

Grizzly Bears

in the Northern Continental Divide Ecosystem



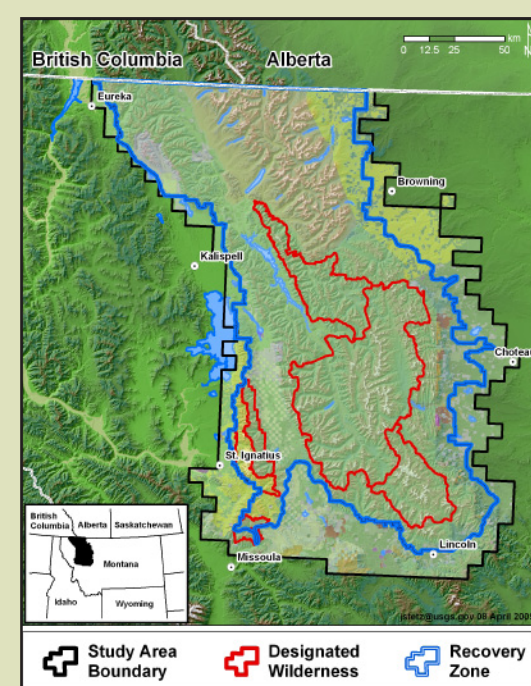
An Endangered Icon

Imagine spotting a grizzly bear ambling near a saguaro cactus in the arid deserts of the southwest or investigating an ant hill under a redwood tree in the lush rainforests of northern California. In the U.S., it's hard to believe grizzly bears have ever lived anywhere but the wild lands of Alaska and the northern Rockies. Surprisingly, it was not so long ago when these large omnivores existed in a variety of habitats throughout the western half of the continent.

Habitat loss, fragmentation and degradation, along with human caused mortality have resulted in a drastic decline in grizzly bear numbers in North America. Today, these iconic predators are restricted to only 2% of their historic range within the continental United States and are currently listed as "threatened" under the Endangered Species Act.

The Northern Continental Divide Ecosystem (NCDE), an eight million-acre mountain landscape in the northwest corner of Montana, constitutes a large portion of the current 2%, making it one of the few areas where grizzly bears still roam.

Understanding bear population densities and trends can be challenging considering how mountainous, heavily forested and remote the lands of the NCDE are. Fortunately, new scientific techniques and interagency cooperation are changing our understanding of the status of grizzly bears. Past and current research is providing wildlife managers with critical pieces of information to not only recover but ensure the survival of grizzly bear populations in this region.



The Northern Continental Divide Ecosystem encompasses nearly 8 million acres of federal, state, tribal and private land in the northern Rockies, stretching from Missoula to the Canadian border. This ecosystem includes a national park, three national forests and four designated wilderness areas.

For More Information

Website Links
Flathead National Forest Home Page:
www.fs.fed.us/r1/flathead

Glacier National Park Home Page:
www.nps.gov/glac

Crown of the Continent Research Learning Center:
www.nps.gov/glac/naturescience/ccrlc.htm

Northern Divide Grizzly Bear Project:
www.nrmssc.usgs.gov/research/NCDEbeardna.htm

Montana Fish, Wildlife and Parks
fwp.mt.gov/wildthings

US Fish & Wildlife Service, Endangered Species:
www.fws.gov/endangered

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The survival of grizzly bears in the Northern Continental Divide Ecosystem depends upon our understanding of how and where they live and the choices we make in helping them remain here.

Grizzly Bears in the Northern Continental Divide

While much is known about bear behavior — countless wildlife documentaries are available highlighting a grizzly bear's life cycle, diet, and habitat preferences — there are still factors of a bear's life we don't understand. But, in terms of managing bears, in addition to knowledge of bear ecology, it is critical to determine the number of bears in a given ecosystem and understand if that number is increasing, decreasing, or remaining stable.

The mountainous and forested terrain of the Northern Continental Divide Ecosystem makes counting, or even finding grizzly bears challenging. Also, distinguishing between sexes can be difficult if cubs are absent. However, recent advances in genetic testing make it possible to extract a DNA fingerprint from bear hair samples, giving scientists the ability to identify the species and sex of the animal the sample came from. It even allows them to identify the individual animal from which the sample originated. This powerful technique offers a new, less invasive, way to study bear populations and provides federal, state, and tribal agencies with much needed information to manage grizzly bear populations.

In 1998, several government agencies and private donors provided funding to the U.S. Geological Survey (USGS) to conduct a population estimate using the new DNA-based identification method. USGS scientists collected hair from bear rubs (trees or posts that bears use to scratch or "rub" their back) located along trails and roads and from baited hair snag stations systematically placed across the ecosystem. Researchers studied the bear population from 1998 to 2000 on two million acres in and around Glacier National Park, covering 13% of the NCDE thought to contain the highest density of bears in the region.

In 2004, a new study began, funding by Congress, that included 7.8 million acres within the Northern Continental Divide. A staggering 34,000 hair samples were gathered that summer from selected locations and natural occurring tree rubs throughout the study area. The results of the project, released in the fall of 2008, provided managers with baseline estimates of both abundance and distribution of grizzly bears in the NCDE.

Through the use of genetic analysis on collected hair samples, researchers were able to determine that an estimated 765 grizzly bears make their home in the Northern Continental Divide. Of those 765, researchers estimate 470 bears are females. Female bears were also found throughout the entire study area, indicating a good reproductive potential for the species.

