

# Keeping the Wild in the West

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A Multi-Species  
Carnivore  
Conservation Initiative  
for the  
American West

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Predator Conservation Alliance  
Bozeman, Montana  
2002



# About This Report



## PURPOSE

America has made great progress restoring grizzly bears and wolves in the western United States. Yet, to assure the long-term restoration of these and other species, this work now needs to be expanded. Other native carnivores such as lynx, wolverines and fishers remain imperiled. Some carnivores, such as grizzly bears, will continue to present long-term conservation challenges despite the progress made to date. To address these challenges, it is time we put all the individual species' needs together, and restore the entire forest carnivore community.

This report advances multi-species conservation by suggesting where, what and how land and wildlife managers can protect and conserve five carnivore species: the grizzly bear, wolverine, fisher, lynx and wolf. Because these five carnivores are "indicators" of healthy forests, successful implementation of multi-species carnivore conservation would help to ensure that forest ecosystems across the American West are restored and maintained for all dependent wildlife.

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Cover photos: Yellowstone NP (grizzly); Daniel J. Cox (wolverine, fisher, lynx, wolves);  
Back-cover: Daniel J. Cox (wolverine); Steve Gehman (cirque).



# EXECUTIVE SUMMARY

## Introducing Multi-Species Conservation

The decline of mid-sized carnivores such as lynx, wolverine, and fisher in the American West demands a renewed effort to save these species from extinction. This decline indicates that bears and wolves are not the only species to have suffered the unintended consequences of intensive forest practices, road and motorized trail development and other human activities in the public lands of the U.S. Northern Rockies. Also, the progress made toward restoring wolves and protecting grizzly bears in this region does not mean that lynx, wolverines, and fishers will automatically recover without help.

When Americans decided to restore the grizzly bear and the wolf thirty years ago, we decided where to begin restoration efforts and what should be done in those areas to succeed. This same approach — deciding what to do and where — is now needed to restore the entire community of forest carnivores native to the American West.

### **STEP 1. DETERMINE WHERE TO FOCUS CONSERVATION EFFORTS**

To establish priority conservation areas, a reasonable starting point is to identify where the carnivores still survive, and work to prevent any further declines in their current distribution. Within these priority areas it is useful to next identify “population centers,” where we know that resident, breeding populations exist. The next step is to identify linkage areas between population centers and other areas of suitable habitat that may not currently be occupied, but where restoration is feasible and desirable.

### **STEP 2. DETERMINE WHAT TO DO IN PRIORITY AREAS**

In mapping priority areas, it becomes clear that the entire forest carnivore community depends on many of the same areas of habitat, and that they face many of the same threats to their survival. Not all human activities in all areas are harmful, but certain activities in certain areas should be addressed where we know they pose problems for wildlife, rare carnivores in particular. These problems can be distilled into the following four factors: human-caused mortality, forest practices, motorized access, and habitat fragmentation.

### **STEP 3. IMPLEMENTATION**

The best maps and scientific information will do no good until they are used to implement improved practices on the ground, where it matters. It is critical to identify best management criteria based upon the best available science and on-the-ground experience, to address the factors limiting carnivore restoration.

Americans can no longer take for granted that these species will continue to exist in the western U.S. Instead, we must make a conscious decision as a society where we will save places for them and how best to protect, conserve, restore and manage a full complement of native species. Predator Conservation Alliance is actively enlisting the help of agency officials, scientists and other conservation-minded groups and individuals needed to refine and implement this initiative. Contact us to find out how you can be a part of Keeping the Wild in the West.



“Grizzlies are wilderness incarnate.” — Doug Peacock

### DESCRIPTION

Grizzly bears define the wildest areas left in the American West. Because of their position atop the food chain, they are excellent indicators of healthy habitat. Conversely, when a forest ecosystem unravels, the grizzly bear is among the first to disappear.

Adult grizzly bears in the American West weigh up to 800 pounds, and can tower eight feet high when standing on hind legs. Their paws are 8 inches across and 10 inches long, not including 4-6 inch claws. Their characteristic

shoulder hump is pure muscle, enabling the grizzly to dig and uproot rocks and logs in search of food. Key foods for grizzly bears include spawning trout in the spring, moths concentrated at high elevation

in the summer, whitebark pine seeds and berries in the fall, and carrion. Like all of the forest carnivores, grizzly bears need large areas where they can find ample food, security, and winter denning habitat.



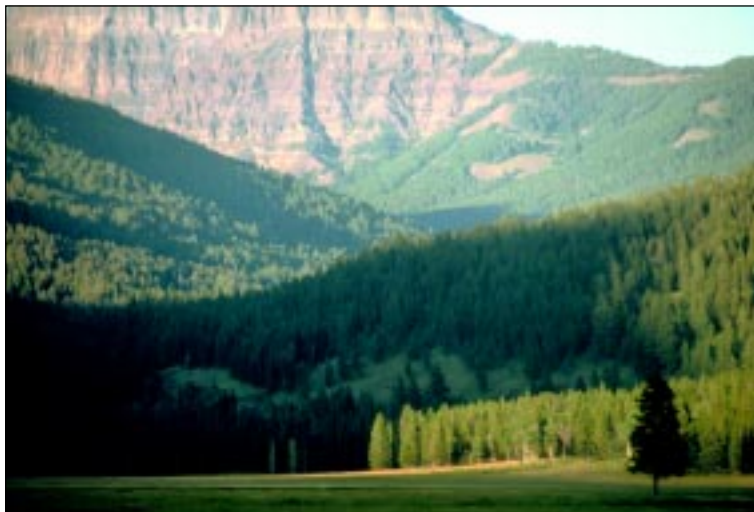
*Grizzly bears, especially females with cubs, avoid areas with human activity and developments, and those bears that use these areas are vulnerable to being killed by people.*

### CONSERVATION STATUS

Biologists estimate that there are fewer than 1,000 grizzly bears still surviving across the American

West. They have been reduced to less than 2% of their original range and numbers. Further, they survive in increasingly isolated “island” populations, which is a common precursor to regional extinction.

In 1975, the grizzly bear was listed federally as a threatened species throughout its range in the contiguous United States. The U.S. Fish and Wildlife Service and other agencies have announced plans to “de-list” the grizzly bear in Greater Yellowstone and the Northern Continental Divide, but grizzly bear conservation will be a long-term challenge due to increasing pressure on its habitat and its risk of being killed by people.

