

Item #16a: Grizzly Bear Populations

Evaluation Objectives: To evaluate whether populations of grizzly bear on the forest are consistent with criteria and methods described in Recovery Plan monitoring.

Methods: Information concerning the number of grizzly bear family groups seen in the Northern Continental Divide Ecosystem (NCDE) and grizzly bear mortalities is collected and reported annually by agency members of the Interagency Grizzly Bear Committee. Data collected includes number of females with cubs, occupancy of bear management unit (BMUs) by family groups, and known human-caused mortality.

Evaluation: The Grizzly Bear Recovery Plan (1993) identified family groups, with cubs of the year, their number and distribution, and known human-caused total and female mortality as recovery criteria. This has been monitored for many years (See Table 16-1 and 16-2).

Acceptable monitored levels for the NCDE are:

- Ten females with cubs inside Glacier National Park (GNP) and 12 females with cubs outside GNP over a running 6-year average both inside the recovery zone and within a 10 mile area immediately surrounding the recovery zone, excluding Canada;
- Twenty-one of 23 BMUs occupied by females with young from a running 6 year sum of observation with no two adjacent BMUs unoccupied;
- Known human-caused mortality not to exceed 4 percent of the population estimates based on the most recent 3-year sum of females with cubs.
- Furthermore, no more than 30 percent of the 4 percent mortality limit shall be females. These mortality limits cannot be exceeded during any 2 consecutive years for recovery to be achieved.
- Furthermore, recovery in the NCDE cannot be achieved without occupancy in the Mission Mountains portion of this ecosystem.

Most bear biologists believe it is unlikely that the above recovery criteria can be met in the NCDE because mortality limits for females are based on this minimum population estimate, as derived from female and cub observations. Female grizzly bears with cubs are extremely difficult to observe in the NCDE because of dense forest canopies and thick shrub fields. For this and other reasons, there has been no organized all-out effort to collect sightings of female with cubs annually in the NCDE and the size (until recently) and trend of the grizzly bear population remained unknown. The results, using the female with cubs sightings for the NCDE, are likely far below actual population size and do not reflect the true status of this grizzly bear population. As an example, the 1993 Recovery Plan estimate of population was 306 bears for the NCDE. Using formulas set up in Recovery Plan which result in a very conservative minimum population estimate, annual estimates have ranged around 330 bears (2003 estimate). Using reliable estimates of a total population rather than a minimum population estimate, would allow for significant change (most likely improvement) in estimating mortality targets and limits (the 4% total and 30% female). This low population estimate is no longer accurate based on the DNA work by United States Geological Survey (USGS) for 2004 that showed there was a minimum

number of 563 bears. With a high degree of confidence, the NCDE grizzly bear population estimate is 765 animals, with a range reliably estimated to be between 715 and 831 individuals.

Table 16-1. 1987-2006 Annual NCDE Grizzly Bear Population and Known, Human-Caused Mortality Data¹ Based on 1993 Grizzly Bear Recovery Plan Criteria.

Note: Highlighted text shows exceeded mortality limits. Data from known, human-caused mortalities, minimum unduplicated counts of females with cubs, and distribution of females with young.

Year	Annual Unduplicated Females w/cubs (outside/inside GNP)	Annual Adult Female Mortality	Annual All Female Mortality	Annual Total Mortality	4% Total Mortality Limit ²	30% All Female Mortality Limit	Annual Total Mortality 6 yr Avg	Annual Female Mortality 6 yr Avg
1987	29 (16/13)	3	7	12			17.2	6.7
1988	25 (12/13)	4	7	9			14.7	6.2
1990	14 (7/7)	2	4	14	16.8	5.0	12.8	5.5
1989	37 (22/15)	1	5	12	20.2	6.1	14.0	6.2
1991	21 (13/8)	0	1	5	16.8	5.0	11.2	5.2
1992	22 (10/12)	2	9	15	12.9	3.9	11.2	5.5
1993	21(12/9)	1	1	5	14.8	4.5	10	4.5
1994	27 (21/6)	1	3	6	16.1	4.8	9.5	3.8
1995	35 (26/9)	1	6	15	19.5	5.8	10.0	4.0
1996	17 (7/10)	2	4	11	18.2	5.5	9.5	4.0
1997	13 (9/4)	2	7	13	14.6	4.4	10.8	5.0
1998	33 (22/11)	2	7	18	13.9	4.2	11.3	4.7
1999	18 (13/5)	3	4	18	13.9	4.2	13.5	5.2
2000	24 (13/11)	7	9	20	15.3	4.6	15.8	6.2
2001	26 (15/11)	4	8	19	13.1	3.9	16.5	6.5
2002	23 (16/7)	3	5	15	14.4	4.3	17.2	6.7
2003	19 (11/8)	5	7	16	13.6	4.1	17.7	6.7
2004	21 (8/13)	5	18	31	12.4	3.7	19.8	8.5
2005	23 (17/6)	8	10	25	11.2	3.4	21	9.5
2006	26 (21/5)	1	4	14	13.9	4.2	20	8.7
2007			7	26				

