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FIVE YEAR UPDATE

of the Programmatic Environmental Impact Statement

THE GRIZZLY BEAR

in Northwestern Montana

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Montana Department of
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THE
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NORTHWESTERN MONTANA

1986 - 1990

Montana Department of Fish, Wildlife and Parks

June 1993

Primary Authors:
Arnold R. Dood
Helga Ihsle Pac

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I. INTRODUCTION

The grizzly bear (*Ursus arctos*) management program of the Montana Department of Fish, Wildlife and Parks (MDFWP) was implemented to promote the survival of viable populations of grizzly bears in Montana and to assist in recovery efforts in other areas. The MDFWP continually evaluates its program to ensure this goal. In addition to annual reviews, the MDFWP prepared the first environmental impact statement (EIS) on its program in 1975 (MDFWP 1975). To further develop the program and provide for complete public review, the MDFWP began preparation of a second, more detailed EIS on grizzly bear management in northwest Montana in 1984 (Dood et al. 1986).

The 1986 EIS summarized all the information relevant to the State of Montana's grizzly bear management program in northwestern Montana including information on the grizzly bear and its habitat, the current grizzly management program, and the legal, biological, political, and philosophical arguments on which that management program was based. The history of the program and the state's goals and management objectives were detailed. Future management was addressed, and possible alternatives and their impacts were discussed.

Specific objectives of the 1986 EIS were to: 1) give a comprehensive presentation of the subject, 2) review the many variables involved, 3) develop a framework for the review of alternatives, and 4) weigh the merits and impacts of various alternatives and through public discussion select a program for improved future grizzly bear management.

This document was prepared in response to a recommendation in the 1986 EIS to update and evaluate new information and the effectiveness of our program at five year intervals. A wildlife program EIS, to be completed in 1995, will serve as further review of the grizzly bear management program and may be sufficient to serve as the complete review scheduled to begin in 1996. If not sufficient, a revised EIS on the grizzly bear management program described here will be prepared.

A. A BRIEF BACKGROUND TO THE PROGRAMMATIC EIS

The 1986 grizzly bear EIS was prepared under the Montana Environmental Policy Act (MEPA), patterned after the National Environmental Policy Act (NEPA). MEPA includes three basic parts:

1. It establishes a policy for a productive and enjoyable harmony between man and his environment
2. It requires state government to coordinate state plans, functions, and resources to achieve various environmental, economic, and social goals, and

3. It establishes that each person is entitled to a healthful environment and has a responsibility to enhance and preserve the environment.

The Montana Fish and Game Commission (MFGC), now the Montana Fish, Wildlife and Parks Commission (MFWPC), adopted rules for implementing MEPA. These rules provide for the preparation and distribution of programmatic reviews whenever necessary to evaluate a series of actions, programs, or policies that affect the quality of the human environment. Currently, grizzly bear management in Montana is being addressed within the framework of MEPA and its regulations.

The 1986 EIS and this update deal with grizzly bear management in that portion of Montana known as the "Northern Continental Divide Ecosystem" (NCDE) (Fig. 1.1) and the "Cabinet-Yaak Ecosystem" (CYE) (Fig. 1.2).

Hunting in general and grizzly bear hunting in particular were addressed in 1975 under the provisions of MEPA. The MDFWP is currently beginning a complete programmatic review of all of its wildlife management programs to ensure they are responsive to public needs while conserving the state's valuable wildlife resources. That review is scheduled to be completed by mid-1995, and may serve as the ten-year review proposed in Dood et al. 1986.

In addition to periodic environmental evaluations, the MFWPC holds public meetings as part of the biennial regulatory and season-setting processes. The MFWPC season-setting procedure is a public process, accessible and open to new data, information, and opinion. Tentative big game seasons and quotas are set in December (odd numbered years), and copies of those tentative recommendations are mailed to sportsmen and other interested parties. Regional open houses and public meetings are held throughout Montana during January (even numbered years). A special public meeting is held in February (even numbered years) at which public comment and suggestions are solicited by the MFWPC. All season-setting decisions for the coming hunting season are completed by the end of August. This procedure is repeated biennially. The more detailed public analysis inherent in MEPA is used periodically when the need for such analysis is evident. It is in this context that the original programmatic EIS and this five-year update were prepared and circulated for comment.

B. ECOSYSTEMS EVALUATED IN THIS EIS

Montana contains all or portions of four of the six areas identified as occupied by grizzly bears in the Grizzly Bear Recovery Plan (USDI 1982). Of these four, only the NCDE and CYE contain enough grizzly habitat within the state to allow for the MDFWP program, by itself, to significantly guide the management of grizzly bears. Although Montana's management program influences grizzly management in other areas (like Yellowstone National Park), management in those areas requires a joint effort with adjacent states.

Figure 1.1. Grizzly bear management area for the NCDE.

Figure 1.2. Grizzly bear management area for the CYE.

This document, therefore, describes only MDFWP's program as it pertains to areas in and adjacent to the NCDE and CYE in Montana. Management directions for the Selway-Bitterroot and Yellowstone grizzly bear ecosystems are not included.

C. HISTORICAL REVIEW UPDATE

Since the historical review presented in the EIS (Dood et al. 1986), the following events have occurred:

- 1985
- Law restricting the sale of grizzly parts passed the state legislature
 - United States Fish and Wildlife Service (USFWS) issued Federal Register emergency rule to allow grizzly bear hunting along Rocky Mountain East Front and to adjust quotas
- 1986
- Final programmatic EIS on the Grizzly Bear in Northwest Montana adopted by MFGC - Recommendations:
 - established population goals for NCDE and CYE
 - reduced total human-caused grizzly bear mortality quota (25 to 21) and further reduced the quota to 14 to account for estimated unreported mortalities
 - reduced female grizzly bear mortality quota (9 to 6)
 - established three bear management units and female grizzly bear subquota in each
 - established management direction dependent upon population status
 - MDFWP began nuisance grizzly bear control program along Rocky Mountain Front (RMF)
 - USFWS adopted final Federal Rule implementing new quotas and grizzly bear hunting areas in NCDE
 - MDFWP requested USFWS review of legality of delisting separate populations. USFWS indicated separate populations can be delisted individually
 - Cabinet Grizzly Bear Augmentation working group formed to draft an Environmental Assessment (EA)
- 1987
- Montana State Legislature passed a law to allow only one grizzly bear to be killed per hunter per lifetime
 - MDFWP internal memo on delisting NCDE population circulated
 - MDFWP initiated a Recovery Status Review for the NCDE (released in draft for public comment in June 1987)
 - USFWS began five-year revision of Grizzly Bear Recovery Plan [MDFWP recommended use of Interagency Grizzly Bear Committee (IGBC) and subcommittee to finalize revision]
 - Cabinet grizzly augmentation EA drafted
 - South Fork of Flathead grizzly bear research project initiated
 - Grizzly bear compendium published

- 1988 - USFWS/MDFWP discussed delisting process, schedule, and required information
- NCDE subcommittee of the IGBC adopted use of female with cub and young as monitoring criteria for recovery but delayed action on target number
 - NCDE subcommittee of the IGBC met to discuss target number of females with cubs/young and delayed action. Request IGBC resolution (Fall IGBC meeting)
 - IGBC adopted position statement on delisting grizzly bears in the NCDE and scheduled special meeting in February to discuss female with cub/young issue
 - Final report of Cabinet grizzly bear study released
 - Public resistance to Cabinet grizzly augmentation EA resulted in formation of Citizens' Involvement Group
 - Damage hunt conducted on East Front resulted in a licensed hunter rather than an agency harvesting a problem bear
- 1989 - IGBC reached consensus at February meeting to:
- 1) Develop Conservation Strategy document containing management plan for population and habitat using reference to existing documents and programs where possible.
 - 2) Continue to monitor female with cub and young on an annual basis as part of the monitoring program
 - 3) Revise recovery plan to contain the 1982 recovery criteria and female with cub and young as additional information
- Citizens involvement group for Cabinet grizzly augmentation supported proceeding with transplant of two subadult females in 1989 and agreed that state involvement is important.
 - Final report of Rocky Mountain East Front Studies completed
 - A 5-year research program began in the Yaak portion of the CYE (cooperative study among USFWS, United States Forest Service (USFS), and MDFWP
- 1990 - One subadult female grizzly was moved to the Cabinets as part of the augmentation program
- Draft grizzly bear recovery plan revision circulated for public review by USFWS
- 1991 - EIS update initiated by MDFWP
- MDFWP implemented a limited entry spring grizzly bear hunt on the Rocky Mountain Front
 - IGBC passed a resolution supporting hunting of grizzlies (Appendix A)
 - Suit filed in state court to halt spring 1991 grizzly bear season along RMF in the NCDE
 - State court ruled in favor of state on spring season and season continued
 - An injunction was filed in Federal Court against all hunting of grizzly bear. Federal court ruling granted a preliminary injunction against grizzly hunting, and the fall season was canceled by MFWPC action

- Grizzly bear season is not among recommendations for 1992 and 1993 biennial hunting season regulations presented to MFWPC for tentative adoption due to the preliminary injunction against Federal rule which allowed the USFWS to authorize the state to conduct a hunting season in the NCDE.

1992 - MFWPC adopted final 1992 and 1993 biennial hunting seasons with grizzly bear season omitted

- USFWS published amended federal rule which removed the authority for the state to establish a grizzly bear hunting season in the NCDE

II. DEPARTMENT GOALS AND MANAGEMENT OBJECTIVES

The policy and grizzly bear management objectives in Dood et al. (1986) remain unchanged through this update. The goals and objectives will be re-evaluated in the ten-year review. They are repeated here for general reference.

A. MONTANA FISH, WILDLIFE AND PARKS COMMISSION POLICY

The MFWPC is the policy making arm of Montana's fish and wildlife program. Section 87-1-301(1), Montana Codes Annotated (MCA) requires the Commission to "set policies for the protection, preservation, and propagation of the wildlife, fish, game furbearers, waterfowl, nongame species, and endangered species of the state for the fulfillment of all other responsibilities of the Department as provided by law".

The legislature has given specific policy direction to the Commission on the issue of grizzly bears. Section 87-5-301, MCA, states:

"It is hereby declared the policy of the state of Montana to protect, conserve, and manage grizzly bears as a rare species of Montana wildlife."

Section 87-5-302 describes the MFWPC's power regarding grizzly bears.

Within this legal framework, the MFWPC developed a grizzly bear policy in Section 12.9.103, ARM (Appendix B). That policy addresses the need to protect grizzly bear habitat, the need to pursue grizzly bear research, the role of regulated hunting in grizzly bear management, depredations, and the appropriate department response to depredations, and requires compliance with federal regulations relating to grizzly bears. It is within this framework and that described by the Endangered Species Act (16 U.S.C. Sec. 1531, et seq.) that specific MDFWP goals for the grizzly bear were developed.

B. SPECIFIC MDFWP GOALS FOR THE GRIZZLY BEAR

1. MDFWP Goals

To provide the people of Montana and visitors with the optimum outdoor recreational opportunities emphasizing the tangible and intangible values of wildlife and the natural and cultural resources of authentic, scenic, historic, scientific, and archaeological significance in a manner:

- a. Consistent with the capabilities and requirements of the resources
- b. Recognizing present and future human needs and desires

- c. Ensuring maintenance and enhancement of the quality of the environment

2. Wildlife Program Goal

To protect, perpetuate, enhance, and regulate the wise use of wildlife resources for public benefit now and in the future.

3. Grizzly Bear Management Objectives

Northern Continental Divide Ecosystem (NCDE):

To manage for a recovered grizzly bear population, to maintain distribution in the management area as defined in Fig. 1.1 and described in Appendix C, and seek to maintain the habitat in a condition suitable to sustain the population, excluding Glacier National Park, at an average density between 1 bear/15 mi² to 1 bear/30 mi².

NORTHERN CONTINENTAL DIVIDE ECOSYSTEM (NCDE) (EXCLUDING GLACIER NATIONAL PARK)

Cabinet-Yaak Ecosystem (CYE):

To manage for a recovered grizzly bear population and to maintain distribution in the management area as defined in Fig. 1.2 and described in Appendix D, and seek to maintain the habitat in a condition suitable to sustain the population at an average density of 1 bear/40 mi² to 1 bear/30 mi².

CABINET YAAK ECOSYSTEM (CYE)

III. DESCRIPTION OF EXISTING ENVIRONMENT

A. THE NATURAL ENVIRONMENT

The natural environment of the NCDE, including geological history, climate, vegetation, and wildlife, was discussed in detail by Dood et al. (1986).

A grizzly bear habitat symposium held in 1985 presented updated information on habitat-mapping evaluation, utilization, improvement, and cumulative effects analysis (Contreras and Evans 1985). Additional updated information on habitat management was supplied in the Grizzly Bear Compendium (IGBC 1987). Research conducted in specific areas also provides updated environmental information including the East Front (Aune and Kasworm 1989), the Blackfeet Indian Reservation (Carney 1988, 1990), the South Fork of the Flathead (Mace and Manley 1990, Mace et al. 1990), the North Fork of the Flathead (McLellan and Shackleton 1988a), and the Cabinet-Yaak (Kasworm and Manley 1988, Kasworm and Thier 1990).

B. THE HUMAN ENVIRONMENT

Dood et al (1986) discussed the human environment including population level and distribution, and economic considerations.

Hunting and fishing license sales in Montana (Table 3.1) provides an indication of the trend in hunter interest in Montana over the last four decades. Recent patterns of recreational activities on national forests in the NCDE (Table 3.2) indicate fluctuations in wilderness, dispersed, developed use, and total use. Numbers of visitors and backcountry use in Glacier National Park (Table 3.3) have exhibited an increase in trend during the last five years.

Table 3.1. Montana hunting and fishing license sales, 1950-1990.

Year	Number of Sales
1950	285,150
1960	375,196
1970	967,947
1980	1,120,144
1983	1,250,518
1986	1,179,615
1987	1,232,612
1988	1,161,886
1989	1,225,853
1990	1,273,755

Table 3.2. Recreational visitor use days by national forest in the NCDE, 1985-1990.