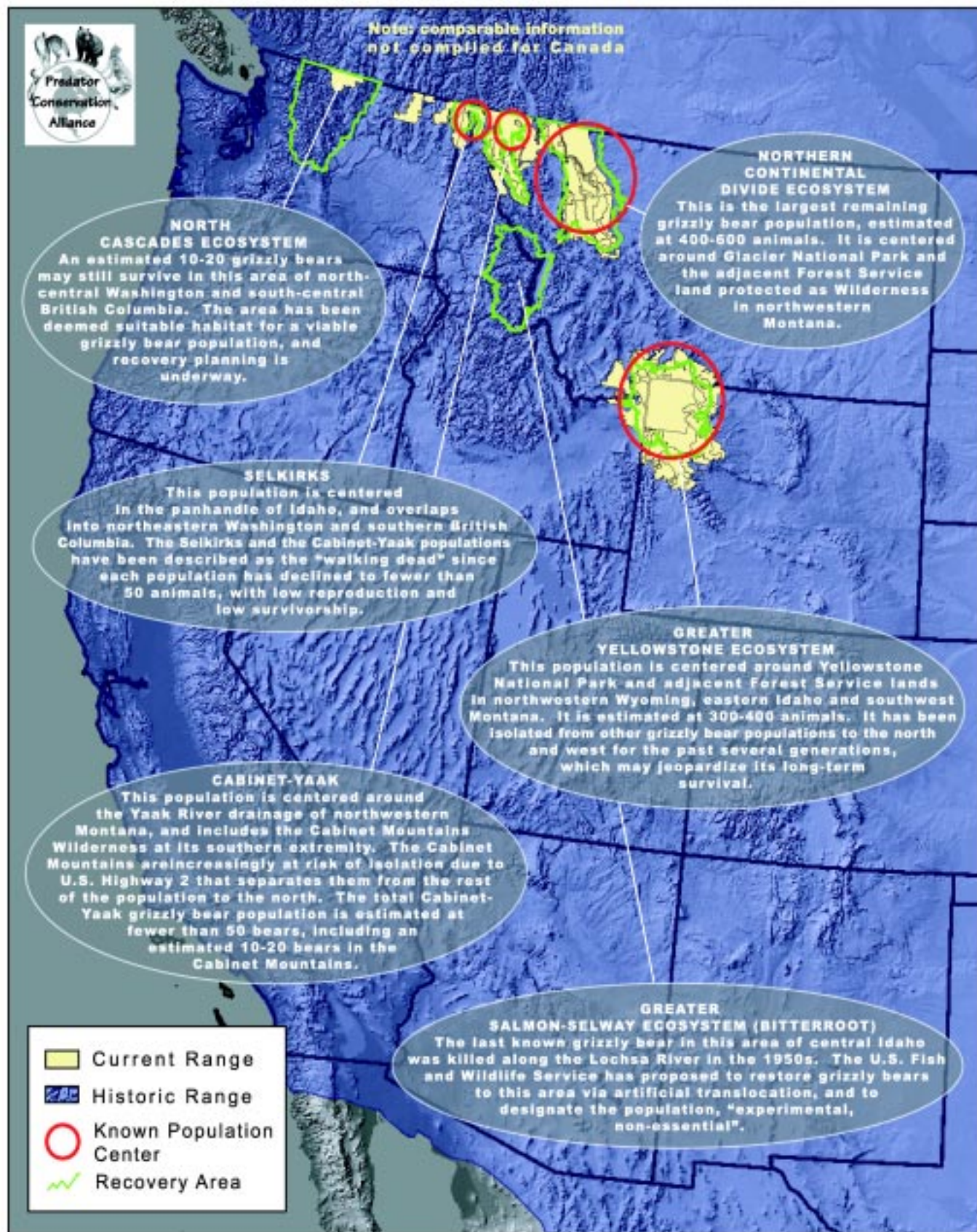


*Grizzly bears are habitat generalists, meaning they make use of a variety of habitats, but these areas must be safe from human disturbance.*



# Grizzly Bear Range Past and Present

Adapted from data published in Bader (2000) and Schwartz (In Press).







When we disturb a wild area, wolverines  
can be the first animals to disappear.

### DESCRIPTION

Independent, strong and ferocious, the North American wolverine is another true symbol of our American wilderness. Its scientific name *Gulo gulo* means “glutton, glutton.” The wolverine’s legendary appetite, strength and fierce disposition give it a reputation as one of the most tenacious carnivores on earth. However, the wolverine makes its living more as a scavenger than a hunter. Relying on dead animals, especially large mammals, the wolverine needs strength to establish and defend its food caches, and endurance to survive long periods without food.

Wolverines are the largest land member of the weasel family, with an average weight of about 30 pounds. They are rumored to be able to drag a whole moose carcass with their compact, heavily muscled bodies.



© Daniel J. Cox

*Wolverines have been given the name “skunk bear” because of the gold or reddish-brown color bands that run from each shoulder to the tail through the shaggy brown coat, much like a skunk. Wolverines need large areas to roam and scavenge for food, mate and find secure den sites.*



Idaho Fish and Game / Jeff Copeland

tion and numbers in the contiguous United States is not comprehensive, but there is scientific consensus that: (1) wolverine range and numbers have decreased dramatically since pre-Columbian times due to human activities and developments, (2) wolverines currently number fewer than 750 across the lower-48 states, and (3) these occur in populations that are increasingly fragmented and isolated both from each other and from wolverine populations in Canada.

The wolverine was petitioned for protection under the Endangered Species Act in 1994 and again in 2000. The Forest Service has listed the wolverine as “Sensitive” in eleven western states; and “Proposed Sensitive” in two others. The U.S. Bureau of Land Management has also classified the wolverine as “Sensitive.”

### CONSERVATION STATUS

Wolverines historically occupied the northern and high-elevation forests of the lower-48 states along the West Coast (Cascades and Sierra Nevada Ranges), Rocky Mountains (Canada border south into Arizona and New Mexico), the Lake States and Northeast. Data on current wolverine distribu-

*A wolverine den site was found at the base of the nearest snow slide. These areas need protection from human disturbance. Like grizzly bears, wolverines make use of a variety of habitats, but unlike bears they have a wider distribution and are active all winter.*



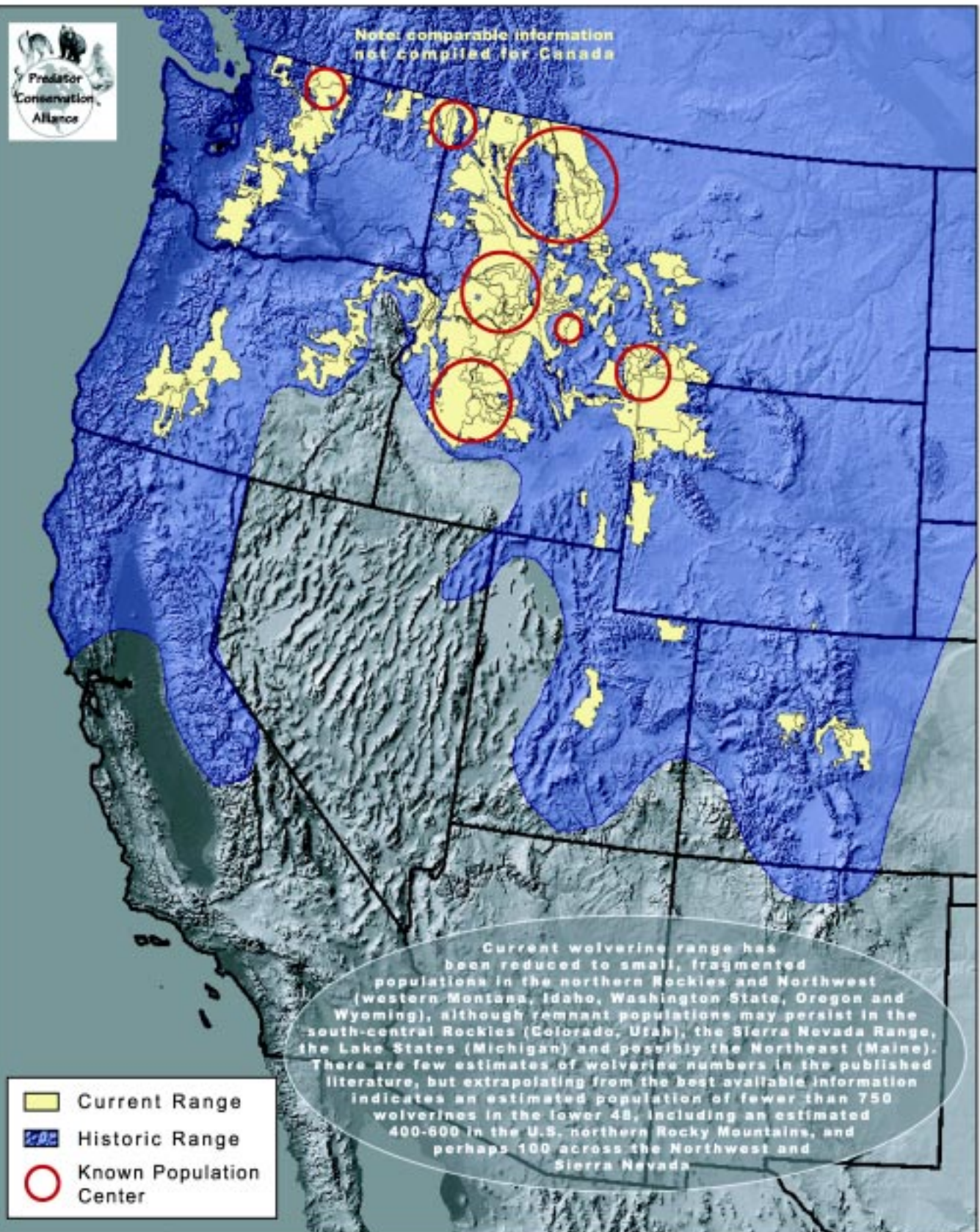
## Wolverine Range

## Past and Present

Data sources: State Natural Heritage Program (2000); Maj and Garton (1994); Gehman and Robinson (2000); MT Dept. of Fish, Wildlife and Parks.



