Put the Fangs Back in Wilderness!

A Call to Restore America's Last Best Places for Wild Carnivores

WildEarth Guardians
A Force for Nature

A Report from WildEarth Guardians
By Wendy Keefover-Ring
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Mission Statement
WildEarth Guardians protects and restores the
wildlife, wild places and wild rivers of the American West.

Inquiries about this report and
WildEarth Guardians' work can be made directly to:
Wendy Keefover-Ring
WildEarth Guardians
312 Montezuma Avenue
Santa Fe, NM 87501
505.988.9126 X 1162
wendy@wildearthguardians.org

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Any mistakes herein are my own.

Executive Summary

In this report, WildEarth Guardians dispels the popular misperception that wilderness-quality lands are safe havens for native carnivores and instead asserts that livestock grazing and accompanying predator control within wilderness-quality lands can be a significant threat to native carnivore conservation. Using Geographic Information System (GIS) analysis, we examined the habitat parameters of five apex carnivores identifying where carnivore habitat occurs within Wilderness Areas and roadless lands, and then overlaid where livestock grazing occurs within these primitive lands.

Our analysis shows that there is a major potential for conflict between livestock production and carnivore conservation on wilderness-quality, federal lands given the amount of these lands that are grazed but also serve as native carnivore habitat. In fact, 42% of roadless and wilderness lands in the western United States—over 37 of the 89 million acres in this category—are open to commercial livestock production. For mountain lions 81% of their roadless habitats are grazed; 52% for black bears; 43% for wolves in the Northern Rockies and in the desert Southwest; 25% for grizzly bears; and 21% for lynx.

In 1964, Congress passed the Wilderness Act to protect special areas for their ecological, recreational, historic, and aesthetic values. Because of pressure from the livestock industry, however, commercial livestock grazing on these special lands has been allowed to continue, with concomitant predator-killing activities from trapping and hounding to lethal toxicants including sodium cyanide and sodium nitrate. As a result, tens of thousands of native carnivores such as coyotes, Mexican gray wolves, grizzly bears, and Canada lynx are slain to protect agribusiness across the U.S., including many on wilderness-quality lands. While not all livestock producers kill native carnivores, many do or employ practices that harm native carnivores.

Commercial livestock production, ubiquitous on Western landscapes, harms large carnivore conservation. Those entities associated with agribusiness, including the U.S. Department of Agriculture's Wildlife Services, actively persecute carnivores—even on designated Wilderness Areas and other roadless lands—leading to a conservation conundrum. Around the world and in North America, over 90 percent of populations of large-bodied carnivores have vanished from their habitats. Despite this alarming statistic, livestock grazing in the West trumps carnivore conservation, even on Congressionally-designated Wilderness Areas and in roadless habitats—the last best sanctuaries for wild native carnivores.

In June 2006 the U.S. Forest Service proposed a directive (71 FR 109, p. 32915-32918) that would have given Wildlife Services, the agency that kills over 100,000 native carnivores annually on behalf of agribusiness, unfettered access to Wilderness Areas and Research Natural Areas. The Forest Service claimed that the proposed revision of its directive merely clarified the existing relationship between itself and Wildlife Services. In truth, the proposed directive, had it been implemented, would have reflected an illegal and dangerous shift in policy to allow motorized vehicles in Wilderness Areas for the purpose of killing wild native

carnivores. That directive and mounting numbers of carnivore kills by Wildlife Services spurred this analysis—because the issue of killing native carnivores on some of our nation's most protected lands continues unabated by Wildlife Services, states, and individuals.

What makes this policy of carnivore persecution within wilderness more discordant with the wilderness ethic and public concern for carnivore conservation is that it is carried out for a select few. Our tally found that there are only 6,065 entities or individuals permitted to graze livestock in the 89 million acres of Wilderness Areas and other roadless lands. WildEarth Guardians' proposal to remedy conflicts between wilderness values (including carnivore conservation)—and commercial livestock production is to retire livestock grazing on federal public lands in the West—especially in Wilderness areas and federally-owned, roadless lands. This can be achieved through a voluntary grazing permit program in which existing permit holders are compensated by private and federal funds in exchange for relinquishing their permits. By retiring allotments in Wilderness Areas and other roadless areas, wildlife will be better conserved—as was the intent of Congress in 1964 when it passed the Wilderness Act. This action would help *put the fangs back into Wilderness*!

Table of Contents

List of Tables

List of Maps

Introduction

The Wilderness Act includes beautifully crafted and sentimental language[1] the purpose of which is, in part, to protect the ecological health of the landscape. Sadly the broader goal of wilderness has been undermined at times by actual on-the-ground activities, especially livestock grazing. Cattle and sheep grazing on public lands has caused and continues to cause significant destruction of wildlife and their habitats at enormous taxpayer expense (Salvo 2009)—even though more than one-half the permittees are hobby ranchers (Gentner and Tanaka 2002). According to our GIS analysis, the western U.S. [2] is comprised of 759 million acres, including 89 million acres of roadless and Wilderness Areas. The federal government allows grazing on 265 million acres of lands, including 97 million acres managed by the Forest Service and 156 million acres by the Bureau of Land Management. All told, 315 million acres in the Western U.S. are leased for grazing, or 42% of the total landmass in the Western U.S. Roadless lands, including Wilderness Areas are grazed. Of the 89 million acres of roadless lands, 37 million or 42% are open to livestock grazing. Livestock grazing benefits a handful of people at best, but has enormous ecological and social costs. Tables 1 & 2.

Table 1 Land Ownership, Roadlessness & Grazing in 11 Western States	
Total Acres	758,571,066
Total Acres of Grazed Lands (All Ownership Types)	314,935,375
Percent of Total Grazed Acres	42%
Total Acres of Grazed Lands Managed by all Federal Agencies	264,707,654
Total Acres of Grazed Lands on the Bureau of Land Management	156,262,235
Total Acres of Grazed Lands on the Forest Service	96,585,747
Total Roadless Acres (including Wilderness Areas)	88,707,121
Total Roadless Acres (including Wilderness Areas) that are Grazed	37,190,337
Percent Roadless (including Wilderness Areas) Acres that are Grazed	42%
Total Number of Livestock Permittees on Roadless Lands	6,065

[1] According to the Wilderness Act, a Wilderness Area is a place "where man and his own works" are not dominant and "where the earth and its community of life are untrammeled by man," a place that retains "its primeval character" that are "affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." 16 USC §1131 et seq.

[2] Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Table 2 Acres of Habitat & Grazing in 11 Western States Relative to Wild Carnivores					
	Mountain Lion	Black Bear	Wolf (Gray & Mex)	Grizzly Bear	Lynx
Habitat (all Lands)	401,017,177	226,342,573	114,450,514	47,806,469	48,856,306
Habitat on Federal Lands	237,874,284	140,449,480	81,441,064	40,251,704	41,451,478
Grazed Habitat (all lands)	195,956,949	93,944,444	65,002,602	20,164,539	20,434,889
Percent of Grazed Habitat (all lands)	49%	42%	57%	42%	42%
Grazed Habitat on all Federal Lands	160,981,617	78,868,550	55,857,976	19,048,371	19,379,782
Percent of Federal Grazed Habitat	68%	56%	69%	47%	47%
Grazed BLM Habitat	76,867,333	22,462,029	15,648,689	761,991	886,694
Grazed USFS Habitat	77,597,704	55,604,475	39,637,353	18,225,183	18,447,751
Roadless Habitat (Federal Lands)	68,919,533	48,800,771	32,752,080	24,650,458	21,262,539
Percent of Habitat which is Roadless[3]	17%	22%	29%	52%	44%
Percent of Roadless Lands that are Habitat[4]	78%	55%	37%	28%	24%
Roadless & Grazed Federal Lands	29,948,088	19,184,339	16,170,623	9,398,719	7,870,676
Percent of Roadless & Grazed Habitat	81%	52%	43%	25%	21%
No. Permittees in Roadless Habitat (by species)	5,775	4,686	3,455	1,422	1,919

[3] This percent is derived by a species' total roadless habitat (i.e., 49 million for black bears) divided by its total habitat acres (i.e., 226 million for black bears).

[4] This percent is derived by a species' roadless habitat number (i.e., 49 million acres for black bears); divided by the total number of roadless acres in the West (87 million).

In this report, we examine the habitat requirements of five apex carnivores: black bears (*Ursus americanus*), grizzly bears (*Ursus arctos horribilis*), mountain lions (*Puma concolor*), Canada lynx (*Lynx canadensis*), and wolves (*Canis lupus*). We map their habitats onto Wilderness Areas and roadless lands in the western U.S. We then overlay where livestock grazing occurs in these landscapes. Our data show that in the western U.S., livestock grazing occurs on 42% of all western lands, including on 42% of all federally-owned roadless lands that include Wilderness Areas. Furthermore, grazing occurs on 81% of mountain lions' roadless habitats, 52% for black bears; 43% for Western wolves; 25% for grizzly bears; and 21% for lynx.

Wilderness Areas and roadless lands that are subject to grazing may be sites for wildlife-killing measures. Livestock-grazing-associated wildlife killing greatly undermines large carnivore conservation (Keefover-Ring 2009). While not all agricultural producers engage in wildlife-killing activities, many firmly embrace them—especially since some extermination efforts come largely subsidized through the Wildlife Services' program.

Most assume that Wilderness Areas and other special lands are protected for their ecological value and for wildlife conservation, but each year, thousands, if not tens of thousands, of native carnivores are killed to protect domestic livestock on these exceptional lands. The intent of the Wilderness Act was to supply sanctuary to our nation's wildlife and special ecosystems—not to subsidize commercial livestock production.