	1985				1986			
National Forest	Developed	Dispersed	Wilderness	Total	Developed	Dispersed	Wilderness	Total
Flathead	262,000	357,900	133,400	753,300	193,500	356,200	133,500	683,200
Helena	70,700	196,100	16,000	282,800	33,600	117,600	11,300	162,500
Kootenai	514,300	1,400,600	30,100	1,945,000	336,100	816,700	8,400	1,161,200
Lewis & Clark	140,700	405,400	62,900	614,000	336,400	520,900	66,700	924,000
Lolo	258,100	1,129,900	11,300	1,399,300	265,600	1,129,200	11,300	1,406,100
TOTAL ¹	1,250,800	3,489,900	253,700	4,758,400	1,165,200	2,940,600	231,200	4,337,000
	1987				1988			
National Forest	Developed ²	Dispersed ²	Wilderness	Total	Developed ²	Dispersed ²	Wilderness	Total
Flathead	294,900	267,900	133,600	696,400	280,300	317,300	119,900	647,500
Helena	106,000	140,700	13,500	260,200	106,000	146,600	7,600	260,200
Kootenai	379,100	762,100	7,700	1,148,900	379,100	735,300	34,500	1,148,900
Lewis & Clark	260,700	363,800	53,800	678,300	260,700	375,600	42,000	678,300
Lolo	370,800	924,800	12,200	1,307,800	370,800	846,300	90,700	1,307,800
TOTAL ¹	1,411,500	2,459,300	220,800	4,091,600	1,326,900	2,421,100	294,700	4,042,700
	1989				1990			
National Forest	Developed ²	Dispersed ²	Wilderness	Total	Developed ²	Dispersed ²	Wilderness	Total
Flathead	322,400	282,100	124,800	729,300	371,100	298,100	125,800	795,000
Helena	126,000	126,400	6,200	258,600	133,000	198,100	4,700	335,800
Kootenai	339,600	833,800	17,000	1,190,400	280,300	785,900	29,700	1,095,900
Lewis & Clark	329,200	405,600	60,300	795,100	371,800	369,800	63,800	805,400
Lolo	477,800	851,300	4,700	1,333,800	496,700	886,100	4,500	1,387,300
TOTAL	1,595,000	2,499,200	213,000	4,307,200	1,652,900	2,538,000	228,500	4,419,400

¹Total: Total recreation visitors days reported for a Forest in given year.

²Categories lumped into nine major groups as opposed to 50+ activities reported on in previous years and are not directly comparable as Developed and Dispersed.

Table 3.3. Visitor use data for Glacier National Park, Montana, 1956-1990.

Year	Number of Visitors	Backcountry Camp Days
1956	718,938	N/A
1957	759,161	N/A
1958	706,841	N/A
1959	722,338	N/A
1960	724,538	N/A
1961	739,982	N/A
1962	966,100	N/A
1963	811,214	N/A
1964	642,000	N/A
1965	847,104	N/A
1966	907,839	N/A
1967	884,049	6,665
1968	964,493	5,131
1969	1,051,165	6,872
1970	1,241,603	6,592
1971	1,303,073	24,765
1972	1,392,145	26,574
1973	1,398,958	27,538
1974	1,406,643	28,257
1975	1,571,393	24,785
1976	1,662,678	28,978
1977	1,656,212	30,109
1978	1,601,131	24,395
1979	1,446,236	25,323
1980	1,475,538	22,640
1981	1,786,843	17,744
1982	1,666,431	16,198
1983	2,204,131	15,507
1984	1,946,783	15,032
1985	1,580,620	13,510
1986	1,579,191	14,784
1987	1,660,737	17,314
1988	1,817,733	16,909
1989	1,821,523	16,969
1990	1,987,000	19,456

IV. DISTRIBUTION AND HABITAT SELECTION

A. DISTRIBUTION

Grizzly bear range in northwestern Montana is continuous with Alberta, British Columbia, the Yukon, Northwest Territories, and Alaska (Herrero, 1985). Evidence presented by Picton (1983) also indicated a sporadically occupied corridor of habitat between the NCDE and the Greater Yellowstone Ecosystem. The present distribution of grizzly bears in northwestern Montana is depicted in Figs. 1.1 and 1.2. There is no evidence indicating decrease in distribution since 1985 in the NCDE; evidence from a variety of sources actually indicates distribution is expanding. Among these are recent sightings of grizzlies outside of recovery lines (Aune and Kasworm 1989; Joslin, personal communication 1991; Mace, pers. comm., 1991). In addition, information gathered on the distribution of females with young as part of the requirements in the USFWS revised draft recovery plan (USDI 1990) indicate they are well distributed in the NCDE.

B. HABITAT SELECTION

Habitat selection was discussed by Dood et al. (1986). Recent studies involving habitat research in the NCDE include the East Front (Aune and Kasworm 1989), South Fork of the Flathead (Mace and Manley 1990, Mace et al. 1990, Mace and Manley 1990a, b), the Cabinet-Yaak (Kasworm and Manley 1988, Kasworm and Thier 1990), and the North Fork of the Flathead (McLellan and Shackleton 1988a). These studies have resulted in a more detailed understanding of how grizzlies select habitats in northwest Montana.

V. GRIZZLY BEAR POPULATIONS

A. DENSITIES

Density estimates have been and continue to be the most widely accepted method for estimating grizzly bear populations. An extensive literature review on grizzly bear density estimation was presented by Dood et al. (1986). Methods involved in determination of grizzly bear densities are varied and individualized according to area and researcher (Table 5.1).

Grizzly bear management programs in the NCDE and CYE are based on density estimates (Table 5.2). These estimates continue to be developed and validated using the best available information. This document provides an opportunity to update and evaluate earlier estimates (Dood et al. 1986). It must be noted that the estimates presented here were developed in a different manner than those presented in 1986 and are not therefore directly comparable with previous estimates. It should also be emphasized that all estimates have been developed using very conservative approaches to ensure that the program in no way negatively impacts the grizzly population.

Two recent studies provide updated density estimates in the NCDE. The East Front Study (Aune and Kasworm 1989) presents updated information for the Badger-Two Medicine, East Front Core, and the Scapegoat Study Areas. The South Fork Study (Mace and Manley 1990) also presents updated estimates. The two studies differ in methodologies used to determine grizzly bear density.

1. East Front

The East Front study derived its density estimates by using a geometric modified minimum composite polygon home range from radioed bears. It was modified because habitat was excluded from the composite that was known to be uninhabitable by grizzlies. The lower minimum density estimate is derived by including only marked bears; the upper minimum density estimate includes marked and individual independent observations of identifiable unmarked bears.

2. South Fork

The South Fork Study has derived preliminary density estimates by determining the percentage of aerial telemetry locations of radioed bears within a 321 mi² study area. This core area comprised about 20% of the entire South Fork unit. Unmarked bears observed or photographed were also included. To be included, individual bears had to meet the following standardized criteria:

Table 5.1. Methods involved in determination of grizzly bear densities by various studies.

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Predefined study area	x	x	x	x	x	x	x	x	x	x	x				x
Population estimate derived from signs of bear presence	x	x													
Population estimate derived from unduplicated sightings of individual bears and family groups			x	x											
Census of bears using Schnabel technique (marked to unmarked animals)					x										
Census of bears using Peterson index (mark-recapture)						x									x
Adjusted estimate to reflect unequal capture probability of females with cubs and unrepresentative sample of cubs.						x									
Population estimate for the area includes only marked and identifiable unmarked bears							x	x	x	x	x		x	x	x
Used a number of known females and an assumed sex ratio of 50:50 to estimate number of males								x							
Subtracted from their population estimate the number of bears equal to the number of average home ranges derived from the portions of bears home ranges that were outside the study area											x				
Population size of an area was determined by using only marked bears and the core area they inhabit												x			
Method using a modified minimum composite home range of marked bears												x	x	x	
Method using the percentage of aerial telemetry locations of radioed bears within a study area.												x			x

a. Zunino & Herrero, 1972 (Italy)
b. Elgmok, 1978 (Norway)
c. Dean, 1976 (Mt. McKinley NP)
d. Martinka, 1974 (Glacier NP)
e. Troyer & Hensel, 1964 (Alaska)
f. Miller & Ballard, 1982 (Alaska)
g. Russell et al., 1979 (Jasper NP)
h. Pearson 1975, 1976 (Yukon)

i. Curatolo & Moore, 1975 (Alaska)
j. Servheen, 1981 (Mission Mtns)
k. Reynolds & Hechtel, 1980 (Alaska)
l. McLellan, 1984 (No. Fk. Flathead, B.C.)
m. Aune and Kasworm, 1989 (East Front, MT)
n. Mace & Jonkel, 1980 (So.Fk. Flathead, MT)
o. Mace and Manley, 1990 (So.Fk. Flathead, MT)

Table 5.2. Minimum density estimates for grizzly bears in the NCDE in 1991.

Area	Size	Density (mi ² /bear)	Number of Bears
Red Meadow	215	10-15	14-22
Whitefish	211	18-25	33-46
Glacier National Park	1,583	6-8	198-264
St. Mary	211	10-20	11-21
Badger-Two Medicine	323	27-38	9-12
South Fork Flathead River	1,624	10-13	125-162
East Front	1,119	25-31	36-45
Swan Front	780	20-30	26-39
Mission Mountains	1,903	25-45	23-42
Scapegoat	1,903	56-112	17-34
Total	9,633	14-20	492-687
Total excluding GNP	8,050	19-27	294-423

- a. A bear must remain alive for 75% of the average active (non-denning) season. This active season ran from 12 March through 25 October. Bears surviving <75% of this period are excluded from density estimates.
- b. All bears captured in the spring snaring grid were assumed to be in the study area between 12 March and their individual capture date.
- c. Bears casting their collars during the year were assumed to have survived if they were observed or photographed in the study area and there was no evidence suggesting they died. Bears that shed their collars and were not subsequently observed or photographed were excluded even when no evidence of mortality was recorded.
- d. It was often possible to classify some unmarked individuals to age class and gender through visual observation and remote cameras. Average percent use of the study area by these classified unmarked bears was assumed to equal percent use of marked bears of the same class. For example, if marked adult females averaged use of 82%, an unmarked adult female was given the same use value.

- e. Observations of unmarked grizzly bears were studied for possible redundancy each year. Thus, a minimum and maximum number of unmarked grizzlies was determined for each year. Density estimates were based on the minimum number.
- f. Unmarked bears were assumed to survive at least 75% of the active season. Strong evidence of death (e.g. MDFWP mortality records) must have been recorded to be excluded from the density estimate.

There was some criticism of the approach utilized in 1986 because the estimates lacked statistical confidence. MDFWP has and is continuing to address these concerns through ongoing research and adjusting density estimates where appropriate.

Previous grizzly bear density estimates were based on similarity in habitat-use patterns, mortality patterns, home range size and overlap, levels of human activity and encroachment, pooled expertise from professional biologists, and other factors (Appendix E, Dood et al. 1986). These estimates were developed utilizing known minimum densities from five study areas within and adjacent to the ecosystem and applying them to larger areas. Lower densities were applied to areas where direct extrapolation was inappropriate due to considerations of habitat or human impacts or where professional expertise indicates that this is appropriate.

Adjustments based on the current review resulted in increased minimum density estimates in some units and in lower minimum density estimates in others.

Current grizzly bear density estimates (mi^2/bear) (Fig. 5.1) for the remaining six units in the NCDE remained unchanged (Dood et al. 1986) due to lack of new information. However, since that time the four units that have had more intensive investigation and density estimates were re-evaluated. Current South Fork Unit density estimates are based on much more detailed information and are higher than in 1986. Density of bears in Badger-Two Medicine, East Front, and Scapegoat Units were also re-evaluated with more detailed recent information. To ensure a program of conservation and because this program is based on minimum estimates of population size, the density estimates were decreased in these units. Lower estimates do not indicate population declines (trend information indicates an increase, Aune and Kasworm 1989); they merely reflect an even more conservative approach to estimating density utilized in this review.

Figure 5.1. Map showing ten units with grizzly bear density estimates in the NCDE for 1991.

B. FEMALES WITH CUBS OF THE YEAR

The USFWS draft revised recovery plan (USDI 1990) recommended a system of monitoring females with cubs, distribution of females with young, and mortality. The MDFWP is currently evaluating this approach and its usefulness for ongoing management in the NCDE. It is possible that this approach may provide an additional measure of population size and/or trend in the future.

Distribution and Occupancy of Females with Cubs and/or Young of the Year

The draft revised recovery plan (USDI 1990) also specifies targets for occupancy of grizzlies by Bear Management Units (BMUs) in the NCDE (Fig. 5.2) by female grizzly bears with young of the year as a running six-year summary of reports. This is designed as one way to demonstrate adequate distribution of the reproductive cohort within the recovery zone. Distribution of reproducing females may also provide evidence of adequate habitat management, assuming that successful reproduction is an indicator of habitat sufficiency. Lastly, adequate distribution of family groups indicates future occupancy of these areas because grizzly bear offspring, especially female offspring, tend to establish home ranges within or near the home range of their mother after weaning.

Unduplicated observations of females with cubs for 1987-1990 in the NCDE are presented in Figs. 5.3 through 5.6 and Tables. 5.3 through 5.6. The first year this data was recorded was 1987. Unduplicated observations of females with cubs (1986-1990) in the CYE are presented in Table 5.7 and Fig. 5.7.

C. GENERAL DISTRIBUTION

Composite home range maps provide additional evidence of grizzly bear distribution and movement within the ecosystems as well as between these ecosystems and Canada (Figs. 5.8 through 5.14).

An additional indicator of grizzly bear distribution in the NCDE is available from the annual grizzly bear hunter survey which asked hunters for information on grizzlies and grizzly sign observed. This information is presented in Figs. 5.15 and 5.16 for the Scapegoat Bear Management Area (BMA), Figs. 5.17 and 5.18 for the Rocky Mountain East Front BMA, and Figs. 5.19 and 5.20 for the Flathead BMA.

Grizzly bear observations in the CYE (Fig. 5.21) from 1950-1990 are low in number but indicate widespread distribution within this area.

Figure 5.2. Bear management units in the NCDE (1991).

Table 5.3. NCDIE unduplicated female grizzly bears with cubs, 1987.