Note: comparable information  
not compiled for Canada







“American martens and fishers appear to be among the most habitat specialized mammals in North America ...” — Buskirk and Powell

## DESCRIPTION

The fisher is a bigger, stronger, darker brown version of its cousin, the marten. The fisher has the same general long and low-slung weasel-like body shape, but it's larger and stockier, with thicker fur



© Alan and Sandy Carey

*Like the wolverine, fishers are highly vulnerable to trapping, including traps set for other species. Their distribution is more widespread — fishers are doing well in the eastern U.S. and range as far south and west as the southern Sierra Nevada in California — but their populations in the West are small and increasingly isolated from each other.*

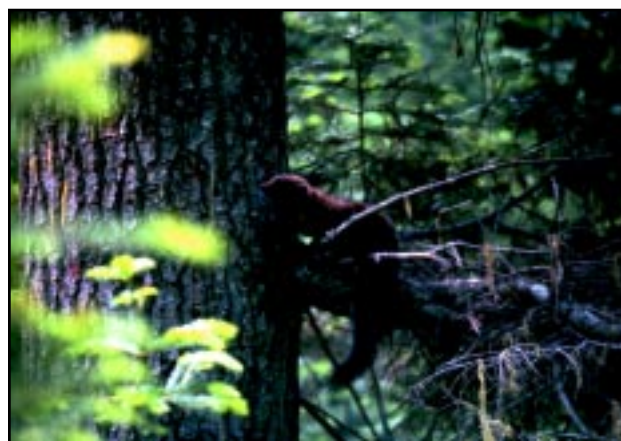
and a flatter face. Why it's called the fisher isn't certain, but the name doesn't make any sense. Although fishers seem to prefer riparian, or streamside, areas, fish actually make up a tiny percentage of their diet.

The fisher inhabits dense forests with extensive overhead canopy and usually avoids open areas. In the western U.S. the fisher requires mature mesic (wet) forests in which to live. The fisher dens in hollow trees and logs, and seeks shelter during the winter in logs, brush piles, and snow dens. The fisher's beautiful dark brown pelt, often with a creamy patch on the throat, is highly prized.

## CONSERVATION STATUS

Historically, fishers occupied the northern and high-elevation forests of the lower-48 states along the West Coast (Cascades and Sierra Nevada Ranges), Northern Rocky Mountains, the Great Lake States and Northeast. Data on current fisher distribution and numbers in the contiguous United States is not comprehensive, but there is scientific consensus that: (1) in the western U.S., fisher range and numbers have decreased dramatically since pre-Columbian times due to human activities and developments; (2) fishers currently number fewer than 600 individuals total among all of the western states; and (3) these individuals occur in populations that are increasingly fragmented and isolated both from each other and from fisher populations in Canada.

Fishers along the West Coast were petitioned for Endangered Species Act protections in 1990 and 2000, and fishers west-wide were petitioned in 1994. The U.S. Forest Service has listed the wolverine as “Sensitive” in 12 western states.



Idaho Fish and Game / L. Kuck

*Fishers have more specialized habitat needs than wolverines or grizzly bears. They depend upon lower-elevation, mature and old-growth forests to survive.*



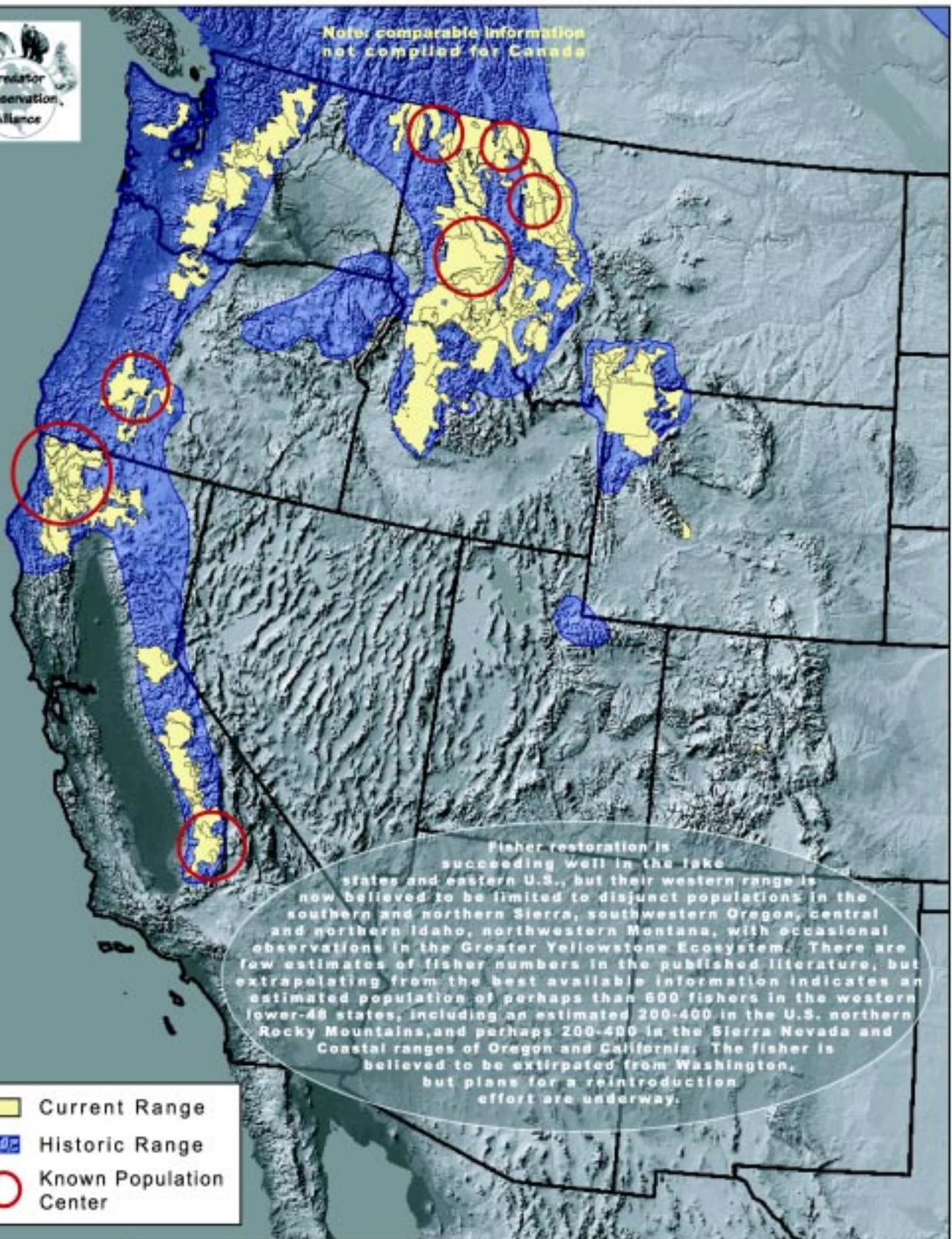
## Fisher Range

## Past and Present

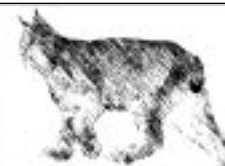
Data sources: State Natural Heritage Programs (2000); Maj and Garton (1994); Gehman and Robinson (2000); Zeilinski et al. (1995); MT Dept. of Fish, Wildlife and Parks.



Note: comparable information  
not compiled for Canada







Lynx need a mosaic of young forests for hunting snowshoe hares, old forests for denning and adequate forest cover for traveling safely through their home range.



#### DESCRIPTION

The lynx is a close cousin to the bobcat. But while the bobcat is found in a variety of habitats throughout North America, the lynx is a species of the “boreal forest,” the high, snowy forests of the north. Lynx need enough mature forest to build dens and provide cover for their kittens, as well as enough new growth to provide food for the snowshoe hare, the primary prey of the lynx.

The lynx is superbly adapted for its life in snowy regions of the far north and high elevations. Its long legs and huge, furry feet (which are as large as those of a mountain lion, an animal three- to five-times its size) act like snowshoes, enabling the lynx to hunt and navigate through the deep snow of the forest where it lives. Long tufts of fur on the tips of its ears and a flared facial ruff give the lynx a mandarin-like appearance.



*Lynx concentrate in small populations at northern latitudes and at high elevations. These populations are vulnerable to isolation and extinction, from habitat loss and mortality due to trapping or poaching.*

© Erwin and Peggy Bauer

Northeast. Today they are reduced to small, fragmented populations in the following areas: (1) the Northwest and northern Rockies, (2) the southern Rockies, thanks to a reintroduction project now underway, (3) the Great Lakes States, where there are regular but unconfirmed sightings, and (4) the Northeast, where a breeding population was recently confirmed in Maine.

The U.S. Fish and Wildlife Service listed the lynx as Threatened throughout its range in the contiguous United States under the Endangered Species Act, effective April 24, 2000.



