AN ALTERNATIVE PATH TO GRIZZLY RECOVERY IN THE LOWER 48 STATES

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Doug and Pegy Sobey

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Executive Summary

There is still time to restore the threatened grizzly, but only by adopting a broader vision of bigger connected ecosystems, protecting ecosystems large enough to account for likely environmental changes, and learning from the past successes and failures in efforts to resolve human-bear conflicts. Recent research reveals that there is still room enough to reach a population of 3000 grizzlies (roughly twice current numbers), by reconnecting grizzlies in Yellowstone to Canadian source populations, and restoring grizzlies to the now-vacant Selway/Bitterroot ecosystem.

Over the last fifty years, we have learned much about the ecology and biology of the bear, and about how to anticipate and resolve bear conflicts caused by garbage, livestock and hunters. We have much to celebrate, because grizzly bears remain in the lower-48 states as a result of 29 years of protection under the Endangered Species Act (ESA).

But, the world in which we live is rapidly changing. Escalating human population growth, rural sprawl, energy development and off-road vehicle use will continue to degrade grizzly bear habitat and further isolate island populations. Global climate change will reduce key grizzly bear foods that contribute to reproductive success and lower levels of human-caused mortality. Introduced diseases will also likely reduce key bear foods such as whitebark pine seeds, forcing bears to expand their movements to procure the calories needed to survive winter sleep and to reproduce successfully.

If current trends continue, the Cabinet Yaak grizzly population will likely disappear, and a similar fate may await the Selkirk and North Cascades. Such events would make the Yellowstone and Glacier populations more isolated and vulnerable to extinction. Such facts as well as worldwide trends, elicited the following prognosis from author David Quammen for grizzlies and other large carnivores. In Monsters of God, he writes, "call me a pessimist, but when I look into the future, I don't see any lions, tigers or bears. . .my guess, a regretfully gloomy one, is that the last wild, viable, free ranging populations of big flesh eaters will disappear somewhere around the middle of the next century. I see the year 2150 as a probable end point to the special relationship between us and them. . .that's not far off—less than eight human generations. It is just time enough to encompass a welter of uncertainties, along with one weighty inevitability: the continuing growth of human population and consumption."

But, we need not and should not accept such a fate for an animal that is a wild icon, lying at the heart of the western experience, and the meaning of national parks such as Yellowstone, Glacier/Waterton, and Banff. We should start by refining the current approaches and protections are now working to increase bear numbers in Yellowstone. In addition, we need to do more to protect habitat and reduce human-bear conflicts and resulting mortalities. This plan is a step in that direction.

This plan is built on several assumptions. First, because grizzly habitat encompasses whole ecosystems (4 million acres or larger), its conservation means maintaining large landscapes and ecological processes, such as fire, that drive them. Second, the impact of people on bears must be incorporated, because bears tend to flourish where people are relatively few in number. Third, limiting rates of human-caused mortality is essential to maintaining an animal with such a low reproductive rate; a small change in the rate at which people kill bears quickly makes a big difference in the health of populations. Fourth, given major questions about the future, it is important to protect large enough areas, so that grizzlies can find alternative foods and secure habitat in a future environment that will continue to change—perhaps very quickly. This means that bears will need to occupy habitat they do not presently live in, to make up for habitat quality that will likely decline in core areas such as Yellowstone Park. Fifth, we seek to ensure that populations are both demographically robust–greater than 400 animals–and if possible, evolutionarily robust–over

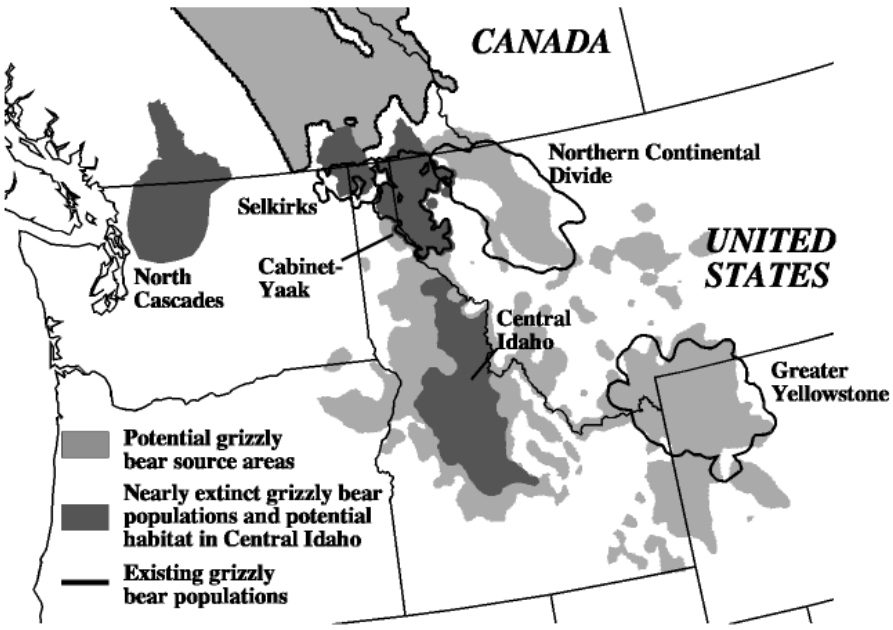
2,000 animals (see maps next page)–so as to survive environmental changes in the short and long-terms. Research has shown that for mammals, several thousand interacting individuals are required to maintain genetic diversity over thousands of years. Given the current configuration and numbers of remaining bears in the lower-48 states, evolutionarily robust levels can only be achieved though expanding the areas where bears can be, and through connecting grizzly ecosystems from Yellowstone to Canada to ensure exchange of individuals and genes.

This last assumption distinguishes this plan from the current approach taken by the U.S. Fish and Wildlife Service (FWS) in the 1992 grizzly bear recovery plan. The FWS plan looks forward only 100 years, and seeks to maintain minimum population levels, with numbers roughly the same as when the populations were listed. Further, FWS manages all remaining ecosystems as isolated populations. These are located in northern Idaho (Selkirks), Northern Continental Divide (NCDE) near Glacier Park, northwest Montana (Cabinet Yaak), northern Washington (North Cascades), northern Montana (Glacier/Waterton) and Greater Yellowstone (GYE). And together they number still only 1000-1500—roughly the same number as at the time of listing. In addition, FWS maintains that Yellowstone bears can be recovered and subsequently removed from ESA protections, or delisted, as an isolated population of 400-500 animals, even though the agency recognizes that bears will likely need to be imported every ten years or so to avoid genetic inbreeding.