#	Date Observed	# Cubs	Location	UTM		BMU
Glacier National Park						
1	5/10/87	2	Many Glacier	30580	540970	3
2	5/10/87	2	Granite Park	29700	540500	6
3	6/28/87	2	Baring Basin	30770	539800	3
4	7/20/87	1	Hidden Lake/Logan Pass	29830	539600	6
5	7/24/87	1	Fifty Mountain	29140	541390	6
6	7/28/87	3	Huckleberry Mountain	71180	538560	6
7	8/06/87	2	Granite Park	29700	540500	6
8	8/07/87	1	Huckleberry Mountain	71180	538560	6
9	8/10/87	1	Lake Janet	28440	542600	3
10	8/15/87	1	Many Glacier Valley	30580	540970	3
11	8/20/87	2	Granite Park	29700	540500	6
12	9/07/87	2	Cutbank Pass	31550	537770	8
13	9/20/87	1	Granite Park	29700	540500	6
Outside Glacier National Park						
14	5/18/87	2	So. Fk. Two Medicine River near	33410	535360	12
15	5/19/87	1	Badger Cabin	37920	531315	16
16	6/22/87	1	Rinkers Creek	38040	531315	16
17	7/13/87	2	Blindhorse Creek	36760	521870	24
18	8/13/87	2	Blondie Creek/Parker Lake	38065	531655	16
			Blindhorse Creek			
19	8/28/87	1	Upper Headquarters Creek	36250	529750	19
20	9/11/87	1	S.F. Two Medicine near Rowe Creek	34075	534700	12
21	10/02/87	1	North of Choteau	40585	530465	out ¹
22	11/28/87	2	Near Ear Mountain	37310	529410	20
23	8/ /87	1	Upper Sourdough Creek	36810	522400	24
24	8/3/87	2	Fatty Creek	28100	528550	17
25	7/14/87	2	Dunham Creek	33010	522780	24
26	6/3/87	2	Near Whitelish	69850	536910	out ¹
27	11/ /87	1	2 mi. west of Whitelish Mountain	67200	540380	5

¹ Outside recovery zone

Figure 5.3. Location of female with cubs observations in grizzly bear management units within the NCDE, 1987.

Table 5.4. NCDE unduplicated female grizzly bears with cubs, 1988.

#	Date Observed	# Cubs	Location	UTM		BMU
Glacier National Park						
1	5/09/88	3	Hay Creek/GTSR	2962	54030	5
2	5/21/88	1	Calf Robe Mountain	3277	53610	8
3	6/02/88	2	McPartland Mountain	2915	53970	5
4	6/10/88	1	Avalanche Lake	2905	53903	5
5	7/04/88	1	Red Mountain	3205	53792	8
6	7/06/88	1	Huckleberry Mountain	7114	53860	5
7	7/09/88	2	Mt. Cleveland	2911	54212	3
8	7/10/88	2	Granite Park	2949	54132	5
9	7/20/88	2	Fifty Mountain	2890	54160	3
10	8/09/88	2	Rainbow Peak	7129	54177	2
11	8/27/88	2	Red Eagle/Triple Divide	3140	53859	8
12	9/24/88	2	Belly River R.S.	3016	54231	3
13	9/25/88	3	Round Prairie	6942	54154	2
Outside Glacier National Park						
14	5/5/88	3	Blackleaf Creek	3780	53180	15
15	6/30/88	2	Paola Creek	3030	53550	7
16	7/02/88	1	Tiger Creek near Hungry Horse	2880	53610	6
17	7/16/88	2	Mt. Grant	2980	53560	7
18	7/18/88	2	Scapegoat Mountain	3630	52410	23
19	7/20/88	2	McDonald Peak, FIR	2800	52520	16
20	7/21/88	1	Quintonkin Creek	2920	53230	9
21	8/10/88	2	Paint Creek	2980	53390	9
22	8/21/88	2	Pilgrim Lakes	2860	53320	9
23	8/22/88	1	Elk Creek	3790	52430	24
24	8/25/88	3	Willow Creek near Pine Butte	3840	52980	19
25	9/14/88	3	Dupuyer Creek	3770	53330	15

Figure 5.4. Location of females with cubs observations in grizzly bear management units within the NCDE, 1988.

Table 5.5. NCDE unduplicated female grizzly bears with cubs, 1989.

#	Date Observed	# Cubs	Location	UTM		BMU
Glacier National Park						
1	5/14/89	3	Upper McDonald	2964	54030	5
2	6/24/89	2	Huckleberry Creek	7128	53861	5
3	6/28/89	2	Two Medicine	3187	53713	8
4	6/30/89	2	Upper McDonald Creek	2952	54039	5
5	6/30/89	2	Waterton drainage	2860	54190	3
6	7/04/89	3	Cutbank Creek	3207	53776	8
7	7/04/89	2	Upper McDonald Creek	2963	54035	5
8	7/10/89	1	Kintla Creek	7103	54273	2
9	7/21/89	2	Cracker Creek	3054	54084	3
10	8/06/89	1	Grinnell Creek	3048	54074	3
11	8/07/89	1	Huckleberry Creek	7115	53879	5
12	8/07/89	3	Huckleberry Creek	7115	53875	5
13	8/18/89	1	Huckleberry Creek	7122	53863	5
14	9/20/89	1	St. Mary	3129	53965	3
15		2	Mt. Cleveland	2913	54228	3
Outside Glacier National Park						
16	5/1/89	2	Quintonkin Creek	2880	53220	9
17	5/1/89	1	Wheeler Creek	2930	53270	9
18	5/1/89	1	Sullivan Creek	3030	53100	9
19	5/25/89	2	Spring Creek	3481	52135	23
20	6/1/89	2	Clearwater Wildlife Manage.	3360	53550	11
21	6/15/89	1	E. Moore Lk. NW Jim Creek	3050	52780	16
22	6/15/89	2	Horizontal Control Station	3049	53490	7
23	6/24/89	1	Essex Creek	3240	53335	10
24	6/28/89	3	Wild River	3305	53865	8
25	8/2/89	2	Middle Fork Flathead River	3160	52580	21
26	8/14/89	2	Hay Coulee Creek	3960	52890	19
27	8/19/89	2	Wigwam Creek	6605	54270	1
28	8/20/89	1	S. Fork Glenn Creek, N. Fork	3541	52810	18
29	8/29/89	2	Glenn Creek	3760	53120	15
30	8/29/89	1	Blindhorse Creek Junction	3060	53010	13
31	8/31/89	2	Hoadley Creek	3505	52605	22
32	9/14/89	1	Townsend Creek	3330	53490	11
33	9/15/89	1	W. Fork of South Fork Sun	3455	52700	22
34	9/30/89	1	River Ahorn Creek	3390	52550	21

There were three additional observations outside of the recovery line.

Figure 5.5. Location of females with cubs observations in grizzly bear management units within the NCDE, 1989.

Table 5.6. NCDE unduplicated female grizzly bears with cubs, 1990.

#	Date Observed	# Cubs	Location	UTM		BMU
Glacier National Park						
1	5/06/90	2	Upper McDonald Creek	2976	54021	5
2	6/19/90	1	Red Eagle	3195	53929	8
3	7/03/90	3	Upper McDonald Creek	2968	54038	5
4	7/06/90	1	St. Mary	3130	53965	3
5	8/04/90	3	Upper McDonald Creek	2970	54048	3
6	8/05/90	3	Akokala	6990	54110	2
7	8/16/90	1	Cameron Lake Headwall	7156	54311	3
Outside Glacier National Park						
8	5/22/90	2	Feather Creek	3090	52940	13
9	6/09/90	1	Railroad Creek	3350	53660	8
10	6/15/90	2	Cinnabar Mountain	3110	53060	13
11	7/07/90	2	Wigwam River	6560	54260	1
12	7/30/90	2	Werner Peak	6880	53830	4

There was one additional observation outside the recovery line.

Table 5.7. CYE unduplicated female grizzly bears with cubs, 1986-1990.

Number	Date Observed	No. of Cubs	Location	UTM		BMU
1	5/30/86	2	Yaak R.	5835	54073	11
2	5/12/87	2	Graves Cr.	6208	52840	22
3	5/12/87	2	Baldy Mtn.	5780	54090	13
4	7/18/87	2	Swamp Cr.	6065	53138	6
5	10/25/87	2	Flattail Cr.	5975	53910	11
6	5/19/88	2	Burnt Cr.	5905	54050	11
7	6/9/89	2	Silver Butte	6000	63108	7
8	9/1/90	2	Klatawa Lk.	5950	53480	2

Figure 5.6. Location of females with cubs observations in grizzly bear management units within the NCDE, 1990.

Figure 5.7. Bear management units in the CYE showing unduplicated female grizzly bears with cubs observations, 1986-1990.

Figure 5.8. Home range map from the Rocky Mountain East Front (Aune and Kasworm 1989) for individual adult and subadult female grizzly bears, 1977-1987.

Figure 5.9. Home range map from the Rocky Mountain East Front (Aune and Kasworm 1989) for individual subadult male grizzly bears, 1980-1987.

Figure 5.10. Home range map from the Rocky Mountain East Front (Aune and Kasworm 1989) for individual adult male grizzly bears, 1977-1987.

Figure 5.11. Composite home range map from the South Fork of the Flathead River (Mace and Manley 1990). (100% = 631 mi²; 95% = 444 mi²)

Figure 5.12. Home range map from the Blackfeet Indian Reservation (Carney 1990) for seven individual grizzly bears.

Figure 5.13. Home range map of eight grizzly bears in the CYE 1986-1990 (Kasworm and Thier 1990).

Figure 5.14. Composite minimum home range polygon of three grizzly bears in the CYE 1983-1987 (Kasworm and Manley 1988).

Figure 5.15. Grizzly bear sightings in the Scapegoat Bear Management Area reported by hunter surveys, 1987-1990.

Figure 5.16. Grizzly bear sign in the Scapegoat Bear Management Area reported by hunter surveys, 1987-1990.

Figure 5.17. Grizzly bear sightings in the Rocky Mountain East Front bear management area reported by hunter surveys, 1987-1990.

Figure 5.18. Grizzly bear sign in the Rocky Mountain East Front bear management area reported by hunter surveys, 1987-1990.

Figure 5.19. Grizzly bear sightings in the Flathead Bear Management Area reported by hunter surveys, 1987-1990.

Figure 5.20. Grizzly bear sign in the Flathead Bear Management Area reported by hunter surveys, 1987-1990.

Figure 5.21. Grizzly bear observations and mortality in the CYE, 1950-1990 (circles indicate mortality).

D. REPRODUCTION

Updated grizzly bear reproductive characteristics in the NCDE (Table 5.8) indicate litter size varying from 1.5 to 2.3 cubs, and mean age at first litter ranging from 5.7 to 6.5 years. Litter frequency averages 2.7 years.

Table 5.8. An update on reproductive characteristics of the NCDE grizzly bear population.

Location and Source	Year	Mean litter size of cubs	Mean age at first litter	Litter frequency (years)	Corpus lutea
Rocky Mtn. East Front (MT) (Aune and Kasworm 1989)	1985	2.16	5.5	2.1	-
	1989	2.20	6.5	2.6	-
South Fork Flathead, MT (Mace and Manley 1990)	1990	1.5	--	--	-
Flathead River, B.C. (McLellan 1989 ^c)	1984	2.5	5.5	3.1	-
	1989	2.3	6.0	2.7	-
Northern Continental Divide Ecosystem, MT (Aune et al. 1992)	1992	2.14	5.7	2.7	2.33

E. AGE STRUCTURE

Updated age structure information for the NCDE (Table 5.9) shows fewer yearlings and more adult grizzlies present in the South Fork of the Flathead than on the East Front.

Table 5.9. Available age structure data for the NCDE grizzly bear population.

Location and Reference	Percentage of Population				
	Year	Cubs	Yearlings	Subadults	Adults
Rocky Mtn. East Front (MT) (Aune 1989)	1985	23	18	25	34
	1989	22	22	24	32
Flathead River, BC (McLellan 1989a)	1984	15	18	24	43
	1988	21	18	27	34
Glacier National Park (MT) (Martinka 1974)	1974	17	15	--	--
South Fork Flathead (MT) (Mace pers. comm.) 1991	1991	21	7	16	56

F. MORTALITY

Updated mortality rates (Table 5.10) for the NCDE are 10% for cubs, 14% for yearlings, from 19 to 39% for subadults, and 21 to 24% for adults.

Table 5.10. An update on mortality rate (%) by age class for the NCDE grizzly bear population.

Location and Source	Cubs	Yearlings	Subadults	Adults
Flathead River, B.C. (McLellan 1989b)	8	12	8	7
Rocky Mtn. East Front, MT (Aune and Kasworm 1989)	8	10	39	24
South Fork Flathead, MT (Mace pers. comm.) 1991 ^a	19	0	19	21
Northern Continental Divide Ecosystem, MT (Aune et al. 1992)	10	14	-	-

^a Natural and human-caused mortalities combined.

G. TREND MONITORING

Ongoing trend monitoring in northwest Montana utilizes a wide range of techniques and surveys. Additionally, the MDFWP is exploring more effective ways to monitor trends. Recent research in Glacier National Park (Kendall et al. 1991) examines bear sign surveys as an inexpensive and non-intrusive method to monitor population trends. Current information (Aune and Kasworm 1989, Mace and Manley 1990, and Keating 1986) indicates that the population in the NCDE is stable to increasing.

The only previous indication of a possible population decline in the NCDE is that of Claar et al. (1986) for the population segment occupying the Mission Mountains. Their analysis and suggestion of population decline is based on the assumption that the Missions were an isolated population. Ongoing research (Mace and Manley 1990) has demonstrated that these bears, together with those of the adjacent Swan range, are part of the same population. The number of bears present in the Mission Mountains at any time is dependent upon natural bear movements. Significant numbers of grizzly bears still use the Mission Mountains as part of their home range.

No additional information is available on the population trend in the CYE from that presented in the 1986 EIS.

H. AUGMENTATION OR REINTRODUCTION

The Cabinet Mountains grizzly bear study, conducted from 1983-1988, concluded that the future of the population was in serious doubt. Factors leading to that conclusion included: only three grizzly bears were captured despite an extensive trapping effort, the individuals captured were of advanced age, few additional grizzly bear sightings were obtained, low numbers of observations of females with young were made, and high mortality rates of marked bears were recorded. The study recommended population augmentation utilizing subadult females having no history of conflicts with humans.