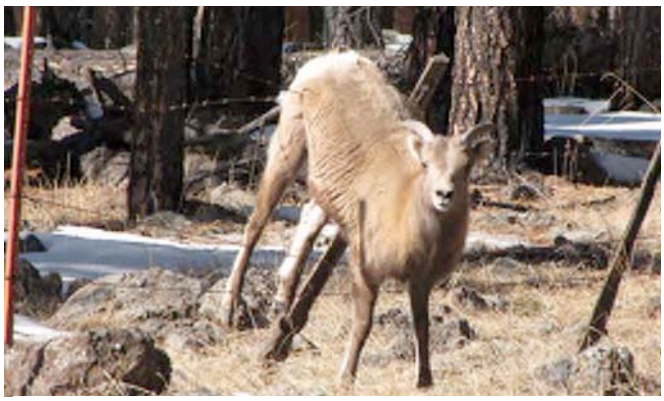
What this report cannot determine, because the data are unavailable, is the actual amount of carnivore killing in roadless and Wilderness Areas for livestock protection. The U.S. Department of Agriculture's Wildlife Services program, operating under the 1931 Animal Damage Control Act and mandated by Congress to kill wildlife to benefit agribusiness, is purposely opaque about where its largely tax-funded $120 million operations occur each year. We do know that some operations occur on lands that have been specially protected by Congress, such as Wilderness Areas. In one example, Mexican wolves inhabit the Blue Range Wolf Recovery Area and reside in large part on the Gila Wilderness. The Mexican wolf recovery program is faltering, however, because federal agents frequently remove Mexican wolves in order to protect livestock growers. Taking the fangs out of Wilderness undermines these special places.

We argue that federal lands designated by Congress as "Wilderness Areas" and public roadless areas should be sanctuaries for native wild carnivores, not zones that undermine their preservation. They are not managed as such, however, and agribusiness concerns trump carnivore conservation. Our data show that many designated Wilderness Areas and other roadless areas are not managed for ecological conservation, but for livestock grazing. Our data expose the Wilderness mystique, that is, some of America's most protected lands are actually home to the myriad damaging affects from exotic, domestic livestock. We call upon Congress and others to restore the promise of wildlands conservation and to boldly and unhesitatingly *put the fangs back into Wilderness*. WildEarth Guardians also advocates for voluntary grazing permit retirement.

Wild Carnivores Require Refugia for Persistence

Carnivores require adequate prey and freedom from the threat of human persecution in order to persist (Noss et al. 1996). If Wilderness Areas and other roadless lands in the West adhered to that promise, conservation of many large native carnivores would be significantly enhanced. As Weaver et al. (1996) write: "the powerful role of refugia in population persistence has emerged as one of the most robust concepts of modern ecology" (p. 972). Refugia should serve as source areas to feed other populations, and refugia should maximize natality but minimize mortality. Because roadless and Wilderness Areas are critical to apex carnivore conservation, these lands, and corridors that connect them should be protected.

Not all Wilderness Areas and roadless lands are habitat to large carnivores. Biologists note that the Rocky Mountains contain large amounts of land that is "rough, inhospitable terrain" (Noss et al. 1996, p. 955), which leaves only a portion of these natural spaces for carnivores and their large-bodied prey. As a result, apex carnivores can find themselves in the same confines of habitable portions of roadless landscape as domestic livestock. Therefore, we conclude that most roadless lands inhabited by these carnivores may also overlap with livestock. The two, livestock and large carnivores, do not mix because of human intolerance that stems from largely perceived but sometimes real threats to livestock. (See: Keefover-Ring 2009). Thus carnivores are frequently subject to direct human mortality associated with livestock-protection regimes.



Bighorn sheep stranded on barbed wire fence.
(Photo: Jean Ossorio)

Large carnivores require vast, connected habitats for finding adequate food—especially in arid climates, but also for gene flow between subpopulations. Biologists define "metapopulation" as "'a network of semi-isolated populations with some level of regular or intermittent migration and gene flow among them, in which individual populations may go extinct but can then be recolonized from other populations'" (Logan and Sweanor 2001, quoting Meffe and Carroll 1997, p. 176). Gene flow is key to persistence in all species.

For large carnivores to endure, however, human-caused disturbance must be restrained so that populations can remain resilient (Noss et al. 1996; Weaver et al. 1996). Weaver et al. (1996) define resilience as the "'ability of systems to absorb disturbance and still maintain the same relationships between populations'" (p. 965). With population and system resilience, comes persistence. Some species, such as wolves, are more resilient than are mountain lions or grizzly bears, because of fecundity, competitive advantage in a multi-carnivore

community, and habitat requirements (Weaver et al. 1996). Yet, as history has demonstrated and we show herein, heavy-handed human disturbance easily disrupts the resilient wolf.

The Value of Carnivores

Apex carnivores significantly influence biological diversity and ecosystem function (e.g., Beschta and Ripple 2009; Ritchie and Johnson 2009). They increase biological diversity by checking effects of mesopredators (e.g., Crooks and Soule 1999; Ritchie and Johnson 2009). In one system, for example, coyotes indirectly protect rare sage-grouse (Mezquida et al. 2006) by reducing mesocarnivores, while in another, wolves indirectly protect pronghorn by killing coyotes (Berger et al. 2008). Despite their importance, humans kill top carnivores by the tens of thousands annually (Keefover-Ring 2009). The persecution comes from individuals, states, and the federal government and is driven by anachronistic belief systems, not empirical science (Keefover-Ring 2009).

To many, wild carnivores invoke powerful symbols that illicit strong feelings—from savagery that needs to be conquered, to spiritual totems, or to important ecological actors (Mattson et al. 2006). Carnivores have historically caused conflict with humans because of perceptions that they compete for human food, including both wild and domestic animals (Baker et al. 2008; Noss et al. 1996; Primm and Clark 1996; Treves 2009) or from largely exaggerated fears that carnivores routinely kill or harm people (Schwartz et al. 2003). Some large carnivores, such as grizzly bears and Mexican wolves, inspire special indignation by some because they symbolize federal authority that connotes interference with individual property rights (Mattson et al. 2006; Primm and Clark 1996).

Because of actions based on these belief systems, populations of large terrestrial carnivores have declined by 95 to 99% from their habitats around the world and in North America (Berger et al. 2001; Ritchie and Johnson 2009). Yet, carnivores take less than 3% of the total number of sheep and cattle produced in the U.S. and typically do not overpower their prey populations (Baker et al. 2008; Keefover-Ring 2009). Most people's values, however, favor large carnivore conservation (Corona Research 2006; Kellert 1996; Manfredo et al. 1994).

Moreover, according to a new study, the idea that the hunting of large carnivores would reduce human anxieties around them or increase tolerance is unsupported. Some hunters believe that they themselves maintain sustainable carnivore population levels, that killing carnivores reduces food competition with humans, that hunters reduce carnivore attacks on humans, or that hunting carnivores builds support for wildlife conservation (Treves 2009). Instead, hunters value carnivores as game species (Treves 2009).

In sum, Wilderness Areas and federal roadless areas should be maintained as sanctuaries for native carnivores, not domestic livestock. As Americans' values shift toward large carnivore conservation, our Wilderness Areas must at long last become the place that Congress had envisioned in 1964. WildEarth Guardians submits that livestock grazing should not be allowed in Wilderness Areas and roadless areas. Rather, a voluntary grazing permit retirement program will alleviate negative human and wildlife interactions and will lead to

better conservation, not only of these ecologically important species, but of their habitats. Let's put the fangs back into Wilderness!

Western Wilderness Carnivores GIS Methodology

- **Habitat Data**

In order to conduct our GIS analysis we generated seamless vector coverages in eleven Western states for species including the mountain lion, Canada lynx, gray wolf, grizzly bear, and black bear. The best available source for Westwide habitat data were the GAP Analysis Programs. Data for each species from each GAP program were downloaded. This included the Southwest Regional GAP (New Mexico, Arizona, Utah, Colorado, Nevada), Wyoming GAP, Montana GAP, Idaho GAP, Washington GAP, Oregon GAP and California GAP. GAP habitat datasets are binary showing areas as either habitat or non-habitat. All data manipulation was done with ArcGIS 9.3.1. All data were projected to Albers Equal Area (AEA), with a central meridian of -96°, 1st standard parallel of 29.5°, 2nd standard parallel of 45.5°and a latitude of origin 23°.

- **Habitat Raster Data**

Some states produce raster habitat datasets and others vector. The following states produced raster habitat models: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. Each raster dataset was resampled to a resolution of 1 kilometer pixels. Each resampled raster was reprojected to the AEA. All final rasters for a species were mosaic'ed together to form a seamless raster for these states. Once the 1km raster data for a species were mosaic'ed, they were reclassified so that all codes representing habitat in each state were normalized. The final raster mosaic was converted to ESRI shapefile vector data.

- **Habitat Vector Data**

The following states produced vector habitat models: Washington, Oregon and California. Data for Washington and Oregon were ESRI coverages. Data for California had to be generated from a lookup table of vegetation types constituting habitat for a species. Once the vegetation types were identified a selection was made. The selected set was exported to a new layer and dissolved to create a vector habitat layer for each California species. Each coverage was converted to an ESRI shapefile and projected to AEA. These were then merged to form a vector dataset for these three states for each species.

- **Habitat Final Merge**

The final vector and final raster datasets for each species were merged. A dissolve was done against the habitat value to form a seamless dataset across the western US. An acreage field was created and populated for each.

- **Roadless Areas**

Roadless areas were obtained from the Bureau of Land Management National Landscape Conservation System (NLCS) and the Forest Service. Bureau of Land Management NLCS roadless areas include congressionally designated wilderness and wilderness study areas. Forest Service roadless areas include congressionally designated Wilderness Areas, Wilderness Study Areas and inventoried roadless areas (IRA's). All these data were merged together and dissolved to reduce the number of polygons for data processing purposes. An acreage field was created and populated.

