Grizzly Bears

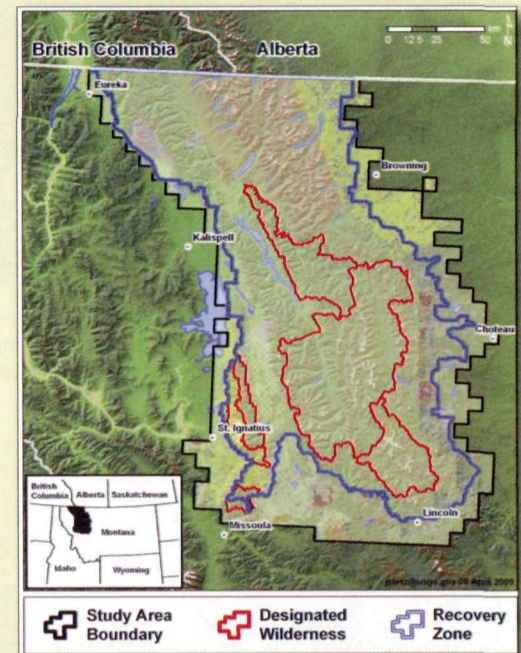## in the Northern Continental Divide Ecosystem

A Threatened 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 suburbs of San Francisco. 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. But it was not so long ago when grizzlies ranged throughout the western half of the continent, from the high plains of Kansas to the Pacific Ocean.

Habitat loss and human-bear conflicts as the West was developed for agriculture, ranching and tourism resulted in a drastic decline in grizzly bear numbers in North America. Today, they are restricted to only 2% of their historic range within the continental United States. While the Yellowstone population is recovered and has been delisted, all other U.S. grizzly populations remain listed as "threatened" under the Endangered Species Act.

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

Determining bear population densities and trends can be challenging under the best circumstances. The rugged and remote nature of the NCDE makes that task even harder. Fortunately, new scientific techniques and interagency cooperation are changing our understanding of the status of grizzlies, providing wildlife managers with critical pieces of information to not only recover the species but ensure the long-term survival of grizzly bear populations in this region.

Map Courtesy Northern Divide Grizzly Bear Project

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, five 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.nrmsc.usgs.gov/research/NCDEbeardna.htm

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

US Fish & Wildlife Service:
www.fws.gov/mountain-prairie/species/mammals/grizzly

This brochure was produced by the Crown of the Continent Research Learning Center.

Cover photo by Milo Burcham.

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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 Ecosystem

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.

How does one go about counting grizzlies in the mountainous and forested terrain of the NCDE? Recent advances in genetic testing make it possible to extract a DNA fingerprint from bear hair samples, giving scientists the ability to identify not only the species and sex of the animal the sample came from, but allows them to identify the individual bear from which the hair 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) and Montana Fish, Wildlife & Parks (MFWP) 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 focused their early efforts in and around Glacier National Park, an area encompassing only 13% of the NCDE but thought to contain the highest density of bears in the region, in a test to determine the feasibility of conducting the project on a much larger scale.

In 2004, a new study, funded by Congress, greatly expanded the study area to 7.8 million acres within the NCDE. A staggering 34,000 hair samples were gathered that summer from 2,558 seperate hair traps and 4,795 naturally occurring tree rubs located in every corner of the immense 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, researchers estimate 470 bears are females. The presence of female bears is critical to the recovery of the species, and the discovery that they make up 61% of the NCDE population indicates a good reproductive potential for the species.

Although the number of bears, particularly females, found to inhabit the NCDE indicates a healthy population, it is only one part of the puzzle that managers need for the recovery of grizzlies to be successful.
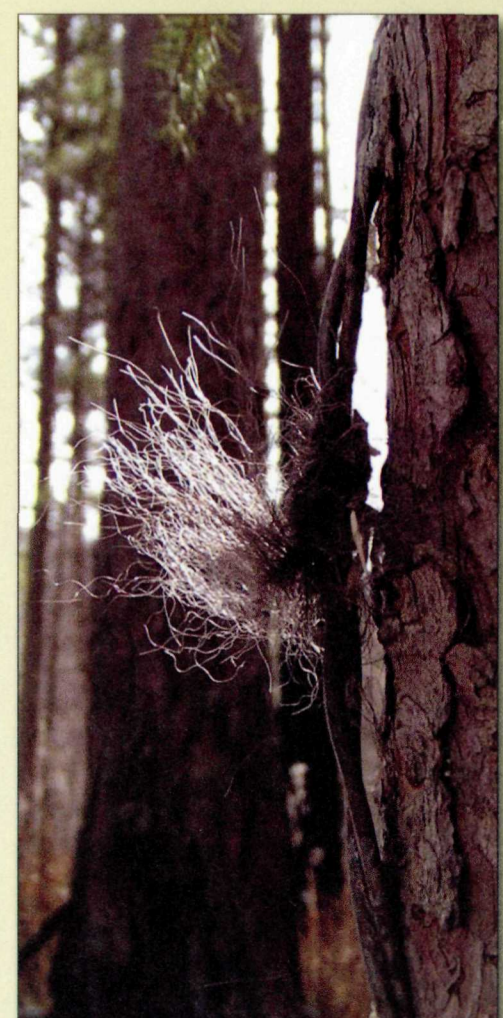