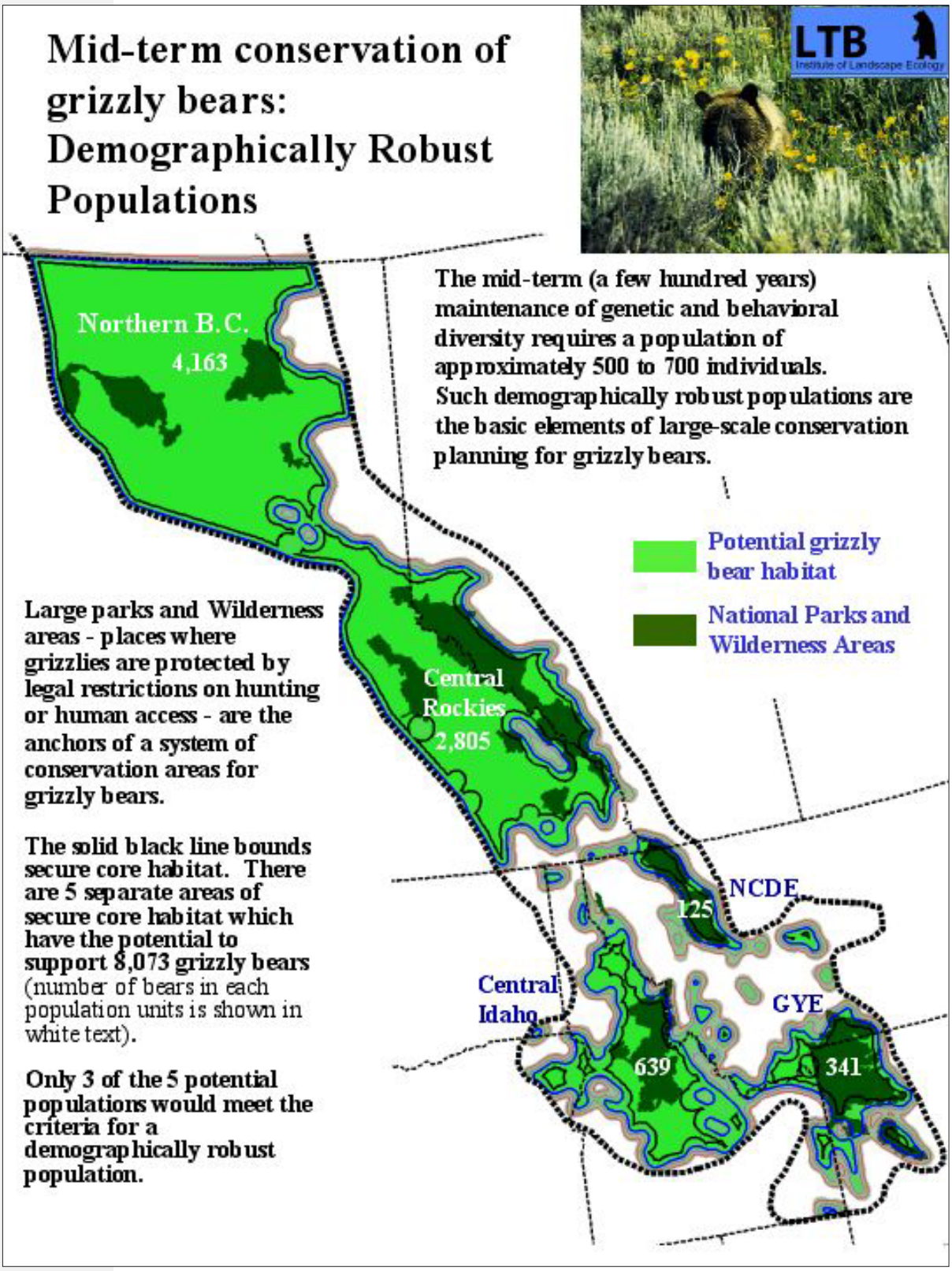
The scientific underpinnings of this alternative path are based on a core/corridors approach described by Reed Noss and others. The model consists of large core areas connected by linkage areas aimed at providing safe passage for bears. The purpose is to allow interchange of individuals between two or more populations, increasing the likelihood of survival of all populations.

Linkage areas are identified by the location of core areas, proximity of core areas to each other and the quality in the habitat. In the context of connecting grizzly bear ecosystems, the term "corridor" is a bit of a misnomer, as what is actually required are large tracts of linked habitat.

This plan is based on three peer-reviewed cores/ corridors habitat assessments, developed over the past six years by Paul Paquet, Reed Noss and Carlos Carroll; Lance Craighead; and Dave Mattson and Troy Merrill. Despite different methods, these studies show largely similar results in terms of suitable core habitat and linkage areas between grizzly ecosystems. Here, we attempt to apply this scientific information in a practical plan for action to ensure the health of grizzlies for the benefit of generations yet unborn.



Courtesy of Troy Merrill, LTB Institute of Landscape Ecology



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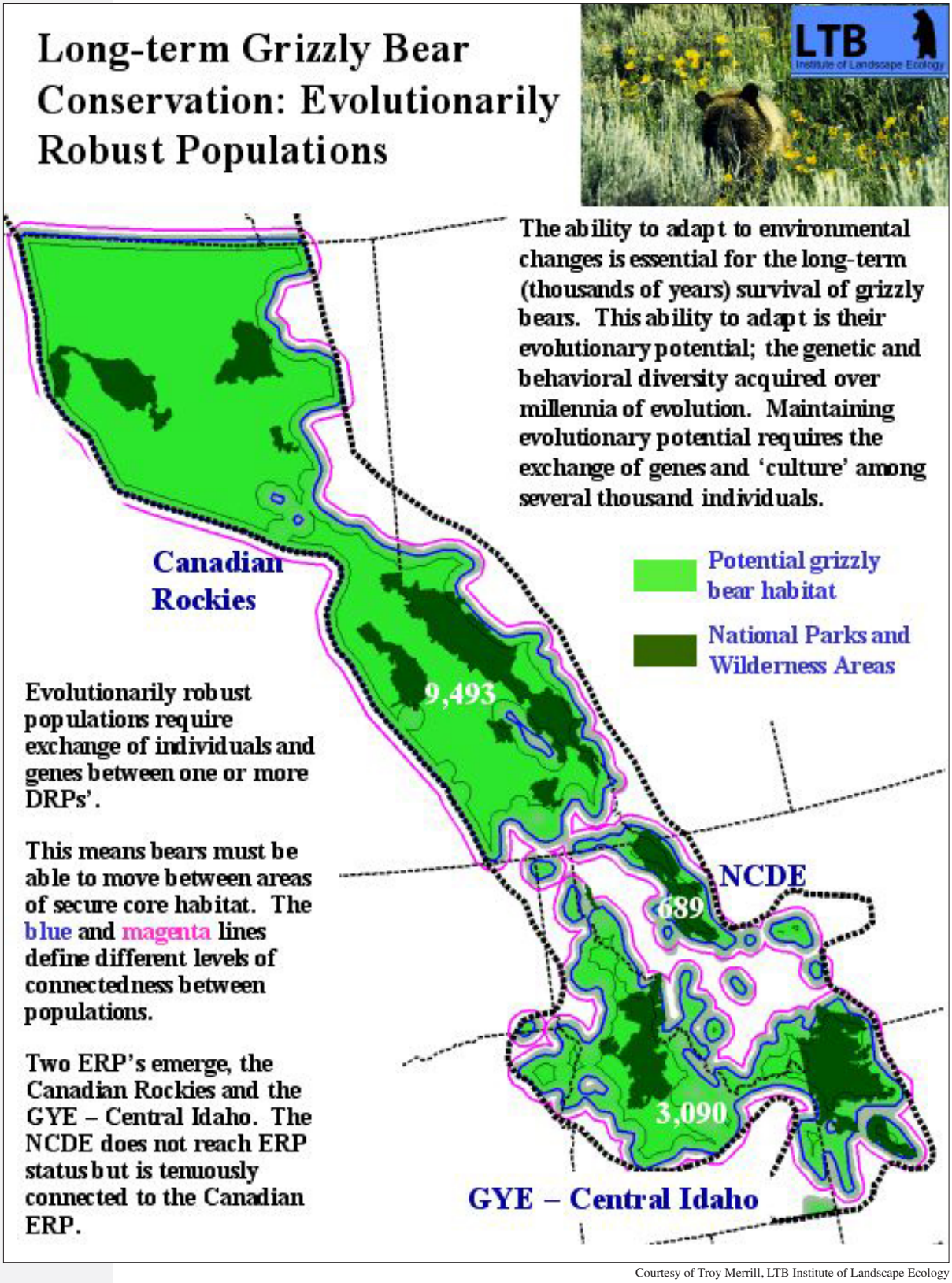
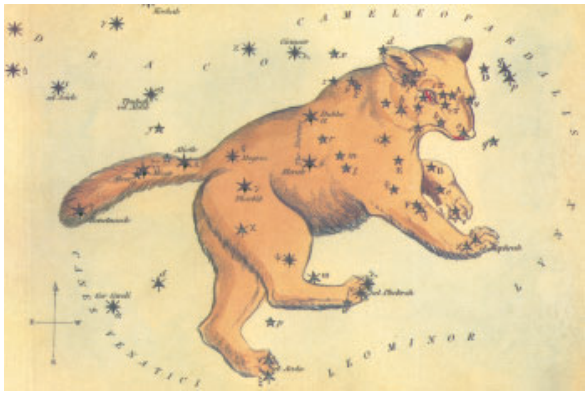


