found by comparing the descriptions of each by Weir (1995) and Jones (1991).

Figure 11. Core Fisher Populations in the western U.S. and southwestern Canada overlaid onto Bailey's Ecoregions of North America
(Bailey 1996; Fisher population locations marked with white stars)



Second, the Northern Rockies region is a vast area of the fisher's former range, and its loss would clearly constitute a "significant gap in the range of the taxon." Similar to what FWS states in its 12-month finding on the West Coast fisher petition, the Northern Rockies fisher population is one of just four remaining fisher populations in the western U.S., and one of just six or seven remaining fisher populations in the lower 48. In addition, the loss of the Northern Rockies fisher population would represent the loss of approximately 80,000 square miles of its former range, an area approximately the size of the state of Idaho, representing approximately one-half of its former range in the western U.S., and at least 10-15% of its former range within the lower-48 states (Lewis and Stinson 1998). It would open up a range gap from southwestern Oregon to northern Minnesota—a

distance that spans two time zones—and eliminate the potential to restore connectivity between fisher populations in the western U.S. and Canada via south-central British Columbia, which likely represents the best hope for long-term fisher restoration in the western U.S.

Third, the genetics work described in detail above indicates that, similar to the West Coast fisher populations, the fisher population in north-central Idaho and west-central Montana shares a genetic haplotyte that is unique among North American fisher populations.

Given the evidence described above, the petitioners believe it is clear that fishers in the Northern Rockies meet the "distinct" and "significant" criteria of a Distinct Population Segment such that they may be added to the list of species and populations protected by the Endangered Species Act.

Endangered Species Act listing factors

Section 4 of the Endangered Species Act (16 U.S.C. § 1533), and implementing regulations at 50 CFR 424 set forth procedures for adding species to the Federal endangered and threatened species list. There are five factors for FWS to consider when determining whether or not listing a species as endangered or threatened is warranted:

A) the present or threatened destruction, modification, or curtailment of its habitat or range;
B) overutilization for commercial, recreational, scientific, or educational purposes;
C) disease or predation;
D) the inadequacy of existing regulatory mechanisms; or
E) other natural or manmade factors affecting its continued existence.

16 U.S.C. § 1533(a)(1).

The remainder of this petition describes how Factors A, B, D, E and possibly Factor C all threaten the ongoing survival and restoration of fishers in the Northern Rockies region, and thus justify the listing of fishers as Threatened or Endangered under the federal Endangered Species Act.

Factor A. The present or threatened destruction, modification, or curtailment of the species' habitat or range.

The best available information clearly indicates that past and ongoing habitat loss and destruction is the primary factor threatening fishers in the Northern Rockies. This is due to the fisher's need for large areas of contiguous mature and old growth forest. Specific habitat threats include logging, roads, outbreaks of fire, insects, and disease in their forested habitat, and climate change because of its tendency to accelerate these outbreaks. Because the vast majority of fisher habitat occurs on the national forests, most loss and destruction of fisher habitat is occurring on national forest lands, yet additional losses occur on state and private lands. Fisher habitat is also in decline in Canada, which harms fishers in the Northern Rockies by isolating them from other North American populations.

Current rates of fisher habitat destruction due to logging may be reduced from historic levels in the Northern Rockies, but fisher range is so reduced that even a low loss of habitat due to anthropogenic factors that are either direct (e.g., forest practices, obstacles to fisher dispersal) or indirect (e.g., climate change) threatens the persistence of these populations. The ongoing threat posed to fishers by habitat decline in California, Oregon and Washington was one of several factors

that resulted in FWS's determination that listing the West Coast fisher population is warranted (USDI 2004 at 18778).

> Vegetation management activities such as timber harvest and fuels reduction treatments, stand-replacing fire, large-scale forest disease outbreaks or insect infestations (e.g., pine beetle), and development can destroy, alter, or fragment forest habitat suitable for fishers.

This section of the petition will demonstrate similar ongoing threats to fisher habitat in the Northern Rockies. We begin with excerpts from the scientific literature that demonstrate the threats posed to fisher habitat by logging, climate change, and roads, followed by a description of past and ongoing destruction of fisher habitat due to these threats on federal, state, tribal and private lands.

As the following excerpts from the scientific literature indicate, more than any other factor, protecting forested habitat is the most important issue facing fisher conservation.

> [A]nimals in this group [martens, sables, and fishers] are the most wilderness-dependent mammals still remaining in forest ecosystems that have been altered by humans. Their presence symbolizes the natural character of our remaining forests, but it also reminds us of the vulnerability of these animals to future environmental changes. It is imperative that we understand how our treatment of forests affects the animals that live in them.
> —Buskirk 1994, p. 1

> [H]abitat is the main concern involving martens and the fisher (*Martes pennanti*), especially in the northwestern United States.
> —Buskirk 1992, p. 318

> While there are some differences in the results from studies that remain to be explained, it is nonetheless evident that in the Northern Rockies fisher are most often found in late successional, complex forests and riparian areas.
> —Johnson 1996, p. 7

> [A]s Harris (1984) suggested, fisher habitat management must involve the management of a 'system' of mature forests as opposed to the management of individual stands. Management at a landscape scale should incorporate a variety of young to mid-successional stages, to promote a diversity of prey species, in conjunction with late successional stages to provide key resting habitat. In a managed forest, the most likely factor limiting fisher populations would be the availability of mature and old-growth forests to provide optimal resting habitat.
> —Jones 1991, p. 111

Forest practices

We document the particular threat to fisher habitat posed by managing forests for timber production in Attachment 9 of this petition. Excerpts from thirteen scientific studies describe the grave threat that commercial logging poses to fishers, such as the following.

> Our data suggest that widespread clearcut logging, which resulted in the removal or fragmentation of once-extensive forest canopies at lower elevations, may have reduced or eliminated suitable habitat for *M. pennanti* in the northwestern Cascade Range. (Aubry and Houston 1992, p. 75)

> Where complex physical structure is lacking, either at the scale of the stand or the landscape, boreal forest martens and fishers tend to be scarce or absent. Major retrogressional habitat change, especially cutting of temperate and boreal coniferous forests, has interfered with natural forest dynamics, especially structural and vegetational heterogeneity. Intensive wood-production programs involving short rotation times generally provide little of either. (Buskirk 1992, p. 318)

> It is our opinion that the precarious status of the fisher population in Washington and Oregon is related to he extensive cutting of late-successional forests and the fragmented nature of these forests that still remain. (Powell and Zielinski 1994, p. 64)

The specific impacts from logging include:

- Fragmented forested habitat;
- Reduced structural diversity;
- Reduced snags, logs and live trees with cavities important to fishers;
- Reduced wetlands;
- Reduced canopy cover;
- Creation of open stands of forest;
- Creation of xeric conditions;
- Increased hardwoods;
- Reduced late-successional, old, uneven-aged stands;
- Reduced coarse woody debris on the forest floor;
- Reduced productive mid-low elevation forests;
- Reduced den sites and resting sites;
- Creation of associated roads disturbing fisher habitat and catalyzing mortality;
- Creation of forest openings greater than 0.4 hectares (1 acre); and
- Reduced large-diameter logs.

Climate Change

While the precise effects on Northern Rockies fishers due to climate change are hard to measure, a forest-dependent species is vulnerable to stresses faced by those forests and the changes that result. Many areas of forest across the region are known to have a higher incidence and intensity of fire, insects and disease outbreaks that have been caused by drought and higher temperatures associated with climate change. The low-elevation, predominantly mesic forests typically used by fishers may not have experienced the tree mortality of higher and drier forests in the region, but some evidence that fishers are affected as well is found in the fact that acreages of national forests that contain fisher habitat affected by fire outnumber by several times the acreages of the same forests cleared for timber (see Table 6 and related text below). In addition, clearing and thinning along the forest

boundaries in order to reduce the risk of fire within the Wildland-Urban Interface is likely to both reduce fisher habitat and pose an obstacle to fisher movement and connectivity between fisher populations.