- **Statistics**

The ArcGIS Calculate Geometry tool was used to populate all acreage fields.

The roadless layer was used to clip the habitat layers and determine the amount of habitat that is within roadless lands. The resulting layer represents habitat that falls within roadless lands. After the clip operation the acreage field was re-populated.

The same methodology was used to determine the amount of habitat that is grazed. WildEarth Guardians has a Westwide grazing database that was used to clip each habitat dataset. The dataset was dissolved for this analysis to reduce the number of polygons and thus processing time. The resulting layer represents the total habitat that falls within actively grazed Federal grazing allotments.

- **Maps**

Final maps for each species were generated with state boundaries and exported as high-resolution jpgs.

Ursidae

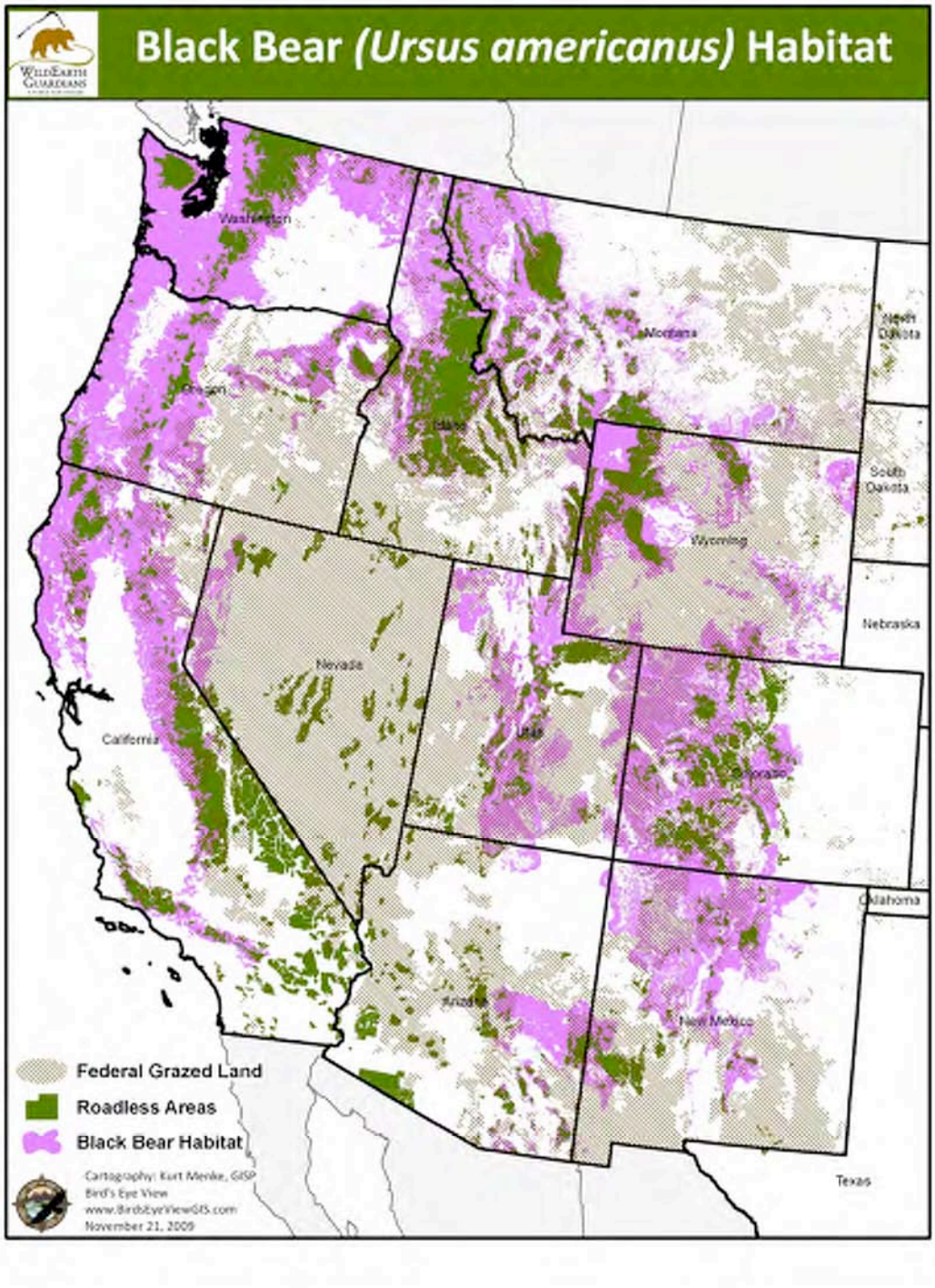
- **Black Bears (*Ursus americanus*)**

Photo: USFWS

As Table 2 shows, the western U.S. provides 226 million total habitat acres to black bears, 140 million of which occur on federal lands, while 49 million acres of black bear habitat occurs on federal roadless lands. For black bears, 55% of their total habitat occurs on Wilderness Areas and roadless lands in the western U.S., while 22% of the total roadless lands in the West constitute black bear habitat (see footnotes "3" and "4").

Grazing on black bear habitat is significant. Table 2. Grazing occurs on 94 million acres (42%) of black bear habitat, on 79 million acres (56%) of federal lands, and on 19 million acres of

Wilderness Areas and roadless habitat lands (52%). The number of livestock permittees in roadless black bear habitat is 4,686. Map 1.



Unfortunately, bear habitat is disappearing due to unprecedented rates of suburban and urban growth. Because of habitat loss, bears increasingly find themselves in ex-urban areas resulting in conflicts with humans and high levels of mortality (Beckmann et al. 2004;

Masterson 2006). Roads spider-webbing into once pristine habitat make it easier for hunters and poachers to kill bears (Craighead 2002), and roads increase the opportunity for vehicle-bear collisions. A shift in global temperatures may especially affect hibernating species such as black and grizzly bears (Humphries et al. 2004). For these reasons, roadless and Wilderness Areas are greatly needed to protect source populations of black bears.

Black bears, the third largest carnivore in North America (behind grizzly and polar bears), survive mainly on plant materials. Black bears prefer forest habitat for forage and movement. They disperse seed and nutrients and create biological diversity by creating small-scale disturbances that open up the forest canopy.

In arid climates such as Colorado, Nevada, Arizona, and New Mexico, bears are slow to recruit new members to their populations and are vulnerable to over-exploitation. A Colorado study showed the females do not breed until they are almost five years of age, and the birth interval comes every two years—depending on sufficient food availability (Beck 1991). In the Pacific Northwest, bears begin to breed at three or four years of age. Stochastic events such as food failures, droughts, or late frosts can decrease forage and increase human-bear conflicts leading to bear mortalities. Winter can add further stresses to a population: adults that start hibernation without adequate nutrition may die in the den. A female that breeds in the summer months may not give birth in the spring if she is in poor physical condition during hibernation. If nutritionally deficient, her body will absorb the fetuses—thus bears' own bodies involuntarily limit their populations when food is in short supply.

Because black bears are not resilient due to their slow reproduction rates, they are seriously affected by habitat loss, global warming, and over hunting. In addition, bears are killed by individuals associated with agribusiness on roadless and Wilderness Areas. Over 40% of black bear habitat is grazed, including 52% of their roadless habitat. Therefore, one way to ensure black bear persistence is to retire livestock grazing permits in the West, and especially in roadless and Wilderness Areas.

- **Grizzly Bears (*Ursus arctos horribilis*)**

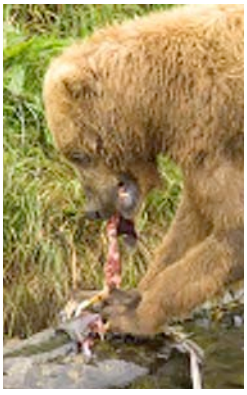
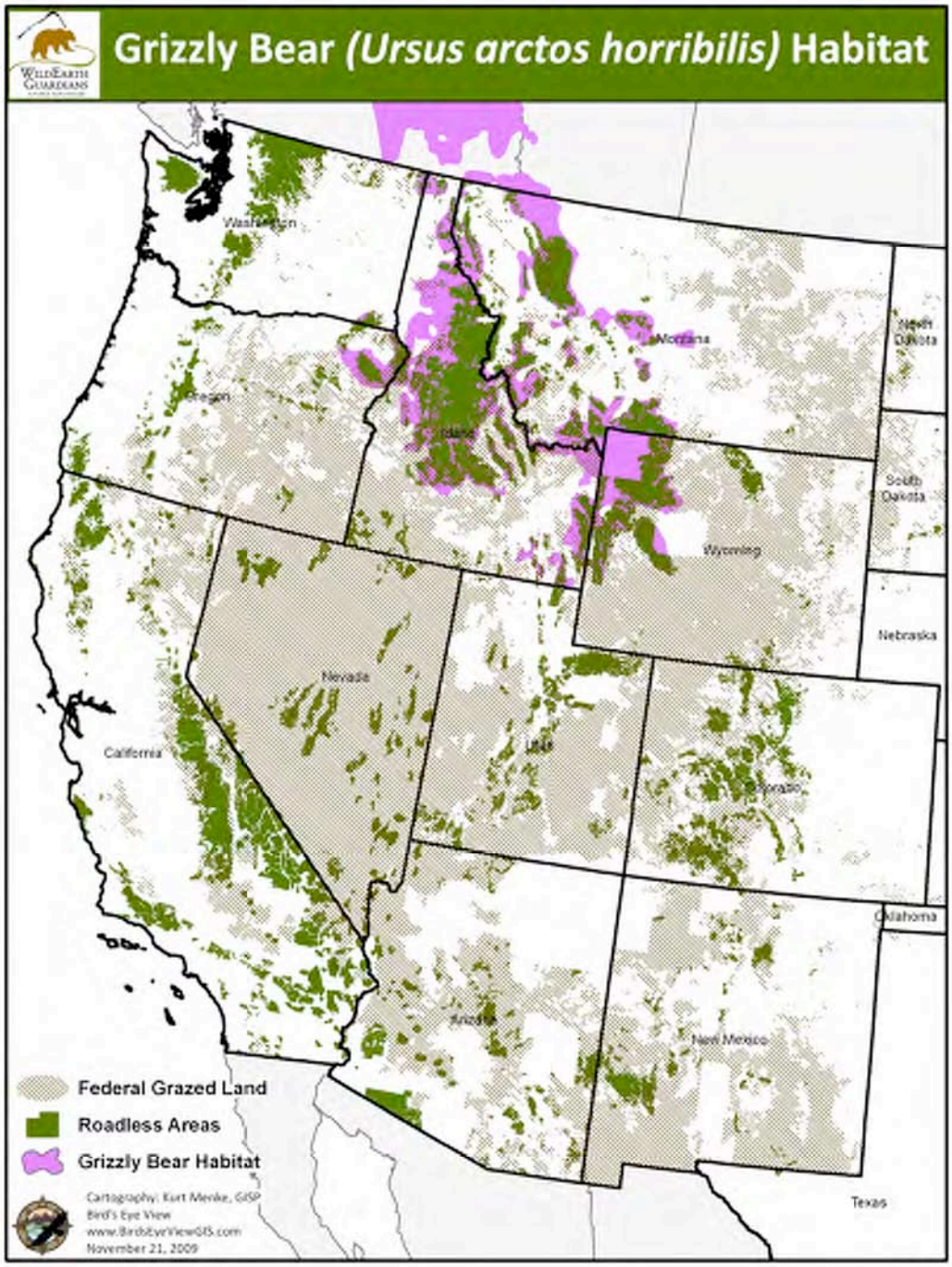