Courtesy of Troy Merrill, LTB Institute of Landscape Ecology

Meaning of the Great Bear

The power of the grizzly reaches beyond its physical strength and sometimes intimidating aspect, to the realm of myth and meaning of the American experience. Its name and body permeate many aspects of today's culture, from toys like the Teddy Bear, sports teams, Disney movies, to the stock market. For many, the grizzly bear is a living symbol of the West, a wilderness symbol of our frontier past. Today, in times of creeping sprawl, asphalt, and congestion, many yearn for the silence and restoration in the audience of wild nature, in untamed landscapes epitomized by the grizzly. The Great Bear too serves as a measure of the integrity of its ecosystems; where grizzlies prosper, other native wildlife species and the human communities that rely upon the land prosper as well.

Grizzlies have played many roles in the company of humans, beginning perhaps as far back as 49,000 years ago, and may have been at the core of the oldest known religion in the world. Throughout human history—until perhaps the last 300-400 years—bears, with their ability to hibernate, have been a symbol of transformation, the ability to move between the worlds of death and life. But, much has changed in a few centuries. The grizzly still holds our collective imagination, but the symbols have evolved, and sometimes now work at cross purposes.



Because of the involvement of the federal government under the authority of the ESA, the bear has become in recent years a battleground between those who support an active role of government in species recovery, and those who wish to rid themselves of governmental controls. To the Forest Service (FS), bears symbolize constraints on activities such as oil and gas development or mining, rather than opportunities for wilderness recreation or spiritual renewal. To the involved state governments, which generate revenues primarily through hunting licenses, bears don't pay their way: thus the states argue for renewing a grizzly hunt. To the federal government, especially in this administration, on the protected list grizzlies symbolize a failure of the act, due to limitations on development and the exercise of private property rights.

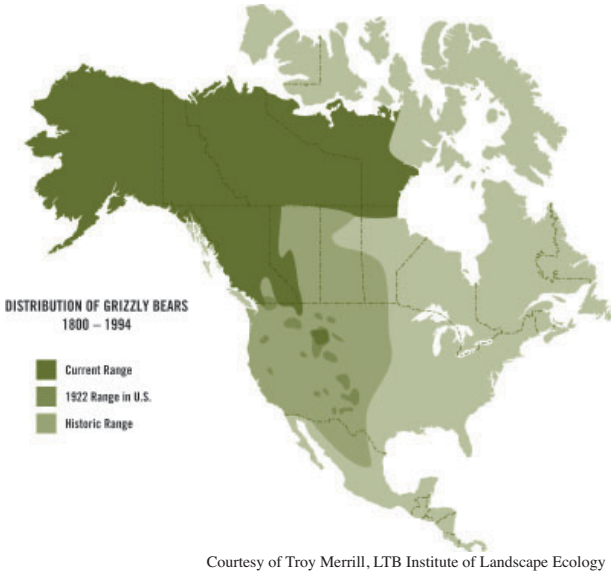
To some sportsmen, bears are an added obstacle to the challenge of hunting elk; to others, they are a part of the thrill of the hunt. To some ranchers, bears present seasonal challenges with livestock, which can be solved with a little ingenuity and knowledge of bear behavior; to other ranchers, they are not tolerated. To some residents they are resented and feared, while to others they are honored as part of the privilege of living in a special place like Yellowstone or Glacier. In some counties like Teton (WY), Gallatin and Park County (MT), they are more or less welcome; in others, such as Fremont, Sublette, Park and Lincoln (WY), they have been prohibited by county resolution.

A scan of recent newspaper articles might suggest that these points of view are evenly divided. They are not. Polls and surveys conducted nationally and regionally, as well as numerous public comment processes on bear policies over the last six years, show consistently that the public overwhelmingly supports bear recovery and expansion of bears into vacant habitat, even in communities on the periphery of grizzly bear ecosystems. Such surveys include Spokesman Review and Forest Service polls on Selway Bitterroot bear recovery, a Wyoming Game and Fish poll on grizzly management in Yellowstone, a poll by Insight Wildlife Management on grizzly recovery in the North Cascades, as well as public comments submitted on the grizzly bear recovery plan, habitat-based criteria for Yellowstone, Yellowstone Conservation Strategy, Selway Bitterroot bear reintroduction EIS, and the Yellowstone state management plans for Idaho, Montana and Wyoming.

WHERE WE ARE AND HOW WE GOT HERE

The grizzly disappeared from much of the American continent in an historic heartbeat, after commanding a place at the top of the food chain from Canada to Mexico, and from the Mississippi River to the California coast, until the arrival of European settlers. Following just three generations of frontiersmen, the Great Bear, which once numbered 50,000-100,000 animals, was eliminated from 98% of its former range in the lower-48 states, and reduced to 1-2% of its former numbers.

Although relatively few in number, settlers in the 1800's came well armed with traps, poisons, guns and a will to dominate the landscape. They settled in productive places such as valley bottoms—the most important habitat for bears and humans alike. Among the fierce creatures of the western frontier, the grizzly was perhaps the most feared and hated of all. What the settlers couldn't kill, federal predator control officials did, hunting down the last of the grizzlies in the 1920's and 30's, in all but a few remote ecosystems.



Courtesy of Troy Merrill, LTB Institute of Landscape Ecology

By the late 1920's when naturalist C. Hart Merriam tallied remaining grizzly bears in the United States, he found only 26 scattered populations, with most declining, and several (including California) down to one lone animal. Grizzlies in the smallest islands winked out first, only surviving in the larger ecosystems such as Yellowstone, or those connected to larger sources populations in Canada.

By the 1950's, with probably fewer than 2,000 bears remaining in six to seven populations, the grizzly's reputation began to change, as the animal became a tourist attraction around Yellowstone dumps. But by then, the alarm bells were ringing. In 1975, concerns about habitat and population numbers prompted the designation by U.S. Fish and Wildlife Service of all lower-48 grizzly populations as threatened under the Endangered Species Act.

SPECIAL STRIKES AGAINST THE BEAR

If you were given the job of creator for a day, and wanted to design an animal that was hard to grow and easy to exterminate, it might well be the grizzly. There are several reasons why: 1.) the grizzly's slow reproductive rate—bears do not sexually mature until they are four or five years old, and then only produce young in small litters, roughly every two to three years; 2.) The young, born blind at 16 ounces, are particularly vulnerable, relying heavily on mother for nutrition and lessons in making a living for the first two years; 3.) Young are sometimes killed by male grown bears; 4.) The grizzly's far-ranging nature and large home ranges, which can be 900 square miles for males, and 450 for females; 5.) Bears eat what we do—a habit which contributes to conflicts in sheep pens, beehives and gardens: and 6.) Bears have a phenomenal memory and live a long time—up to 35 years in the wild. This means that if a bear gets a taste of apples in the fall, he often returns again and again, until transformed into a "nuisance" bear—and subsequently shot.

Perhaps, though, the biggest strike against the bear relates less to ursine biology and behavior, than it does to ours. The fact is that the grizzly represents a miniscule health risk (compared to dog bites,

Continued . . .

lightening strikes and bee stings) is irrelevant to those who fear that they may become dinner. This dread has been with us for thousands of years, and continues to drive today's conflicts. Taken together, these factors—a combination of bear biology and ecology, and human psychology and behavior—mean that it is easier to kill bears than it is to grow them.