© Alan and Sandy Carey

*The lynx's fate is closely tied to that of its main prey, the snowshoe hare. In deep, soft snow, their long legs and the size and character of their feet give the lynx a competitive advantage over coyotes, bobcats and mountain lions.*



#### CONSERVATION STATUS

Lynx historically occupied the northern forests of the lower-48 states in the Northwest, Rocky Mountains, Great Lakes States and



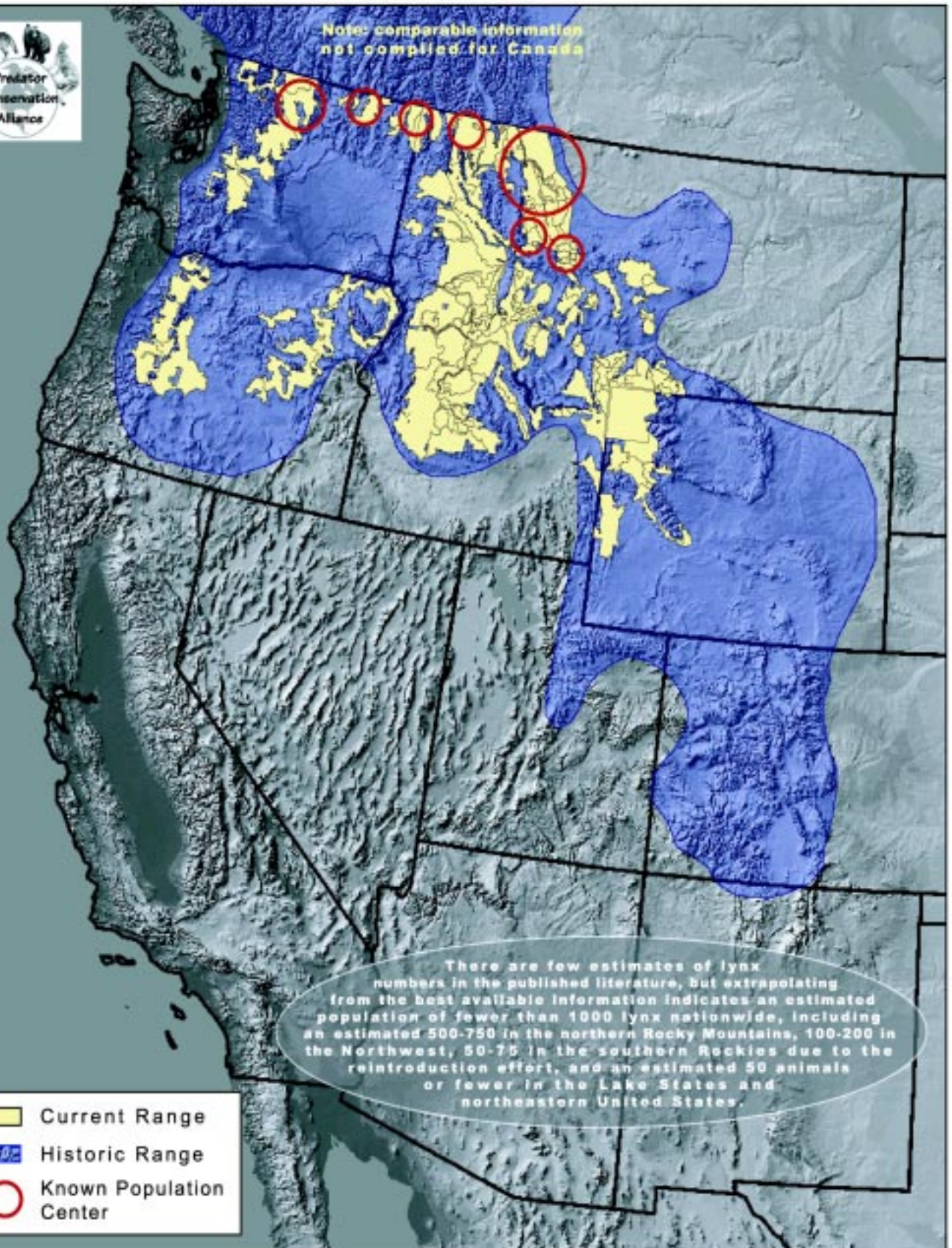
# Lynx Range

# Past and Present

Data sources: McKelvey et al. (2000); MT Dept. of Fish, Wildlife and Parks.



Note: comparable information  
not compiled for Canada







*“Only the mountain has lived long enough to listen objectively to the howl of the wolf.” — Aldo Leopold*

#### DESCRIPTION

**W**olves are the largest members of the dog, or canid, family. Males are slightly larger than females, weighing up to 150 pounds and measuring 4- to 5- feet long. Wolves are known for their ability to prey on large, hoofed mammals, such as deer, caribou and moose. Wolves are equipped to run down their prey at speeds of 35- to 45-miles per hour. Their diet also includes a variety of small mammals, and they are known to kill competing carnivores such as coyotes, wolverines and mink. Wolves can also last for long periods without food.

Wolves, like the black bear, wolverine and cougar, are considered habitat “generalists.” Their primary needs are adequate prey, adequate space for hunting and denning, and — perhaps most importantly — not to be killed by people.



© Daniel J. Cox

*Wolves can live in a variety of habitats, but they need large areas to locate their natal dens and rendezvous sites, find ample prey, and limited human presence to reduce their risk of being killed.*

#### CONSERVATION STATUS

**H**istorically, wolves ranged across the lower-48 states and all of North America, from the Arctic to Mexico. The current range of the wolf in the lower 48 includes the Great Lakes States (MN, WI, MI), with a population of an estimated 2000-2500 wolves; the northern Rocky Mountains (MT, ID, WY), with 500-600 wolves; and endangered populations in the Southwest (AZ, NM) and Southeast (NC). Suitable habitat for wolves still exists in the Northeast, southern Rocky Mountains, and Northwest, among other areas. There are currently three wolf populations in the northern Rocky Mountain region.

With passage of the Endangered Species Act in 1973, the wolf was listed as an endangered species



© Bert Goodman

*This is excellent wolf habitat: ample natural prey and minimal presence of people and livestock. Wolves can coexist with livestock operations, provided that the stock are carefully managed to reduce the risk of conflicts.*

throughout its range in the contiguous United States. The U.S. Fish and Wildlife Service has announced plans to de-list the wolf in the Great Lakes states and in the northern Rockies as soon as 2003.



# Wolf Range Past and Present

Adapted from data published in USDI et al. (2002).



Note: comparable information not compiled for Canada

## NORTHWEST MONTANA

Wolves made it from Canada back into northwestern Montana on their own. After recolonizing the Flathead River Drainage in British Columbia in the early 1980's, a pack denned in the North Fork Valley west of Glacier Park in the spring of 1986, and by the end of 2001 they numbered an estimated 80-90 wolves total. They are organized into packs that range from Glacier National Park west to the Yaak Valley, south to the Bitterroot Divide (west of Missoula) and the Deerlodge National Forest (west of Helena). Seven of these packs successfully bred in 2001.

## CENTRAL IDAHO

Since 1995, the number of confirmed wolves in central Idaho went from an estimated dozen or fewer with no known reproduction prior to the reintroduction, to more than 250 at the close of 2001. They roam in packs that range as far south as the Pioneer Mountains east Ketchum, and as far north as the Saint Joe River drainage just south of Interstate 90. Fourteen of these packs successfully bred in 2001.

## GREATER YELLOWSTONE

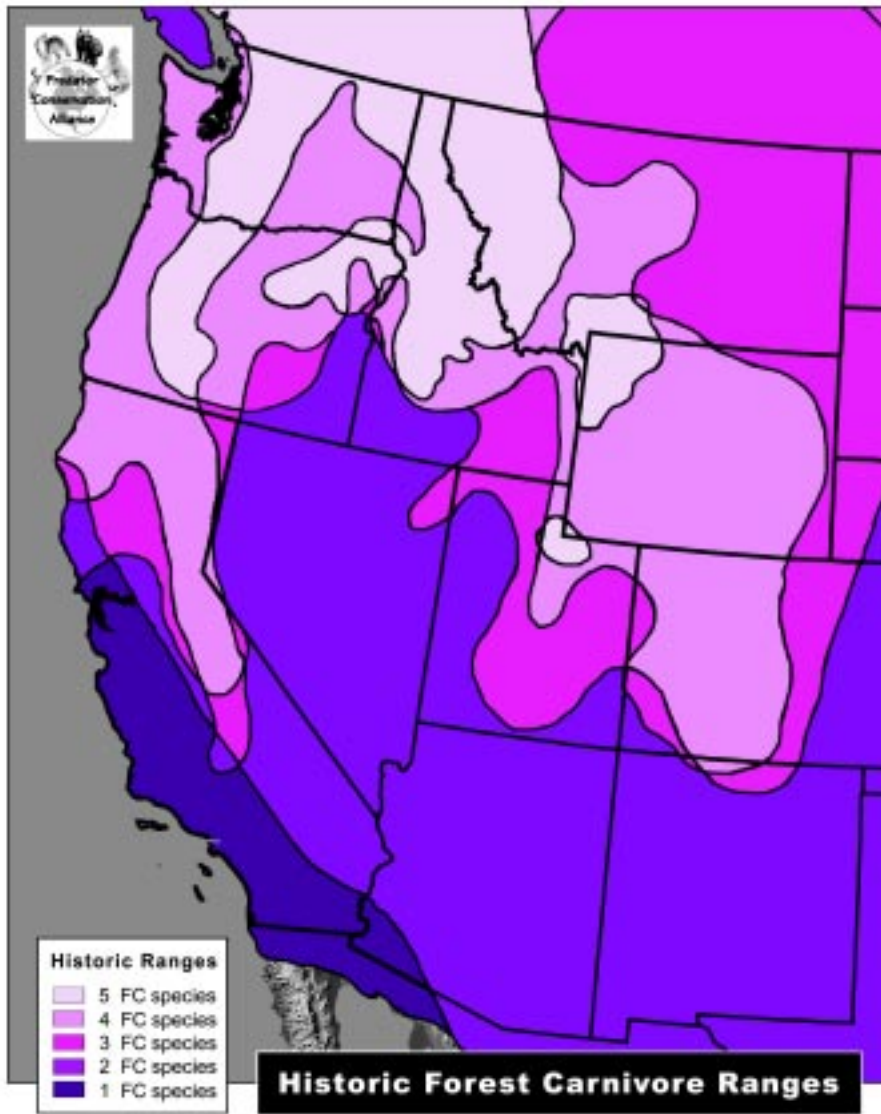
Between 1995 and 2001, the number of confirmed wolves in the Greater Yellowstone Ecosystem went from zero to more than 200. These animals are organized into packs that range throughout Yellowstone National Park, and have recently established territories to the east and south in Sunlight Basin, Jackson Hole and the Gros Ventre Mountains of Wyoming, and north and west into the Absaroka, Madison and Gravelly Ranges of Montana. Thirteen packs successfully bred in 2001.