The first of four projected transplants was completed in July 1990. The 4-year old female weighed 71 kg and remained in the Cabinet Mountains following release. Her movements from July through October encompassed 191 km², and she denned during late October (Kasworm and Thier 1990). As was recommended in the 1986 EIS, additional efforts are under way to further augment the population in this area.

VI. MANAGEMENT PROGRAM REVIEW

A. MORTALITY QUOTA

The MDFWP is responsible for compiling reports of all known and probable grizzly bear mortalities in Montana. These data are summarized in annual reports (Greer 1971-1985, Palmisciano 1986, Dood and Pac 1988, Pac and Dood 1989 and 1990). Reports record mortalities from all causes including hunting, control actions, natural deaths, transplants, illegal killing, etc.

The Code of Federal Regulations [50 CFR 17.40 (b)] established a human-caused mortality quota of 25 grizzly bears for northwestern Montana in 1975 (Appendix F). At that time, the MDFWP (Woodgerd 1974) felt a mortality quota of 25 was appropriate based on the fact an average annual mortality of 28 (1967 through 1974) had not inhibited population increase. MDFWP elected in 1983 to establish a female subquota of 13 for the NCDE (7 west of the Continental Divide and 6 east of the Divide) to avoid any possibility of local overharvest. These quotas involved the total man-caused grizzly mortality including illegal kills, accidents, control actions, and hunter harvest. In 1985, as a response to problems with grizzlies utilizing areas which were not in the legally described boundaries where hunting could occur, an Emergency Federal Regulation changed the boundaries and also reduced the total quota to 15 to account for unreported mortalities which may have been occurring. It further set a female subquota of 6. In 1986, the final rule was established allowing a known human-caused mortality of 14 total and 6 females. All quotas were and have been reviewed annually to determine if they needed adjustment.

B. HUNTING SEASONS

Hunting has been an integral part of Montana's grizzly bear management program since its inception. Several changes in hunting regulations have been made over the years in order to maintain viable populations. Many of these were outlined by Dood et al. (1986: 6-8). However, because of their relevance, some of these are repeated here along with more recent changes. Many of these changes were specifically designed and implemented to protect females.

The use of dogs for bear hunting was prohibited in 1921, and bears were declared game animals in 1923. The unrestricted spring hunting of grizzlies ended in 1940, and prohibitions on the killing of cubs or females with cubs and baiting of bears followed in 1947 and 1948, respectively.

Changes instituted in 1967 required that hunters purchase a special grizzly bear license and that successful hunters purchase a trophy license within 10 days of taking a grizzly. Starting in 1970, grizzly bear hunting licenses had to be purchased prior to the opening of the hunting season (traditionally mid- to late October through late November

with some back country areas opening September 15); the date has varied by year. Since 1971, successful hunters have been required to submit the hide and head for inspection and tagging at the time they obtain their trophy license.

Regulations in effect from 1971 through 1981 prohibited a successful grizzly hunter from applying for a grizzly license for the following seven years. This was changed to a "once-in-a-lifetime" harvest effective March 27, 1987 (Appendix G).

When grizzly bears in the conterminous 48 states were listed as threatened in 1975, Montana was the only state authorized to allow hunting grizzly bears in a specifically delineated area (see Appendix F). Several other changes also went into effect at this time. One significant change was that an annual quota for grizzly bear mortalities assignable to any human activity was implemented. Along with this change, hunters were required to report the kill of a grizzly to an officer of the MDFWP within 48 hours (the 10-day period to obtain a trophy license was not changed) (Appendix G), and the season was to be closed on 48-hour notice if the quota was reached.

The quota was set at a total of 25 bears in 1975 and remained at this level through 1984. However, female subquotas established in 1983 limited the female harvest to a maximum of seven west of the Continental Divide and six east of the Divide. Either area could then be independently closed on 48-hour notice if the female subquota was reached. In order to monitor the female harvest under the total quota/female subquota system, hunters were required to leave evidence of sex intact on the hide or carcass when the animal was presented to obtain a trophy license.

Female subquotas were reduced in 1983 to six west of the Divide and three east of the Divide. Quotas were again reduced (total of 15, female subquota of 6) in 1985. Three Bear Management Areas (BMAs) were also established (Flathead, East Front, and Bob Marshall-Scapegoat) with the female subquotas divided among them. Other new regulations in 1985 defined young as up to 2 years of age (under prohibition on taking of females with young) and also stated that hunters "may not" shoot grizzly bears found in groups of two or more. The latter regulation was changed in 1986 to a request that, "to reduce the likelihood of taking a female, hunters should, if at all possible, not shoot grizzly bears found in groups of two or more". Similar regulations have been in effect since that time.

Changes incorporated into the 1986 regulations included a further reduction in the total quota to 14 plus adjustments to both the boundaries of the three BMAs and the female subquota within each. The Scapegoat BMA was formed from a portion of the former Bob Marshall-Scapegoat BMA with a female subquota of one. The size of both the Flathead and the newly designated Rocky Mountain East Front BMAs were increased with female subquotas of two and three, respectively.

Hunting season dates have a large influence on the sex ratio of the harvest (see Dood et al. 1986: 69-71). Therefore, to provide additional protection to females, the opening of the grizzly bear hunting season in the NCDE has been delayed until October 1 since 1986.

In order to allow more flexibility in the taking of grizzly bears meeting criteria for removal as nuisance bears (to minimize continued conflict and to prevent human injury), a grizzly bear "damage hunt" was authorized for the East Front BMA in 1987. The area was expanded to include the entire NCDE in 1991.

The damage hunt was established to allow hunters, following specific procedures and under strict supervision, to take animals which would normally be removed by state or federal authorities. Although 4,449 people applied for a spot on the annual damage hunt roster between 1987 and 1991, hunters were utilized on only two occasions, and only one of the two hunters succeeded in taking an offending bear.

Based on a review of management programs in Canada and research data from the East Front area of Montana, the MDFWP felt that a limited spring grizzly bear hunt could be used to focus mortality on males if it closed early enough (Appendix H₁). A limited entry (50 permits) spring hunt was authorized for the Rocky Mountain East Front BMA by the MFWPC on March 7, 1991. Applications had to be received or postmarked by March 21, and 415 met this deadline. The season ran from April 1 through May 4, and the female subquota for that BMA (3) was in effect to avoid the possibility of excessive mortality.

All 50 hunters were interviewed by telephone after the close of the season; the questionnaire and a summary of the results are presented in Appendix H₂. A harvest of three males occurred which was what had been predicted in the justification prepared by the MDFWP (Appendix H₁).

C. CLOSURE AUTHORITY

The MFWPC has the authority to close hunting seasons at any time. When the quota system was established, it was recognized that the total quota or female subquota might be reached before the start of the scheduled hunting season. In that event, the season would not be held that year. A statement to that effect is included in the annual hunting regulations.

The grizzly bear season closed early in four of the five years covered by this update when total or female mortalities approached or reached the quotas. In addition, the hunting season in the Flathead BMA did not open in 1989 or 1990 because the female subquota was met prior to October 1, largely as a result of bears being struck by trains at a major grain-spill area.

By closing the season as quotas were approached or met, neither the total quota nor the female subquota has ever been exceeded.

D. OTHER REGULATIONS

Since 1947, the annual limit has been one grizzly bear of either sex per license holder. As stated previously, this was changed to one bear per lifetime in 1987. A person must obtain a trophy license before removing any portion of a grizzly bear from the state. Additional regulations cover hunting hours, tagging requirements, and required clothing color.

E. HUNTER SURVEYS

Questionnaires have been sent periodically to grizzly bear licensees to obtain information on whether they actually hunted or not, number of days and areas hunted, observations of bears or bear sign, whether they shot at or killed a grizzly bear, plus other information and comments (Greer 1972, 1974a). Following the recommendations of the 1986 EIS, surveys have since been conducted on an annual basis during the period covered by this update (see Table 6.1). Appendix H₂ includes an example of the type of surveys which are conducted.

F. SEASON SETTING PROCESS

Big game hunting season regulations, including those for grizzly bears, are presented to the MFWPC at their December (odd numbered years) meeting biennially. Before adjourning, the MFWPC develops a set of tentative regulations which are sent to interested parties and are available to anyone. Each MDFWP region holds several public meetings to explain, discuss, and solicit public input on the tentative regulations. The MFWPC holds another public meeting in February (even numbered years) to receive further input and adopts a set of final regulations one week later.

Table 6.1. Results of grizzly bear hunter questionnaires for the NCDE, Montana 1985-1990.

	1985	1986	1987	1988	1989	1990	AVERAGE
Number of license holders	306	120	188	226	114	128	180.3
% responding	80	74	74	63	64	70	19.5
% hunted grizzlies	50	83	66	57	40	65	64.8
% did not hunt grizzlies	50	17	34	73	40	35	35.8
% did hunting incidental to elk or deer hunting	62	32	2	2	32	33	33.8
% hunted primarily for a grizzly	38	66	73	83	62	67	64.8
% passed up an opportunity to shoot in hopes of seeing a larger bear	9	7	9	10	7	9	6.3
% could have shot a grizzly bear ^a	23	73	--	--	--	-	-
% shot at a grizzly bear	23	21	7	5	5	2	11.0
Number that killed a grizzly	-	4	2	2	0	-	2.3
Mean number of days spent hunting grizzlies	8.4	5.7	4.5	3.7	8.4	8.8	6.6
Minimum number of days hunted	1	1	1	1	2	-	1.2
Maximum number of days hunted	35	32	21	10	40	65	27.2
Number of days hunted for those that saw a grizzly	14.0	--	4.6	3.7	10.0	23.4	11.1
Number of days hunted for those that did not see a grizzly	7.3	5.6	4.5	3.7	7.6	7.3	6.0
Number of days hunted per successful hunter	6.2	2.4	7.0	7	--	5.0	4.3
Number of days hunted for hunters that passed an opportunity to shoot a bear for a larger bear	25.5	4.8	4.3	3.1	10.0	23.4	11.9
Number of days hunted for hunters not passing up any opportunities	7.7	5.8	3.7	3.7	8.3	7.3	6.3
% not seeing a grizzly	34	83	72	66	40	90	62.5
% seeing a grizzly	66	57	28	30	26	10	42.8
% of above seeing 1 bear	66	79	62	35	33	73	51.8
% of above seeing 2 bears	20	21	19	19	25	2	19.5
% of above seeing 3 or more bears	73	--	23	31	25	50	23.3
% seeing black bear	31	83	--	--	--	--	--
% not seeing black bear	50	59	--	--	--	--	--
% observing grizzly sign (scat or tracks)	2	--	60	63	62	50	62.4
% not observing grizzly sign	23	--	66	37	40	50	37.6
% of hunters hunting in Flathead Mgt. Area	--	--	50	61	0 ^b	0 ^c	29.3
% of hunters hunting in East Front Mgt. Area	--	--	28	27	40	84	53.0
% of hunters hunting in Scapegoat Mgt. Area	--	--	19	13	24	16	18.0

^a This question was not included in 1987-1990

^b Flathead Unit was closed to hunting in 1989

^c Flathead Unit was closed to hunting in 1990

VII. GRIZZLY BEAR MORTALITY

A. NCDE

1. Total Human-Caused Mortality

Average annual known human-caused grizzly bear mortalities in the NCDE, including GNP, prior to 1986 were 22.7 bears/year (Dood et al. 1986). This declined to 11.6 bears/year from 1986-1990 (Table 7.1, Figure 7.1, Appendix I) with 2.6 bears harvested legally and 9 bears dying from other human causes. Reported non-hunting mortality has exceeded hunting mortalities during every year since 1985.

Among bears of known sex, male grizzly bear mortality exceeded female mortality in 3 of the last 5 years and in 15 of the 19 years preceding 1986 (Fig. 7.2). The ratio of male:female mortality averaged 53:47% for the last five years as compared to the previous ratio 59:41% (Dood et al. 1986). This change is due to implementation of female mortality subquotas and female mortality has not exceeded allowable limits in any year.

Among known 1986-1990 human-caused mortalities, the ratio of adult (5+ years):younger animal mortality was 43:57% (Table 7.2). The previous ratio was 49:51% (Dood et al. 1986). Age distribution of female grizzly bear mortalities during 1986-1990 (Fig. 7.3) indicated an average of 6.5 years. The average ratio of adult:younger females for those years was 44:56%. Age distribution of males (Fig. 7.4) from human-caused mortality during 1986-1990 indicated a younger age than for females ($\bar{X}$ = 5.3 years). Average adult:younger male ratios were 42:58%.

Distribution of Grizzly Bear Mortality by Landownership and BMA

In the NCDE during 1986-90, 47% of the mortalities occurred on the Flathead National Forest, 26% on private land, 12% on the Blackfeet Indian Reservation, 5% on both the Lewis and Clark National Forest and Glacier National Park, 3% on the Flathead Indian Reservation, and 2% on MDFWP lands (Fig. 7.5, Table 7.3). Most (55%) of the known human-caused mortalities occurred on the Flathead Management Area (Table 7.4).

2. Hunting Mortality

From 1986-90, 22% (n=13) of all human-caused mortalities were due to regulated hunting. Average hunting mortality was 2.6 per year (range = 0-5), 62% of which were females (Table 7.1, Fig. 7.6).

When sexes were combined, the ratio of adult to subadult animals in the hunter harvest was 69:31% (Table 7.1, Fig. 7.6). Adults comprised a greater proportion of female legal harvest than did subadults (Fig. 7.7). During the period 1986-90, adults constituted 75% and 60% of the total female and male harvest, respectively.

Table 7.1. Summary of total known human-caused mortality of grizzly bears in the NCDE, 1986-1990.