In Biological Conservation, author David Ehrenfeld described these special strikes as "those characteristics of animal species that can lower their survival potential. " In developing a hypothetical composite, a "most endangered animal," Ehrenfeld concluded that this was a large predator, "with a narrow habitat tolerance, long gestation period, and few young per litter. It is hunted for a natural product and/or for sport, but it is not subject to Fish and Game management. It has a restricted distribution, but travels across international boundaries. It is intolerant of man, reproduces in aggregates, and has non-adaptive behavioral idiosyncrasies. Although there probably is no such animal, this model, with one or two exceptions, comes very close to being a description of a polar bear"—and pretty close to a grizzly too.

The Numbers


Photo Courtesy of Doug & Pegy Sobey

Today, none of the populations in the U.S. and Alberta can be considered evolutionarily robust because their numbers are far below the threshold of about 2,000 animals. Other populations are also not demographically robust and several are on the brink of extinction.

When the grizzly was first added to the endangered species list, its future was in doubt, even in Glacier and Yellowstone which contained the largest populations. Yellowstone bear numbers have increased slightly from the early 1980's, when the populations may have hit rock bottom (perhaps 200 individuals). Between 300 and 600 grizzlies live in Yellowstone today, occupying more habitat in the wildlands of Wyoming, including the Tetons, southeast Absarokas, and Gros Ventres ranges, than in 1975 when they were listed.

Several of the most recent Yellowstone population analyses demonstrate a strong link between abundance of whitebark pine seeds and population growth. In good years of whitebark pine seeds, the Yellowstone population grows at an estimated 1-7% per year, but in poor whitebark pine seed years, the population declines at similar rates. Reasons include a high fat content of the seeds which are seen as key to female grizzlies' reproductive success, and the location of whitebark pine trees in remote areas away from high numbers of people.

Because ecosystem-wide grizzly counts have not been conducted outside Yellowstone, the estimates for other populations are cruder. In the NCDE, an estimate of 325-425 individuals can be derived using methods in the 1992 grizzly recovery plan. A preliminary DNA hair sampling effort in 2000 in the northern 1/3 of the ecosystem by Kate Kendall showed 234-339 individual bears. Sampling of bears was expanded in 2002 to include the NCDE (south of Canada) using DNA hair analysis and radio telemetry techniques, and is expected to yield a population estimate for the NCDE by 2006.

In the Cabinet Yaak Ecosystem, FWS estimates 20-30 bears, with only perhaps 10-14 bears remaining in the Cabinet Mountain portion, which is increasingly isolated from the Yaak part of the ecosystem.

Several biological opinions by FWS and recent publications show that the population is declining. This close to zero, Cabinet Yaak bears face imminent extinction. And the Selkirks and Cascades may not be far behind. The Selkirks have an estimated 25-36 grizzlies, and the North Cascades have only 5-10 bears in the U.S. portion.

North of the U.S. border, population estimates are even less precise, as they are mostly derived from models evaluating habitat capability, and extrapolated from a few specific studies. In 2003, Alberta scientists recalculated the size of Alberta grizzly populations, concluding that there may be only roughly 500 individuals left in a declining population.

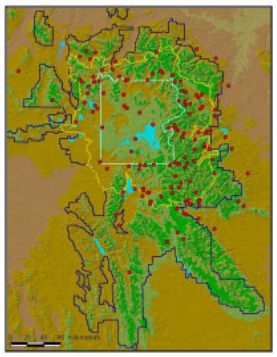
In British Columbia, scientists estimate between 6-20,000 bears. There is general agreement that B.C. grizzly population numbers and habitat are shrinking close to the U.S. border in the Granby/ Kettle, Selkirk, Cabinet Yaak and North Cascades ecosystems. The future of grizzly bears in the latter area is in such jeopardy that the B.C. government is moving to augment the North Cascades population to keep it afloat.

The Killings Fields

Grizzlies die principally because humans kill them. Since the time of listing, the overall rates of killing have declined somewhat, and the causes and the specific locations of human-caused grizzly deaths have changed. For example, bears today rarely are killed inside the national parks due to major sanitation and education efforts, but garbage-related deaths are common outside the parks. Grizzly hunting is no longer allowed in the lower-48 states, but continues today in adjacent ecosystems in Alberta and in British Columbia.

Roughly 10-15 grizzlies are killed each year in the lower-48 states. According to FWS, most human-caused grizzly bear mortalities are preventable. Human-caused mortalities tend to concentrate in certain "black holes" where garbage, livestock and hunting-related conflicts chronically occur. Today, the primary causes of grizzly bear deaths in the (GYE) are grizzly habituation to human foods and refuse (20% of the total human-caused mortality 1980-2002), and big game hunters (nearly 17% of the total human-caused mortality 1980-2002). And, in the NCDE, habituation accounts for almost 20% of all grizzly mortalities 1990-2001. Here 60% of all grizzlies mortalities occur on 16% of the ecosystem, which are in private ownership—and most of these relate to handling of garbage and other bear attractants. Very few bears are killed each year in the Cabinet Yaak and Selkirks, because these populations are so small; but an average of 2 bears have been killed every year for the last three years in the Canadian portion of these ecosystems.

Distribution of known and probable human-caused mortalities, and mortalities from undetermined cause during 1994-2003.



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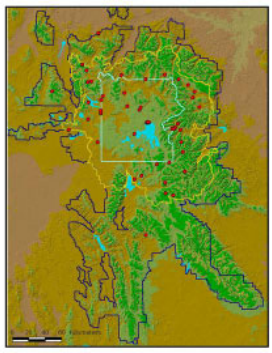
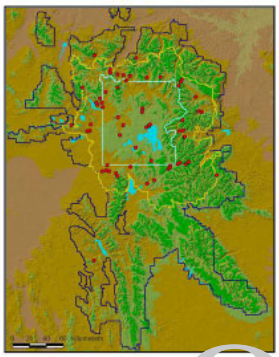
Distribution of known and probable human-caused mortalities, and mortalities from undetermined cause during 1984-93.



IGBST

Distribution of known and probable human-caused mortalities, and mortalities from undetermined cause during 1975-83.



IGBST

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HABITAT LOSS

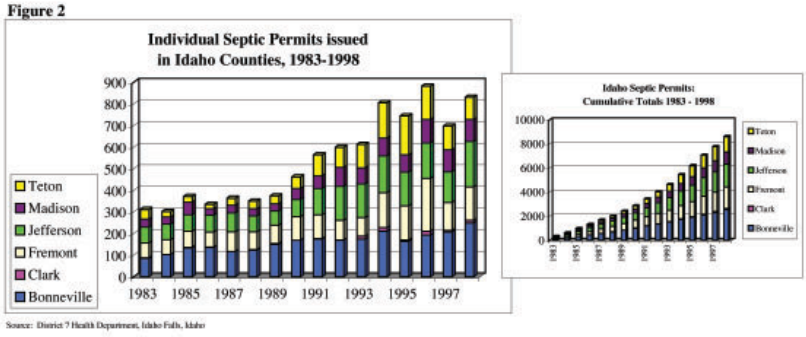
In 1975, 1,000 grizzlies were estimated to remain in the lower-48 states in five ecosystems. Scientists have found that grizzly populations with the greatest prospects of long-term viability occupy large ecosystems (20,000 km≤ or 7700 square miles) which are at least 50% roadless. All remaining ecosystems have lost considerable amounts of roadless secure habitat since the time of listing. The smallest of all remaining grizzly ecosystems, the Cabinet Yaak and Selkirks are the worst, now reduced to half or slightly more than half of the size of ecosystems where bears have tended to disappear historically.