Photo: USFWS

The western U.S. provides 48 million acres of habitat to grizzly bears, 40 million acres occurs on federal public lands, while 25 million acres are situated in roadless and Wilderness Areas habitat. For grizzly bears, 52% of their habitat contains no roads – while 28% of roadless lands in the West are grizzly bear habitat. Table 2.

Grazing on grizzly bear habitat is significant. Table 2. Grazing occurs on 20 million acres (42%) of grizzly bear habitat, on 19 million acres (47%) of federal lands habitat, and on 9 million acres of Wilderness Areas and roadless habitat lands (25%). Livestock permittees in roadless and Wilderness Areas grizzly bear habitat equal 1,422. Map 2.



Grizzly bears and black bears avoid roads (Mattson et al. 1996)—even roads that only see one car per day (Schwartz et al. 2003). Roads enormously influence grizzly bear mortality because animals living in proximity to roads are often mistakenly killed by black bear hunters, poached, or are killed by agencies because they come into contact with humans (Schwartz et al. 2003). For these reasons, roads can increase grizzly bear mortality by a factor of five (Schwartz et al. 2003). For their security, grizzly bears require seasonal road closures when

they are moving to forage (Schwartz et al. 2003). Because roads are important sources of bear mortality, grizzly bear conservation on Wilderness and other roadless lands is imperative.

Grizzly bears, the second largest carnivore in North America—behind polar bears—have large home ranges that include shrub cover, forested land, and open areas, depending on time of year and seasonal food availability (Schwartz et al. 2003). Grizzly bears' home ranges average between 73 and 414 square kilometers but can be as large as 2,600 square kilometers—depending on food availability and sex of the animal (males occupy larger ranges). Where salmon fisheries are available, home ranges are quite small when compared to bears in habitats where they are more dependent on vegetative diets (Schwartz et al. 2003).

Because of high energy content and digestibility of animal matter, meat is considered valuable bear food, and bears that consume large quantities of ungulates or fish can far exceed the size of bears that are reliant on plant-based diets (Schwartz et al. 2003). In springtime, for interior populations of bears, carrion is an important and common food source, and in early summer, bears hunt neonates of moose, caribou, and elk (Schwartz et al. 2003). Grizzly bears' diet is varied and comes from: rodents, ground-nesting birds, army cutworm moths, ladybird beetles, berries, roots, and bulbs. An important grizzly bear staple in the Northern Rocky Mountain region includes whitebark pine nuts, which are available in red squirrel middens. Bears raid the middens. Because the whitebark pine is in dramatic decline due to exotic fungus and blister rust (Schwartz et al. 2003), grizzly bear biologists are greatly concerned about bear populations. Wolves have mitigated the decline of whitebark pine to some degree for bears because they provide carrion (Wilmers and Getz 2005).

Grizzly bears play important ecological roles. Important seed and nutrient dispersers, grizzly bears initiate small-scale disturbances in their ecosystems. They are also considered an umbrella species, given that grizzly bear habitat safeguards can provide collateral benefits to co-occuring plants and animals. Unfortunately, grizzly bear populations continue to shrink from anthropogenic threats.

Historically, grizzly bears ranged in western North America from the top of Mexico to Canada and Alaska (NatureServe, 2010), but were largely extirpated by the 1920s and 1930s because of exaggerated fears by humans (Schwartz et al. 2003). Prior to European colonization, grizzly bears inhabited landscapes "from mountain tops to valley bottoms and plains" (Schwartz et al. 2003, p. 577). Currently, grizzly bear populations have been largely relegated to remote habitats in rugged mountains (Schwartz et al. 2003).

According to NatureServe, grizzly bears are "presumed extirpated" across most of their former range (Arizona, California, Colorado, Kansas, Manitoba, Minnesota, Navajo Nation, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, Saskatchewan, South Dakota, Texas, and Utah), are "critically imperiled" in Idaho, Washington, and Wyoming; "imperiled" and "vulnerable" in Montana; "vulnerable" in Alberta, British Columbia, and Yukon Territory, unranked in the Northwest Territories and Nunavut, but are "apparently

secure" in Alaska. According to NatureServe, the North American grizzly bear population likely numbers over 30,000 in Alaska, over 21,000 in Canada, but less than 1,000 in the Lower 48.[5]

In 1975, all grizzly bear populations in the Lower 48 (Yellowstone, Northern Continental Divide, Selkirk, Cabinet-Yaak, North Cascades, and Bitterroot) were listed as threatened under the ESA (40 FR 31734-31736). In 1991, the FWS found that the North Cascades bears were warranted but precluded from receiving an upgrade to endangered protection, even though the population consisted of less than 20 animals.[6] In 1999, the Selkirk population was also warranted but precluded from receiving endangered species status because of higher priority listings.[7]

On March 22, 2007, the FWS delisted the Yellowstone Distinct Population Segment and determined that grizzly bears were recovered in that region.[8] In April 2007, the FWS initiated a five-year review of all grizzly populations in the Lower 48 states (72 FR 19549-19551). While the Selway-Bitterroot has no bears at all, the FWS has acknowledged that a reintroduction was necessary, but unfeasible because of a lack of funds. Despite FWS' purported recovery efforts, grizzly bear populations are teetering on the brink of extinction in the contiguous U.S. Therefore, in 2009, the Yellowstone Ecosystem DPS were returned to their status as *threatened* by court order.[9]

- **Grizzly Bear Mortality**

In 2008, an unprecedented number of grizzly bears were killed by humans—a total of 48 in one year compared with an average of 24 per year for the years 1999 through 2007 (IGBST 2009b). This level of mortality exceeded the allowable threshold set by the Interagency Grizzly Bear Study Team (IGBST): 9% female mortality and 15% mortality for males (IGBST 2009b).

Most of the mortality, 14, came from hunters for "defense of life" reasons—and most of these mortalities involved females with dependent young. Because Yellowstone area grizzly bears rely on white bark pinecones for food in the fall, and because these trees are in decline due to climate change, grizzly bears are attracted to ungulate-hunting activities.[10] As a result of

[5] NatureServe.org (last visited 1/23/10).

[6] See: http://www.fws.gov/mountain-prairie/species/mammals/grizzly/cascades.htm.

[7] See: http://www.fws.gov/mountain-prairie/species/mammals/grizzly/selkirk.htm.

[8] See: http://www.fws.gov/mountain-prairie/species/mammals/grizzly/yellowstone.htm.

[9] Greater Yellowstone Coalition v. FWS, U.S. District Court, Missoula, Montana, Case CV 07-134-M-DWM.

[10] When bowhunters use elk calls, they attract grizzly bears. Also, bears have begun to associate gunshot sounds with gut piles left by hunters. Biologists call it the "dinner bell effect." When bears hear gunshots, they expect to find food. Unfortunately for all involved, some bears have attempted to usurp carcasses when hunters are present.

the high hunter-associated mortalities, the (IGBST) issued 21 recommendations to prevent negative conflicts resulting in grizzly bear mortalities such as requiring that hunters wear bear pepper spray in a manner that is readily accessible, that bow hunters hunt in groups if they are using elk calls, and changing the ungulate-hunting season to correspond to the time when female bears have entered their dens for the season (IGBST 2009b).

In 2008, hunters shot five grizzly bears because of mistaken identity—they thought they were black bears. The IGBST recommended that states do more to teach hunters to distinguish between black and grizzly bears. Five more were killed in human developed areas by agencies, and four were killed for cattle depredation. No grizzly bears were killed for sheep depredation, although three had been in the previous decade. In 2009, the grizzly bear mortalities declined to 28, although it was still higher than the average of 24 for the years 1999 to 2007. Table 3.