¹ Within the recovery zone and within 10 miles outside the boundary of the recovery zone.

² Calculated as 4% of the minimum population estimate for the most current year, which is based on the minimum number of females with cubs seen over the past three years. For the NCDE, a 60% sightability correction is estimated. Therefore, the number of females with cubs for the most recent 3 years is summed, the known adult female human-caused mortalities are subtracted, this number is divided by 0.6 (60%), and this number is divided by 27.4% (the estimated % of the population that is adult females). The result is the estimated minimum population.

Table 16-2. 2006 Status of the NCDE in Relation to the Demographic Recovery Targets

Acceptable Monitoring Level Criteria	Target Number	2006 Number
Females w/cubs (6-yr avg)	22	23.0 (138/6)
Inside GNP (6-yr avg)	10	8.3 (50/6)
Outside GNP (6-yr avg)	12	14.7 (88/6)
Mortality limit as 4% of min. est.	Less than 13.4	13.9 (6 yr avg) exceeds limit
Female mort limit as 30% of total mortality	Less than 4.0	8.7 (6 yr avg) exceeds limit
Distribution of female w/young	21 of 23 w/ Missions occupied	23 of 23, Missions are occupied

Table 16-3. Sources of NCDE Grizzly Bear Mortality

Category	1980-2002	2003	2004	2005	2006	2007
Capture mortality	10	0	3	4	2	0
Car	13	0	3	1	0	7
Found dead	1	0	0	0	0	0
Human fatality	11	0	0	0	0	0
Human site conflicts or Management	55	7	13	6	3	2
Legal hunter	81	0	0	0	0	0
Illegal	4	4	5	9	3	1
Livestock depredation	22	0	0	0	0	0
Malicious (also illegal)	44	0	0	0	0	0
Mistaken ID	29	0	1	1	1	1
Natural	15	0	0	0	0	0
Self-defense	23	1	1	2	0	4
Train	29	4	4	0	3	5
Under investigation	8	0	0	0	0	0
Unknown/Probable Illegal	10	0	4	0	1	5
Augmentation	0	0	0	1	1	0
Total	355	16	34	24	14	24

In summation of the above sources of NCDE mortality, the Fish and Wildlife Service (FWS) wrote in their Biological Opinion On The Effects Of The Flathead National Forest Plan Amendment 19 Revised Implementation Schedule On Grizzly Bears, October 25, 2005, “An increase in known human-caused mortality is associated with rural roaded areas and primarily private property. As described in this biological opinion, known human-caused mortality of grizzly bears on Forest Service lands is consistently lower than rural roaded private lands, despite bears spending significantly more time on forest lands than private lands.”

Grizzly bear family group and mortality data, consistent with Recovery Plan monitoring requirements, has been collected since 1987. The data indicate that family group numbers and distribution met required Recovery Plan levels up until the mid-1990s. Human-caused mortality data indicate that since about 2000, the required Recovery Plan 6-year average levels for annual total mortality and female mortality have exceeded required levels. This has created some concerns in the environmental community but bear researchers have demonstrated the difficulty in meeting required female mortality levels. “Bear researchers and biologists agree that the above recovery criteria cannot be demonstrated in the NCDE because females with cubs are

extremely difficult to observe because dense forest canopies and shrub fields conceal individuals. For this and other reasons, there has been no organized effort to collect sightings of family groups annually in the NCDE, and the size and trend of the grizzly bear population remains unknown. Therefore, the minimum annual counts are likely below actual population size and do not reflect the true status of this population of grizzly bears” (from the Northern Continental Divide Ecosystem Grizzly Bear Population Monitoring Team Annual Report – 2006).