## SOUTHWESTERN U.S.

Sixty-five Mexican wolves were released in this area between 1988 and 2001, and about 30 still survive in the wild. The recovery area includes the Apache National Forest in southeastern Arizona and the Gila National Forest in southwestern New Mexico.

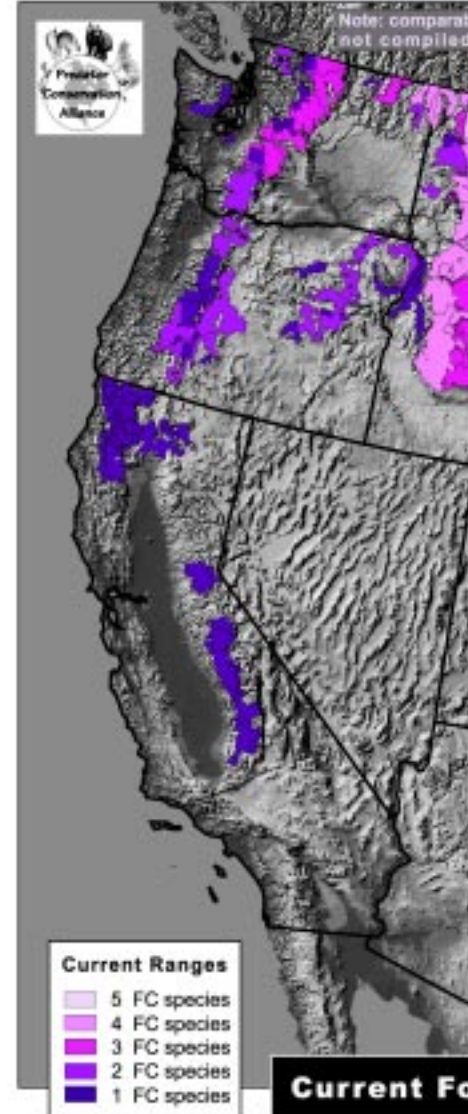
- Current Range
- Historic Range
- Known Population Center





### HISTORIC CARNIVORE DISTRIBUTION IN THE AMERICAN WEST

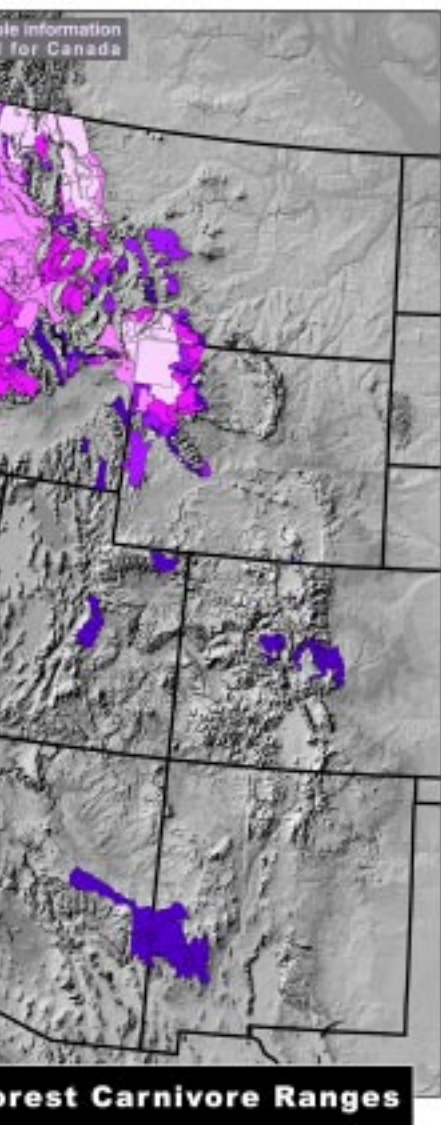
All five focal carnivores — grizzly bears, wolves, lynx, wolverines, fishers — roamed much of the American West prior to western settlement. Wolves and grizzly bears were the most widespread, due to their ability to survive in a variety of habitats (USDI 1993, USDI 1987, Defenders of Wildlife 1999, BC Ministry of Environment, Lands, and Parks 1995). Lynx lived in the snowy, high-elevation areas south along the Rocky Mountains as far south as Colorado and in the Pacific Northwest (McKelvey et al. 2000). Wolverines occupied the mountainous areas along the Rocky Mountains south to northern New Mexico, and from the Northwest south throughout the Sierra Nevada (Hash 1987). Fishers preferred the lower elevation forests of the northern Rocky Mountains, the Northwest, and Sierra Nevada (Lewis and Stinson 1998, Gibilisco 1994).



### PUBLIC LANDS V FOREST CARNIVORE OBS

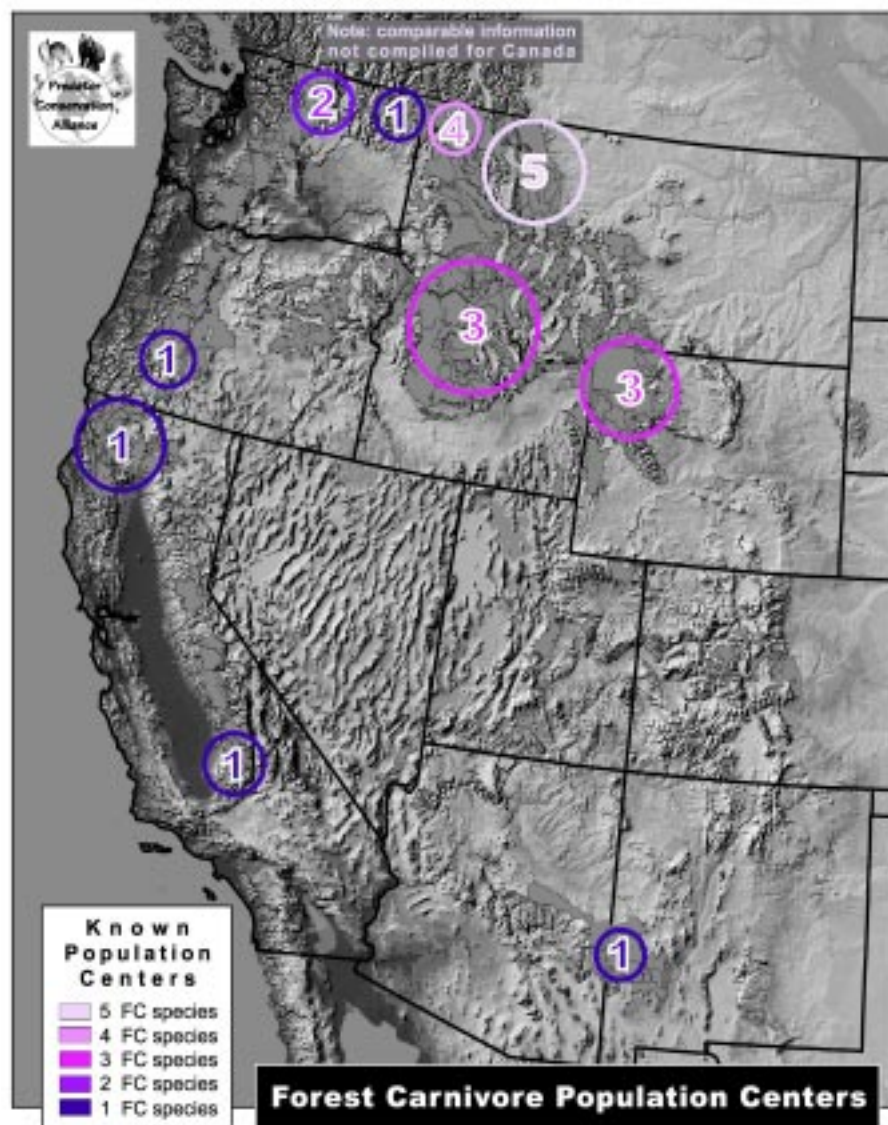
This map shows all public lands in the western United States with observations of one to five forest carnivores (wolves, grizzly bears, lynx, wolverines, fishers). Not all observations represent residents; animals may not be “residents” of the area. Therefore, this map may represent an optimistic view of carnivore distribution in the western United States. It shows where carnivore species persist in the boreal forest northward along the Rocky Mountains into Canada and southward along the Cascade, Coast Range, and Sierra Nevada in California. All five forest carnivores have been observed in the U.S. northern Rocky Mountains: the Pacific Northwest (Glacier National Park and adjacent areas) and in the extreme northwest corner of Montana, the Idaho panhandle and northeastern Washington, and the Yellowstone Ecosystem.