Table 3 2009 Grizzly Bear Mortalities Greater Yellowstone Ecosystem[11]	
Agency Kills (*i*.e., Bears in Human Development)	3
Hunter Mistakes for Black Bear	2
Livestock Protection	1
Natural (*i*.e., Instraspecific strife)	2
Vehicle Collisions	2
Cub of the Year (All Mothers had been Killed)	7
Defense of Life (2 hunters; 1 hiker; 1 unknown)	4
Under Investigation (No reason cited)	6
Unknown	1
Total	28

More than half of grizzly bear killed by humans go undetected—from 46 to 66% (Schwartz et al. 2003). Grizzly bears are susceptible to sodium cyanide-M-44 ejecting devices. Although one collared animal was discovered killed by an M-44, more deaths could go undocumented if the animals are uncollared. Wildlife Services reports killing two grizzly bears in 2005. Historically, indiscriminate predator-control activities led to grizzly bear population decline. Today, human-caused mortality is the single largest contributor of bear deaths. Sheep-raising particularly attracts grizzly bears (Wilson et al. 2006), and therefore is inappropriate in grizzly bear country given that the species is nearly extirpated.

In short, grizzly bears can only persist if decision makers actively protect them. However, agencies tend to be unduly influenced by local populations that happen to be well-armed and are easily antagonized about restrictions in grizzly bear country (Mattson et al. 1996). The cost has been to over-estimate grizzly bear populations, which results in overkill that is

[11] Data from the Interagency Grizzly Bear Study Team Interagency Grizzly Bear Study Team. 2009a. 2009 Known and Probable Grizzly Bear Mortalities in the Greater Yellowstone Ecosystem. http://www.nrmsc.usgs.gov/science/igbst/2009mort.

not easily overcome by a species that has a particularly low fecundity. As Mattson et al. (1996) write: "Put simply, the societal costs—failure to meet conservation policy aims—of unintentional over-kill will be greater than the costs of unintentional population increases. Furthermore, the former is without immediate remedy if it leads to extirpation" (p. 1018).

Even less resilient than black bears, grizzly bears may be the species most dependent on Wilderness and other roadless areas for their persistence. Far more robust measures need to be implemented to prevent grizzly bears from heading toward extirpation as their numbers are less than 1,000 in the Lower 48. Grizzly bears are particularly drawn to livestock operations—and 42% of their habitat occurs on grazed lands and on 25% of roadless grizzly bear habitat. Yet, they cannot tolerate roads and have been subject to high levels of mortality in recent years, resulting in their relisting status. For all of these reasons, grazing allotments in grizzly bear habitat should be voluntarily retired as part of a public and private buyout program.

Felidae

- **Lynx (*Lynx canadensis*)**

Photo: Erwin and Peggy Bauer/USFWS

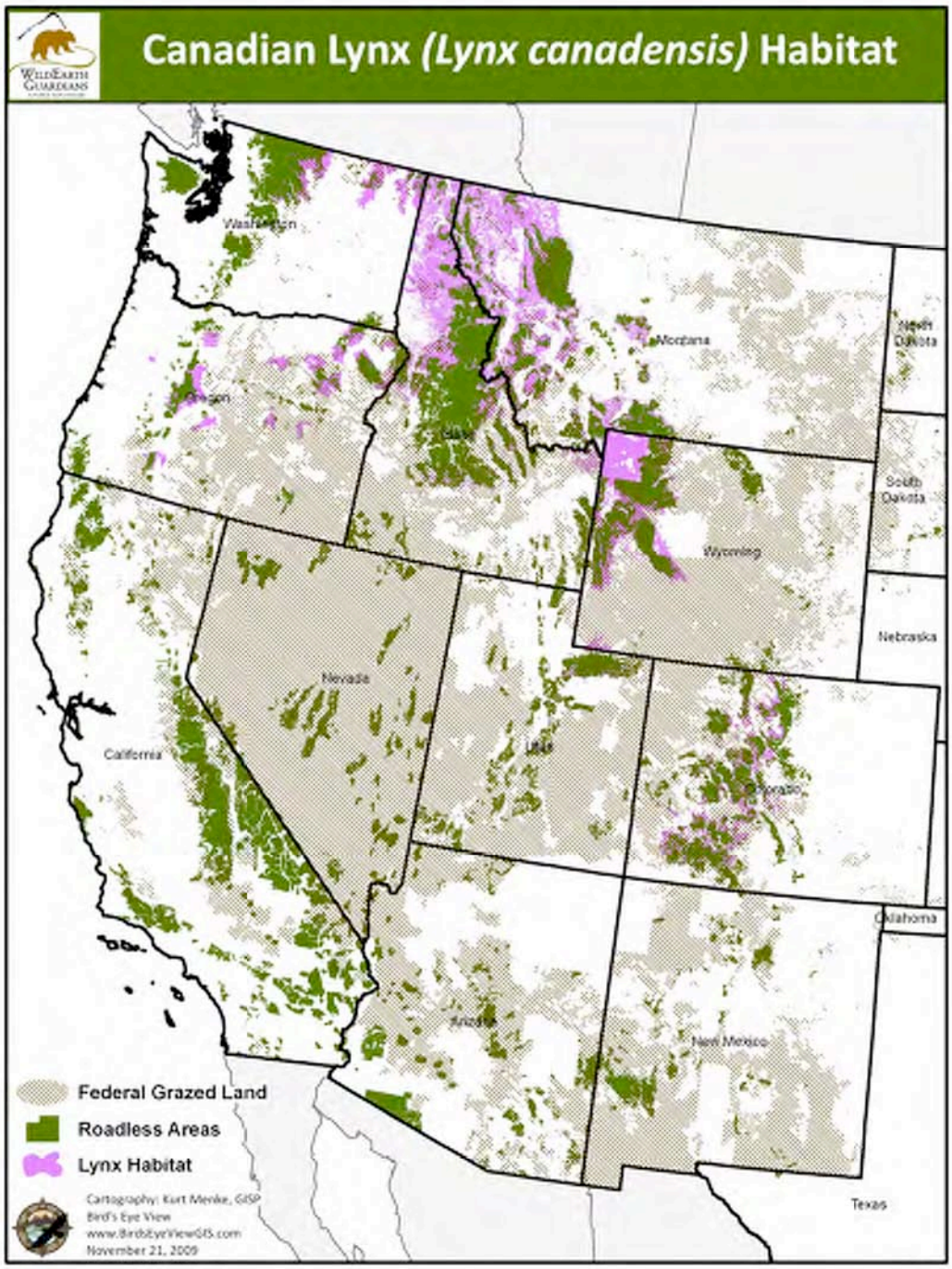
The western U.S. provides 49 million acres of habitat to lynx, 41 million acres occurs on federal public lands, while 21 million acres are situated in roadless and Wilderness Areas habitat. For lynx, 44% of their habitat contains no roads – while 24% of roadless lands in the West are lynx habitat. Table 2.

Grazing on lynx habitat is significant. Table 2. Grazing occurs on 20 million acres (42%) of lynx habitat, on 19 million acres (47%) of federal lands habitat, and on 8 million acres of Wilderness Areas and roadless habitat lands (21%). The number of permittees on lynx roadless areas habitat equals 1,919. Map 3.

Lynx prefer to live in various forest types but require old growth forests with large-downed trees at high altitudes for denning. Like all species, reproduction and recruitment is the key to their survival. They are largely dependent upon snowshoe hares for sustenance. Roadless areas with linkages are critical to lynx persistence.

Historically, lynx were easily trapped and poisoned—nearly to extirpation. While there are more robust lynx populations in Canada and Alaska, their future in the Lower 48 States appears bleak; they rank as either "critically imperiled" or "presumed extirpated." Lynx are listed as a threatened species under the ESA, except in New Mexico (on December 17, 2009, the FWS determined their listing was "warranted but precluded" (74 FR 66937-66945). No mitigation for trapping or poisoning for lynx occurs in New Mexico, where at least 14 have

migrated and been killed (Shenk 2008). Lynx are easily caught in snares intended for coyotes (Carroll 2007).



In the western U.S, lynx occur in Montana, Wyoming, Washington, Idaho, Colorado, and New Mexico. The Colorado Division of Wildlife (DOW) sponsored reintroduction efforts from 1999-2006, during which time it released 218 lynx. In that time, DOW recorded 126

kittens born (DOW 6/24/09). Birth rates seem to coincide with snowshoe hare populations. Colorado lynx have dispersed to Wyoming, Utah, and New Mexico (Shenk 2008).

Global warming could hinder lynx populations and their range even more. Carnivores that live in biological islands, that is, isolated from other populations, such as the pine martens and lynx in southeastern Canada and northeastern U.S., will be greatly harmed with global warming events (Carroll 2007). A decrease in snowfall make these two species in these regions vulnerable to sympatric carnivores such as fishers, which compete with martens; and coyotes, which compete with lynx (Carroll 2007).

To protect these vulnerable species from the effects of global warming, Carroll (2007) suggests that wildlife managers create bioregional conservation plans and protect vulnerable populations by reducing trapping not only in their core areas but also in critical linkages. Protecting roadless and Wilderness Areas, and preventing the trapping of coyotes and other carnivores perceived as livestock predators, are key to lynx persistence as 42% of their habitat is grazed including 21% of their habitat on Wilderness Areas and roadless lands.