Roads

The impacts of roads on fishers are well documented in the scientific literature, and specifically include the following:

- Direct habitat loss;
- Displacement;
- Direct mortality from vehicles;
- Secondary habitat loss due to associated human developments;
- Provision of vectors for the invasion of exotic species;
- Barriers to dispersal;
- Loss of habitat available to fishers;
- Population isolation;
- Increased likelihood of local extinctions;
- Disturbance due to increased access;
- Access for furtrappers; and
- Increased access for off-highway vehicles and snowmobiles that result in fisher disturbance and mortality.

FWS's discussion of the effects of roads on the West Coast fisher population applies equally well to fishers in the Northern Rockies (Attachment 1, pp. 18779-18780). The following additional excerpts from the scientific literature are specifically directed at the effects roads on fishers in the Northern Rockies region.

> Logging activities are often associated with new road construction which in turn provides additional access to trappers. Consequently, managers must consider the impacts of increased roading on fisher vulnerability to trapping.
> —Jones 1991, pp. 116-117

> Roads pose an additional threat by increasing access to previously remote habitats and populations. The probability of trapping and the vulnerability to trapping is probably directly related to roads and ease of access.
> —IDFG 1995, p. 10

The remainder of this section of the petition describes past and ongoing destruction of fisher habitat on federal, state, tribal and private lands in the U.S. Northern Rockies, plus in historically contiguous fisher habitat in western Canada.

Public lands, federal

The bulk of fisher habitat in the U.S. Northern Rockies is within national forests managed by the U.S. Department of Agriculture, Forest Service. National forest lands across the Northern Rockies region have been extensively logged since the mid-20th century, and this continues today. Table 6 below indicates that more than 2 million acres have been logged since 1945 from the seven national forests that are known to support resident fisher populations today. Logging has been reduced from its peak between the late 1960's and the 1980's, but an average of nearly 20,000 acres is still cut from these forests each year today. The same table indicates that more than 800,000 acres of these seven

national forests have been lost to outbreaks of fire, insects and disease since 1945, and an average of nearly 70,000 acres is consumed by these outbreaks in these forests each year today. This is several times the acreage affected by logging across the region on average, or in the case of the Nez Perce National Forest, 20 times more acres are affected by outbreaks of fire/disease/insects than logging.

Table 6. Acres logged and burned in USFS Region 1 national forests that contain fisher habitat (USDA 2008)

	Totals, 1945 - 2006				Current annual avg (2002-2006)			
Forest	Silv. Removal	Fire, Other	Total	% Silv.	Silv. Removal	Fire, Other	Total	% Silv.
Kootenai	630,282	63,047	693,329	91%	6,373	366	6,739	95%
Idaho Panhandle	552,591	40,774	593,365	93%	3,577	4,646	8,222	43%
Lolo	347,376	126,702	474,078	73%	3,044	13,649	16,694	18%
Flathead	295,205	128,424	423,629	70%	3,315	15,025	18,340	18%
Clearwater	245,510	64,896	310,406	79%	1,162	5,546	6,708	17%
Nez Perce	170,243	141,718	311,961	55%	1,003	21,613	22,616	4%
Bitterroot	125,796	268,020	393,816	32%	1,403	8,991	10,394	13%
Total	2,367,003	833,581	3,200,584	74%	19,878	69,836	89,714	22%

Public lands, state

The State of Montana owns more than 500,000 acres of forest lands in the state, and manages these lands to provide revenue to support public education in Montana (Montana DNRC 2008). Some of these lands include fisher habitat, such as significant holdings in the Swan and Stillwater River Valleys south and west of Glacier National Park in northwestern Montana. Although these lands are managed to maintain biodiversity, the mandate to obtain revenue from timber production results in significant destruction of fisher habitat every year under current management practices.

The State of Idaho owns more than 750,000 acres of commercial timberland, and manages these lands to secure the "maximum long term financial return" to public education and other charitable institutions in Idaho. Some of these lands include fisher habitat, including holdings in the Idaho Panhandle (Priest Lake, Kootenai Valley) and in north-central Idaho (St. Joe, Ponderosa, Clearwater, Maggie Creek). In fact, five of these six areas are the source of five of the six largest timber sales from all of Idaho's state lands proposed in 2008 (Idaho Department of Lands 2007). Although there is a stewardship component to the management of these lands—the second component of the IDL's mission statement is to "provide protection to Idaho's natural resources"—there is no question that revenue generation from timber takes precedence over other resource values, such as maintaining habitat for fishers. Thus, the past and ongoing management of these lands results in significant destruction of fisher habitat every year. Recent statements from Idaho officials indicate that cutting levels are likely to increase on state lands in North Idaho, in response to forest health concerns, interest in faster growth rates, and demand for smaller trees (Ridler 2008).[38]

[38] "Timber harvest on state-owned lands in Idaho will likely increase due to concerns that insect infestations, diseases and forest fires are on the rise because of a warming climate, state officials say…
The state had been cutting about 182 million board feet annually until 2003, when the land board approved an increase to 212 million.

Tribal lands

Fisher habitat is affected by timber extraction and outbreaks of fire, insects and disease within the following American Indian reservations in the Northern Rockies region: Blackfeet, Coeur d'Alene, Flathead, and Nez Perce. Petitioners' initial research into the management of these lands indicates that due to the limited amount of fisher habitat on these lands, and the limited scale of human-caused and natural disturbances to these forests, habitat loss within these reservations may not be a significant threat to fishers at this time (N. Albrecht, pers. comm.).

Private lands

Plum Creek Timber Company owns more than 1,250,000 acres of forested lands in Montana, according to its website (Plum Creek 2008). These lands include fisher habitat, and the following mission statement for the management of these lands is clearly not consistent with maintaining mature and old growth forests that fishers depend upon (Plum Creek 2008):

> Our primary business is to actively manage our timberlands to capture the most value from every acre we own. That means owning timberlands in the most robust markets, making prudent investments in the growth of our timberland assets and harvesting trees at the best "economically mature" point in the life cycle of a tree.

Furthermore, Plum Creek recently announced that it has become a Real Estate Investment Trust, meaning that it is currently selling off many of its holdings to land developers (Plum Creek 2008). Conversion of these lands to residential or recreational developments in most cases permanently precludes their ability to provide habitat for fishers.

Potlatch Corporation owns more than 840,000 acres in Idaho, according to its website (Potlatch 2008), and these lands include fisher habitat. This corporation deserves credit because (a) its holdings in Idaho are 100 percent certified by the Forest Stewardship Council (excluding the portion of its lands that are for sale), and (b) it is funding fisher research currently underway on its lands. Yet given that its lands are managed to generate revenue from timber production, a significant portion of fisher habitat is destroyed every year under current management practices.