#### WITH CURRENT OBSERVATIONS (POST-1990)

the western United States with current observations — grizzly bears, wolves, lynx, and fishers have been verified, and some of these areas where they were reported. There is a more realistic view of forest carnivore distribution. It is apparent that one or more forest carnivore species extend from Canada southward through the Colorado and northern New Mexico, the Klamath-Siskiyou and Sierra Ranges into southern California. They have been reported in few areas of the western United States (the Northern Continental Divide Ecosystem (wild lands), the Cabinet-Yaak Ecosystem (wild lands), the Selkirk Ecosystem of the Selkirk Mountains, the Selkirk Mountains of Washington, and portions of the Greater



#### KNOWN POPULATION CENTERS OF ONE OR MORE FOREST CARNIVORE SPECIES

This map represents a more conservative look at current forest carnivore distribution by showing only those areas where there are known population centers of one to five forest carnivores — grizzly bears, wolves, lynx, wolverines, and fishers. Population centers can be defined as areas with resident, breeding populations. There is only one area of the western United States that still serves as a population center for all five carnivore species: the Northern Continental Divide Ecosystem in northwestern Montana. The Idaho Panhandle is known to contain population centers of each of these carnivore species except wolves. Central Idaho holds wolves, wolverines, and fishers, but not grizzly bears or lynx. Greater Yellowstone accommodates grizzly bears, wolves, and wolverines, but not lynx and fishers. The North Cascades of Washington contain population centers of lynx and wolverines, while the Okanogan Highlands of north-central Washington contain just lynx. There are small fisher populations in southwestern Oregon, and in the Klamath-Siskiyou and southern Sierra Nevada mountain ranges in California. There is a small, reintroduced wolf population on the border between Arizona and New Mexico.



# Factors Limiting Carnivore Recovery

“...predation by humans appears to be the most likely factor to have affected the number of wolverines...” — Van Zyll de Jong



## HUMAN-CAUSED MORTALITY

When most people think of protecting an imperiled species, they think of protecting it from being killed, and indeed people are the leading cause of death for all of the forest carnivores in the western U.S. Many of these deaths can be prevented with careful management of our activities in certain areas. Regulating trapping to ensure that rare carnivores are not killed in traps set for other species, responsibly managing livestock, pets, food and garbage so they do not attract carnivores, and ensuring that predator control actions are selective against offending animals only are examples of how to reduce human-caused loss of life.



Idaho Fish and Game

Lynx hunting has been banned in the lower 48 states, but lynx remain vulnerable to poaching and traps set for other carnivore species.

“Wolverines are highly susceptible to trapping because they travel widely and are readily attracted to baits. Any of the adult wolverines in our work were missing one or more toes and many had broken teeth. We believe many of these mutilations were the result of encounters with leg-hold traps. Because of their scavenging nature, wolverines come readily to bait and are vulnerable to skilled trappers. In areas where enhancement of wolverine populations is the goal, bait trapping for all species should be curtailed.” (Hornocker and Hash 1981, pp. 1297, 1300)

“In Idaho, where fishers are protected, Luque (1983) estimated that at least 163 animals were inadvertently trapped over a 5-year period in sets made for marten, coyote and possibly bobcat. In Montana, approximately 10% of radio-tagged reintroduced fishers were killed in traps set for coyote and marten.” (Heinemeyer and Lewis 1994, p. 11)

“Because fishers are easily trapped, where fisher populations are low they can be easily jeopardized by the trapping of coyote, fox, bobcat, and marten...” (Powell and Zielinski 1994, pp. 63-64)

“Control actions should be directed towards the capture of specific offending wolves rather than local populations” (USDI 1987, pp. 33-34).

“For yearling and adult wolves, the leading cause of mortality has been legal killings due to control actions related to livestock predation.” (Smith 1997, p. 7)



# Best Management Criteria

Besides being dangerous...conflicts inevitably end up being trouble for bears...

## BEST MANAGEMENT CRITERIA FOR HUMAN-CAUSED MORTALITY

### ● Carefully manage attractants (livestock, pets, food, garbage)

Improper storage of our foods, garbage, game and other “attractants” in grizzly bear habitat are serious problems because they lead to human/bear conflicts. Besides being dangerous to people, these conflicts

inevitably end up being trouble for bears, whether they are immediately shot, or simply become “habituated” to people (lose their fear and wariness), which increases their chances of being killed in future. In order to minimize the risk of human/bear conflicts, human activity sites should be kept clean of all potential grizzly bear attractants. Backcountry campers, anglers and hunters should make use of bearproof containers and hang potential attractants on “bear poles” to ensure foods, fish and game are inaccessible to grizzly bears.



PCA File Photo

*Both the burro (far right, behind sheep) and the dog (center foreground) help guard livestock. Active stewardship by guard animals and people is essential for preventing conflicts with wild predators.*

### ● Keep predator control selective

Wolves, grizzly bears and other forest predators are at risk of mortality due to lethal methods of predator control and management to protect livestock.

### ● Regulate hunting and trapping

Carnivore hunting and trapping should be allowed only in areas where they are known to be widespread and abundant. Where carnivore trapping is allowed, it should be closely regulated to ensure healthy carnivore populations are maintained. “Incidental take” refers to rare carnivores killed by traps set for other, more common animals. This is a significant threat to rare carnivores, and thus trapping should be prohibited in places where it poses a risk to rare carnivores.



# Factors Limiting Carnivore Recovery

As the forests go, so go the forest carnivores...

## FOREST PRACTICES

All of the forest carnivores depend on healthy forests to survive. Forest carnivores are at the top of the food chain, so they rely on the health of the entire forest community in order to secure sufficient prey and raise their young. The term “forest practices” refers to how we manage the forests—including logging, thinning, replanting, fire-fighting, etc. These are the most important issues facing forest carnivores. Examples of improved forest practices to benefit forest carnivores include: protecting old growth and mature forests where they are in short supply, avoiding large clearcuts that are unusable by carnivores and may pose an obstacle to their movement, and in general maintaining a healthy forest mosaic for forest carnivores and their prey.