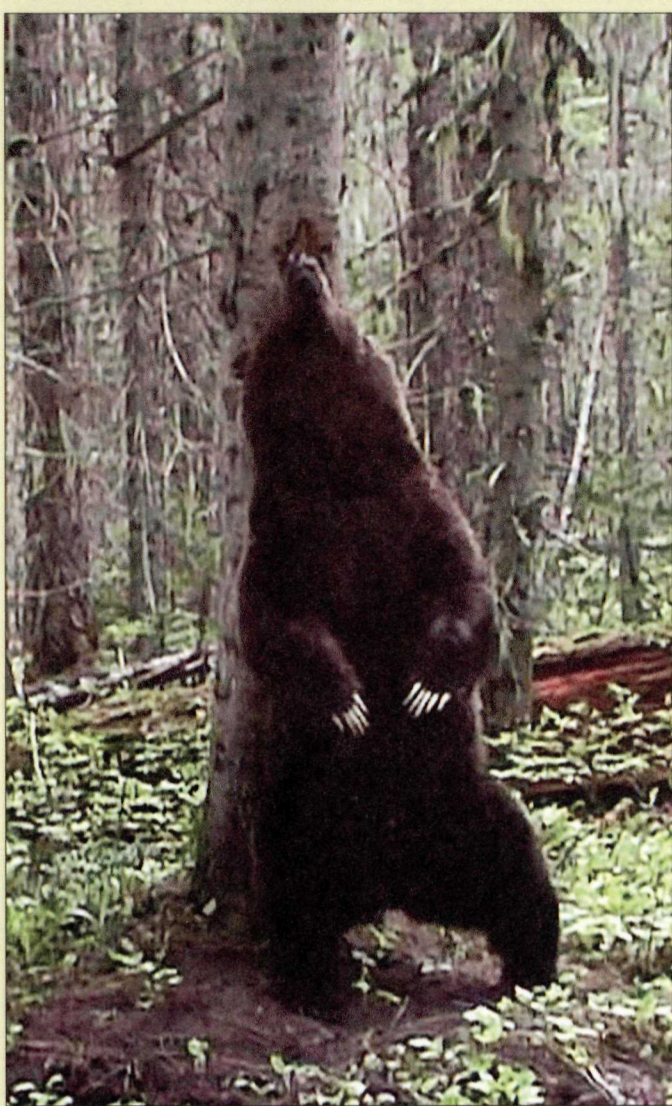Photo Courtesy Northern Divide Grizzly Bear Project

Photo Courtesy Northern Divide Grizzly Bear Project

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.

Photo Courtesy Northern Divide Grizzly Bear Project

Grizzly bears use "rub trees" 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.

Grizzly at hair trap. Courtesy Northern Divide Grizzly Bear Project

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 techniques being pioneered through the analysis of DNA extracted from bear hair samples gathered from rub trees. This method will be tested over three years, beginning in 2009, by USGS scientists to determine how to use it in combination with radio collars to determine status and trends of bear populations.

Understanding this population trend data, in conjunction with baseline population estimates established through the hair trap DNA project, will help managers assess the current condition of the NCDE grizzly population to determine if recovery objectives have been met.

NPS Photo

Measuring "Bear Years"

Radio collars are invaluable tools which allow bear researchers to gather survival and reproductive data on individual bears. Once enough data, approximately 100 "bear years", is accumulated it becomes possible to mathematically estimate trends in the grizzly population. A "bear year" is gathered through monitoring a single bear over the course of one year. Thus, a sample of 25 collared 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 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 bear researchers with valuable data, including near real-time location information about individual bears.

NPS Photo

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

Photo by Milo Burcham

- 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. Scientists 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.

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 offspring. Combined, this critical information helps determine whether or not grizzly populations are recovering. Although the current prognosis looks good, human-caused mortality rates, improper storage of food, garbage and other attractants (resulting in dangerous, food-conditioned bears), and changes in people's attitudes toward grizzlies can quickly alter 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.
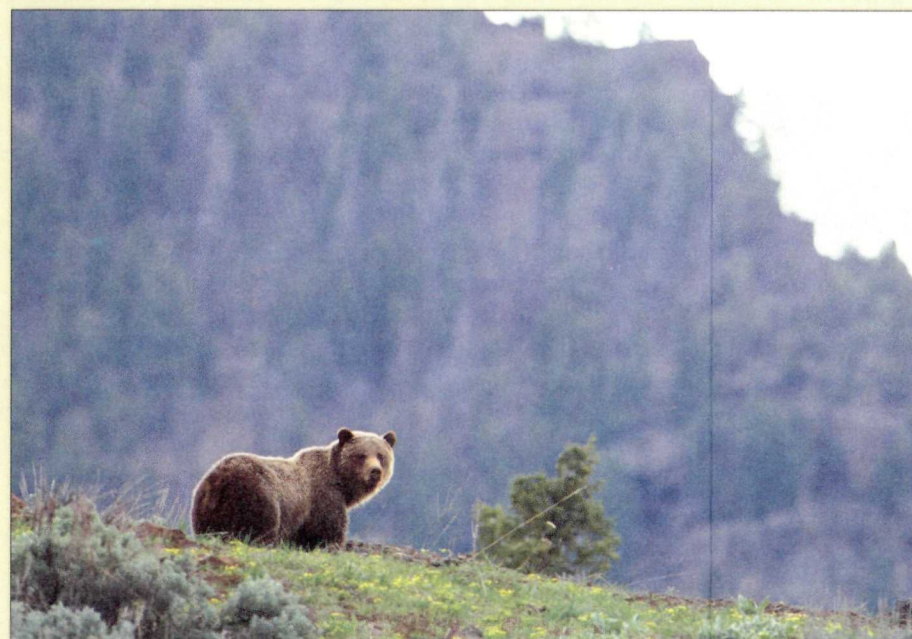

Photo by Milo Burcham

Ultimately, the long-term survival of grizzlies depends upon 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 any ground gained in the last 30 years. They would quickly find themselves right 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 creature a true possibility in the near future.