That is rising to about 219 million board feet for about the next decade, said [Idaho Department of Lands Forest Management Bureau Chief Bob] Helmer, the increase coming from additional harvest in northern Idaho approved by the land board in October for the Maggie Creek Supervisory Area due to insect- and disease-killed trees…
Though state-owned Idaho forests are only growing 160 million board feet a year, Helmer said that 219 million of board feet being cut is sustainable.
'A lot of our stands are older stands,' he said. 'They contain some older trees, though most of the stands have been harvested at least once. Our anticipation is that if we cut at 219, our growth out on the ground is going to continue to increase.'…
He also said the state is rethinking its harvest rotation of 80 to 120 years.
'You have a pretty big honking tree by then,' he said. 'But the industry has changed to where they want smaller trees. It's easier to handle them from a logging perspective. We see this shift in industrial thinking.'" (Ridler 2008)

Destruction of fisher habitat in Canada

Weir's (2003) status review of fishers in British Columbia provides evidence of past, current and future decline of fisher habitat in the province due to logging and other human activities and developments, which indicates that we cannot rely on Canadian fisher populations to "rescue" fisher populations in the U.S.[39]

In sum, past and ongoing loss and destruction of fisher habitat due to logging, roads, climate change, and other factors threatens fisher populations across the Northern Rockies region. The petitioners seek a listing of a Northern Rockies fisher DPS to identify core areas of fisher habitat and connections between them, and consultation with the U.S. Fish and Wildlife Service for all federal actions within these areas, to ensure decisions maintain and enhance fisher survival and restoration in these areas.

Factor B. Overutilization for commercial, recreational, scientific, or educational purposes.

Next to habitat loss, trapping presents the greatest threat to fishers, both intentional trapping where it still occurs in Montana, and incidental trapping of fishers in traps set for other species in Montana and elsewhere in their range. Up to seven fishers are legally trapped in Montana each winter, including a subquota of five fishers from Trapping District 2 in western Montana, and a subquota of two fishers from Trapping District 1 in northwestern Montana (MDFWP 2007). Fisher mortality due to trapping is greatly reduced from historic levels in the Northern Rockies, but fisher populations are so reduced that even a low level of mortality due to direct or incidental trapping threatens the persistence of these populations. Similarly, fisher populations in California, Oregon and Washington are protected from trapping by state law, but the ongoing threat posed to fishers by trapping throughout this area was one of several factors that resulted in the FWS determination that listing the West Coast fisher population is warranted (USDI 2004 at 18780, emphasis added):

> The fisher has been commercially trapped since the early-1800s. Although exact numbers are unknown, trapping caused a severe decline in fisher populations… Even low rates of additive mortality from trapping have been predicted to affect fisher population stability (Powell 1979, Lewis and Stinson 1998), and may slow or negate population responses to habitat improvement (Powell and Zielinski 1994). Powell (1979) reported that as few as one

[39] "Forest harvesting has probably had the greatest single effect on habitat quality for Fishers throughout the province... The threats to Fisher habitat are likely to continue to grow because forest harvest will continue. Additionally, forests in considerable portions of the Fisher's range in British Columbia are currently experiencing substantial tree mortality caused by outbreaks of the mountain pine beetle (*Dendroctonus ponderosae*) and other insects." (Weir 2003, p. v, emphasis added)

"Habitat alterations, primarily through forest harvesting activities, hydroelectric developments, and land clearing have changed the composition of many landscapes in which Fishers occur." (*Ibid*, p. 13)

"During the past 15 years, more than 21,300 km2 of forested land has been harvested in the four forest regions that support Fisher populations in the province… Of this 21 300 km2, more than 90% was logged using clearcut harvesting systems." (*Ibid,* pp. 14-15)

"Continued harvesting of late-successional forests using conventional clearcut harvesting at the 15-year-average rate of 1420 km2/year… will likely pose a substantial threat to Fisher populations in the central interior of British Columbia… In the Prince George Forest Region alone, over 25,000 km2 of forests are currently under attack from insects (British Columbia Ministry of Forests 2002), an area that is more than the total area that has been logged in the Cariboo, Kamloops, Prince George, and Prince Rupert forest regions combined over the past 15 years." (*Ibid,* p. 16, emphasis added)

to four additional mortalities per year due to trapping over a 100 km2 (39 mi2) area could cause a significant decline in a reduced fisher population. The potential effects on fishers of legal trapping of other species may be significant when considered in conjunction with habitat loss and other sources of mortality.

Other than Montana's data on its fisher trapping season, the petitioners are not aware of much data on fisher mortality due to trapping specific to the Northern Rockies region. Yet Jones (1991) reports a significant level of fisher mortality due to traps set for other species, consistent with findings elsewhere in North America.[40]

A more recent analysis from the Idaho Department of Fish and Game indicates that 17 fishers were accidentally trapped between 1990 and 2007 and turned in for a reward (IDFG 2007). This figure does not include an unknown number of additional fisher trapping mortalities that have gone reported. Five of the 17 reported mortalities occurred in the 2006-2007 trapping season, and two in the 2005-2006 season, indicating that this mortality source may be increasing. Fifteen of the 17 fisher mortalities came from the Clearwater region, and the remaining two came from the Panhandle region. Relatively few martens are trapped in these areas compared to other parts of Idaho, such that reported fisher mortality represented nearly 10% of the number of martens reported trapped in these two districts during the past two years (IDFG data from 2005-2006 and 2006-2007 trapping seasons). Fisher mortality could be significantly reduced if marten trapping was closed throughout this area, without significantly reducing the number of martens trapped in Idaho.

See Attachment 10 of this petition for a detailed description of the risks posed to fisher populations by trapping. In sum, the best available information clearly indicates that trapping has a tremendous impact on fisher populations. The petitioners seek listing of a Northern Rockies fisher DPS to close the fisher trapping season in Montana. We also seek to restrict traps set for other species in all core areas of fisher range to reduce the risk that fishers may be incidentally hurt or killed.

Factor C. Disease or Predation.

The petitioners are not aware of any specific data that indicate disease currently threatens fisher populations in the Northern Rockies. Yet similar to the West Coast fisher populations, fishers are

---

[40] "Trapping has been one of the two most important factors influencing fisher population (the other being logging) (Powell 1982). Numerous authors have reported on the high susceptibility of fishers to trapping (Coulter 1966, Kelly 1977, Powell 1982, Raine 1981). Further, fishers are frequently trapped in sets for other furbearers (Hamilton and Cook 1955, Coulter 1966). Although fishers have been protected from trapping in Idaho since the 1930's, Luque (1983) estimated that 163 animals were inadvertently trapped in Idaho during a 5 year period (1978-1982) in sets made for marten, coyote, and probably bobcats. A minimum of 4 fishers were trapped and killed from my study area; 2 each in the 1986 and 1987 trapping seasons. One additional fisher was caught, but released, in each of the 1986 and 1987 seasons. All of the animals trapped in my study area were caught in marten sets. Therefore, current trapping regulations in Idaho do not appear adequate in 'protecting' fishers."

"Fisher populations are very sensitive to trapping pressure; light trapping pressure resulting in small increases in mortality may cause local extirpation (Powell 1979, 1982). The incidental captures of fishers in my study area may be preventing the population from reaching higher densities. Coulter (1966) stated that trapping for other species should be restricted in areas having an objective of increasing the fisher population. Even if live animals are released from leg-hold traps, Coulter (1966) found crippling losses to be high." (Jones 1991, pp.115-116, emphasis added)

so reduced in number in the Northern Rockies that even a low level of risk from diseases to which fishers are susceptible may threaten their ongoing survival (USDI 2004 at 18780-18781):

> Fishers are susceptible to many viral-borne diseases, including rabies (Family *Rhabdoviridae*), canine and feline distemper (*Mobillivirus sp.*), and plague (*Yersinia pestis*). Contact between fishers and domesticated dogs and cats and other wild animals susceptible to such diseases (raccoons, coyotes, martens, bobcats, chipmunks, squirrels, etc.) may lead to infection in fishers. Although specific information on fisher diseases is limited, populations of three other mustelids, the black-footed ferret (*Mustela nigripes*), the marten, and the sea otter (*Enhydra lutris*), have experienced outbreaks of various parasitic, fungal, or bacterial diseases.

Fishers in the Northern Rockies are known to suffer predation from other hunters, such as mountain lions, coyotes, and human trappers, especially fishers newly translocated from other areas (e.g., Roy 1991). Again, given the small sizes and isolation of fisher populations in the Northern Rockies, even low levels of predation threaten fisher survival and recovery.