Year	86	87	88	89	90	Total	1986-90 Average	1967-85 Average
Hunt	5	3	4	0	1	13	2.6	12.5
Non-hunt	9	8	5	12	11	45	9.0	10.2
Total	14	11	9	12	12	58	11.6	22.7
<u>Hunt</u>								
Male	3	1	0	0	1	5	1.0	7.5
Female	2	2	4	0	0	8	1.6	5.1
<u>Non-hunt</u>								
Male	5	4	2	7	5	26	5.2	5.0
Female	4	4	3	5	4	19	3.8	3.6
Unknown sex								2.0
<u>Hunt</u>								
Adult	3	3	2	0	1	9	1.8	5.9
Subadult ¹	2	0	2	0	0	4	0.8	5.4
Unknown sex								1.1
<u>Non-hunt</u>								
Adult	2	3	4	5	2	16	3.2	4.1
Subadult	6	2	1	7	7	23	4.6	5.0
Cub	1	3	0	0	2	6	1.2	0.0
Unknown sex								1.1
<u>Hunt</u>								
Adult M	1	0	0	0	1	3	0.6	3.3
Adult F	2	2	2	0	0	6	1.2	2.8
Unknown sex								0.6
<u>Non-hunt</u>								
Adult M	2	1	2	1	1	10	2.0	2.5
Adult F	0	2	2	1	1	6	1.2	2.0
Unknown sex								1.1
Total Male	8	5	2	7	9	31	6.2	12.2
Total Female	6	6	7	5	3	27	5.4	8.5
Total Unknown Sex	0	0	0	0	0	0	0.0	2.0

¹ Subadult is any bear that is older than a cub and less than 5 years old.

Figure 7.1. Number of known human-caused grizzly bear mortalities by cause of death in the NCDE, 1967-1990.

Figure 7.2. Total known mortality by sex of grizzly bears in the NCDE, 1967-1990.

Table 7.2. Number of known human-caused adult and subadult grizzly bear mortalities in the NCDE, 1986-1990.

	1986	1987	1988	1989	1990	Total	%
Adult	5	6	6	5	3	25	43
Subadults and cubs	9	5	3	7	9	33	57
Totals	14	11	9	12	12	58	100

Figure 7.3. Age distribution of female grizzly bears of total known human-caused mortality in the NCDE, 1986-1990.

Figure 7.4. Age distribution of male grizzly bears of total known human-caused mortality in the NCDE, 1986-1990.

Figure 7.5. Number of known human-caused grizzly bear mortalities by land ownership of kill location in the NCDE, 1986-1990.

Table 7.3. Number of known human-caused grizzly bear mortalities by land ownership of kill locations in the NCDE, 1986-1990.

Land Ownership	1986	1987	1988	1989	1990	Total (%)
Flathead National Forest	7	2	5	4	4	27 (47)
Private - Montana	1	0	3	4	4	15 (26)
Blackfeet Indian Reservation	0	0	0	2	0	7 (12)
Lewis and Clark National Forest	1	1	0	0	1	3 (5)
Glacier National Park	1	1	1	0	0	3 (5)
Flathead Indian Reservation	2	0	0	0	0	2 (3)
Montana Department of Fish, Wildlife and Parks	1	0	0	0	0	1 (2)
Total	14	11	9	12	12	58 (100)

Figure 7.6. Number by sex of grizzly bears harvested by hunters in the NCDE, 1967-1990.

Table 7.4 Number of known human-caused grizzly bear mortalities by Bear Management Area in the NCDE, 1986-1990.

#	Bear Management Areas	1986	1987	1988	1989	1990	Total
1	Flathead	7	5	5	9	6	32
2	East Front	3	3	2	1	3	12
3	Scapegoat	0	0	1	0	0	1
4	Blackfeet IR	1	2	0	2	3	8
5	Glacier NP	1	1	1	0	0	3
6	Flathead IR	2	0	0	0	0	2
	Total	14	11	9	12	12	58

Figure 7.7. Number by age class of grizzly bears harvested by hunters in the NCDE, 1967-1990.

Distribution of Hunting Mortality by Bear Management Areas

Of 13 hunting mortalities during the five-year time period, 69% occurred in the Flathead BMA and 31% in the East Front (Fig. 7.8.). No hunting mortalities occurred in the Scapegoat Area. Previous information from 1973-1985 indicated 83% in the Flathead, 8% on the East Front, and 9% in the Scapegoat Bear Management Areas.

Figure 7.8. Number of known human-caused grizzly bear mortalities by bear management area in the NCDE, 1986-1990.

3. Human-Caused Nonhunting Mortality

- a. Control - A grizzly bear legally killed or removed alive from the ecosystem by state, tribal, or federal government officials to defend against damage to property or potential injury to humans
- b. Illegal - An illegally killed grizzly bear includes marauding bears killed illegally by private individuals, grizzly mistaken for a black bear, poaching, and deliberate vandal killing.

- c. Trapping Casualty - A grizzly bear accidentally killed by agency personnel during transplant or research operations.
- d. Vehicle Collision - A grizzly bear accidentally killed when struck by a train or motorized vehicle.
- e. Unknown/Under Investigation - A grizzly bear mortality that is under investigation. Cause of death can not be determined or has not yet been assigned.
- f. Legal, Defense of Life - A grizzly bear legally killed by a citizen acting in self-defense or in the defense of others.

For the 1986-90 period, an annual average of 9.0 grizzly bears (range 5-12) were lost from the population from known human causes other than hunting (Table 7.1). Distribution of nonhunting and hunting mortalities in the NCDE from 1986-90 (Fig. 7.9) shows a concentration of deaths only along the south border of GNP. These were due to train collisions.

Male grizzly bears predominate the nonhunting mortalities (Table 7.1). During the 1986-90 period, females averaged 42% of nonhunting mortality. Subadults and cubs comprised 64% of the nonhunting mortality (Table 7.1).

Illegal mortalities comprised 31% (n=14, Table 7.5) of the total non-hunting mortalities. During 1975-85, most illegal mortalities resulted when marauding bears caused sheep depredation problems. Because of greater agency involvement in recent years, control actions have replaced what would have possibly been illegal deaths in the past. Control actions now constitute 27% of the mortalities and removals compared to 17% reported in the 1986 EIS. Vehicle collisions, especially with trains, increased to 16% compared to 8% reported from 1975-1985. Trapping mortalities increased to 9% from the previous 4% reported due to increased research and management efforts. Defense of life mortalities were similar in both time periods.

4. Unreported Illegal Mortality

Unreported illegal grizzly bear mortalities are difficult to document. However, a method to calculate that mortality rate was described by Brannon et al. (1988) using data obtained from radio-monitored grizzly bears including age, sex, and fate. The percentage of unreported mortalities (those that would go undetected without the benefit of radio telemetry) among these monitored bears is extrapolated to the entire population and adjusted to account for vulnerability of the sample and the population (Dood et al. 1986).

Table 7.5. Number of known human-caused grizzly bear mortalities by cause of death in the NCDE, 1986-90.

	1986	1987	1988	1989	1990	Total
Illegal	5	1	3	5	0	14
Trap	2	1	1	0	0	4
Control	1 ^a	5 ^a	1	0	5 ^a	12
Train/road kill	1	0	0	2	4	7
Hunt	5	3	4	0	1	13
Unknown/Under Investigation	0	1	0	1	2	4
Legal, Defense of Life	0	0	2	4	0	4
Total	14	11	9	12	12	58

^a live removal

The list of monitored bears includes all bears known to be alive (outside of GNP) through monitoring or capture within an individual year (Appendix J). Bears that die are included in the list for the year of their mortality because they were known to be alive at least part of that year.

The number of unreported mortalities detected only because of use by radio telemetry is divided by the total number of bears monitored during a time period.

$$\frac{\# \text{ Unreported mortalities}}{\# \text{ bears monitored}} = \frac{\text{Unreported mortality rate}}{\text{mortality rate}} \times 100 = \text{percent mortality rate}$$

Several assumptions are made:

- monitored bears are representative of the sampled population (see qualifiers below), and therefore mortality rates of monitored bears can be extrapolated to the entire population
- An upper mortality figure can be estimated by applying the rate of confirmed (unreported) deaths to the estimate of the minimum number of bears in the NCDE (excluding Glacier National Park)

- c. Transplanted bears are not used in the analysis because their vulnerability may be higher than other bears.
- d. Because mortalities occur throughout the year, the figure developed includes crippling loss (although crippling loss is not considered an illegal mortality)

The unreported mortality rate is considered an upper estimate for the following reasons:

- a. Research results indicate that all bears in the ecosystem are not vulnerable to this type of mortality and those that are, are not vulnerable all the time.
- b. The sample of research bears utilized to develop this rate has a higher proportion of subadult animals than the whole population. (An exception to this is in the South Fork Study where a systematic grid snaring program was implemented.) The subadult age class is the most vulnerable to this type of mortality.
- c. Records from undercover enforcement operations and reports submitted for possible rewards under both the state program and the Audubon reward program indicate that there is not a large unreported kill going undetected.

The upper limit in ten year increments varies from 3.5% to 0.7% (Tables 7.6 and 7.7). The rate calculated from the complete data set (1975-1990) is 2.1%. This rate then can be multiplied by the minimum NCDE population estimate (outside of Glacier National Park) of 294 bears.

$$A. 294 \times 0.007 = 2.0 \text{ bears (last ten years)}$$

$$B. 294 \times 0.035 = 10.3 \text{ bears (highest rate)}$$

$$C. 294 \times 0.021 = 6.2 \text{ bears (1975-1990 entire data set)}$$

The number of unreported mortalities is determined by taking the mean between no unreported mortalities (0) and the upper limit established by the calculations of the data.

In case A, the mean unreported illegal bear deaths is $0-2 = 1$ bears, in case B $(0-10) = 5$ bears, in case C $(0-6) = 3$ bears.

Table 7.6. Unreported grizzly bear mortality data to calculate rate.

Year	Total number of bears monitored	Number of unreported mortalities
1975	2	0
1976	10	2
1977	16	1
1978	15	0
1979	24	3
1980	23	0
1981	20	0
1982	22	0
1983	22	0
1984	27	0
1985	22	1
1986	26	0
1987	24	0
1988	33	0
1989	46	1
1990	47	0
Total	379	8

Table 7.7. Summary of unreported mortality rate for grizzly bears in the NCDE by ten-year increments.

Years	Total number of bears monitored	Number of unreported mortalities	% unreported mortality rate
1975-84	181	6	3.3
1976-85	201	7	3.5
1977-86	217	5	2.3
1978-87	225	4	1.8
1979-88	243	4	1.6
1980-89	265	2	0.8
1981-1990	289	2	0.7
Total 1975-90	379	8	2.1

The total quota of allowable man-caused mortalities in the NCDE from 1986 to 1990 was 21 (6% of the minimum estimated population of 356 outside GNP). This figure was then reduced to 14 to account for an assumed 66% rate of reporting of these deaths.

The best available current information indicates that the total quota should be 18 (6% of the updated minimum population estimate of 294). This must then be reduced to account for unreported deaths utilizing one of the following:

Case A - last 10 years (1981-1990) = 18 - 1 = 17 bears

Case B - highest 10 years (1976-1985) = 18 - 5 = 13 bears

Case C - entire data set (1975-1990) = 18 - 3 = 15 bears

Case A (an allowable known man-caused quota of 17) should best represent the current situation regarding unreported mortalities. However, to remain conservative Case C was utilized, resulting in a final total quota of 15. There is nothing to suggest that Case B is currently valid or that the female subquota should be altered.

In summary, the unreported mortality rate has decreased from previous estimates. Therefore, we recommend that the total quotas should be 15 with a subquota of 6 females. The decrease in unreported mortality is probably related to extensive MDFWP efforts to minimize bear-human conflicts (especially on the Rocky Mtn. Front) and increased undercover enforcement efforts coupled with stiff sentences.

B. CYE

1. Total Mortality

Grizzly bear data from the CYE were recorded and compiled from public and agency sightings. The file includes records of mortalities from 1950 (Table 7.8), and sightings, tracks, scats, digs, hair, and dens dating from 1960 (Fig. 5.21) (Kasworm and Thier 1990).

Six mortalities have occurred since 1985 involving two males, three females, and one of unknown sex. The bear listed as a hunter kill in 1988 was killed in the British Columbia hunt. This animal was tagged in the United States and spent most of his time there. All known mortality during the time period occurred north of the Kootenai River in the Yaak portion of the ecosystem.

Table 7.8. Grizzly bear mortality in the Cabinet-Yaak area, 1950-1990.

Year	Location	Total	Sex/Age	Mortality Cause
1950	Squaw Cr	1	Subadult	Unknown
1951	Pete Cr	1	Adult Male	Nuisance
1951	Papoose Cr	2	Subadults	Unknown
1951	Goat Cr	1	Subadult Male	Unknown
1952	Felix Cr	6	2 Adult Females, 4 Yearlings	Nuisance
1953	Obrien Cr	1	Subadult Male	Hunter Kill
1953	Kenelty Mt	1	Unknown	Hunter Kill
1953	20-Odd Mt	1	Unknown	Hunter Kill
1953	Burnt Cr	1	Unknown	Hunter Kill
1953	17-Mile Cr	1	Unknown	Hunter Kill
1954	N F Bull R	1	Unknown	Hunter Kill
1954	S F Bull R	1	Unknown	Hunter Kill
1954	Cedar Lk	1	Unknown	Hunter Kill
1954	Cedar Lk	1	Unknown	Hunter Kill
1954	Taylor Pk	1	Unknown	Hunter Kill
1954	Silverbutte Cr	1	Unknown	Hunter Kill
1954	Silverbow Cr	1	Adult Female	Hunter Kill
1955	Wolf Cr	1	Adult Male	Control (Depredation)
1955	Mt. Headley	1	Subadult	Nuisance
1955	Baree Lk	1	Adult Male	Unknown
1955	Baree Lk	1	Adult Female	Unknown
1955	Bear Cr	1	Subadult Male	Hunter Kill
1958	Squaw Cr	1	Adult Female	Nuisance
1959	E F Rock Cr	2	Adult Female, 1 Cub	Hunter Kill
1959	W F Thompson R	4	Adult Female, 3 Cubs	Unknown
1959	Cliff Cr	1	Unknown	Unknown
1960	Prospect Cr	2	Adult Female, 1 Cub	Unknown
1964	Graves Cr	2	Subadults	Unknown
1964	Wanless Lk	3	Subadults (Adult Wounded)	Unknown
1965	Snowshoe Cr	2	Subadults	Unknown
1968	Bear Cr	1	Adult Female	Illegal Kill
1968	Granite Cr	1	Subadult Male	Nuisance
1969	Priscilla Pk	1	Adult Female	Unknown
1970	Thompson R	1	Unknown	Unknown
1970	Cameron Cr	1	Subadult Male	Unknown
1970	Squaw Cr	2	Adult Female, Subadult Female	Nuisance
1971	Murr Cr	1	Adult Female	Unknown
1972	Rock Cr	1	Subadult	Mistaken Identity
1974	Swamp Cr	1	Adult Male	Hunter Kill
1977	Rabbit Cr	1	Adult Male	Unknown
1985	Lyons Cr	1	Adult Male	Defense of Life
1986	Burnt Cr	1	Cub	Unknown
1987	Flattail Cr	1	Female Cub	Mistaken Identity
1988	Lewisby Cr	1	Adult Male	Hunter Kill
1988	N F 17-Mile Cr	1	Adult Female	Defense of Life
1989	Burnt Cr	1	Subadult Female	Trap Mortality (Predation)
1990	Poverty Cr	1	Subadult Male	Unknown

VIII. DAMAGE CONTROL

A. NUISANCE GRIZZLY BEARS

A discussion of nuisance grizzly bears was presented by Dood et al. (1986). The IGBC guidelines define a nuisance grizzly bear in the following three conditions:

Nuisance:

Condition A. The bear causes significant depredation to lawfully present livestock or uses unnatural food materials (human and livestock foods, garbage, home gardens, livestock carrion, and game meat in possession of man) which have been reasonably secured from the bear resulting in conditioning of the bear or significant loss of property.