- **Mountain Lions (*Puma concolor*)**

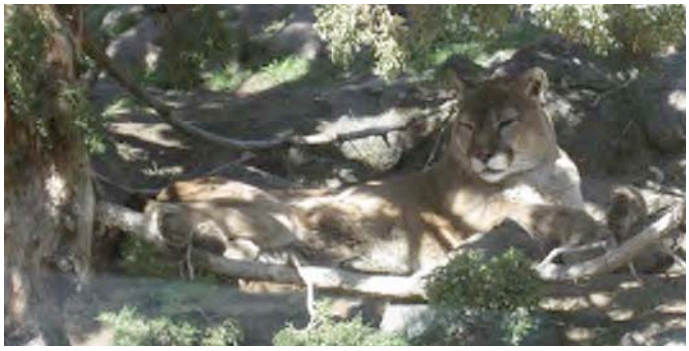
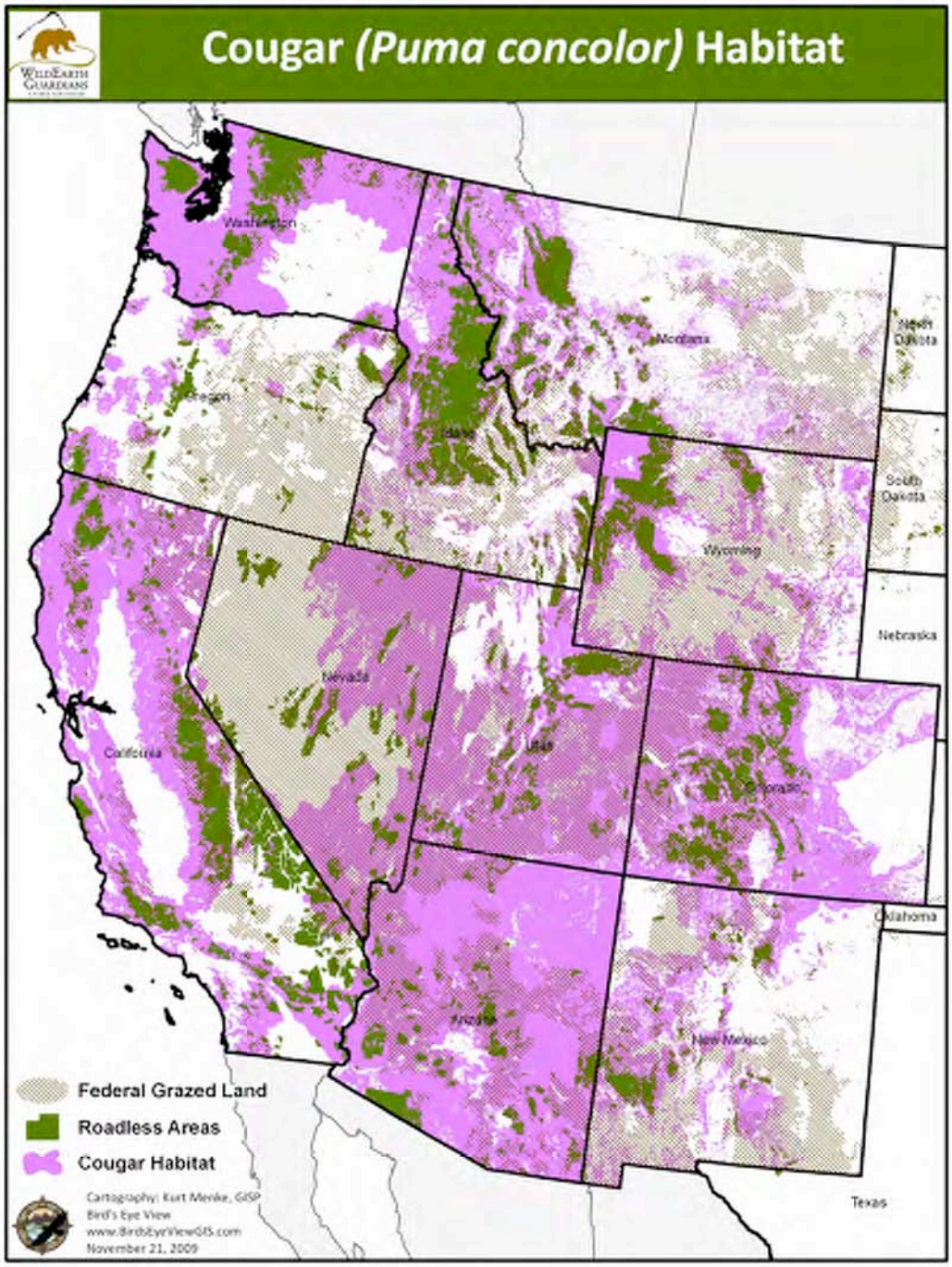


Photo: Mike Irwin

The western U.S. provides 401 million acres of habitat to mountain lions, 238 million acres occurs on federal public lands, while 69 million acres occur in roadless and Wilderness Areas habitat. For mountain lions, 17% of their habitat is without roads—while 78% of roadless lands in the West are lion habitat. Table 2.

Grazing on mountain lion habitat is significant. Table 2. Grazing occurs on 196 million acres (49%) of mountain lion habitat, on 161 million acres (68%) of federal lands habitat, and on 30 million acres of Wilderness Areas and roadless habitat lands (81%). The number of permittees on mountain lions' roadless areas habitat equals 5,775. Map 4.

The highest source of lion mortality from anthropogenic causes comes from sport hunters (Cougar Management Guidelines 2005). Livestock producers and Wildlife Services also kill mountain lions for livestock protection reasons. Roads offer access to outfitters and houndsmen, resulting in higher numbers of kills than in areas where the landscape is roadless. Also, roads are an important source of mortality because of vehicle collisions. For these reasons, it is imperative that some mountain lion populations be protected in refugia away from roads.



Mountain lions generally occur in low densities because they are obligate carnivores (they eat no plants) and their food is patchily distributed across arid landscapes (Logan and Sweanor 2001). Mountain lions are extraordinarily unsocial (Logan and Sweanor 2001). Lions establish "home areas"—territories that move along with prey migrations. Males' home ranges are generally larger than those established by females (Logan and Sweanor 2001). Home areas may overlap, but lions avoid each other, usually until the female is available for

breeding—generally at 27 months. She will give birth to approximately 3 kittens every other year. Many kittens do not survive to adulthood. Once emancipated from their mother, subadult lions strike out and find their own home ranges. They establish a territory in suitable habitat either by inhabiting a vacant territory or out-competing a resident lion. Intra-specific strife over competition for territories leads to high levels of mortality in a lion population (Logan and Sweanor 2001).

If the lion in a home range is removed or killed, then the vacancy likely will attract a younger, dispersing animal (Lambert et al. 2006). Younger lions are more likely to have negative interactions with humans than older animals (Beier 1991, Murphy et al. 1999). Ironically, exploiting lion populations can exacerbate negative interactions between mountain lions and people or livestock (Lambert et al. 2006). Over-hunting a lion population can change a population age structure to one with more young adults or juveniles (Lambert et al. 2006, Stoner et al. 2006, Robinson et al. 2008). The removal of 40% of the nonjuvenile population for four years or more reduces the number of individuals in a population, and creates a demographic structure that is younger, produces fewer kittens, and is socially unstable (Stoner et al. 2006). High hunter kill rates on adult females harms a population's ability to recruit new members (Anderson and Lindzey 2005). Therefore, both hunting and predator-control programs could potentially destabilize a lion population, which could, ironically, lead to increased mountain lion conflicts with people and with livestock (*see e.g.,* Lambert et al. 2006).

Because nearly 50% of mountain lion habitat is grazed including 81% of their roadless habitat and because this species has particularly low resilience to human persecution, mountain lions particularly need refugia from human-induced threats in roadless and Wilderness Areas. A voluntary grazing permit buyout program could be enormously beneficial for the conservation of mountain lions.

Canidae

- **Coyotes (Canis latrans)**

Photo: DianeHargreaves.com

Coyotes, known for their vocalizations, are also called "song dogs." Weighing an average of 30 pounds, coyotes have adapted to diverse ecosystems from deserts and grasslands to forests—even large cities. They range from the Arctic to Central America and across the breadth of the U.S. Generally, coyotes hunt alone because their primary prey consists of rodents, rabbits, and hares (Kitchen et al. 1999). Omnivorous, they also eat a wide variety of fauna and fruits. Their keen eyesight, sense of smell, and incredible speed increases hunting success. Coyotes scavenge (Smith et al. 2003).

Coyotes are important ecosystem actors—their presence increases biological diversity (Crooks et al. 2001; Henke and

Bryant 1999). Coyotes limit populations of smaller carnivores such as foxes, skunks, raccoons, and even house cats. Therefore, coyotes indirectly benefit ground-nesting birds, such as sage-grouse and meadowlarks (Mezquida et al. 2006).

Highly intelligent and ecologically important, coyotes have long suffered from human persecution. In urban areas, coyotes face intolerance because they can prey on unsecured pets, or they face perceptions that they threaten human safety. In rural areas, tens of thousands of coyotes are killed annually with poisons, traps, snares, and by aerial gunning—often with the use of tax dollars (Keefover-Ring 2009). Outdoor writer Mike Finkel (1999) writes, "Between killing contests, Wildlife Services' actions, and state, local and private agencies, it is estimated that 400,000 coyotes are killed each year. That is more than 1,000 coyotes a day—almost a coyote a minute."

Coyotes occur as solitary individuals, most often as mated pairs, or in family groups called packs. Mated for life, the pack consists of the alpha pair and their progeny—from different age litters. When a pack is left intact, only the alpha pair breeds—a natural birth control mechanism. If one or both members of the alpha pair are killed, all the members of the pack are now "permitted" to breed—which increases the number of breeders (Crabtree and Sheldon 1999). After lethal control operations, litter sizes increase, and individuals migrate from other areas (Goodrich and Buskirk 1995; Knowlton et al. 1999). Killing coyotes has the exact opposite intended effect: more individuals come to the killing area and coyotes have expanded their historic range by a factor of three (Crabtree and Sheldon 1999).