The petitioners believe that more research is needed to better understand fisher mortality and identify its causes, including disease and predation. The projected effects of climate change on disease is a research priority as well.

Factor D. The Inadequacy of Existing Regulatory Mechanisms.

ESA Listing Factors A and B described above demonstrate that existing regulatory mechanisms have failed to adequately address the following threats to fishers in the lower-48 states:

1. The destruction of fisher habitat due to past and ongoing forest practices, roads and other motorized access into their habitat, and the effects of climate change; and
2. Unsustainable legal trapping in Montana and incidental trapping mortality throughout the fisher's range.

Regarding Point 1, fisher habitat is managed according to regulations in place by the various federal, state, and local land management agencies, which have failed to prevent habitat declines in the past. The Forest Service manages its lands subject to national forest plans, which contain standards to protect old growth habitat that benefits fishers; fishers and their habitat are also subject to specific regulations as a "Sensitive" species throughout national forest lands in the Northern Rockies region. Similar planning and implementation regulations govern the management of fisher habitat on other federal, state, tribal and private lands across the Northern Rockies region. Yet these regulations have clearly been inadequate to prevent the decline of fisher habitat to its current reduced area. Furthermore, in 2008 the U.S. Forest Service significantly weakened National Forest Management Act regulations that protect fishers and other wildlife. Under the Forest Service's new forest planning rules, the agency's forest plans no longer establish mandatory standards, and the requirement of the former NFMA regulations that the Forest Service maintain viable populations of native species on its lands no longer applies.

Regarding Point 2, fishers are protected by regulations against overtrapping, incidental trapping, and poaching, but again these regulations have clearly failed to prevent the decline of fisher populations to their low levels today.

Compounding these problems, a lack of coordination across administrative boundaries has resulted in a failure to monitor fisher populations and their status over time, and to prevent decline and fragmentation of those fisher populations that still survive. Fishers need a functional network of patches of mature, old growth forests across the Northern Rockies region that provide habitat and a protected refuge from trapping, but past and current regulations have failed to provide this.

Overview of the Fragmentation problem

The remainder of this section, in conjunction with Attachment 11 to this petition, is devoted to the fragmentation of fisher habitat and populations, since it is clear that not only have current regulations failed to prevent declines in fisher range and numbers, the lack of coordinated management across administrative boundaries has resulted in the isolation of fisher populations in the Northern Rockies from each other and from outside fisher populations, which is a major threat to their ongoing survival and recovery.

Heinemeyer (1993) describes this problem and its remedy in the recommendations that conclude her study:

> The few fisher populations in the northern Rockies are widely dispersed, and because of the low probability of exchange, probably cannot constitute a metapopulation. This lack of regional dynamics dramatically increases the risk of extinction for each population and for the species in the region. Priority in fisher management should be to remedy this situation through the protection of critical habitats for colonization and dispersal, protection of present populations, and re-establishment of other populations to form a network of connected subpopulations. (pp. 108-109)

Fisher habitat should be managed so that it is as contiguous as possible across the landscape. Isolation of a fisher population or subpopulation makes it vulnerable to extirpation. The scientific literature is replete with data that indicate that fragmentation is a major threat to fisher populations, and recommendations for how to restore and maintain connectivity between fisher populations, such as the excerpts contained in Attachment 11 to this petition.

The best available scientific information clearly indicates that past and ongoing regulations have failed to prevent the decline of fishers to date in the Northern Rockies, including loss of their habitat and mortality due to trapping and other threats. In addition, fragmentation of fisher habitat and populations is well documented as a major threat at the local, regional and international scales. The petitioners seek an ESA listing of the Northern Rockies fisher DPS to catalyze reforms to current regulations to ensure they no longer threaten fisher survival and restoration in the Northern Rockies.

Factor E. Other natural or manmade factors affecting the continued existence of the species.

A variety of ecological traits and anthropogenic factors described in Parts III and IV in this petition affect the survival of fishers in the Northern Rockies region. Ecological traits include their dependence on large areas of mature and old growth forests, their low reproductive rates, their low population densities, and their tendency toward isolation despite their physiological capacity to disperse. Anthropogenic factors that threaten their survival include past and ongoing forest practices, road construction, and development that reduce and fragment fisher habitat, past and

ongoing trapping in fisher habitat that reduce and fragment fisher populations, and climate change due to manmade factors that cause outbreaks of fire, insects, disease, and forest practices that further degrade and isolate fisher habitat. This combination of factors has resulted in yet another factor that is the leading threat to fisher viability in the Northern Rockies today: the small size of fisher populations and their isolation from each other and from fisher populations outside the region, which make fishers vulnerable to demographic, environmental and genetic stochastic events that could result in their extirpation from the Northern Rockies region.

Wisely et al. (2004) conclude their paper with a warning about vulnerability of the West Coast fisher populations due to these very factors, which the petitioners believe is directly relevant to fishers in the Northern Rockies.

> The relatively high level of genetic structuring among populations of fishers throughout their range has been amplified in the Pacific distributional peninsula. This genetic structure is the result of population isolation and limited gene flow. Reduced dimensionality, habitat specificity and habitat fragmentation are the likely causes. One effect of population isolation and reduced gene flow is vulnerability to extinction (Gilpin and Soulé 1986). Erosion of remaining genetic diversity threatens these populations with inbreeding, inbreeding depression, and a reduced ability to adapt to changing environments (Allendorf and Leary 1986). Of equal concern is the demographic fate of these isolated populations. Populations in the south have a smaller effective population size than northern populations. Small population size coupled with low migration rates increase vulnerability to stochastic demographic events and environmental changes (Holsinger 2000). We have demonstrated isolation among populations with limited exchange, suggesting that populations on the Pacific coast have little demographic buffer from variation in the population growth rate. Immediate conservation action might be needed to limit further erosion of the unique genetic architecture found in this one-dimensional metapopulation. (p. 646, emphasis added)

Conclusion and requests for relief

This petition has described how fishers in the U.S. northern Rocky Mountains are in danger of extirpation from the Northern Rockies within the foreseeable future due to their small and isolated population sizes, their dependence upon late-successional forests that are in decline from logging, roading, the effects of climate change, and their vulnerability to trapping in Montana and Idaho, among other factors. Designating these fisher populations as a Distinct Population Segment and adding them to the list of Endangered or Threatened species will protect their remaining strongholds from timber extraction and trapping, and recovery planning will identify and stimulate recovery actions to ensure their long-term survival and restoration in this region.

Given these findings, and the fact that four to five of the ESA listing factors are responsible for the imperiled status of fishers in the Northern Rockies today, the petitioners request that fisher populations in the U.S. northern Rocky Mountains be listed and protected as "Endangered" or "Threatened."

The petitioners also request that Critical Habitat be designated for fishers in the Northern Rockies that includes all areas of the Northern Rockies fisher DPS where fishers are known to be resident, as well as all additional areas needed to support a recovered fisher population under projected climate change scenarios, and including linkage zones to facilitate connectivity between core fisher population areas.

Dated this ___ day of February, 2009.

Respectfully submitted by:

_____

David Gaillard, Rocky Mountain Region Representative
Defenders of Wildlife
109 S. Eighth Avenue
Bozeman, Montana 59715
406-586-3970

Noah Greenwald M.S., Science Director
Center for Biological Diversity
PO Box 11374
Portland, OR 97211
503-484-7495

Gary Macfarlane, Executive Director
Friends of the Clearwater
P.O. Box 9241
Moscow, ID 83843
208-882-9755

Larry Campbell, Executive Director
Friends of the Bitterroot
P.O. Box 442
Hamilton, MT 59840

Literature Cited

Allen AW. 1987. The relationship between habitat and furbearers. In: Novak M., Baker J.A., Obbard M.E., Malloch B., editors. Wild furbearer management and conservation in North America. Ontario Ministry of Natural Resources and the Ontario Trappers Association. pp 164-79.