HUMAN GROWTH AND RURAL SPRAWL

Since listing, human population in grizzly ecosystems has rapidly increased. For example, between 1970-2000, a Sonoran Institute report showed that human population in the GYE grew by 141,621 people, an increase of 61%, compared to 38% growth nationally. Of particular concern is growth in the GYE, which has been isolated from other grizzly bear ecosystems for the longest period of time. A report published in 1998 by the Sierra Club shows mounting development in the 20 counties encompassing the Greater Yellowstone Ecosystem. Development is concentrated in important wildlife habitat, particularly along streams, adjacent to public lands and away from towns. The most rapid growth is occurring in key bear habitat in Gallatin and Madison Counties, Montana; Bonneville, Fremont, Jefferson and Teton County, Idaho; and Lincoln County, Park and Teton County, Wyoming. Several of these counties, particularly Gallatin and Madison in Montana, and Fremont and Teton counties in Idaho, are especially important to connecting Yellowstone grizzlies to other populations, including the Selway/Bitterroot Ecosystem.

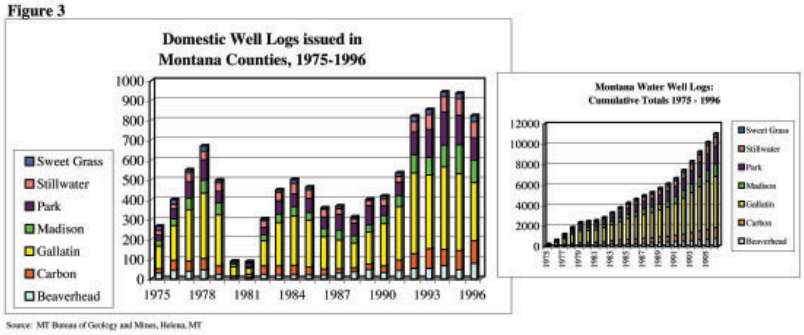
In "Paving over Paradise, a study of rural growth in the borderlands of Yellowstone Park", published in 2002 by Montana State University and Park County Environmental Council, researchers found that between Livingston and Gardiner, from 1969-1999 the number of housing units in the valley doubled every 10 years. A similar study by the Sonoran Institute showed human population doubling every 7 years in Teton County, Idaho. The Flathead area of the NCDE and the Cabinet Yaak and Selkirks ecosystems are experiencing similar rates of growth.

Figure 2



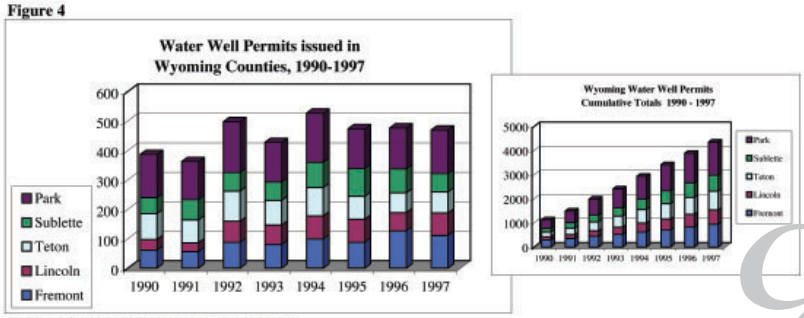
Source: District 7 Health Department, Idaho Falls, Idaho

Figure 3



Source: MT Bureau of Geology and Mines, Helena, MT

Figure 4



Source: Wyoming State Engineer's Office, Ground Water Division, Cheyenne, WY

Vanessa Johnson, 1998

Logging and Road-building

National forest road building and logging increased in grizzly habitat, particularly through the 1980's. More then 120,000 acres of roadless secure habitat was clear-cut in the NCDE, and 280,500 acres were cut and roaded in the Cabinet Yaak Ecosystem. On the Targhee and Gallatin Forests near Yellowstone, hundred of thousands of acres were clear-cut and roaded since 1975, resulting in the elimination of breeding females from several bear management units. Today, parts of four bear management units in Yellowstone violate habitat effectiveness standards in the Conservation Strategy as a result of excessive historic logging and roading.

Vacant Habitat


Photo Courtesy of Greater Yellowstone Coalition

Analysis by Dr. David Mattson and Troy Merrill shows that much suitable habitat in the U.S. and transboundary area along the 49th parallel is either completely unoccupied by bears, or contain far fewer bears then these lands can support. Of particular importance is the Selway Bitterroot ecosystem, which could sustain 400-600 bears, boosting grizzly recovery significantly in the lower-48 states, and providing a bridge from Yellowstone to Canadian source populations. In 1999, scientist Mark Boyce also concluded that recovery of grizzlies in the Bitterroot would greatly diminish the probability of grizzly bear extinction in the lower-48 states.

In contrast to wolf recovery efforts, work to reintroduce grizzly bears in suitable habitat has not proven to be successful. In the early 1990's, the federal government released four grizzlies in the Cabinet Yaak Ecosystem, as a result of concerns over the small size of the population and likelihood of extinction. Not one of these grizzlies is known to live to this day. (FWS and others are conducting DNA research to see if the introduced bears contributed to the gene pool in the area).

Another failed attempt involves the Selway Bitterroot ecosystem, where the grizzly had been largely eliminated in the ecosystem by the early part of the 20th century. After an extensive analysis and public comment process, FWS had planned to reintroduce five grizzlies in the Selway Bitterroot wilderness every year for five years beginning in 2002. Despite the fact that 98% of the public comments received by the government supported grizzly recovery in the area, the Bush Administration has refused to proceed with reintroduction. The principle cause was Idaho Governor Dirk Kempthorne, who pledged a state litigation war chest of over $1 million to prevent grizzly bear reintroduction, with the pronouncement: "I oppose bringing these massive flesh-eating carnivores into Idaho." Although the project is now on political ice, there is no reason to believe that bears could not be successfully recovered there in the future, if bears and bear habitat is adequately protected.

In the meantime, bears have been able to successfully recolonize formerly vacant wildland habitat on their own, in the southeast Absarokas and Tetons in Wyoming, the Gravellies in Montana, and along the Rocky Mountain Front east of Glacier. Experts believe these trends will continue if people are tolerant of bears and if development activities are limited.

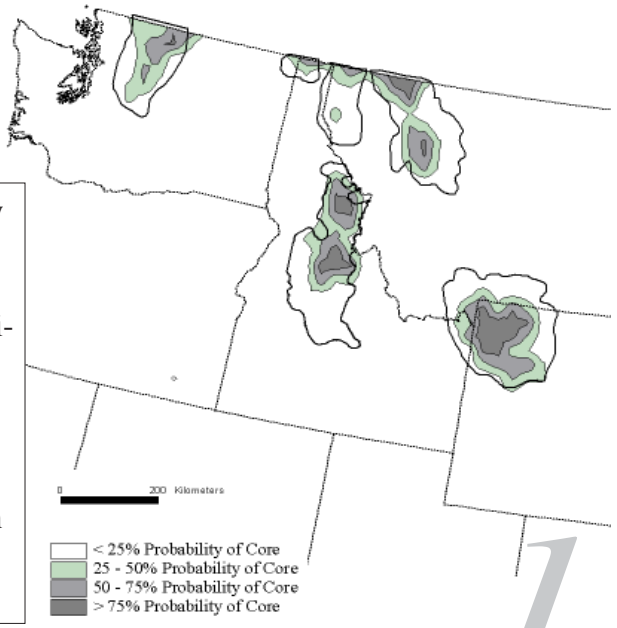
Grizzly's Safety Net: The Role of the Endangered Species Act

There is little dispute about the fact that the grizzly would not likely have remained in the lower-48 states but for the protections afforded by the Endangered Species Act (ESA). Although implementation has been at times far from perfect, many positive steps were taken, such as stopping grizzly bear hunting, and improving garbage management and some land management practices. Together, these actions have resulted in more grizzlies over a larger area today than were predicted if pre-ESA mortality rates continued. Although this does not mean that grizzly populations are viable in the long term, at least they are still here.