Condition B. The bear has displayed aggressive (not defensive) behavior toward humans which constitutes a demonstrable immediate or potential threat to human safety and/or a minor human injury resulted from a human/bear encounter.

Condition C. The bear has had an encounter with people resulting in a substantial human injury or loss of human life.

To update, better understand, and manage nuisance grizzly bear situations, data on nuisance bears were gathered from records collected by MDFWP, Animal Damage Control, the USFWS, and GNP from the years 1986-1990 (Appendix K). Information contained in these records is not complete because some problem situations involving grizzlies were not recorded, and records indicating that bears were involved without identifying the species were excluded. An "incident" is defined as a unique nuisance occurrence, isolated by location and date.

There was a total of 129 incidents recorded during 1986-1990 in the entire NCDE south of Canada including GNP. Groups could consist of one to four bears. An average of 26 incidents occurred per year, involving an average of 24 groups of grizzlies per year (Table 8.1). The maximum number of individual grizzly bears involved in reported problem incidents averaged 35 per year. Many incidents involved grizzlies of unknown identity. Therefore, one bear may have been responsible for several incidents, inflating the number of individual grizzlies involved. Of the average 35 individual bears involved in incidents per year, 17% became mortalities.

Table 8.1. Summary of reported nuisance grizzly bear situations in the NCDE, 1986-1990.

	East ¹		West ²		GNP ³		Unknown		Total
	No.	%	No.	%	No.	%	No.	%	No.
Incidents	67	52	31	24	29	22	2	2	129
Nuisance groups of grizzly bears	61	50	30	25	29	24	2	2	122
Individual bears ⁴	80	46	39	22	54	31	2	1	175
Transplants due to nuisance situations ⁵	22	65	10	29	2	6	0	0	34

¹ East of the Continental Divide

² West of the Continental Divide

³ Glacier National Park

⁴ Indicates maximum number of individual nuisance grizzly bears reported. This may be over-inflated since some individual bears could be reported more than once when identification to specific individuals is impossible

⁵ Indicates where transplant originated

Of the incidents reported, 52% occurred east of the Continental Divide, 24% were west of the Continental Divide, and 22% were in GNP. This may not reflect a true picture of the situation due to biases in record keeping in different areas and the intensive nuisance bear prevention program occurring on the East Front.

In the CYE, only one nuisance bear incident was recorded for the 1986-1990 time period. This was a grizzly bear mortality record resulting from defense of life in 1988.

Category and Type of Nuisance

In the NCDE, most problem incidents involved the general nuisance category (50%), 45% involved livestock, and 5% involved property (Table 8.2). The predominate type of incident was a threat to people and/or homes (33%).

East of the Divide, cattle (39%), sheep (30%), and residence damage (16%) were the major types of problem grizzly incidents. Situations involving danger of injury to people were the predominate grizzly bear problems west of the Continental Divide (43%) and in GNP (90%).

Table 8.2. Percentage of nuisance grizzly bear incidents by category and type in the NCDE, 1986-1990.

Category	East	West	GNP	NCDE Total
Livestock	77	20	0	45
Property	6	3	3	5
Nuisance	17	77	97	50
Total	100	100	100	100
<u>TYPE</u>				
Cattle	39	10	0	23
Sheep	30	7	0	17
Raided Camp	4	3	3	4
Cabin Damage	16	27	0	15
People/home	1	43	90	33
Beehives	6	0	0	3
Other	3	10	6	5
Total	99	100	99	100

Sixty-nine percent of 43 nuisance bears of known fate died during the six-year time period (Table 8.3).

Closures on trails and/or campgrounds in GNP average 27 per year from 1986-1990. These were to prevent dangerous encounters with grizzly bears (Table 8.4). Ten human injuries and two human fatalities resulting from grizzly bears have occurred during those five years (Appendix L).

B. AVERSIVE CONDITIONING

Recent research (Gillin et al. 1992) on nuisance grizzlies showed positive human avoidance trends to aversive conditioning techniques. This research was conducted in the Yellowstone Ecosystem, but the technique should also be applicable in the NCDE and warrants further investigation.

The product "Counter Assault" (investigated by Dr. Charles Jonkel, University of Montana) has also shown positive results in deterring aggressive problem bears in captive situations. However, no quantitative data is available from bears in the wild.

Table 8.3. Known fate of nuisance grizzly bears in the NCDE, 1986-1990.

Fate	Number	Percentage
Management control ¹	11	26
Illegal mortality	6	14
Hunter kill	2	5
Alive	14	33
Self-defense kill	5	12
Kill under inquiry	2	5
Trap mortality	3	7
Total of Known Fate	43	102

¹ 7 of these were live removals to zoos or research facilities.

Table 8.4. Glacier National Park bear sightings, incidents, and management actions 1986-1990.

	1986	1987	1988	1989	1990
Sightings:					
Black	1448	1285	948	1,290	880
Grizzly	1089	1265	890	1,318	686
Unknown	259	345	324	327	343
TOTAL	2,796	2,895	2,162	2,935	1,909
Human fatalities due to grizzlies	0	2	0	0	0
Personal Injuries due to:					
Black	0	0	0	0	0
Grizzly	3	2	0	3	2
Unknown	0	0	1	0	0
Closures (temporary trail and/or campground)	31	36	22	27	20
Incidents of Property Damage	2	1	2	2	2
Bear Fatalities from management actions					
Black	0	2	3	3	0
Grizzly	1	1	1	1	0
Bears translocated (within Park)					
Black	6	3	1	4	1
Grizzly	0	2	0	0	0
Bears translocated (outside park)					
Black	3	0	0	1	0
Grizzly	0	0	0	0	0

C. TRANSLOCATION OF NUISANCE GRIZZLIES

Riley et al. (1992 in press) examined translocation records of nuisance grizzly bears in northwestern Montana. The study: (1) described the type of bears involved in conflicts, (2) determined factors affecting translocation success, and (3) tested the hypothesis that translocation is a feasible method to control mortality of grizzly bears. Males comprised 58% of all translocated bears. The median age of all bears was 3.5 yr., and the modal age was 2.5 year. Subadults comprised a significantly greater proportion of the nuisance bear population than the wild population. Livestock, residential, garbage, and apiary oriented offenses represented 30, 40, 20, and 4% of the total, respectively. Sex was the only variable that significantly predicted success. Females were more likely to be successfully translocated. Bears older than 1.5 yr were successfully translocated 44% of the time among first time translocations; this declined to 15% for bears moved more than one time. Thirty-eight percent of the translocated bears died within two years of translocation. The average cost of a capture and translocation was \$1,038.00, not including personnel salaries and administrative costs. An aggressive program focused on preventative action was recommended as a better way to deal with problem situations. The MDFWP is implementing this approach in its management efforts.

D. COMPENSATION/REIMBURSEMENT

There is no government-sponsored program to reimburse livestock operators for animals lost to grizzly bears. However, during the last five years (1986-1990), the Great Bear Foundation paid \$20,000 in grizzly depredation reimbursement claims (Bill Callaghan 1992, pers. comm.).

E. SANITATION

Sixty-two percent of grizzly bear problems in the Greater Yellowstone area were due to sanitation problems on private lands surrounding the Park (Ellig et al. 1990). The Yellowstone Subcommittee of the IGBC assigned a task force to look into alternatives/strategies for managing attractants on these private lands. In the NCDE, similar problems exist which contribute to nuisance situations. A sanitation program is currently being developed by the NCDE management subcommittee of the IGBC to address these concerns. In addition, the MDFWP is addressing concerns about possible sanitation related problems through its local management plans (Appendix M).

A sanitation program has also been established for the CYE by the Northwest Ecosystem Subcommittee. The program is currently inventorying sites and identifying potential problems.

MDFWP and Animal Damage Control (USDA) have a cooperative program to prevent and minimize damage caused by grizzlies, black bears, and mountain lions (Appendix N).

IX. HUMAN INTERACTIONS

A. HABITAT ENCROACHMENT

MDFWP has recognized and is continuing to deal with habitat encroachment problems (see Recommendations section, page 104). The immediate and long-term effects of human activities and habitation within grizzly bear habitat have been well documented and discussed in the EIS (Dood et al. 1986). In addition, McLellan and Shackleton (1988) documented a situation where resource extraction industries contributed indirectly to grizzly bear mortalities. His findings indicated that such activities can disrupt bear behavior, create additional energy costs, cause displacement, alter habitat, disrupt bear social interactions, and improve access to bear habitat for hunters and poachers. Recent human activities involving habitat encroachment are also documented in the CYE (Kasworm and Manley 1988) and on the East Front (Aune and Kasworm 1989).

B. FIRE SUPPRESSION

Fire is a natural and essential ecological component in the northern Rocky Mountains. Hammer and Herrero (1987) found that snags and deadfalls resulting from fire created feeding sites. They also speculated that in the absence of recurring wildfire, successional trends could result in a loss of grizzly bear feeding habitat.

Prescribed fires are recognized by the Forest Service as important management tools, but wildfires are considered undesirable phenomena (Risbrudt 1989, Tomascak 1989). Wildfires are suppressed equally inside and outside of wilderness areas, with objectives being to maintain the least expenditure of funds and loss of value in resource outputs and opportunities (Risbrudt 1989).

Table 9.1 summarizes the number and size of wildfires and prescribed fires in the Bob Marshall/Great Bear, Cabinet and Scapegoat/Danaher wilderness areas during 1986-1990.

Fires in the NCDE have burned over 300,000+ wilderness acres (Forest Service, National Park, and private) since 1985. This should be good for grizzlies in the long term and was recommended as an important component of grizzly bear management in the 1986 EIS. Although fire in some areas probably has mostly positive effects, in others it can be detrimental because of removal of security cover where this is a limiting factor on bear populations. In addition, allowing natural fires to escape wilderness areas and burn onto private lands has created hardships for some private landowners.

Table 9.1. Number and size of fires in the three wilderness areas in the NCDE, 1986-1990.

		Bob Marshall/ Great Bear		Cabinet		Scapegoat/Danaher	
Year		Wildfires suppressed	Prescribed natural fire	Wildfires suppressed	Prescribed natural fire	Wildfire suppressed	Prescribed natural fire
1985	#	1	2	1	1	0	0
	Acres	1	1	0	-	0	0
1986	#	0	6	0	1	0	1
	Acres	0	321	0	1	0	2
1988	#	36	4	3	0	5	2
	Acres	701	50,002	-	0	8	60,748
1989	#	0	0	0	0	0	0
	Acres	0	0	0	0	0	0
1990	#	10	1	0	0	2	0
	Acres	1	0	0	0	2	0
TOTAL	#	53	13	4	2	8	3
	Acres	703	50,324	-	-	10	60,750

C. VEGETATION MANIPULATIONS

Recent practices involving vegetation manipulation in the NCDE include programs associated with the Libby Habitat Enhancement Project, the Hungry Horse Habitat Enhancement Project, and the Habitat Protection Project (Nyberg 1991).

Mitigation plans were developed by MDFWP in 1984 and 1985 to compensate for impacts to wildlife habitat as a result of construction of Libby and Hungry Horse dams (Wood 1991). These plans identified the need to protect 8,950 acres of riparian habitat for grizzly and black bears in northwestern Montana. Habitat protection was identified as the preferred strategy because techniques for enhancing bear habitat on public lands (chiefly USFS) are currently unknown or of limited success or value. The mitigation plans specified that mitigation should occur on lands where secure habitat is at risk. Habitat protection could be achieved by use of a variety of tools including conservation easements, fee-title acquisitions, and/or cooperative agreement with landowners.

Initially, projects were developed and funded directly through Bonneville Power Administration. As of January 1, 1991, all projects will be funded by the Wildlife Mitigation Trust Settlement Agreement.

To date, two projects specific for grizzly and black bears have been completed. A conservation easement was purchased on the Rocky Bar O Ranch along the North Fork of the Flathead River (Appendix O). A total of 512 acres was restricted by a no-development easement to protect critical riparian habitat. BPA mitigation funds were used to acquire easements on 408 of these acres of the Rocky Bar O Ranch. As a result of these easements and further negotiations, 582 additional acres of this ranch were acquired in fee title. As a result of these negotiations, one section of land (640 acres) in the Swan Valley was also restricted by a conservation easement to protect bear habitat. A total of over 1700 acres of important grizzly bear habitats was protected as a result of this project.

A second project to protect bear habitat was completed in September 1990 in the CYE. A conservation easement was placed on 107 acres of private land in the Copper Creek drainage of the Bull River which limits further development of this property and restricts activities that would conflict with bear use.

The Bear Tree Challenge, a program on the Lewis and Clark National Forest, is intended to restore about 1,000 acres of prime foraging habitat for grizzly bears over five years (1989-1994) through integrated management using tree harvest, planned fires, and planting of forage trees (Diamond 1991). See Appendix P for a more detailed description of the program and the individual environment assessments.

D. DISTURBANCE FROM HUMAN ACTIVITIES

Effects of roads and access as factors of disturbance and mortality on grizzly bears was reviewed by Dood et al. (1986). Studies since then confirm that discussion. Archibald et al. (1987) found that adult female grizzly bears significantly changed their pattern of use near zones of log-hauling activity in British Columbia. Mattson et al. (1987) indicated that adult female and subadult grizzly bears have higher energy costs due to avoidance of developments and roads which may result in higher mortality and lower productivity among this cohort.