Anderson E. 1994. Evolution, prehistoric distribution, and systematics of Martes. In: Buskirk S.W., Harestad A.S., Raphael M.G., Powell R.A., editors. Martens, sables and fishers: biology and conservation. Ithaca (NY): Cornell University Press, pp. 13-25.

Arthur S.M., Paragi T.F., and Krohn W.B. 1993. Dispersal of Juvenile Fisher in Maine. Journal of Wildlife Management 57(4): 868-874.

Arthur, Stephen M. and William B. Krohn. 1991. Activity patterns, movements, and reproductive ecology of fishers in southcentral Maine. Journal of Mammalogy 72(2):379-385.

Aubry, K. and D. Houston. 1992. Distribution and status of the fisher (*Martes pennanti*) in Washington Northwest Naturalist 73:69-79.

Aubry, Keith B. and Jeffrey C. Lewis. 2003. Extirpation and reintroduction of fishers (*Martes pennanti*) in Oregon: implications for their conservation in the Pacific states. Biological Conservation 114:79-90.

Bailey, Robert G. 1996. Ecoregions of North America. U.S. Dept. of Agriculture, Forest Service, Washington, DC, and The Nature Conservancy, Conservation Science Division, Arlington, VA. http://www.fs.fed.us/rm/ecoregions/products/map-ecoregions-north-america/#

Banci V. 1989 A fisher management strategy for British Columbia. British Columbia Ministry of the Environment, Lands and Parks, Wildlife Branch. Wildlife Bulletin No. B-63.

B.C. Conservation Data Centre. 2007. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, BC. Available: http://srmapps.gov.bc.ca/apps/eswp/.

BC Species and Ecosystems Explorer. 2003. Victoria, British Columbia, Canada. Available: http://srmapps.gov.bc.ca/apps/eswp/ (accessed November 17, 2003).

Beckwitt, E. 1990. Petition for a rule to list the Fisher as Endangered. North San Juan, California:Central Audubon Society.

Berg, W. and D. Kuehn. 1994. Demography and range of fishers and American martens in a changing Minnesota landscape. Pp. 262-271 in S.W. Buskirk, A.S. Harestad, M.G. Raphael, and R.A. Powell (eds.). Martens, Sables, and Fishers: Biology and Conservation. Cornell University Press.

Biodiversity Legal Foundation. 1994. Petition for a rule to list the Fisher, *Martes pennanti*, as "threatened" in the western United States under the Endangered Species Act, 16 U.S.C. Sec. 1531 et seq. (1973) as amended. Petition to the U.S. Dept. of the Interior, U.S. Fish and Wildlife Service, December 22, 1994.

Brander RB, Books DJ. 1973. Return of the fisher. Natural History 82(1):52-7.

Brown L.N. 1965. A fisher, *Martes pennanti*, in Sheridan County, Wyoming. The Southwestern Naturalist 10:143.

Buck, S. 1982. Habitat utilization by fisher (*Martes pennanti*) near Big Bar, California. M.S. thesis, Humboldt State University, 85 pp.

Buck, S., C. Mullis, and A. Mossman. 1994. Habitat use by fishers in adjoining heavily and lightly harvested forests. Pp. 368-376 in S.W. Buskirk, A. Harestad, and M. Raphael, comps. eds. Martens, sables and fishers: biology and conservation. Ithaca, NY: Cornell University Press.

Buskirk, Steven. 1992. Conserving circumboreal forests for martens and fishers. Conservation Biology 6(3):318-320.

Buskirk, Steven. 1994. Introduction to the Genus Martes. Pp. 1-10 in S.W. Buskirk, A.S. Harestad, M.G. Raphael, and R.A. Powell (eds.) Martens, Sables, and Fishers: Biology and Conservation. Cornell University Press.

Buskirk, S. and R. Powell.. 1994 Habitat ecology of fishers and American martens. Pp. 283-296 in S.W. Buskirk, A.S. Harestad, M.G. Raphael, and R.A. Powell (eds.) Martens, Sables, and Fishers: Biology and Conservation. Cornell University Press.

Campbell LA, Zielinski WJ, and Macfarlane DC. 2000. A risk assessment for four forest carnivores in the Sierra Nevada under proposed forest service management activities [unpublished report]. USDA Forest Service Sierra Nevada Framework Project.

Cannings, S.G., L.R. Ramsay, D.F. Fraser, and M.A. Fraker. 1999. Rare amphibians, reptiles, and mammals of British Columbia. Wildl. Branch and Resour. Inv. Branch, B.C. Minist. Environ., Lands and Parks, Victoria, B.C. 198 pp.

Carroll, Carlos, William J. Zielinski, and Reed F. Noss. 1999. Using presence-absence data to build and test spatial habitat models for the fisher in the Klamath region, U.S.A. Conservation Biology 13(6):1344-1359.

Center for Biological Diversity and Sierra Nevada Forest Protection Campaign 2000. Petition to list the fisher (*Martes Pennanti*) as an endangered species in its West Coast range. Tucson, Arizona, November 2000.

Chadwick, Douglas H. 2007. Quest for a forest phantom. Defenders Magazine 82(3):20-23, Summer 2007.

Dark S.J. 1997. A landscape-scale analysis of mammalian carnivore distribution and habitat use by fisher [MSc thesis]. Arcata (CA): Humboldt State University.

deVos A. 1951 Recent findings in fisher and marten ecology and management. Transactions of 16th North American Wildlife Conference 16:498-507.

Dodge W.E. 1977 Status of the fisher (*Martes pennanti*) in the conterminous United States. U.S. Department of the interior (Unpubl. rep).

Douglas Carman W. and Marjorie A. Strickland. 1987. Fisher. Pp. 511-529 in M. Novak, J.A. Baker, and M.E. Obbard (comps. eds.) Wild furbearer management and conservation in North America. Ontario Ministry of Natural Resources.

Drew, R.E., J.G. Hallett, K.B. Aubry, K.W. Cullings, S.M. Koepf, and W.J. Zielinski. 2003. Conservation genetics of the fisher (*Martes pennanti*) based on mitochondrial DNA sequencing. Molecular Ecology 12:51-62.

Earle RD. 1978. The fisher-porcupine relationship in Upper Michigan [MSc thesis]. Houghton (MI): Michigan Technical University.

Fontana, Anna; Irene Teske; Kim Pritchard; and Marg Evans. 1999. East Kootenay fisher reintroduction program, final report, 1996-1999. Submitted to Gary Tipper, Wildlife Biologist, Ministry of Environment, Lands and Parks, Cranbrook, B.C., June 1999.

Freel Maeton 1991 A literature review for management of the marten and fisher on national forests in California. U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Region, Los Padres National Forest, July 1991.

Frost, Herbert C., William B. Krohn, and Charles R. Wallace. 1997. Age-specific reproductive characteristics in fishers. Journal of Mammalogy 78(2):598-612.

Garant, Yves and Michel Crete. 1997. Fisher, *Martes pennanti*, home range characteristics in a high density untrapped population in southern Quebec. The Canadian Field-Naturalist 111(3):359-364.

Gehman, Steve. 1995. Stalking the elusive fisher, finally the existence of this rare predator is confirmed. Yellowstone Science 3(4):2-3.

Gehman, Steven and Betsy Robinson. 2000. Rare carnivore surveys on the Gallatin National Forest, Three-year summary report, Winters 1997-98, 1998-99, and 1999-2000. Unpublished report by Wild Things Unlimited, Bozeman, Montana, December 2000.