✿ *“Wolverines appear reluctant to cross openings of any size such as recent clear cuts or burns. Tracking revealed that wolverines meandered through timber types, hunting and investigating, but made straight-line movements across large openings. Tracks further indicated they often ran or loped across such openings.”* (Hornocker and Hash 1981, p. 1298-1299)

✿ *“Fishers occur most commonly in landscapes dominated by mature forest cover and they prefer lateral forests over other habitats... In the Pacific states and in the Rocky Mountains, they appear to prefer late-successional coniferous forests... and use riparian areas disproportionately more than their occurrence... Everywhere they exhibit a strong preference for habitats with overhead tree cover...”* (Powell and Zielinski 1994, p. 52)

✿ *Fishers avoid nonforested areas... Fishers have avoided areas 25 m across and less in the Midwest... Large forest openings, open hardwood forests, recent clearcuts, grasslands, and areas above timberline are infrequently used in the West... (Powell and Zielinski 1994, p. 55)*

✿ *Snowshoe hares generally occur in areas of dense forest cover, including shrubs and “doghair” thickets of small trees. These structures are common in naturally regenerating areas after fire, but do not result from standard, even-aged forestry practices. Thus, we believe that natural regeneration and stand development will likely benefit hares and, ultimately, lynx.* (McKelvey et al. 2000, pp. 14-15)

✿ *“Canada lynx utilize late successional forests with large woody debris, such as downed logs and windfalls, to provide denning sites with security and thermal cover for kittens...”* (USDI 1998, p. 36995)



PCA File Photo

*Large clearcuts impede most wildlife movement, effectively isolating remaining populations of rare carnivores.*



# Best Management Criteria

**“The most influential factor affecting lynx habitat is human alteration of... the forest’s capacity to sustain lynx populations.” — USDI 1998**

🐾 *“Lynx require adequate travel cover (frequently intermediate successional forest stages) to provide connectivity within a forest landscape for security, movement within home ranges, and access between densities and foraging areas.” (USDI 1998, p. 36995)*

🐾 *“Canada lynx avoid openings such as clearcuts, unforested areas, and grasslands... and snowshoe hares are also unlikely to use such areas because of the lack of cover...” (USDI 1998, pp. 37001-37002)*

🐾 *“The most influential factor affecting lynx habitat is human alteration of the distribution and abundance, species composition, successional stages, and connectivity of forests, and the resulting changes in the forests’ capacity to sustain lynx populations.” (USDI 1998, p. 37001)*

## BEST MANAGEMENT CRITERIA FOR FOREST PRACTICES

- 🎯 **Protect old growth and mature forests**
- 🎯 **Maintain adequate vegetative cover for security, foraging, travel, etc.**
- 🎯 **Avoid large clearcuts**
- 🎯 **Maintain coarse, woody debris on the forest floor**
- 🎯 **Protect young forests from thinning**



*Allowing forested areas to recover naturally after fire or other disturbance maintains a mosaic of vegetation and cover needed to support wildlife, including rare carnivores and important prey species.*

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# Factors Limiting Carnivore Recovery

“Roads probably pose the most imminent threat to grizzly habitat today...” — USDI 1993



## MOTORIZED ACCESS

Forest carnivores need security from excessive disturbance by people. The single greatest threat to carnivore security is roads and other means of motorized access, including ATV's (all-terrain vehicles), motorcycles, snowmobiles and helicopter skiing operations. Sometimes non-motorized access can also be a problem, but in most cases it wields far less impact than motorized access, because people are limited by how much terrain they can cover without the aid of a combustion engine. Keeping unroaded areas unroaded, and restoring roaded areas so that access is compatible with maintaining security for carnivores and their prey are tremendously important steps needed to protect all forest carnivores.



Alliance for the Wild Rockies

Intensive forestry practices and road development are incompatible with maintaining secure habitat required by most forest carnivores.

🐾 *The management of roads is the most powerful tool available to balance the needs of bears and all other wildlife with the activities of humans” (USDI 1993, pp. 21-22, 145).*

🐾 *“Any unroaded land represents important and unique opportunities to assure adequate habitat and security for grizzly bears and other resource values such as watershed and big game security. Management should seek to maintain these areas as unroaded wherever possible.” (USDI 1993, p. 149) .*

🐾 *“Technological advances in over-snow vehicles and increased interest in winter recreation has likely displaced wolverines from potential denning habitat and will continue to threaten what may be a limited resource.” (Copeland 1996, p. 129)*

🐾 *“Winter recreational use, particularly snowmobile and heli-skiing, may be having potentially severe localized habitat impacts on wolverines. While the im-*

*pact on populations due to removal of critical denning habitats is more obvious, these recreational uses may be placing additional impacts on wolverine populations by removing foraging habitats as well. Management of snowmobile and heli-skiing is warranted in areas with significant amounts of potential denning habitat, and should include access restrictions during the denning period (February – April).” (Heinemeyer et al. 2001, p. 18)*

🐾 *“Data on demise of wolf and increase in road densities compared between 1926 and 1960. Wolves failed to survive when road densities exceed 0.93 miles/sq mi.” (Thiel 1985, summarized in USDI 1988)*

🐾 *“Data is consistent with Thiel (1985). Wolves generally do not occur where road densities exceed 0.58 km/sq km.” (Mech et al. 1988, summarized in USDI 1988)*



# Best Management Criteria

“Wolverine(s) ... survived the years of unlimited hunting and trapping because of the vast expanses of ... wilderness habitat.” — Hornocker and Hash 1981

## BEST MANAGEMENT CRITERIA FOR MOTORIZED ACCESS

### 🎯 Keep unroaded areas unroaded

Unroaded areas provide tremendously important refugia for all forest carnivores. Unroaded areas should remain unroaded wherever possible and roaded areas should be reclaimed to an unroaded condition wherever possible.

### 🎯 Restore roaded areas to minimize roads

There is no “magic” road density below which forest carnivores can thrive and above which they will either flee or die. The basic rule is the fewer roads, the better. No roads at all is by far and away the best habitat condition for most wildlife. However, re-

cent research does indicate that there are some “threshold” road densities above which roads are particularly harmful. At the very least, road densities and motorized trail access should be reduced where the combined total exceeds one mile of road or motorized trail per square mile of terrain.

### 🎯 Designate specific routes, play areas for ATV's and snowmobiles

Road density standards may be meaningless if ATV use is not addressed. The topography and vegetation can be such that these vehicles can go virtually anywhere, for example, through the woods right alongside a closed road. The best solutions to this problem are to restrict ATV's to designated routes that are consistent with clear, numerical road density standards, and to provide adequate education and enforcement to ensure compliance.



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*Removing unnecessary roads can improve habitat security, enhance non-motorized recreation opportunities, and provide local employment in forest-dependent communities.*



# Factors Limiting Carnivore Recovery

The best opportunity for management of a functional carnivore community in North America is the northern Rocky Mountains ...

## HABITAT AND POPULATION FRAGMENTATION

Fragmentation and isolation of forest carnivore populations and their habitat is another emerging problem across much of the West. When large populations break up into smaller ones that are isolated from each other, those small populations are at higher risk of extinction, due to environmental, demographic and genetic factors. Fragmentation was a major factor in the decline of the grizzly bear in the American West, to less than two percent of its original range and numbers. Reversing this process is critical to restoring grizzly bears and the entire community of forest carnivores. To succeed, we must identify the current population centers of each of the forest carnivores, and identify obstacles to connecting these centers. Where obstacles are caused by people, such as highways, residences or other developments, we must try to make them more “permeable” to carnivores and other wildlife, so they can successfully negotiate over, under, or through them.



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Removal of forest cover, roads and uncontrolled land subdivision can prevent wildlife movement and dispersal.

“When traffic volume increases, there is an evolution of highways from gravel roads to paved two lane roads, and from two lane highways to more problematic four lane highways and “super highways” like the Interstate system. The eventual result of such a progression in the highway system on rare carnivores is the slow strangulation of viability due to population isolation, loss of habitat, mortality of individuals and a decline in potential population size. All of these factors are primary causative agents in the decline and extirpation of wildlife worldwide.” (Ruediger et al. 1999, pp. 1-2)

“Habitat fragmentation, habitat loss, and excessive harvesting have caused declines in wildlife populations throughout the world. Reintroduction programs have become an important tool in restoring or augmenting such wildlife populations.” (Williams et al. 2000, p. 895)

“Regional, rather than local, [wolverine] populations must be considered in any management program. Our study area was large, relative to that for other species, yet it became clear we were dealing with a local unit of a regional population.” (Hornocker and Hash 1981, p. 1300)

Aversion to open areas has affected local distributions and can limit population expansion and colonization of unoccupied range [for fishers]... An area of farmland in Upper Peninsula Michigan delayed expansion of the population to the north by at least 15 years... and the Penobscot River delayed expansion of fishers to eastern Maine for over a decade... (Powell and Zielinski 1994, p. 55)

“National Forests will be contributing to the maintenance of viable [fisher] populations. It may not be possible for a forest to



# Best Management Criteria

It may be the last place in the lower 48 states where this opportunity exists.” — Ruediger et al. 1999

*sustain a population by itself. Therefore, the maintenance of old growth and mature habitat management areas will be coordinated between adjacent forests and other land management agencies to provide connection of suitable habitat in areas to ensure interaction between individuals and maintain viability throughout their range.” (Freel 1991, p. 2)*

✿ “... The greatest longterm risk to the fisher in the western United States is probably population extinction due to isolation of small populations.” (Heinemeyer and Jones 1994, p. 24)

✿ “I believe it is crucial that preferred resting habitat patches [for fishers] be linked together by closed-canopy forest travel corridors. ... These corridors should ideally be located along streamside riparian areas.” (Jones 1991, p. 112)