Kasworm and Manley (1990) found that grizzlies used habitat 0-914m from open roads and 0-122 m. from open trails, significantly less than expected during spring and fall in the Cabinet Mountains. They also determined that when a road was opened, grizzly bears moved greater distances between radio locations than when the road was closed.

Research in the backcountry of Yellowstone National Park documented that when such areas were open to hikers, grizzly activity was significantly reduced in areas greater than 500 m from forest cover, and bears avoided areas around occupied campsites (Gunther 1990).

A study (Smith and VanDaele 1990) investigating impacts of hydroelectric development on brown bears in Alaska found that bears were not displaced from their home range when the development occurred. However, they did tend to avoid open areas and shifted use to dense, secure cover. These authors expressed concern for potential long-term negative impacts to grizzlies due to improved vehicular and foot access, and increased incentive for development.

E. PUBLIC PERCEPTIONS

Public perception and support of grizzly bear recovery and management programs are pivotal to the long term success of those programs. Scientific research since 1985 has increased knowledge about the impacts and use of these perceptions and tolerances in wildlife management programs. This knowledge is currently being used to improve the long term management program in the NCDE.

Steven Kellert (1985) describes the importance of socio-economic and perceptual factors in the management of endangered species. "Most endangered species programs tend to emphasize biological assessments and technical solutions. Additionally, attempts to consider the social context of endangerment are typically narrow in perspective and inclined to stress economic and monetary problems. Despite the mandate of the ESA to consider aesthetic, ecological, education, historical, recreational, and scientific values of wildlife, most endangered species efforts omit consideration of these values." He also stated: "An approach to the species preservation problem suggesting that its causes and solutions are woven into the fabric of modern society implicitly assumes the need to examine fundamental social and perceptual forces."

The concept of a social consideration in defining recovery programs was further elaborated in "Toward a Concept of Wildlife Management." (Decker and Purdy 1988). "This concept reflects the maximum wildlife population level in an area that is acceptable to people. Wildlife Acceptance Capacity is particularly useful for assessing how wildlife population management decisions may affect public opinion." They also stated "like biological carrying capacity, several dynamic factors limit wildlife acceptance capacity; therefore, wildlife acceptance capacity is not a static number. These factors include people's acceptance, thresholds for various forms of damage and nuisance associated with a particular wildlife species in a given situation, perceived competition of a species in disease transmission to humans or their domestic animals, and the values humans place on species of concern such as economic, aesthetic, ecological, educational, scientific, and intrinsic values." They further state that "toward that end, we believe the concept of Wildlife Acceptance Capacity can be valuable for developing and applying affective wildlife management strategies." They also suggested that this concept could very well be applied to such wildlife related issues as the presence of grizzly bears. Dood et al. (1986:114) suggested just such an approach when they stated: "public attitudes and perceptions of the grizzly bear and its management are probably the most critical factors for successful management of the grizzly bear."

The concept of Wildlife Acceptance Capacity sets the stage for the development of a reasonable program for grizzly bear management. Decker and Purdy (1988) suggest that "just as biological carrying capacity can be affected by purposeful intervention by management (eg. setting back plant succession), Wildlife Acceptance Capacity can also be manipulated (eg. educational efforts)." People not only live, work, and recreate in bear country, but bears in the NCDE have also extended their range into areas occupied by people. Use of the concept of Wildlife Acceptance Capacity allows us to develop a program which will promote bear recovery not only in this ecosystem but also in other areas in the future.

X. RESEARCH PROGRAM

Grizzly bear research in the NCDE and CYE since the EIS (Dood et al. 1986) has been conducted in the following areas:

Study Area	Agency(s)	Researcher	Years/ Status
South Fork of the Flathead River	Montana Department of Fish, Wildlife and Parks, U.S. Fish and Wildlife Service	Keith Aune Rick Mace Tim Manley	1987-1990 Ongoing
North Fork of the Flathead River	U.S. Fish and Wildlife Service, British Columbia Forest Service, British Columbia Wildlife Branch, British Columbia	Fred Hovey Bruce McLellan	Ongoing
East Front Research Validation of the East Front Cumulative Effects Model	Montana Department of Fish, Wildlife and Parks Montana Department of Fish, Wildlife and Parks	Keith Aune Keith Aune	1986-1988 1986-1988
Cabinet/Yaak	U.S. Fish and Wildlife Service, U.S. Forest Service, Montana Department of Fish, Wildlife and Parks	Wayne Kasworm Timothy Thier	Ongoing
Blackfeet Indian Reservation	Bureau of Indian Affairs	Daniel Carney	Ongoing
Glacier National Park	Glacier National Park, University of Montana	Kate Kendall Lee Metzgar	Ongoing
Wildlife Research Laboratory	Montana Department of Fish, Wildlife and Parks	Keith Aune Phil Schladweiler	Ongoing

For information on publications of these studies, see Literature Cited under the various researchers' names.

Objectives of these studies follow:

EAST FRONT (1977-1987)

Objectives:

1. Review and analyze previously accumulated data on grizzly bears
2. Further delineate and define essential habitat and important use areas within the study area
3. Determine impacts associated with oil and gas exploration and other human activities
4. Make recommendations to protect and maintain grizzly populations and habitat. Specific information regarding plant phenology and presence of bear foods, grizzly bear habitat requirements on a seasonal basis, population numbers on a seasonal and year long basis, food habits on a seasonal basis, interaction with other wildlife species, and bear home ranges, movements, and distribution were gathered.

SOUTH FORK OF THE FLATHEAD RIVER

Population Study

1988

Job Objective - The primary goal of the population study is to identify factors limiting grizzly bears, and develop reliable and practical methods to determine population status and trend.

Objectives include:

1. Measure population parameters long term and assess their reliability in determining population status and trend. These include such parameters as population size, density, females with cubs, sex, and age structure
2. Quantify costs associated with population census estimates and trend monitoring programs
3. Identify the limiting factors of grizzly bears in the South Fork Flathead (including habitat availability, habitat modifications and losses, and population related factors such as intra-specific competition, man-caused and natural mortality)

1989

Job Objective - The goal of the program was to develop and test the tools and methodologies to survey grizzly bears using remote, self-activating camera units in a fashion capable of documenting the presence and individual identity of grizzly bears. Specific objectives were to:

1. build approximately 30 camera units
2. identify and construct approximately 30 sample sites within the South Fork Flathead study area
3. sample the grizzly bear population during the pre-berry, berry, and post-berry foraging seasons
4. develop the sampling criteria to optimize sample site selection, sampling period, baiting procedures, and camera performance
5. use information from radio-instrumented grizzly bears to document the percent of bears sampled, differences in photographic capture rate among age and sex classes, and optimum sampling intensity
6. evaluate the technique as a grizzly bear sampling method.

1990

Population Enumeration Job Objective

1. develop population size and density estimates
2. determine population parameters including
 - a. age and sex ratios
 - b. litter sizes
 - c. age of first reproduction
 - d. age distribution
 - e. causes and rates of mortality
 - f. reproduction rates
3. develop several reliable trend monitoring techniques
4. determine home range size, fidelity, and overlap
5. determine costs associated with population census estimates and trend monitoring programs

1990 - Use of Systematically Deployed Remote Cameras to Monitor Grizzly Bears

Job Objectives - The goal of the program was to develop and test the tools and methodologies to survey grizzly bears using remote, self-activating camera units in a fashion capable of documenting the presence and individual identity of grizzly bears. The specific objectives of the 1990 program were to:

1. Continue testing remote camera sampling procedures to determine best criteria for
 - a. sample site selection
 - b. sampling period
 - c. bait type and baiting procedures
 - d. camera deployment procedures.
2. Determine percent of known bears sampled by remote camera
3. Document differences in detection by age and sex of bears, by sampling season

4. Determine probable sampling intensity required to sample a Bear Management Unit
5. Evaluate the camera technique as a grizzly bear monitoring method.

Habitat Use and Disturbance Studies

1988-1990

The primary goal of the habitat study is to obtain quantitative information on how bears select habitat and what influence road traffic has on habitat use. Specific study objectives include:

1. Determine if vegetative community-type importance values correlate with frequency of community types used by radioed bears
2. Determine if the Landsat Vegetation Classification System developed for the study area adequately classify grizzly bear habitat and whether importance values can be derived
3. Compare importance values derived from micro-site analysis of bear locations with importance values derived for community types and associated Landsat class
4. Determine the effects of roads on the use of habitat by grizzly bears and how traffic on roads influences habitat effectiveness.

NORTH FORK OF THE FLATHEAD RIVER

Objective -

1. Document aspects of grizzly bear population dynamics (bear density rate and causes of mortality, and natality rate) during a period of rapid resource industry development, to determine if and how their demography was affected.

CABINET-YAAK

1988

Objectives -

1. Review and analyze all previously collected data on grizzly bear distribution, movements, and habitat-use in the Cabinet Mountains
2. Determine general seasonal patterns regarding distribution, movement corridors, habitat use and preference, food habits, and behavioral patterns of radio-collared grizzly bears
3. Use collected data to make recommendations regarding validation or modification of the Cumulative Effects Analysis Process and other management policies

4. Conduct black bear (*Ursus americanus*) studies incidental to grizzly bear investigations to provide basic ecological data on local black bear populations. Black bear productivity, population status, habitat-use, distribution movements, and behavioral data were gathered and analyzed.

1989 and 1990

Objectives -

1. Document grizzly bear distribution in that portion of the Cabinet/Yaak Ecosystem north of the Kootenai River consisting primarily of the Yaak River drainage
2. Describe the characteristics of the Yaak area grizzly bear population in terms of reproductive success, age structure, mortality causes, and estimates of numbers of bears using the area
3. Determine habitat use and movement patterns of grizzly bears in the area. Determine habitat preference by season and assess the relationship between habitats affected by man such as logged areas and grizzly bear habitat use. Determine seasonal movement patterns of grizzly bears and movement between the Cabinet Mountains to the south of the Kootenai River and the Yaak area to the north of the Kootenai River
4. Determine the relationship between human activity and grizzly bear habitat use through the description of avoidance zones (should they exist) and the use of habitat in relation to ongoing logging, open and closed roads, and human residences
5. Suggest management techniques to limit human-induced mortality of grizzly bears
6. Provide data in a format that could be integrated in the Selkirk/Cabinet-Yaak Cumulative Effects Model
7. Conduct black bear studies incidental to grizzly bear investigations to determine interspecific relations. Data on black bear densities, movements, habitat use, and food habits relative to grizzly bears will be gathered and analyzed.
8. To test grizzly bear augmentation techniques in the Cabinet Mountains to determine if translocated bears will remain in the area of release and ultimately contribute to the population through reproduction.

BLACKFEET INDIAN RESERVATION STUDY

1987-1990

Objectives -

1. Determine the seasonal distribution and seasonal habitat use of grizzly bears on the Blackfeet Indian Reservation
2. Describe and locate grizzly bear habitat on the Blackfeet Indian Reservation

3. Determine the extent of movement of grizzly bears between the Blackfeet Indian Reservation and neighboring lands
4. Document grizzly bear mortalities and causes of mortality on the Blackfeet Indian Reservation.

GLACIER NATIONAL PARK

Population trends based on ground survey information

Objectives - Survey trails in Glacier National Park for bear tracks and scats during five consecutive years. Use this data to generate a model that simulates the occurrence of bear sign on trails to monitor long-term trends of dispersed populations.

Berry Production Study

WILDLIFE RESEARCH LABORATORY

Objectives

1. Determine the cause of death, animal condition, food habits, and relative health of grizzly bears through standard necropsy techniques
2. Monitor the parasites and diseases of grizzly bears in Montana
3. Evaluate the reproductive performance of female grizzly bears in Montana
4. Conduct morphological and comparative anatomical studies on grizzly bears.

Other ongoing research in the NCDE includes:

Study Area	Agencies	Researcher
Identification of bear scats to species by thin-layer chromatography	GNP, MSU, INT	Harold Picton
Environmental relationships of cow parsnip	INT	Campbell
Communicating appropriate behavior in grizzly country	UM, INT	McCool
Effects of hexazinone on soil water and plants	UM, NAPIAP, INT	Stark
Fate of two forms of hexazinone in huckleberry fields	UM, NAPIAP, INT	Stark
Prototype model for assessment of cumulative effects	GNP, USFS, NPS, BLM, SEM, INT	Bevan
Vegetative productivity of grizzly bear habitat components	FWS, INT, USFS	Vandehey

XI. ENFORCEMENT

Department enforcement efforts concerning grizzly bears are focused in three areas: patrols of both wilderness and non-wilderness areas, damage control, and poaching investigation.

Wilderness and nonwilderness areas are patrolled during the general hunting season as well as other times. Camps are checked for harvested game and compliance with outfitter regulations.

Response to nuisance bear complaints involves many MDFWP personnel in some capacity, although enforcement personnel are frequently contacted first.

MDFWP enforcement personnel investigate and prosecute all violations involving illegal mortality. Cases are processed through the county attorney's office or turned over to the USFWS when they appear to involve interstate movement of grizzly bear parts or prosecution under the ESA. The MDFWP also coordinates with federal officials in undercover operations.

Ten cases of illegal grizzly bear mortalities were investigated in the NCDE during 1986-1990 (Appendix Q). Three investigations are still open, four were not prosecuted or resulted in acquittals, and five resulted in convictions with a total of \$20,000 in fines. One conviction is currently under appeal.

The Cabinet-Yaak Grizzly Bear Mortality Task Force was created under the direction of the Northwest Ecosystems Managers Subcommittee. It is comprised of representatives from local industry, USFS, MDFWP, USFWS, and other interested members of the public. The charge of this group was to reduce mortality of grizzly bears in the CYE. Methods used to date include public information, law enforcement coordination among agencies, changes in existing regulations, and inventory of sanitation facilities. Suggestions for improving these facilities to reduce human-bear conflicts are being developed.

XII. PUBLIC INFORMATION AND EDUCATION

Statewide Activities - Grizzly Identification and Conservation Education Efforts 1986-1990

1. SPECIAL PUBLICATIONS (APPENDIX R)

Bear identification posters continued to be distributed until spring 1988 when wallet-sized bear I.D. cards were developed. These were distributed to all MDFWP regional offices and license agents statewide with instructions to give a card to each sportsman purchasing a black bear license or Sportsman's license. Distribution of the cards to black bear license purchasers has continued to date, and they have also proved popular for distribution at sports shows and fairs across Montana.