Gerstenberger, S.L., J.H. Gilbert, and J.A. Dellinger. 1996. Environmental contaminants and cholinesterase activity in the brain of fisher (*Martes pennanti*) harvested in northern Wisconsin. Bulletin of Environmental Contamination and Toxicology 56:866-872.

Gibilisco Charles G. 1994 Distributional dynamics of modern *Martes* in North America. Pp. 59-70 in S.W. Buskirk, A.S. Harestad, M.G. Raphael, and R.A. Powell (eds.). Martens, Sables, and Fishers: Biology and Conservation. Cornell University Press.

Goldman FA. 1935. New American mustelids of the genera *Martes*, *Gulo*, and *Lutra*. Paper presented at the Proceedings Biological Society of Washington 48.

Graham, R.W. and M.A. Graham. 1994. The late quaternary distribution of *Martes* in North America. Pp. 26-58 in S.W. Buskirk, A. Harestad, and M. Raphael, comps. eds. Martens, sables and fishers: biology and conservation. Ithaca, NY: Cornell University Press.

Grinnell J, Dixon JS, Linsdale JM. 1937. Furbearing mammals of California. Vol. 1. Berkeley (CA): Univ. of California Press. 375 p.

Hagmeier E.M. 1956 Distribution of marten and fisher in North America. Canadian Field-Naturalist 70:149-168.
Hagmeier E.M. 1959 A re-evaluation of the subspecies of fisher. Canadian Field-Naturalist 73:185-197.
Hahr, Meg. 2001. Winter distribution and habitat use of lynx, fisher, and wolverine in Glacier National Park, Montana. Masters Thesis, University of Montana, Missoula, Spring 2001.
Hall ER. 1981. The mammals of North America. 2nd ed. New York: John Wiley & Sons. p. 980-1009.
Heinemeyer, K.S. 1993 Temporal dynamics in the movements, habitat use, activity, and spacing of reintroduced fishers in northwestern Montana. M. Sc. Thesis, Univ. of Montana, Missoula, 154 pp.
Heinemeyer, K.S. and J.L. Jones. 1994. Fisher biology and management in the western United States: a literature review and management strategy, (Version 1.2) U.S.Department of Agriculture, Forest Service, Northern Region, Missoula, Montana, March 1994.
Higley JM, Yaeger JS, Colegrove AB, Pole AJ, Whitaker DA. 1998. Hoopa Valley Indian Reservation fisher study (Progress report) [unpublished]. Hoopa (CA): USDI Bureau of Reclamation, USDI Bureau of Indian Affairs, and Hoopa Valley Tribe.
I.D.F.G. 2007. Furbearer progress report. Project W-170-R-31, Study III, Job 1, July 1, 2006 to June 30, 2007. Prepared by Summer Crea, Technical Records Specialist; Compiled and edited by Don Kemner, Wildlife Staff Biologist, Boise, Idaho, September 2007.
I.D.F.G. 2006. Idaho snow-track survey, Winter 2006. Unpublished report prepared by Gina Patton, Wildlife Bureau, Idaho Department of Fish and Game, Boise, Idaho, December 2006.
I.D.F.G. 2005a. Idaho Comprehensive Wildlife Conservation Strategy. Appendix B: Common and scientific names of Idaho species of greatest conservation need. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. http://fishandgame.idaho.gov/cms/tech/CDC/cwcs_pdf/appendix%20b.pdf
I.D.F.G. 2005b. Idaho snow-track survey, Winter 2005. Unpublished report prepared by Gina Patton, Wildlife Bureau, Idaho Department of Fish and Game, Boise, Idaho, November 2005.
I.D.F.G. 2004. Idaho snow-track survey, Winter 2003-2004. Unpublished report prepared by Gina Patton, Wildlife Bureau, Idaho Department of Fish and Game, Boise, Idaho, December 2004.
I.D.F.G. 1995. The fisher (*Martes pennanti*) In Idaho: habitat conservation assessment (HCA). Saving all the Pieces, The Idaho State Conservation Effort, draft dated Feb. 15, 1995.
Idaho Department of Lands. 2007. Fiscal Year 2008 Timber Sale Plan, State of Idaho, Department of Lands, signed April 16, 2007.
Irvine, G.W., L.T. Magnus and B.J. Bradle. 1964. The restocking of fishers in lake states forests. Transaction of the North American Wildlife Natural Resource Conference 29:307-315.
Johnson Steven 1996 Identification of potential fisher habitat on the Kootenai National Forest Draft report, U.S. Dept. of Agriculture, Forest Service, Kootenai National Forest, July 11, 1996.
Johnson, W.A. and A.W. Todd. 1985. Fisher, *Martes pennanti*, behaviour in proximity to human activity. Canadian Field-Naturalist 99:367-369.
Jones J.L. 1991 Habitat use of fisher in northcentral Idaho. Masters thesis, University of Idaho, Moscow, Idaho, May 1991 Study.
Jones, J.L and E.O. Garton. 1994. Selection of successional stages by fishers in north-central Idaho. Pp. 377-387 in S.W. Buskirk, A.S. Harestad, M.G. Raphael, and R.A. Powell (eds.) Martens, Sables, and Fishers: Biology and Conservation. Cornell University Press.
Keinath, D., B. Heidel and G. P. Beauvais. 2003. Wyoming Plant and Animal Species of Concern. Prepared by the Wyoming Natural Diversity Database - University of Wyoming, Laramie, Wyoming, http://uwadmnweb.uwyo.edu/wyndd/.
Klug RR. 1997. Occurrence of Pacific fisher (Martes pennanti) in the Redwood Zone of northern California and the habitat attributes associated with their detections [MSc thesis]. Arcata (CA): Humboldt State University.
Krohn, W.B., S.M. Arthur and T.F. Paragi. 1994. Mortality and vulnerability of a heavily trapped fisher population. Pp. 137-145 in S.W. Buskirk, A. Harestad, and M. Raphael, comps. eds. Martens, sables and fishers: biology and conservation. Ithaca, NY: Cornell University Press.
Kuehn D.W. 1989 Winter foods of fishers during a snowshoe hare decline. Journal of Wildlife Management 53(3):688-692.