Coyotes may be one of the most adaptable and resilient species on the planet. Yet, each year tens of thousands of them are killed because of livestock protection reasons, which are often exaggerated and unfounded (*supra*). While coyotes do not require Wilderness—the Western landscape—including its flora, fauna, and its people require coyotes. For this reason, we advocate for a voluntary grazing permit buyout program.

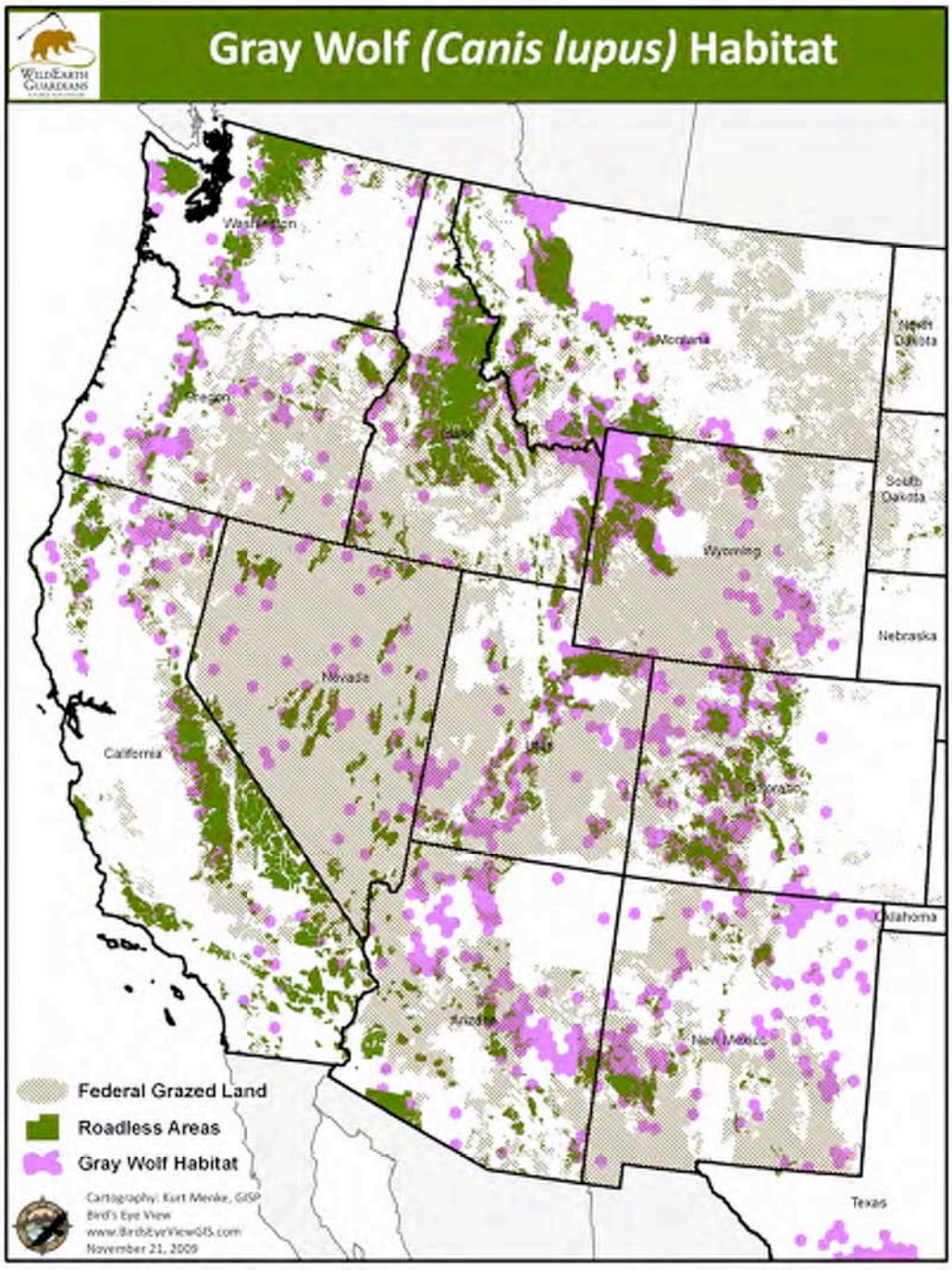
- **Wolves (*Canis lupus*)**

Photo: DianeHargreaves.com

The western U.S. provides 114 million acres of habitat to wolves (both gray and Mexican), 81 million acres occurs on federal public lands, while 33 million acres are situated in roadless and Wilderness Areas habitat. For wolves, 29% of their habitat contains no roads – while 37% of roadless lands in the West are wolf habitat. Table 2.

Grazing on wolf habitat is significant. Table 2. Grazing occurs on 65 million acres (57%) of wolf habitat, on 56 million

acres (69%) of federal lands habitat, and on 16 million acres of Wilderness Areas and roadless habitat lands (43%). The number of permittees on roadless areas wolf habitat equals 3,455. Map 5.



Wolves prey on a variety of fauna, primarily ungulates. Ecologically functioning populations of wolves have been instrumental in restoring biological diversity, including increasing the

number of song birds, pronghorn, and other species, while simultaneously improving the ecology of rare riparian systems (e.g., Berger et al. 2008; Beschta and Ripple 2009; Smith et al. 2003). Their presence even effects the soil nutrients, soil microbes, and plant quality because decomposing prey carcasses enrich soils (Bump et al. 2009). In the Yellowstone ecosystem, wolves act as a buffer to the effects of climate change by not only creating greater amounts of carrion, but making it available year round, and the scavengers that benefit include bald and golden eagles, grizzly bears, ravens and magpies, and coyotes (Wilmers and Getz 2005). Wolves therefore benefit themselves and other numerically rare species such as grizzlies and eagles. Wolves may be important in protecting extraordinarily rare species such as grizzly bears (Constible et al. 2008).

Largely extirpated from the continental U.S., wolves have rebounded in just five percent of their historic range. Their persistence remains a challenge as the federal agency in charge of their recovery, the FWS, is quick to remove federal protections in order to appease a small but vocal opposition: livestock growers and some hunting organizations, who believe that wolves compete with them for the ungulates they also like to hunt. As a result, wolf politics has been a roller coaster ride. We examine three distinct population segments (DPS) of wolves.

- **Northern Rockies Wolves**

In February 2008, the FWS removed ESA protections for gray wolves residing in the Northern Rocky Mountain region,[12] which allowed for over 500 wolves to be killed in 2009 in Montana and Idaho. The decision took effect on March 28, 2008 and gave authority to Idaho and Montana to regulate wolf populations. In March 2009, President Obama's new Secretary of the Interior Ken Salazar reaffirmed the Bush-era decision by the FWS to remove protections for gray wolves in Idaho and Montana, but leaving full protections in Wyoming because the state's management allowed wolves outside of the national park to be shot on sight. The new "wolf rule" became effective in May 2009.[13] In announcing the rule, Secretary of the Interior, Ken Salazar indicated that Idaho and Montana should not be "punished" for Wyoming's failure to offer a plan that would sustain wolves. As Bergstrom et al. (2009) write, "that hosting an endangered species living mostly on federal public lands in the northern Rockies is [considered] forced punishment on a state" (p. 992) is a poor-reasoned position for the nation's top wildlife official to take. Because wolves have been recovered to less than one-third of the Northern Rockies DPS, their delisting is premature (Bergstrom et al. 2009).

[12] Under the ESA, either a species, subspecies, or distinct population segment of a vertebrate species can be listed. 16 U.S.C. § 1533. Our usage of the term distinct population segment is within the ESA's meaning of this term. The Northern Rockies gray wolf distinct population segment is found in the states of Wyoming Montana, and Idaho and in portions of Oregon, Washington, and Utah.

[13] The FWS's May 2009 delisting included Montana, Idaho, the eastern third of Washington and Oregon—but not Wyoming because the State's proposed conservation plan was extermination focused. 74 FR 15123-15188.

In June 2009, a coalition of conservation groups brought litigation in an attempt to reverse the delisting decision and to prevent Idaho and Montana from allowing wolf hunts. In September 2009, U.S. District Judge Don Molloy made a determination to allow the wolf hunts to go forward. While he denied plaintiffs' preliminary injunction, the lawsuit has not yet been decided.[14]

Montana's Fish, Wildlife and Parks Commission set a hunting quota of 75 wolves, but closed the season after 72 wolves were killed; the sport hunt ended a long-term study of Cottonwood Pack, which caused Montana officials to stop the wolf hunt early (Bergstrom et al. 2009; Murphy 2009). Most wolves that were killed by sporthunters were opportunistic ungulate hunters (MFWP et al. 2010). Comparing livestock protection kills and sport hunters kills, nearly 50% more wolves were killed for livestock protection reasons. Table 4.

In Idaho, a quota of 220 wolves for the general hunt was set, with an additional 35 wolves on Nez Perce tribal lands for tribal members only. Sport hunters killed far more wolves (70%) than did livestock producers in Idaho. Table 4.

Montana's landscape is more fragmented and more roaded than Idaho's, where lands are remote and rugged; this led Idaho to extend their wolf season in order to fulfill the wolf quota (MFWP et al. 2010).

Table 4
Wolf Mortality in the Northern Rockies
(Data from FWS et al. (2010))

	Wildlife Services & Livestock Producers	Sport Hunter	Poach	Vehicle/ Train	Unknown/ Other	Total
Idaho	93	134	12	0	31	270
Montana	145	72	6	4	17	244
Oregon	2	0	0	0	0	2
Washington	0	0	0	0	0	0
Wyoming	32	0	0	0	0	32
Total	272	206	17	4	47	546

Notably, unlike Idaho or Montana with wolf mortalities in the triple digits, Wyoming's wolves enjoy all their federal protections, and so far fewer were killed in 2009.