The parts of the ESA that have been most important to the survival of the grizzlies are Sections 7 and 9. Section 7 requires that agencies take a hard look at potential impacts before undertaking federal activities that may harm grizzlies, and do not jeopardize the continued existence of a population. Accomplishments achieved under Section 7 include the following: 1.) a phase-out of camping facilities near Fishing Bridge in Yellowstone, so as to reduce human-bear conflict; 2.) reductions in logging and roading on the Flathead, Gallatin and Targhee Forests; and 3.) prohibition of a new ski area from being built near Hebgen Lake, part of the best ecological connection between Greater Yellowstone and the Selway Bitterroot Ecosystem further west.

Section 9 prohibits illegal "take" of protected animals, which means not only direct killing, but also harassment. Although the effectiveness of Section 9's deterrent power is hard to measure, most believe that it has probably reduced poaching and illegal killing. Courts have found, too, that habitat destruction can constitute an illegal "take" of grizzlies. In combination with Sections 7, Section 9 has helped improve federal land management, particularly regarding road-building and clear-cutting. Specifically, the Flathead has closed 778 miles of roads and the Targhee Forest over 300 miles to restore bear habitat, following successful litigation under Section 7 and 9. It is important to note that many successes for the bear would not have happened but for these ESA provisions, as well as citizen access to the courts.

Another important benefit of the ESA was the research and monitoring that followed listing. Over the years, this work has improved the understanding of bear habitat relationships, population structure, dynamics and behavior, and human impacts. And with funding through Section 6 of the Endangered Species Act, the states were able to expand their monitoring and research programs as well. Taken together, this research underscored the importance of managing for bears on an ecosystem-wide scale, rather than focusing on individual animals or parcels of land.



The Endangered Species Act enables grizzly bears to survive in more places across the U.S. In this map, the areas shown in shades of gray represent the percentage of probabilities where we would expect grizzly bears to survive if humans killed bears at the same rate now as they did in the past. The solid black lines indicate currently where bears can survive because the ESA and changes in human attitudes have reduced the rate that humans kill bears.

Information Provided by Troy Merrill, LTB Institute of Landscape Ecology

The Challenges Ahead. . .

Grizzly habitat continues to disappear rapidly. The most important expected change relates to the number of people living and recreating in the Northern Rockies, where the population is expected to double by 2025, in part due to the landscape's high amenity values. In Sierra Club's 1998 report, planning professionals projected little to no decline in current development levels. One Montana planner noted that given the status quo and development regulation, the inevitable result would be a "peanut butter smear of low density, inefficient development" across the landscape.

Considering these trends, recent analysis for the World Wildlife Fund Canada, Carlos Carroll, Reed Noss and Paul Paquet showed that over the next 25 years in the Yellowstone to Yukon region, the landscape will have lost 15% of its ability to support six species of carnivores. David Mattson and Troy Merrill also predict that core grizzly bear habitat will be reduced significantly in Yellowstone and the NCDE, which will be further isolated, perhaps permanently, from each other. If current trends continue, all core habitat in the Yaak would likely disappear, as well as connectivity of these Selkirks and Cabinet Yaak to Canadian sources populations—spelling extinction for these border populations.

Exacerbating these problems is the decline of Alberta's grizzly population just north of the U.S. Canada border. That would further isolate remaining bear populations. And, continued population growth in Canada especially along the 49th parallel as well as the expansion of major east-west highways such as the Trans Canada Highway and Highway 3, could permanently isolate populations in the lower-48 states.

Energy Development


Photo Courtesy of Philip M. Hocker

Recently developed technologies and current federal policies have reinvigorated the interest of energy corporations in the region. At stake are over five million acres of habitat in and around the Greater Yellowstone Ecosystem, especially in Wyoming, and hundreds of thousand of acres along Montana's Rocky Mountain Front, adjacent lands in Alberta, and the Flathead Valley in British Columbia. The pressure to develop these lands is enormous. For example, in a 2003 survey of EPA employees in the Rocky Mountain region, respondents said that the agency faces unprecedented political pressure from Bush administration; more than half of the respondents said that the President's energy plan and other administration initiatives have become more "important" than environmental protection. One respondent stated that "in the trenches at EPA both junior and senior staff see science as becoming secondary to servicing industry, especially the energy industry." (#4)

Park Use

Since the time of listing, park use and recreational pressure on the shoulder seasons of spring and fall have also increased. While visitors numbered 2.2 million annually in 1975, use has increased to 3.02 million in 2003 according to Yellowstone Park officials. Park use is expected to continue to rise.

Continued . . .

Motorized Vehicle Use

All-terrain-vehicle (ATV) use has grown to be a problem for the grizzly as well as many other wildlife species in the region. Former Forest Service Chief Mike Dombek has called off-road-vehicle (ORV) use the most significant threat to natural resources in the region. According to Forest Service reports, ORV use in the United States increased more than 150% between 1990 and 1998. And during this time, the number of states registered ORV's and motorcycles in Montana more than doubled. Yet, thus far, the Forest Service has done little to monitor use on public lands. Nonetheless, the abundant studies on roads shed important light on ATV impacts on bears; in a recent settlement of a court case on the Gallatin Forest, the Forest Service conceded that this significant recent use must be evaluated for impacts on grizzlies.

Threats from all terrain vehicles are not limited to the U.S.: for example, ATV registrations have increased 6.2 times between 1987 and 2003 in Lethbridge, near Waterton Park, and ATVs are now common in grizzly habitat. In addition, snowmobile use in the region has also been escalating. Although snowmobiles were originally thought not to impact bears, they are using bear habitat later and later in the springtime—until July in some areas—four months after bear's emergence from their dens.


Photo Courtesy of Tim Stevens

Fickle Foods

New factors, such as introduced diseases are also taking a toll on key bear foods in Yellowstone. Of particular concern is the introduction of Lake trout and whirling disease around Yellowstone Lake that could adversely affect the future of the cutthroat trout, used by over 80 grizzlies on Yellowstone Lake tributaries. Lake trout have already been found to reduce the number of cutthroat around such areas as West Thumb; and whirling disease has adversely affected trout in some tributaries to Yellowstone Lake.

Also, the spread of white pine blister rust in whitebark pine and the mountain pine beetle is threatening this key fall food source for bears. In addition, global warming is anticipated to significantly change the character of the landscape in grizzly bear ecosystems over the upcoming decades, reducing the abundance of key foods such as whitebark pine and army cutworm moths by possibly as much as 90%-95%.


Photo Courtesy of Jeff Henry

In addition, the specter of brucellosis infecting domestic cattle from wild bison has fueled the killing frenzy currently underway for bison that roam into Montana; this winter over 500 animals have been removed from a population of 4,000. Scientists in Yellowstone Park have said that a long-term reduction of bison could set back recovery of the grizzly. Additional diseases and introduced species could also cause harm to key bear foods. These include chronic wasting disease, which could lower elk and deer numbers in the GYE, and New Zealand mud snails, recently discovered in Yellowstone Park, which could reduce essential foods for fish.

Loss of Genetic Diversity

The remaining populations in the lower-48 states, particularly Yellowstone, are remnant islands. The Yellowstone population has less genetic variation than is found in any other known island population in North America. Grizzlies in Yellowstone have lost 15-20% of their genetic variability over the last 100 years of isolation, according to Petkau and others. Expected continuing loss of diversity is in the range of 1-4% per generation. In breeding depression could reduce long-term viability and exacerbate problems of population declines stemming from food loss, habitat loss and human conflicts.

According to researchers Lisette Waites and Craig Miller, a Yellowstone population of 1850 grizzlies is needed to maintain long-term genetic potential and reduce the effects of inbreeding. Such numbers could only be achieved by expanding and connecting Yellowstone to other grizzly ecosystems.