Analysis of hair samples also allowed researchers to determine genetic health of the grizzly bear population. Although overall genetic variation indicate a healthy population, it is only one part of the puzzle that managers need for the recovery of grizzlies in the NCDE to be successful.





Successful monitoring of the long-term health of grizzly bear populations will likely require using a variety of data collection techniques, including DNA analysis of hair samples collected from rub trees as well as radio tracking of individual bears.



Grizzly bears use "rub trees" primarily as a means to communicate with each other, a behavior that may help reduce conflicts within a population. Because bears use the same rub trees for generations, they can be a reliable source of hair samples from which DNA can be extracted.

Trend Monitoring

The key to successful management of any species, particularly one that is threatened or endangered, is an understanding of not only how many individuals there are in an ecosystem (population estimates), but also how the population is changing.



A cooperative effort between multiple agencies is currently underway to monitor the survival and reproductive status of female grizzly bears in the Northern Continental Divide Ecosystem. The study, which involves radio-collaring individual bears and tracking them through time, will help scientists and managers determine the population trend for grizzly bears in the NCDE. Radio collars provide a means to obtain information about the cause of mortality (death) and reproductive success. It is this data that is required to determine if a population is stable, increasing or decreasing (population trend) and why.

Managers of the NCDE's grizzly population are optimistic about the recent development of non-invasive research techniques being pioneered through the analysis of DNA being extracted from bear hair samples gathered from rub trees. This method is being tested over the next three years by USGS scientists to determine whether it can be used alone or in combination with collaring to determine status and trends of bear populations.

This population trend data, in conjunction with baseline population estimates established through the hair trap DNA project, can help managers recover the NCDE grizzly population from threatened status.



Measuring "Bear Years"

Population trends can be mathematically estimated after accumulating about 100 "bear years" of survival and reproductive data. A "bear year" is gathered through monitoring a single bear over the course of one year through radio tracking. Thus, a sample of 25 bears tracked for 4 years would yield 100 bear years of data.

Managers of the NCDE grizzly population are striving to keep 25 bears (primarily females with cubs) radio-collared in the NCDE with state-of-the-art GPS/ARGOS collars. These collars locate themselves through the Global Positioning Satellite (GPS) system, and then transmit their location to researchers through the ARGOS satellite system. This provides scientists in the lab with near real-time location information about individual bears.



Delisting the Grizzly

Removing a species from the Endangered Species List is the ultimate goal of any wildlife manager. But to do this certain criteria must be met. The criteria for "delisting" grizzlies in the NCDE has changed dramatically as new and better data has become available about the health and habitat requirements of a healthy grizzly population.

Regardless of any changes in the criteria, five questions must be reviewed and answered before any species is taken off of the Endangered List:



Is there a threatened destruction, modification, or curtailment of the species' habitat or range?



Is the species subject to over-utilization for commercial, recreational, scientific, or educational purposes?



Is disease or predation a factor?



Are there adequate existing regulatory mechanisms in place, taking into account the initiatives by states and other organizations, to protect the species or habitat?



Are other natural or manmade factors affecting its continued existence?

Ultimately, the recovery of any species is more than a one-time calculation of the number of animals. It requires a population sufficient to assure long-term health and existence, adequate habitat to meet the needs of this recovered population, and adequate regulatory mechanisms to assure long-term population health.

The Path to Recovery

When an animal or plant is placed on the Endangered Species List, it's intended to be temporary. Biologists and wildlife managers spend time, expertise, and resources on studying and managing the species in question with the goal of ensuring its long-term survival. Media reports of success often focus on a targeted number...declaring the recovery of an endangered or threatened species only by its increased population size. Unfortunately, recovery is not that simple and what can be mistaken as a simple numbers game is actually much more complex.

In the case of grizzly bears, the data obtained from DNA hair sampling and trend monitoring (both described above) is helping researchers identify how many bears live in the Northern Continental Divide Ecosystem, their distribution within it, mortality of females and their success rate in producing new offspring. Combined, this critical information helps determine whether or not grizzly populations are recovering. Although the current prognosis looks good, factors like habitat fragmentation, human-caused mortality rates, and loss of food sources can quickly change the great bear's fate.

Consequently, population size and distribution are not sufficient indicators that grizzlies will be removed from the Endangered Species List, or "delisted." Another key component, listed in the Grizzly Bear Recovery Plan for the NCDE, includes having management systems in place that help keep bears off the list. In a nutshell, this means that wildlife managers must have evidence that there is sufficient habitat to allow for a healthy bear population in which more bears survive and reproduce than die each year and that adequate steps have been taken to assure that the causes of mortality have been limited or controlled.

Tracking the bear population's breeding success rate versus its mortality rate takes significant staff time and substantial funding. To adequately manage grizzlies, federal, state, and tribal wildlife managers need to obtain timely, area-specific information on grizzly bear status and changes. Yet sustaining current levels of funding may not be feasible for long-term monitoring. This poses a problem. Grizzly bears cannot be declared recovered based only on population size, distribution, and amount of habitat. Efficient and effective monitoring programs must also be in place if grizzly recovery is to succeed.



Ultimately, the bear's long-term survival depends on detecting population declines quickly. Naturally, low female reproductive rates combined with high female mortality rates could cause rapid changes for the population. If these declines are not detected early enough grizzlies could rapidly lose the ground gained in the last 30 years only to be placed back on the Endangered Species List.

As challenging as it is to establish a management system that is both scientifically accurate and cost effective, one thing is certain. Current research is providing wildlife managers with critical pieces to the management puzzle, making recovery of this iconic predator a true possibility in the near future.