In 2008, Idaho, Montana, and Wyoming wolves killed 628 domestic livestock (mostly sheep and cattle) and 14 dogs (Bergstrom et al. 2009). That same year, one severe storm killed 1,200 calves and lambs (Bergstrom et al. 2009). In the Northern Rockies, only three percent of all livestock losses come from *all carnivores combined* (Bergstrom et al. 2009). In 2009, wolves killed 214 cattle, 721 sheep, 24 dogs, 4 llamas, and 4 goats (FWS et al. 2010). In

[14] Defenders of Wildlife et al. vs. FWS, Consolidated cases, CV 09-77-M-DWM; CV 09-82-M-DWM, Sept. 8, 2009.

2009, the Defenders of Wildlife paid $194,742 in compensation to livestock producers. Montana and Idaho also have compensation funds—some of the those funds for compensation come from private sources (FWS et al. 2010).

Wolf-watching tourism raises approximately $36 million per year in the Northern Rockies (Duffield et al. 2008), a considerable sum especially when compared with small gains realized by states for wolf hunting licenses: Montana Fish, Wildlife and Parks earned $749,196 from wolf tag revenues in 2009, while Idaho Game and Fish earned $423,280 (FWS et al. 2010).

Despite the mortality of nearly 550 wolves in the Northern Rockies, including the removal of 10 packs in Montana, 7 packs in Wyoming, 8 packs in Idaho, and one of the three packs in Oregon, FWS claims that the wolf population is expanding and has increased over 2008 levels (FWS et al. 2010). We find this level of mortality of a top carnivore that is only re-established in 5% of its historic range to be troubling. North America needs more wolves, but that will only come with increased tolerance by wildlife officials, Congress, and more protection by FWS.

- **Southern Rockies Wolves**

At the beginning of 2010, it appears that wolves may have recolonized western Colorado near De Beque. DNA samples are being examined to confirm reported wolf tracks, scat, and a sighting by a wolf biologist on the High Lonesome Ranch. Wolves have been confirmed in Colorado on at least three other occasions (Edward 2009). As of Spring 2010, a wolf killed in Colorado by suspicious means is still under investigation by the FWS.

In March 2008, WildEarth Guardians filed suit against the National Park Service for its failure to adequately consider the reintroduction of a self-regulating population of gray wolves into Rocky Mountain National Park as part of its plan to address ongoing elk overpopulation problems. In a landscape absent of wolves, elk have caused a decline in the Park's aspen and willow communities, which has led to the desiccation of surface waters and adverse effects on beavers, a keystone species. To stem the overbrowsing problem, the government approved an annual cull on hundreds of elk each year using snipers. Culling elk will not prevent them from congregating and overbrowsing – something only coursing carnivores such as wolves can prevent.

Biologists have concluded that Colorado can support a population of over 1,000 wolves because of abundant elk and deer herds and large amounts of public lands—including national forests and Wilderness Areas (Bennett 1994; Carroll 2007; Carroll et al. 2006). Scientists have identified four core areas in the Southern Rockies that could support wolves: 1) Rocky Mountain National Park; 2) White River, Routt National Forest, and Flattops Wilderness; 3) San Juan Mountains and Weminuche Wilderness; and 4) Vermejo Park Ranch and Carson National Forest (Edward 2009).

Moreover, Colorado's public has indicated to federal wildlife officials by a 71% margin that it wants wolves (Edward 2009; Manfredo et al. 1994), and two-thirds of Colorado voters (including 44% of farmers and ranchers) want wolves (Edward 2009; Meadow et al. 2005).

Despite the public's desire and the ability of the Southern Rocky Mountain ecoregion to support wolves, the federal government and others have proposed policies that reduce wolves to core areas in the Northern Rockies, and that limits their ability to disperse and recolonize suitable habitats in the Southern Rocky Mountain ecoregion. Wolves must be allowed to restore themselves by having safe corridors from the Northern Rockies to Mexico.

- **Mexican Wolves (*Canis lupus baileyi*)**

Livestock interests have and continue to doom Mexican wolves, or "lobos". In 2010, the wild population consists of a mere 42 individuals despite 30 years of supposed protections under the ESA. Since 2003, the FWS, to appease livestock growers, has removed dozens of individual wolves as part of their "put and take" strategy—the term used to describe how FWS releases captive-bred wolves, on the one hand, and then removes them for any slight to the livestock industry, on the other.

The Mexican gray wolf, the smallest, rarest, and most genetically distinct subspecies of the gray wolf species, once ranged in Arizona, New Mexico, Texas, and the Republic of Mexico. By the 1930s, the U.S. Bureau of the Biological Survey (now "Wildlife Services") exterminated Mexican wolves both north and south of the border (Robinson 2005). In 1976, the lobo was listed as endangered under the ESA. 43 FR 9607. In 1977, the FWS initiated emergency conservation efforts. It trapped the last known remaining five wild wolves over a three-year period from the States of Durango and Chihuahua, Mexico, and founded a captive breeding program in the US.

In 1998, the FWS designated these wolves as "nonessential experimental." 63 FR 1752. It then designated 4.4 million acres of public lands on Apache and Gila National Forests of Arizona and New Mexico as the Blue Range Wolf Recovery Area. The Mexican wolf is only allowed to occupy certain lands, even though suitable lands exist on public lands outside of the legal boundary.

From 1998 to 2003, the FWS managed the Mexican wolf recovery effort, but in 2003, it decided to share management authority with Arizona Game and Fish Department, the New Mexico Department of Game and Fish, The White Mountain Apache Tribe, the Forest Service, and Wildlife Services. The interagency team, called the Mexican wolf Adaptive Management Oversight Committee ("AMOC"), does not work towards wolf recovery. Neither AMOC, FWS, nor the U.S. Forest Service (which manages the majority of the lobo's habitat) has acted with the best interests of the Mexican wolf in mind. WildEarth Guardians and The Rewilding Institute are currently in court against FWS and the Forest Service to press these agencies to use all of their power to revive the faltering lobo recovery effort.

Livestock producers have not been required to remove livestock that have died, despite the attractant this presents to lobos. In fact, it has been a pattern and practice to bait the wolves with sick, dying, or vulnerable livestock so that the wolves can be removed. New Mexico livestock producer Mike Miller admitted to *High Country News*, "'We would sacrifice a calf to get a third strike [and subsequent wolf removal]'" (Dougherty 2007).

Since the reintroduction began, the FWS removed dozens of wild wolves from the population. The FWS instituted this liberal-removal policy despite warnings from a panel of experts that the constant manipulation of the Mexican wolf population would lead to interference with pack formation, persistence, and establishment and maintenance of home ranges (Paquet et al. 2001).

On top of this, in 2007, WildEarth Guardians filed suit against the Forest Service for allowing grazing to continue on more than one quarter million acres of the Gila National Forest until 2016 without a public review process. The Forest Service disregarded the harms caused by poor livestock husbandry practices, the indirect grazing effects on wild ungulate populations, the need for wolves to have wild prey, and other issues. The agency determined that ten-year permits could have so-called "categorical exclusions" from public review. The matter is now before the Tenth Circuit Court on appeal.

As of 2010, only 42 known lobos exist in the wild. In 2009, at least eight individuals died[15]—but likely more because of undocumented natural and human causes. In 2008, the population was officially reported at 52 individuals. Poaching remains an important culprit in the lobos' decline. A few in New Mexico see the Mexican wolf as a symbol of federal interference with livestock grazing "rights" despite the fact that recovery is taking place on America's first Wilderness Area, the Gila Wilderness (Bird and Horning 2009), and that Defenders of Wildlife pays for livestock losses.

Because wolves in the Northern Rockies and the desert Southwest have faced such a difficult year because of human persecution, and because much of the angst stems from livestock protection conflicts, it makes enormous sense for a voluntary grazing permit buyout program in wolf habitat, especially since 57% of their habitat is grazed by livestock, including 43% of wolf habitat on Wilderness Areas and other roadless lands.

Voluntary Federal Grazing Permit Retirement

WildEarth Guardians and our partners are working on proposals to allow the federal government and conservation organizations to buy out grazing permits from willing grazing permittees in order to permanently retire grazing allotment from livestock use (Salvo 2009). Grazing permit retirement is a voluntary, market-based solution that would end livestock and

[15] Monthly project updates: Arizona Game and Fish http://www.azgfd.gov/w_c/es/wolf_reintroduction.shtml, and FWS http://www.fws.gov/southwest/es/mexicanwolf/.

wildlife conflicts and save taxpayers hundreds of millions of dollars in the long run, and save species and habitat into perpetuity.

In the Northern Rockies, private efforts have successfully retired grazing allotments to protect grizzly bears and other species. The result: a reduction of wildlife-livestock conflicts and greater conservation for rare wildlife. In the Southwest, however, year-round grazing on public lands including in roadless and Wilderness Areas has amplified conflicts with Mexican wolves.

Around the world, large-bodied carnivore populations have declined by 90-95%, and native mammalian carnivores in North America are in trouble because of persistent human conflicts—many of which stem from livestock grazing on federal public lands. Despite this information, livestock grazing in the West continues to trump carnivore conservation, even within Congressionally-designated Wilderness Areas and in roadless habitats in the West—the last best places for wild native carnivores.

In this report, we expose that designated Wilderness Areas and roadless lands provide sanctuary for wild carnivores. Our data show that in the western U.S., livestock grazing occurs on 42% to 57% of native mammalian carnivore habitat, including on 42% of all Congressionally-designated Wilderness Areas or roadless lands. The management of these lands for domestic livestock production exposes these species to trapping, snaring, hounding, aerial gunning, and poisons. Now is the time to embrace the challenge of facing these sticky issues with an economic carrot to dispel some deep-seated conflicts and to move towards large carnivore conservation and restoration throughout the West.

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