Yet, under the state management plans that would take effect after delisting, further expansion of the grizzly population beyond its current distribution is unlikely, especially in Idaho, where politicians have stated that bears will not be allowed outside the current recovery zone. Post-delisting policies of killing "nuisance" bears will also likely limit bear survival on the ecosystem's periphery, and reinforce the population's current isolation.

Transboundary Ecosystem Management

Presently there are few mechanisms to address transboundary grizzly bear management challenges between Alberta, British Columbia, Montana, Idaho and Washington. While grizzlies are protected as threatened in the U.S., they are not protected in Canada, where hunting continues and legal killing is commonplace. Thus, threatened U.S. bears are often killed when they wander into Canada. Furthermore, habitat protections differ sharply between jurisdictions. Adjacent to habitat managed as wilderness in the U.S. portion of the Selkirks, lie clear-cuts along the Canadian border. Road and access management approaches differ markedly on both sides of the border, despite the fact that the relevant research was conducted both in U.S. and Canada grizzly ecosystems. For the most part, forest practices and park protections standards are far weaker in Canada, where the bear is not protected under the Canadian version of the ESA, the Species at Risk Act.

A weak attempt to coordinate between management of bears between agencies has been made through the Interagency Grizzly Bear Committee. To date, coordination has primarily taken the form of reporting, and has not demonstratively improved management. For example, such coordination has done nothing to promote transboundary recovery of grizzlies in the North Cascades Ecosystems. Although B.C. government has attempted to move forward with augmentation to improve the prospects of grizzly recovery, FWS has yet to begin a process to recover bears on the U.S. side of the border.

Shortcomings in Law Enforcement

Driving the ongoing high levels of grizzly mortality and incremental loss of habitat is a failure to fully implement existing laws and policies. The level of commitment and leadership within management agencies is a problem, as well as the adequacy of funding for law enforcement and monitoring. Resources for law enforcement are expected to decline further after delisting.

Continued . . .

The Justice Department has not been aggressive about prosecuting cases involving malicious killings; for example, in Yellowstone since 1990, poachers have been convicted in 3 cases in Wyoming and one in Montana by the federal government out of a total 20+ malicious illegal killings. Furthermore, law enforcement staff is shrinking; due to budget cuts the Bridger Teton, for example, only has only two law enforcement staff on a forest of over 3.6 million acres.

In a 1998 survey by Public Employees for Environmental Responsibility (PEER) of FWS special agents, 64% strongly disagreed and 34% disagreed that expenditures and staffing in law enforcement have kept pace with the needs of wildlife protection. In the same survey, 60% of respondents described the agency's effectiveness in protecting wildlife as weak or very weak, and 77% of respondents did not believe that FWS supports the wildlife program. This problem has worsened recently, as many managers have come to believe that Yellowstone delisting is imminent, so carrying out protection policies is less urgent.

In addition, the Forest Service's implementation of existing road/access standards is uneven at best, and inadequate at worst. Signs of the anti-government culture of many ATV users are the frequent means that many violations of road closures to protect wildlife. For example, in 2004 the Greater Yellowstone Coalition found that on the Targhee Forest, allowable total and open road density standards were exceeded by twice the levels allowed in the forest plan, as a result of gates being broken and circumvented.

Furthermore, the Forest Service continues to allow key bear habitat inside legislatively protected Wilderness and Wilderness Study Areas to be degraded by routine illegal incursions of snowmobiles and/or ATV's, especially in the Beartooths in Montana, the Gallatin Range in Montana and Jedediah Smith Wilderness in eastern Idaho.

In Canada, outside its national parks, law enforcement is stretched even thinner than in the U.S. And, Canadian budgets have recently suffered as well, with severe cutbacks in resource management in both provinces. A 2004 report by West Coast Environmental Land in B.C., for example, showed a 30% reduction in the number of conservation officers, responsible for enforcement of wildlife laws between 2000 and 2003. Further cutbacks are expected in both countries.

Money Woes

Grizzly conservation and management is expensive and costs are rising. As of 2001, the government spent $1.6 million annually on grizzly research and monitoring, education and habitat management. And expenses will continue to grow; for example, the recently promulgated Conservation Strategy for Yellowstone calls for an additional $1 million above current levels after delisting. And, an assessment of grizzly needs that have not been met are estimated at an additional $2 million annually, above current costs.

Federal land management budgets are increasingly tight and the state governmental officials have said they cannot or will not shoulder additional costs for grizzly management. After delisting, states will also lose current federal funding for grizzlies under Section 6 of the ESA. The states do not have a plan to replace these funds. Ideas such as establishing a conservation endowment trust funded by Congress for monitoring, research and education appear unlikely. How agencies will pay for increased future costs of grizzly management is not clear.

An Alternative Path: Some Practical Steps

Protect Secure Habitat

Given the isolation and fragmentation of habitat in the past, all remaining secure habitat must be protected. This would go a long way to protecting habitat where bears could expand and connect to other ecosystems. All inventoried roadless areas on BLM and Forest Service lands, and all roadless land in adjacent grizzly ecosystems in Canada should be maintained in a roadless condition. And the agencies should also protect roadless areas less then 5000 acres in size which are adjacent to existing wilderness areas and parks.

Restore Degraded Habitat

In some currently occupied or potential habitat, the landscape has become so lethal or the habitat so fragmented that bears can not successfully move from one core area to another. In such cases, it will be necessary to restore habitat and/or to lower rates of human-caused mortality, by obliteration and closure of roads and high use trails, and eliminating domestic sheep.

Reduce Human-Caused Mortality

More needs to be done to reduce preventable bear mortality by improving human behavior, such as handling of garbage and other attractants, hunting practices, and management of livestock allotments, especially in lands connecting ecosystems and in areas where bears are recolonizing.

1.) Develop a system to promote learning by experience, and a team approach to resolving bear-human conflicts. Significant successes with garbage management have been achieved in the past few years through a shared approach involving agencies, citizens, non-governmental organizations and scientists. These successes can be expanded upon, but only if the government avoids "command and control" approaches

2.) Expand Forest Service food storage/sanitation program. Of particular importance are: a) ecosystems where the populations are so close to extinction, such as the Selkirks, where no mandatory food storage rules presently exist; b) Currently occupied habitat outside the purview of existing food storage policies; and c.) potential linkage zones between ecosystems, and areas where bear area expanding.

Photo Courtesy of Doug & Pegy Sobey

Photo Courtesy of Zöoprax Productions

Continued . . .

Promote Stewardship and Protection of Private Lands

1.) Identify and prioritize current occupied and potential habitat for grizzly recovery on private lands. Such analysis could help prioritize lands for easement acquisition and purchase, on a willing seller/willing buyer basis.

2.) Monitor bear use of private land. A comprehensive monitoring program, and sanitation and conflict resolution efforts designed to involve interested landowners in assessing what grizzlies are doing seasonally and why, could help anticipate and resolve problems.

3.) Share information on habitat and bear use. One of the major challenges facing grizzly conservation on private lands in the balkanization of data among resource management agencies, private lands conservation groups, local governments and others. We encourage the sharing of information and ideas relevant to protection of critical land parcels, and to resolving human-bear conflicts.

4.) Enact county garbage ordinances. We recommend that each county in grizzly bear habitat develop legally enforceable mechanisms to prevent habituation to garbage. Recognizing that there can be a considerable cost to changing garbage management regimes to ones that are bear resistant, we recommend collaborative fundraising and planning efforts with agencies to assist communities in the transition process.

5.) Correlate private land growth patterns to adjacent public land management. Protection and restoration on public lands may need to increase to compensate for the loss of private land habitat due to development. We recommend the development of a system to evaluate grizzly habitat needs at the home range scale, and provide ways to make up for the loss of private lands due to development, by improving habitat quality on nearby public lands.