Kyle, C.J., J.F. Robitaille and C. Strobeck. 2001. Genetic variation and structure of fisher (*Martes pennanti*) populations across North America. Molecular Ecology 10:2341-2347.
Leonard RD. 1986. Aspects of reproduction of the fisher, Martes pennanti, in Manitoba. The Canadian Field-Naturalist 100:32-44.
Lewis, Jeffrey C. and Derek W. Stinson. 1998. Washington State status report for the fisher. Washington Dept. of Fish and Wildlife, Olympia, Washington, September 1998.
Lewis, Jeffrey and William Zielinski. 1996. Historical harvest and incidental capture of fishers in California Northwest Science 70(4):291-297.
Lucas, Eric 2006. Fascinating fishers. Horizon Air Magazine 17(7):82-87, July 2006.
Maj, Mary and E.O. Garton. 1994. Fisher, lynx, wolverine; summary of distribution information. Pp. 169-175 In L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski, tech eds. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. U.S. Dept. of Agriculture, Forest Service, Gen. Tech. Rep. RM-254.
Martin SK. 1994. Feeding ecology of American martens and fishers. In: Buskirk SW, Harestad AS, Raphael MG, Powell RA, editors. Martens, sables and fishers: biology and conservation. Ithaca (NY): Cornell University Press. p 297-315.
Mazzoni AK. 2002. Habitat use by fishers (Martes pennanti) in the southern Sierra Nevada [MSc thesis]. Fresno (CA): California State University.
Milstein, Michael. 1995. Rare animal captured-on film. Billings Gazette, Sunday June 11, 1995, pp. 1C, 3C, Montana.
M.D.F.W.P. 2007. Furbearers. Montana trapping and hunting regulations 2007. Montana Department of Fish, Wildlife and Parks, Helena.
M.D.F.W.P. 2005. State Furbearer Program Newsletter, Spring 1995. Montana Department of Fish, Wildlife and Parks, Helena.
M.D.F.W.P. 1995. Statewide Furbearer Program 1993-94 Annual Management and Harvest Report. Prepared by Brian Giddings, Statewide Furbearer Coordinator, Montana Department of Fish, Wildlife and Parks, Helena, August 15, 1995.
M.N.H.P. and M.D.F.W.P. 2006. Montana animal species of concern. Helena, MT: Montana Natural Heritage Program and Montana Department of Fish Wildlife and Parks. 17 p. http://nhp.nris.mt.gov/reports/2006_MASOC.pdf
Montana D.N.R.C. 2008. Montana Department of Natural Resources and Conservation website, accessed January 2008: http://dnrc.mt.gov/trust/about_us/acreage.asp.
Paragi, Thomas F., Stephen M. Arthur, and William B. Krohn. 1994. Seasonal and circadian activity patterns of female fishers, *Martes pennanti*, with kits. The Canadian Field-Naturalist 108:52-56.
Plum Creek 2008. Plum Creek Timber Company website, accessed January 2008: http://www.plumcreek.com/.
Potlatch Corporation 2008. Potlatch Corporation website, accessed January 2008: http://www.potlatchcorp.com/IdahoTimberlands.aspx.
Powell R.A. 1979 Fishers, population models and trapping. Wildlife Society Bulletin 7:149-154.
Powell R.A. 1993 The fisher: Life history, ecology and behavior, 2nd ed. Minneapolis, MN: University of Minnesota Press. 237 p.
Powell R.A. 1994a Structure and spacing of Martes populations. Pp. 101-121 in S.W. Buskirk, A. Harestad, and M. Raphael, comps. eds. Martens, sables and fishers: biology and conservation. Ithaca, NY: Cornell University Press.
Powell R. A. 1994b Effects of scale on habitat selection and foraging behavior of fishers in winter. Journal of Mammalogy 75(2):349-356.
Powell, Roger A. and William J. Zielinski. 1994. Fisher. Pp. 38-73 in L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski, tech eds. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. U.S. Dept. of Agriculture, Forest Service, Gen. Tech. Rep. RM-254
Proulx, Gilbert, Harold N. Bryant and Paul M. Woodard (eds.). 1997. *Martes*: Taxonomy, ecology, ecology, techniques, and management. Proceedings of the second international *Martes* symposium, The Provincial Museum of Alberta, Edmonton, Canada.

Proulx, G., A. Kolenosky, M. Badry, et al. 1994. Post-release movements of translocated fishers. Pp. 197-203 in S.W. Buskirk, A. Harestad, and M. Raphael, comps. eds. Martens, sables and fishers: biology and conservation. Ithaca, NY: Cornell University Press.

Quick H.F. 1953 Wolverine, fisher and marten studies in a wilderness region. Transactions of the North American Wildlife Conference 18:513-533

Rand A.L. 1944 The status of the fisher (Martes pennanti Erxleben) in Canada. Canadian Field-Naturalist 58:77-81

Ridler, Keith. 2008. Idaho officials might cut more trees on state land. Times-News Magicvalley.com article, Boise, Idaho, published January 30, 2008.

Rosenberg, K.V. and R.G. Raphael. 1986. Effects of forest fragmentation on vertebrates in Douglas-fir forests. Pp. 263-272 in J. Verner, M.L. Morrison, and C.J. Ralph (eds.) Wildlife 2000: Modeling habitat relationships of terrestrial vertebrates. University of Wisconsin Press.

Roy K.D. 1991 Ecology of reintroduced fishers in the Cabinet Mountains of northwest Montana. Masters thesis, University of Montana, Missoula, Montana. 94 p.

Ruediger, Bill, James J. Claar, and James F. Gore. 1999. Restoration of carnivore habitat connectivity in the northern Rocky Mountains. Unpublished paper, U.S. Dept. of Agriculture, Forest Service, Northern Region, Missoula, Montana.

Ruggiero, Leonard F., Keith B. Aubry, Steven W. Buskirk, L. Jack Lyon, and William J. Zielinski. 1994. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM-254, Fort Collins, Colorado, September 1994.

Schwartz, Michael K. 2007. Ancient DNA confirms native Rocky Mountain fisher (*Martes pennanti*) avoided early 20th Century extinction. Journal of Mammalogy 88(4):921-925.

Schwartz, Michael K., Todd Ulizio, and Ben Jimenez. 2006. U.S. Rocky Mountain Fisher Survey Protocol. U.S.Department of Agriculture Forest Service, Rocky Mountain Research Station, Missoula Montana.

Seglund AE. 1995. The use of rest sites by the Pacific fisher [MSc thesis]. Arcata (CA): Humboldt State University. 66 p.

Slauson KM, Zielinski WJ, Holm GW. 2003. Distribution and habitat associations of the Humboldt marten (Martes americana humboldtensis) and Pacific fisher (Martes pennanti pacifica) in Redwood National and State Parks: Final report to Redwood National and State Parks, CA.

Strickland M.A. 1994 Harvest management of fishers and American martens. pp. 149-164 in S.W. Buskirk, A. Harestad, and M. Raphael, comps. eds. Martens, sables and fishers: biology and conservation. Ithaca, NY: Cornell University Press.

Teske I.E. 1997 East Kootenay fisher reintroduction program. Year 3, Progress Report, June-October 1997 Prepared for Anna Fontana, BC Ministry of Environment, Lands and Parks, Cranbrook, British Columbia, November 1997.

Teske I.E. 1998 East Kootenay fisher reintroduction program Year 4, Progress Report, June-October 1998. Prepared for Anna Fontana, BC Ministry of Environment, Lands and Parks, Cranbrook, British Columbia, October 1998.

Teske I.E. 1998 East Kootenay fisher reintroduction program. Year 4, Progress Report, November 1997 - May 1998 Prepared for Anna Fontana, BC Ministry of Environment, Lands and Parks, Cranbrook, British Columbia, May 1998.

Thier, T. 2000. [Region 1] furbearer report. Montana Department of Fish, Wildlife and Parks. Eureka.

Thomasma, L.E., T. Drummer, and R.O. Peterson. 1991. Testing the habitat suitability index model for the fisher. Wildlife Society Bulletin 19:291-297.

Thomasma, L.E., T. Drummer, and R.O. Peterson. 1994. Modeling habitat selection by the fisher. Pp. 316-325 in S.W. Buskirk, A. Harestad, and M. Raphael (comps. eds.) Martens, sables and fishers: biology and conservation. Ithaca, NY: Cornell University Press.

Thomas NJ, Cole RA. 1996. The risk of disease and threats to the wild population. Endangered Species Update. University of Michigan School of Natural Resources and Environment. December 1996 Vol 13 No. 12. (Available at http://www.otterproject.org/esu_1296/06.html).

Thorne ET, Williams ES. 1988. Disease and endangered species: The black-footed ferret as a recent example. Conservation Biology 2(1):66-74.

Truex RL, Zielinski WJ, Golightly RT, Barrett RL, Wisely SM. 1998. A meta-analysis of regional variation in fisher morphology, demography, and habitat ecology in California [draft report submitted to California Department of Fish and Game]. Arcata (CA): USDA Forest Service, Pacific Southwest Research Station, Redwood Sciences Lab.