✿ “Loss of suitable habitat for Canada lynx reduces the potential for population growth or recolonization of the lynx and further confines lynx to smaller, more isolated habitat units. Isolation increases the susceptibility of the lynx to human-caused threats, natural stochastic events, and effects of genetic bottlenecks... The increased fragmentation of forest lands and loss of connectivity within and among blocks of habitat in the interior Columbia River basin of Washington, Oregon, Idaho, and Montana has reduced the ability of some wildlife populations to move across the landscape, resulting in long-term loss of genetic interchange.” (USDI 1998, p. 37005)

✿ “We cannot assume that lynx populations in the contiguous United States will be maintained by dispersal of lynx from Canada, nor that connectivity with larger habitat areas in Canada will be maintained in perpetuity... Clearly, ecoprovince-wide planning is necessary to provide the broad-scale information necessary for effective conservation of lynx.” (McKelvey et al. 2000, p. 9)

## BEST MANAGEMENT CRITERIA TO MINIMIZE FRAGMENTATION

- 🎯 **Restore and maintain connected carnivore populations at multiple scales — local, regional, and transboundary.**
- 🎯 **Make highways and associated human developments permeable to wildlife.**
- 🎯 **Reintroduce carnivores into areas of suitable habitat that they cannot recolonize on their own.**



© David Gaillard

Where this highway once posed a lethal barrier to wildlife movement, the overpass (in Banff National Park, British Columbia) now provides connectivity for wildlife.



# Implementing Multi-Species Conservation

**Conservation work needs to be coordinated, increased and expanded to ensure it is adequate to successfully restore carnivores west-wide.**

The best information in the world is no good without action. This initiative will be of no help to carnivores by sitting on a shelf; it is only useful when applied toward improving conditions for carnivores on the ground. Wolves and grizzly bears were first protected in the early 1970's, but it took years before recovery plans were written and implemented, finally yielding on-the-ground progress. The lynx, wolverine, and fisher likely cannot wait for a similar process, particularly since many of the threats they face are steadily escalating in many portions of their remaining range.

Predator Conservation Alliance (PCA) is working to implement multi-species carnivore conservation in several ways. PCA has already researched and compiled the best available scientific information regarding the conservation status and needs of each of these five carnivores, which we are providing to agency officials, biologists, policy-makers, and the interested public throughout the West. PCA distilled this information into this report to build a larger constituency for multi-species conservation, which we will continue to expand with public information and education programs throughout the northern Rocky Mountain region and nationwide. Finally, PCA will work to ensure timely and effective implementation of multi-species conservation practices by land and wildlife management agencies in the northern Rockies and across the American West. We will follow up this report with a periodic bulletin that highlights the use of best management criteria in various carnivore research and management projects across the West.

There are many examples of implementation of best management criteria in forest plan revisions, travel and recreation management, project-level decisions, state and federal wildlife plans, international conservation policies, et cetera. To succeed, this work must be carried out in multiple scientific disciplines, with multiple pilot projects, and by multiple groups of people to recover what has been so diminished.

Restoration will affect not only the carnivores, which are magnificent animals, worthy of our best efforts. As integral members of healthy forests, recovered carnivore populations will help re-establish healthy, sustainable prey populations, vegetation, watersheds, and all the essential goods and services that our public forests provide.



PCA file photos; Lynn Rogers (wolf).

# Conclusion

**P**redator Conservation Alliance created its multi-species conservation initiative by combining existing scientific information on each of the forest carnivores into a common set of recommendations, and by identifying and mapping areas where their implementation would help restore one or more forest carnivores. The U.S. northern Rocky Mountains (Idaho, Montana, Wyoming) is clearly a priority area for carnivore conservation in the American West. Other areas with one or more carnivores still surviving, and potential habitat to restore others, include: the Pacific Northwest (Washington, Oregon, northern California), the U.S. southern Rocky Mountains (Colorado, Utah, northern New Mexico), the Sierra Nevada (California) and the southwestern U.S. (Arizona, southern New Mexico, Nevada, southern California). Recommendations for carnivore conservation common to these areas reflect the need to address the following four limiting factors:



**Human-Caused Mortality**



**Motorized Access**



**Forest Practices**







**Habitat and Population Fragmentation**

Successful solutions that address these problems are being put into practice in many areas, but most need to be improved and all should be expanded.

Restoring carnivore populations on our public lands will improve the quality of people's lives in adjacent communities and for Americans nationwide, by protecting water quality, biological diversity, historic and cultural sites — all parts of our natural heritage — for ourselves and for future generations.

PCA is actively enlisting the help of agency officials, scientists and other conservation-minded groups and individuals needed to implement this initiative. Contact us about how you can assist in this important effort.

## WHAT YOU CAN DO

-  **Learn about America's carnivores and their habitat needs**
-  **Participate in decisions that affect public wildlife on public lands**
-  **Share your knowledge and enthusiasm with others by writing a letter to your local paper, hosting a program in your school, or organizing a community event**
-  **Support Predator Conservation Alliance and other conservation groups working to protect wildlife and habitat**



# Who to Contact / More Information

## FEDERAL LAND AND WILDLIFE AGENCIES

### U.S. Fish and Wildlife Service

National Director, 1849 C Street, NW, Washington, DC, 20240, 202-208-4717

Mountain-Prairie Region (CO, MT, UT, WY), P.O. Box 25486, Denver Fed. Ctr., Denver, CO, 80225, 303-236-7920

Pacific Region (CA, ID, NV, OR), Eastside Federal Complex, 911 NE 11th Ave., Portland, OR, 97232, 503-231-6118

Southwest Region (AZ, NM), P.O. Box 1306, Albuquerque, NM, 87103-1306, 505-248-6282

Grizzly Bear Recovery Leader, Univ. Hall, Rm 309, U. Montana, Missoula, MT, 59812, 406-243-4903

Wolf Recovery Leader (N. Rockies), 100 North Park, Suite 320, Helena, MT, 59601, 406-449-5225

Wolf Recovery Leader (Southwest), 2105 Osuna Road NE, Albuquerque, NM, 87113, 505-346-2525

### U.S. Forest Service

National Chief, P.O. Box 96090, Washington, DC, 20090-6090, 202-205-1661

Northern Region (MT, north ID), P.O. Box 7669, Missoula, MT, 59807, 406-329-3511

Intermountain Region (south ID, NV, UT), Federal Building, 324 25th St., Ogden, UT, 84401-2310, 801-625-5354

Pacific Northwest Region (OR, WA), P.O. Box 3623, Portland, OR, 97208, 503-221-2877

Pacific Southwest Region (CA), 1323 Club Drive, Vallejo, CA, 94592, 707-562-8737

Rocky Mountain Region (CO, WY), P.O. Box 25127, Lakewood, CO, 80225, 303-275-5008

Southwest Region (AZ, NM), Federal Building, 517 Gold Ave., SW, Albuquerque, NM, 87102, 505-842-3292

## STATE WILDLIFE AGENCIES

Arizona Game and Fish Department, 2221 W. Greenway Rd., Phoenix, AZ, 85023-4312, 602-942-3000

California Department of Fish and Game, 1416 Ninth Street, Sacramento, CA, 95814, 916-445-0411

Colorado Division of Wildlife, 6060 Broadway, Denver, CO, 80216, 303-291-7208

Idaho Department of Fish and Game, 600 S. Walnut, Box 25, Boise, ID, 83707, 208-334-3700

Montana Dept. of Fish, Wildlife, and Parks, P.O. Box 200701, Helena, MT, 59620-0701, 406-444-2535

Nevada Department of Wildlife, Box 10678, Reno, NV, 89520, 702-688-1500

New Mexico Department of Game & Fish, PO Box 25112, Santa Fe, NM, 87504, 505-876-8008

Oregon Department of Fish and Wildlife, 2501 SW First Ave., Portland, OR, 97207, 503-872-5272

Utah Division of Wildlife Resources, 1594 W. North Temple, Salt Lake City, UT, 84114, 801-538-4700

Washington Dept. of Fish and Wildlife, 600 Capitol Way N., Olympia, WA, 98501, 360-902-2234

Wyoming Game and Fish Department, 5400 Bishop Blvd., Cheyenne, WY, 82006, 307-777-4600

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**P**redator Conservation Alliance works to conserve and restore forest and grassland ecosystems by protecting predators and their habitats — saving a place for America's predators. This place is on the ground in the U.S. Northern Rockies and Northern Plains, where we work to protect predators and the places they live. Predator Conservation Alliance also works to create a place for predators in the human heart and mind, by increasing public awareness of the important ecological role that predators play.