Photo Courtesy of Doug & Pegy Sobey

Develop New Framework for Transboundary Grizzly Management

1.) Develop grizzly population and habitat targets and management standards for all border populations, emphasizing protection, maintenance and restoration of lands between grizzly ecosystems.
2.) Develop and implement citizen involvement and educational initiatives designed to show the transboundary nature of grizzly habitat needs, and the importance of problem-solving in a transboundary context.
3.) Institute a system to compile ecosystem-wide mortality and human-bear conflict information which can be used to prioritize problem-solving efforts.
4.) Provide incentives for community leadership development, emphasizing small-scale projects to provide learning opportunities, and work with targeted constituencies, (e.s., such as residents, sportsmen and recreationists) on non-lethal deterrent methods and sanitation measures.
5.) Create a transboundary bear recovery process among agencies, non-governmental organizations and other interested parties, aimed at protecting habitat, reducing human bear conflicts, sharing information, and recognizing that what works to resolve problems on one side of the border may not work on the other.
6.) Develop augmentation programs, where needed, to improve the prospects for connecting grizzly populations, while avoiding harm to source populations used for such augmentation programs.

Improve Recovery Program with Broader Public Participation

1.) Create a recovery team, which includes representatives of non-governmental organizations.
2.) Address issues associated with uncertainties in habitat and population numbers, and their short and long-term consequences.
3.) Open all aspects of the recovery program including underlying assumptions to scrutiny and comment by the public, and develop new and constructive mechanisms to engage the public in resolving conflicts with bears.
4.) Enlist the involvement of independent scientists, as recommended by the National Academy of Sciences, to participate in a thorough review of the scientific underpinnings of the grizzly bear recovery plan and related policies.
5.) Develop long-term sustainable funding sources to ensure implementation of the recovery program.
6.) Develop specific guidelines and criteria for monitoring and measuring the success and failure of implementation of recovery program, as recommended by the Society for Conservation Biology.
7.) Provide clear measurable thresholds to trigger changes in course to respond to future conditions.
8.) Expand efforts to prosecute poaching cases, and to ensurethat habitat and sanitation standards are implemented. In some cases, new agreements between state and federal law enforcement agencies will be needed to enforce road closures and other habitat measures.

Photo Courtesy of Florian Schulz

Conclusion

Implementing this plan will rely on collective knowledge, a willingness to learn, and more open communications and relationships between citizens, conservationists and governments to accomplish what none can do alone: create a safe and sustainable future for the bear and the communities that depend on its ecosystems. It demands reengaging a public that is increasingly wary the government and the rules that come with the bear. And, it requires thinking and acting in short and long-term time frames, and at multiple scales. Thus, working on small-scale community sanitation projects is no less important than large-scale restoration of habitat across the U.S./Canada border.

Perhaps most importantly, it relies on a sense of humility, recognizing that there is much we still do not know. And the world continues to surprise us. Who would have predicted 20 years ago, for example, such profound events as the introduction of Lake trout into Yellowstone Lake, the spread of white pine blister rust, or the emergence of all terrain vehicles as one of the most significant threats to public lands? Because the future is so uncertain, we chose a conservative course to hedge our bets—a direction justified for populations down to the last 1% of former numbers.

The window of opportunity is closing fast on our remaining grizzlies. But the practical steps outlined here are well within our reach, good for the bear and the region's economy, and future of wilderness in the West. If we fail to seize the moment, and lose the grizzly in the lower-48 states, will future generations forgive us?

Photo Courtesy of Florian Schulz

List of Appendices

Appendix A

Recommendations by Ecosystem

Greater Yellowstone Ecosystem

1.) Promote recolonization of vacant habitat in the Wind Rivers, Palisades, southeast Absarokas and Owl Creeks, and the Centennials and nearby Gravellies, Snowcrest and Tobacco Root ranges.
2.) Prohibit energy development on public land in Greater Yellowstone Ecosystem in suitable bear habitat.
3.) Limit roads and ATV use using the best available science, to protect core grizzly bear habitat, and connections between core areas.
4.) Phase out domestic sheep allotments.
5.) Explore new ways to engage the public in resolving conflicts in communities and elk hunting areas.

Northern Continental Divide Ecosystem

1.) Prohibit new energy development along the Rocky Mountain Front, adjacent areas in the Castle Crown and in the Flathead Valley in B.C.
2.) Promote private lands protections among NGO's, the state of Montana and Plum Creek.
3.) Protect the Castle Crown area as a provincial park.
4.) Protect the Flathead (B.C.), reestablishing it as part of Waterton Park and new wildlife management areas.
5.) Prohibit the paving of the North Fork of the Flathead road.

Selway Bitterroot

1.) Augment the population under full ESA protections.
2.) Maintain transitional habitat between the Greater Yellowstone Ecosystem and Selway/ Bitterroot, as well as that to the north to the Purcell's.

Selkirks, Cabinet/Yaak, Purcells

1.) Prohibit development of the Rock Creek Mine.
2.) Revise the Forest Service access and other standards, so as to protect all remaining core habitat and restore degraded habitat to increase grizzly numbers, using the best available science, to 300 animals in the Selkirk and Cabinet Yaak.
3.) Protect all remaining wild country on both sides of the border.
4.) Establish priority grizzly management areas recommended in B.C.'s Conservation Strategy.
5.) Stop the B.C. grizzly hunt.

Central Rockies, Canada

1.) Protect the Bighorn area and other key foothills habitat.
2.) Stop the sport hunt in B.C. and Alberta.
3.) Mitigate the impacts, as possible, from the Trans Canada Highway and railroad for grizzlies and other wildlife.
4.) Expand bear and habitat monitoring programs, which have been shrinking in recent years.
5.) Protect and restore degraded habitat in Alberta, placing priority on foothills habitat.

APPENDIX B

WHY YELLOWSTONE GRIZZLIES SHOULD NOT BE DELISTED

Conservationists are opposed to premature removal of ESA protections, because of habitat protections are inadequate and development pressures are mounting. Until the grizzlies have increased in numbers, occupying all available suitable habitat, and have been successfully reconnected to the populations in Selway Bitterroot and Canada, the population should not be considered recovered.

Other concerns include the following:

1.) Delisting will remove the "look before you leap" requirements of the ESA, facilitating development over concerns about the grizzly and habitat needs.
2.) The states are more vulnerable to pressure from corporations and local politicians. For example, the state of Wyoming has allowed the county governments in Fremont, Sublette, Lincoln and Park counties to pass ordinances prohibiting the presence of bears in these counties. After delisting, the counties would have a greater say in day-to-day management of grizzlies.
3.) The states lack the resources to manage the grizzly after delisting. The Conservation Strategy calls for an additional $1 million per year above current levels after delisting for implementation of the strategy. How these funds will be generated is not clear.
4.) Bear are not protected in their current range, or in habitat which is suitable for bear occupancy. The grizzly is only protected (partially) in an artificially small recovery zone, and not in the entire range it occupies at the current time. Habitat outside this zone is under increasing pressure from private land and energy development.
5.) The delisting plan authorizes a grizzly hunt, which is not justified based on current population numbers, and could lead to excessive mortalities.
6.) Delisting plans lack a system of ensuring mid-course corrections, to respond to changes in environment or habitat quality. Without such a system, due to lag times inherent in bear biology, habitat could be lost after it is too late to correct, but before such losses show up in mortality levels.
7.) If bear numbers plummet after delisting, there is little chance of relisting the bear, partly because the trigger mechanisms for status reviews and relisting in the Conservation Strategy are discretionary and vague. Further, the Bush administration has successfully avoided listing a single species voluntarily, despite a backlog of thousands of species which are in danger of extinction. Litigation to relist is likely to be time consuming, possibly proving to be too little, too late.

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