U.S.D.A. 2008. Roadless Area Conservation, Spreadsheet List, Regional Sensitive Species Lists. U.S. Dept. of Agriculture, Forest Service, http://roadless.fs.fed.us/documents/feis/data/sheets/summspd/tes_supp/tes_supp.shtml.

U.S.D.A. 2007. Acres harvested by cutting method and other drain (summarized from R-1 Timber Stand Data Base). Unpublished tables by the U.S. Department of Agriculture Forest Service, Northern Region, Missoula, Montana, January 26, 2007; available online at: http://www.fs.fed.us/r1/forest_range/timber_reports/timbersales.shtml

U.S.D.A. 2005. Forest Service Manual 2600, Wildlife, Fish and Sensitive Plant Habitat Management, Chapter 2670, Threatened, Endangered and Sensitive Plants and Animals, Amendment No. 2600-2005-1, U.S. Department of Agriculture Forest Service, National Headquarters, Washington, D.C., effective September 23, 2005.

U.S.D.A. 1994. Wolverine, lynx, and fisher habitat and distribution maps, draft hierarchical approach and draft conservation strategies. Unpublished memo from Western Forest Carnivore Committee Chairperson Bill Ruediger (U.S. Dept. of Agriculture, Forest Service, Northern Region, Missoula, Montana) to Forest Supervisors (R-1), Regional Foresters (R-2, R-4, R-5, and R-6), and cooperating agencies (state and federal). September 14, 1994.

U.S.D.I. 2008. After a Long Absence, Rare Native Mammal Returns to Washington State and Olympic National Park. Press Release issued by Olympic National Park, U.S. Department of Interior, January 27, 2008. http://www.nps.gov/olym/parknews/rare-native-mammal-returns-to-washington-state-and-olympic-national-park.htm

U.S.D.I. 2004. Endangered and Threatened Wildlife and Plants; 12-month Finding for a Petition to List the West Coast Distinct Population Segment of the Fisher (*Martes pennanti*). U.S. Department of Interior, Fish and Wildlife Service, Portland, Oregon. Federal Register 69:18769.

U.S.D.I. 1996. Endangered and threatened wildlife and plants; 90-day finding for a petition to list the fisher in the western United States as threatened. U.S. Department of Interior, Fish and Wildlife Service, Federal Register 61:8016-8018.

Vinkey, Ray S. 2003. An evaluation of fisher (*Martes pennanti*) introductions in Montana. M.S. Thesis, University of Montana, Missoula, 97 pp.

Vinkey, Ray S., Michael K. Schwartz, Kevin S. McKelvey, Kerry R. Foresman, Kristine L. Pilgrim, Brian J. Giddings, and Eric C. LoFroth. 2006. When reintroductions are augmentations: the genetic legacy of fishers (*Martes pennanti*) in Montana. Journal of Mammalogy 87(2):265-271.

Weaver, John. 1993. Lynx, Wolverine and Fisher in the Western United States: Research Assesment and Agenda for the Interagency Lynx-Wolverine-Fisher Working Group. U.S. Dept. of Agriculture, Forest Service, Intermountain Research Station, Missoula, Montana, April 1993.

Weckwerth, R.P. and P.L. Wright. 1968. Results of transplanting fishers in Montana. Journal of Wildlife Management 32:977-980.

Weir, R.D. 2003. Status of the fisher in British Columbia. B.C. Ministry of Water, Land and Air Protection, Biodiversity Branch, Victoria, and B.C. Ministry of Sustainable Resource Management, Conservation Data Centre, Victoria; Wildlife Bulletin No. B-105, March 2003, 38 pp.

Weir R.D. 1995. Diet, spatial organization, and habitat relationships of fishers in south- central British Columbia [MSc thesis]. Burnaby (BC): Simon Fraser University.

Weir, Richard D.; Ian T. Adams; Garth Mowat; and Anna J. Fontana. 2003. East Kootenay fisher assessment. Prepared for Ministry of Water, Land and Air Protection, 105 Industrial Road G, Cranbrook, BC V1C 6H3, May 2003.

Weir R.D., Harestad A.S. 2003. Scale-dependent habitat selectivity by fishers in south-central British Columbia. Journal of Wildlife Management 67(1):73-82.

Williams R.M. 1962 The fisher returns to Idaho. Idaho Wildlife Review 15(1):8-9.

Williams, Rod N., L. Kristen Page, Thomas L. Serfass, and Olin E. Rhodes, Jr. 1999. Genetic polymorphisms in fishers (Martes pennanti). The American Midland Naturalist 141: 406-410.

Williams, Rod N., Olin E. Rhodes Jr., and Thomas L. Serfass. 2000. Assessment of genetic variance among source and reintroduced fisher populations. Journal of Mammalogy 81(3):895-907.
Wisely, Samantha M. Steven W. Buskirk, Gregory A. Russell, Keith B. Aubry, and William J. Zielinski. 2004. Genetic diversity and structure of the fisher (Martes pennanti) in a peninsular and peripheral metapopulation. Journal of Mammalogy 85(4):640-648.
Yocum, C.F. and M.T. McCollum. 1973. Status of the fisher in northern California, Oregon and Washington. California Fish and Game 59(4):305-309.
York, E. 1996. Fisher population dynamics in north-central Massachusetts [MSc thesis]. Amherst (MA): Univ. Massachusetts. 122 p.
Zielinski, W.J. 1984. Plague in pine martens and the fleas associated with its occurrence. Great Basin Naturalist 44(1):170-5.
Zielinski, W. and R. Barrett. 1997. Southern Sierra Nevada fisher and marten study: Progress report IV 15 May 1994 - 2 October 1996. Progress Report IV, USDA Forest Service, Pacific Southwest Research Station, University of California, 24 March 1997.
Zielinski W.J, Duncan N.P. 2004. Diets of sympatric populations of American martens (*Martes americana*) and fishers (*Martes pennanti*) in California. Journal of Mammalogy 85(3):470-477.
Zielinski, W.J., N.P. Duncan, E.C. Farmer, R.L Treux, A.P. Clevenger, and R.H. Barrett. 1999. Diet of fishers (*Martes pennanti*) at the southernmost extent of their range. Journal of Mammalogy 80(3):961-971.
Zielinski WJ, Barrett RH, Truex RL. 1997c. Southern Sierra Nevada fisher and marten study: progress report IV. Arcata (CA): USDA Forest Service, Pacific Southwest Research Station.
Zielinski, William J. and Thomas E. Kucera. 1995. American marten, fisher, lynx, and wolverine: Survey methods for their detection. USDA Forest Service, Pacific Southwest Research Station, General Technical Report PSW-GTR-157, Albany, California, August 1995.
Zielinski, W.J., T.E. Kucera, and R.H. Barrett. 1995. Current distribution of the fisher (*Martes pennanti*) in California. California Fish and Game 81(3):104-112.

Personal Communications

Nate Albrecht, Biologist, Coeur d'Alene Tribe, Plummer, Idaho, February 2008, April 2008.
Sam Cushman, Biologist, U.S. Department of Agriculture Forest Service Rocky Mountain Research Station, Missoula, Montana, February 2008, April 2008.
Brian Giddings, Statewide Furbearer Coordinator, Montana Department of Fish, Wildlife and Parks, Helena, February 2008.
Sonya Knetter, Non-game Biologist, Idaho Department of Fish and Game, Coeur d'Alene, Idaho, February 2008.
Diane Evans Mack, Non-game Biologist, Idaho Department of Fish and Game, McCall, Idaho, February 2008.
Joel Sauder, Non-game Biologist, Idaho Department of Fish and Game, Lewiston, Idaho, January 2008, April 2008.
Michael Schwartz, Biologist, U.S. Department of Agriculture Forest Service Rocky Mountain Research Station, Missoula, Montana, January 2008, April 2008.