Estimates of population trends or female survival rates are not currently required for grizzly bear recovery in the NCDE. However, should the 1993 recovery plan be revised, the ability to calculate these parameters will greatly enhance our knowledge of population status and should help clarify the legal status of the population under the Endangered Species Act.

The understanding of the population status of grizzly bears in the NCDE has improved dramatically recently. In 2004, an interagency field effort was undertaken to enumerate population size of grizzly bears over the entire NCDE. Under this program, DNA samples were collected from bear hair entangled on barbed wire corrals placed throughout the NCDE. These hair samples provide a unique genotype and gender for each individual that entered the wire corral or rubbed on a tree. From this data, researchers estimate population size with confidence limits and relative bear density across the NCDE. The DNA-based population study identified 563 individual grizzly bears roaming the 7.8 million-acre NCDE when the study was conducted in summer 2004. That reflects the minimum number of bears in the study area that summer, based on genetic analysis of 33,000 hair samples that were collected. Information about the individual bears has been applied to a series of statistical models to generate an unprecedented population estimate.

This benchmark estimate of population size will not be the only work required for recovery. Led by MT FWP, a companion program started in 2004, is occurring that tracks population trend and female vital rates over time and provides ancillary information on other indices of population health. The goal is to have at least 25 female bears fitted with collars every year through 2009, when the study is expected to produce a statistically reliable indication of whether the bear population is increasing or declining.

Grizzly bears are killed in various situations involving people, and a number of actions have been implemented that help reduce human-caused mortality. FWP has full time employees working with private individuals to help reduce mortality risk situations on private land. Many of the garbage dumpsters in grizzly habitat have been modified or converted to “bear resistant” dumpsters. An “aversive conditioning” program has been implemented to condition bears to avoid areas that humans use. A food storage program has been implemented on four national forests, and the Blackfoot Reservation, complementing an existing program in Glacier National Park. Burlington-Northern Santa Fe-Pacific has implemented special management requirements in the Middle Fork of the Flathead River to address train operations, train crew awareness, and the cleanup of grain spills. A significant access management program has been, and continues, to be implemented on national forests. All of these actions result in reduced mortality risk to grizzly bears.

The FNF received a Biological Opinion from the FWS which stated, “... there is no evidence to suggest the population is in decline. Grizzly bears are widely distributed on the forest and the

NCDE and occurrences are being increasingly documented outside the recovery zone. The broad distribution of grizzly bear locations outside and known grizzly bear distribution within the recovery zone, including consistent occupancy of more than 21 of 23 BMUs by female grizzly bears with young over 6-year averages, and 23 of 23 BMUs occupied for at least the past 3 years (2001, 2002, 2003), suggests an expansion is likely and partially due to increased grizzly bear numbers in areas of the recovery zone. A similar expansion in the range of grizzly bears occurred in the Greater Yellowstone Ecosystem during a period of known increasing trend in the grizzly bear population” (Biological Opinion On The Effects Of The Flathead National Forest Plan Amendment 19 Revised Implementation Schedule On Grizzly Bears, October 25, 2005).

Recommended Action: Bear researchers and biologists agree that the above criteria described in the 1993 recovery plan cannot be demonstrated in the NCDE because females with cubs are extremely difficult to observe as dense forest canopies and shrub fields conceal individuals. The state FWP and federal FWS agencies have the responsibility to monitor the population and trends. The Forest Service needs to 1) continue to cooperate with other federal, state and tribal agencies in the NCDE subcommittee population and trend monitoring study, 2) continue to demonstrate actions that are known to reduce adverse effects to bears and, 3) continue to minimize bear/human conflicts.