In summer 1990 at the request of the Interagency Grizzly Bear Committee, the cards were adapted for use by several states and federal agencies. Almost 100,000 cards have been printed and distributed throughout Montana and other western states.

Bear identification information continues to be included in MDFWP's annual big game hunting regulations as well as in black bear hunting regulations.

Montana Outdoors, MDFWP's official publication, is as a valuable means for educating the public about concerns surrounding management of the grizzly. Since 1986, four articles concerning grizzlies and their management have appeared in the magazine (May/June 1986, May/June 1987, May/June 1989, and May/June 1990). The Catchall Section of the magazine's September/October 1986 issue included information and drawings designed to aid hunters in distinguishing black bears from grizzlies. The May/June 1987 issue featured an article accompanied by 18 photographs specifically geared toward educating the public about the differing physical characteristics of black bears and grizzlies.

In spring 1989, the Conservation Education Division of the MDFWP contracted with the Department of Speech Communication at Montana State University to develop a comprehensive Public Information Plan for the agency's bear identification program. Information efforts since fall 1989 have followed recommendations presented by the plan's developers including printing and distributing "Know the Bear Facts" stickers to hunters.

2. MEDIA EFFORT

News releases specifically detailing ways to distinguish grizzlies from black bears or advising hunters to learn ways to recognize the different species were sent to over 200 print and electronic news outlets (including most in-state and many national) on the following dates: April 11, April 18, May 2, Sept. 12, and Oct. 3, 1986; April 10, Sept.

4, and Sept. 11, 1987; April 8, 1988; April 7, 1989; and April 12, 1991. Montana Outdoors Newspaper Columns dealing with bear identification were included in packets sent on April 11 and June 6, 1986; April 24, 1987; April 22, 1988; and April 13, 1990.

Radio Public Service Announcements encouraging bear hunters to know the differences between black bears and grizzlies including brief descriptions of physical characteristics were developed and distributed to over 20 statewide radio stations for play during the following months: April 1986, April and May 1987, Sept. 1987, April and May 1988, April and May 1989, and April 1990.

3. BEAR EDUCATION EFFORTS WITH PROJECT WILD

Bear boards exhibiting the differences between black and grizzly bear tracks and skulls were made available to Project WILD facilitators and local Bozeman educators in 1989.

A presentation was made on grizzly bears to 50 educators attending the Montana Education Association meeting held in Bozeman October 18, 1990.

4. ADDITIONAL STATEWIDE EFFORTS

MDFWP Regional Information Officers continue to emphasize bear identification through radio programs, presentations to various groups, and in talks to hunter safety classes. Hunter safety instructors have incorporated identification of all game animals including bears in their hunter safety curricula.

XIII. RECREATION MANAGEMENT

Dood et al. (1986) discussed recreational activities occurring in grizzly bear habitat in the NCDE including campgrounds, groomed snowmobile trails, and outfitting. More recently, the grizzly bear compendium (IGBC 1987) presented a literature review pertaining to recreational management which addresses campgrounds, trails and back country use, and consumptive recreational use management.

The MDFWP continues to work with the IGBC to further refine its recreation management programs so that the requirements of grizzlies are addressed.

XIV. LAND MANAGEMENT

A. MDFWP LANDS

MDFWP lands where grizzly bear management programs are in place include the Sun River, Ear Mountain, Blackleaf, and Blackfoot Clearwater (Dryer Ranch) Wildlife Management Areas, and the DeRozier Unit of the Kootenai Wildlife Management Area.

On the DeRozier Unit, roads are closed yearlong to exclude traffic when elk, deer, and grizzly bears use the area.

The Sun River, Ear Mountain, and Blackleaf Wildlife Management Areas are all along the Rocky Mountain East Front and extensively used by grizzly bears. Grizzly bear management on these areas follows the Interagency Rocky Mountain Front Management Guidelines (BLM 1987). These guidelines regulate human activities to avoid or minimize adverse impacts to grizzly bears. Other lands set aside for managing grizzlies on the East Front include the Sun River Game Preserve, the Pine Butte Swamp Preserve, and the Boone and Crockett Ranch. Also, many private ranches are very tolerant of grizzly bear presence on their properties.

Six land purchases and leases benefitting grizzlies both directly and indirectly by benefiting other species have occurred since 1986 (Table 14.1).

B. NORTHWEST POWER ACT - GRIZZLY BEAR MITIGATION

In 1980, Congress passed the Pacific Northwest Power Planning and Conservation Act. Its purpose is:

1. to restore the region's fish and wildlife resources through appropriate mitigation, protection, and enhancement actions
2. to develop the region's electric power and conservation plan.

The act also specified that the Bonneville Power Authority must use all its funding and legal resources to implement the purposes of the act

MDFWP, in conjunction with other entities and agencies, assessed wildlife losses and developed mitigation and enhancement plans for five northwestern Montana hydroelectric projects (Libby, Hungry Horse, Noxon Rapids, Cabinet Gorge, and Thompson Falls). Specific wildlife mitigation projects for each of the five dams, including those to benefit the grizzly bear, have been recommended. Impacts to the grizzly bear were identified for all five facilities with the greatest documented for the Hungry Horse project. The Hungry Horse mitigation program is a high priority for the grizzly bear and calls for approximately 10,000 acres of easement or acquisition within

Table 14.1 MDFWP wildlife protection areas purchased or leased 1986-1990 in the NCDE and CYE.

Date	Location	Acres	Primary Species Benefitted
3/87	Alberton WMA (Dept. State Lands) Clark Fork River lease	666	Elk
9/87	Island - Buffalo Head Park (Stillwater River)	4.5	Nongame bird and mammal species
6/88	Kitpatrick-Kootenai River Wildlife Management Area	65.5	Bighorn sheep
3/89	Thompson Falls, Clark Fork Wildlife Habitat Protection Area	209	Nongame bird and mammal species
10/89	Dryer Purchase in addition, leases with: Champion International Department of State Lands Plum Creek	2,960 12,822 1,640 160	Elk, deer, sandhill crane, riparian bird species
1/90	East Thompson Falls (Mt. Silcox)	1,552	Bighorn Sheep

the North Fork and Middle Fork of the Flathead River. Currently, the Habitat Protection Project addresses concerns for grizzlies (Appendix S).

C. BURLINGTON NORTHERN MANAGEMENT

A memorandum of agreement signed by Burlington Northern, MDFWP, GNP, and the Lewis and Clark and Flathead National Forests addressed grizzly bear management concerns along the corridor between East and West Glacier (Appendix T). This agreement will greatly assist in assuring grizzly bear use of this area and maintaining the travel corridor between Glacier National Park and the rest of the ecosystem to the south.

XV. INTERAGENCY COORDINATION

Montana is currently a member of the Interagency Grizzly Bear Committee. The committee meets at least twice a year to coordinate all grizzly bear management and research activities of the agencies involved. Three management subcommittees (Yellowstone, Northern Continental Divide, and Northwest) and a research subcommittee were formed to implement the actions outlined by the IGBC. These subcommittees also meet at least twice each year. MDFWP personnel spend 20-30 days per year attending these committee and subcommittee meetings. Additional time is spent responding to proposals for action presented to the committees.

In addition to the IGBC, the MDFWP meets at least once annually with the USFS and BLM to coordinate activities and resolve management problems. MDFWP has three wildlife biologists participating in the interagency cumulative effects process.

The MDFWP also coordinates with the USFWS through their local Endangered Species Enhancement office in Helena and grizzly bear recovery coordinator. This coordination primarily involves Section 7 (ESA) consulting on development activities for public land, responding to nuisance grizzly complaints, and reviewing ongoing management programs.

The Section 7 consultation procedure begins when a federal agency (usually the USFS or BLM) requests a list of threatened or endangered species present in the project area from the USFWS. Next, the requesting federal agency makes a determination, usually in the form of an environmental assessment, as to whether the particular project may affect the continued existence of the grizzly bear or adversely modify its habitat. If the federal agency makes a "may affect" determination, they must initiate the consultation process with the USFWS. A biological opinion is then rendered by the USFWS. A jeopardy opinion must include reasonable and prudent alternatives which must be implemented if the project is to proceed. Unless the measures listed are met by the developer, the federal agency initiating the consultation then denies the project. However, these alternatives may result in some impacts to the grizzly because all impacts cannot be foreseen. Because no legal authority is granted MDFWP in these consultations, our role is primarily to provide information and suggest action.

Nuisance grizzly complaints are coordinated with the USFWS through their grizzly bear recovery coordinator. Nuisance grizzly guidelines have been developed for both the NCDE and CYE. Current procedures require a conference call between involved agency contacts prior to any action. The MDFWP has authority to determine the fate of the bear if agreement cannot be reached between the agencies. MDFWP personnel or U.S. Department of Agriculture Animal Damage Control agents implement relocation or control of grizzly bears outside national parks and Indian reservations. Relocation of a grizzly bear requires prior approval of the appropriate landowner (usually USFS) where the bear is to be released.

As discussed earlier, cooperative management guidelines have been developed for the RMEF. Guidelines for hardrock mining activities are also being developed in the Cabinet Mountains through a coordinated research study in that area.

The MDFWP and wildlife managers in British Columbia and Alberta hold grizzly bear coordination meetings on an annual basis to integrate grizzly bear mortality and habitat management information. Current efforts are being directed toward developing a long term habitat map for Montana and the two provinces in Canada as well as maintaining and promoting shared grizzly bear populations.

SECTION XVI. MANAGEMENT ALTERNATIVES AND PREFERRED ALTERNATIVE

Management alternatives were presented and discussed in detail by Dood et al. (1986). The preferred alternative, using hunting as a management tool, was being pursued by MDFWP during 1986-1990 and remains the preferred alternative for both the NCDE and the CYE (Appendix A). However, the difference in population status in the two ecosystems dictates a different management option for each.

The population status in the CYE continues to indicate that the recommended management action there should be those listed under Population Status A by Dood et al. (1986), and the grizzly hunting season should remain closed.

The present status of grizzly bears in the NCDE is stable to increasing at an estimated minimum population of 294 (excluding Glacier National Park). We continue to recommend a regulated hunting season under Population Status C (Dood et al. 1986). In the fall of 1991, a lawsuit was filed against the USFWS in Washington D.C. to stop the hunting of grizzlies. Three days prior to the start of the fall hunt, a preliminary injunction was issued against the hunt. Loss of hunting as a management tool will, in the long run, result in an increase in illegal kills, more self-defense kills, and more people being injured and killed by bears due to reduced wariness and habituation to people. Incentives for grizzly bear recovery in other areas will also decline.

Efforts should now be directed at regaining the use of hunting as a management tool. Further, the MDFWP recommends that a hunting season be conducted under a total mortality quota and a female mortality subquota, both of which would apply only to the NCDE.

Regulated hunting as a management tool for grizzlies has a long successful history in Montana. Reasons why hunting is such an important tool for promoting long term recovery and survival of grizzlies is discussed briefly. Regulated hunting allows us to select against unwary bears or bears that associate and habituate to people. This selection for a "wariness" in the bear population has long been noted. Theodore Roosevelt in 1885 stated: "Constant contact with rifle-carrying hunters, for a period extending over many generations of bear-life, has taught the grizzly by bitter experience that man is his undoubted overlord, as far as fighting goes; and this knowledge has become a hereditary characteristic (emphasis added). No grizzly will assail a man now unprovoked, and one will almost always rather run than fight; ...".

This approach was also recognized in the 1975 USFWS rule which stated that isolated taking of nuisance bears is not sufficient by itself to prevent numerous depredations, threats to human safety, or selection for wary bears. In contrast, a regulated hunt does select against unwary bears and creates a fear of man. This instills wariness in individual bears, keeping them from becoming problem animals and promotes

the long-term survival of the bear population and of people who come into contact with bears. Without benefit of a regulated hunt, MDFWP response to conflict situations can only occur after they have developed.

Because wildlife populations produce surplus animals, some can be removed, and the population can still increase. Population estimates and trend data for the NCDE as well as other data indicates this is the case. It is important to make the distinction between regulated removal as we now know it and the unregulated mortalities that occurred in the past. Current highly managed and regulated hunting programs can promote population increases and recovery. At the turn of the century, the situation was unregulated. Bears were persecuted and killed without provocation, license, limit, or season and in excessive numbers.

The State of Montana's grizzly bear management program uses hunting as only one tool among many to promote the long-term conservation of the grizzly bear. The regulated public hunt must therefore be evaluated in the context of an overall bear management program and its efforts to promote recovery of this species. Evidence from this review demonstrates this management program has promoted recovery of the grizzly bear in Montana. The grizzly bear hunting portion of this program has been modified and quotas reduced despite evidence of an increasing population in the ecosystem. In addition, this management tool has been sparingly applied, and almost half of the ecosystem is totally closed to hunting in any one year. MDFWP's handling of the hunt has been conservative and continues to be so in order to promote long term survival of grizzly bears in Montana in viable numbers.

Further, hunting pressure exerted on this population is too limited to result in loss of access by bears to substantial portions of the habitat. Hunting may alter the timing and nature of use of some habitats for short periods of time, but any negative impacts to the population are negligible when considering the size of the ecosystem and the limited amount of hunting allowed.

Mortality records for 1975-1990 show that allowable mortality quotas have never been exceeded. These quotas were established at responsible yet conservative levels and have allowed the population to continue to increase. Quotas are reviewed annually. The MDFWP has also responded to recommendations from the USFWS and adjusted quotas in a responsible and reasonable way. Mortality rates in the NCDE are low, and MDFWP has made substantial efforts to protect the female segment of the population.

The 1982 Recovery Plan recommended that the grizzly bear hunting program be examined annually in terms of its impact on population goals and to develop alternatives which assure compatibility between sport hunting and goal attainment. Some of the alternatives suggested were to reduce female mortality by prohibiting the shooting of bears in groups of two or more. The MDFWP changed the regulations which prohibited the shooting of cubs or females accompanied by cubs to now prohibiting the shooting of

young or females accompanied by young. Young are defined as bears 2½ years old and younger. In addition, current regulations request that hunters not shoot at any bear observed in a group to further protect females.

The 1982 Recovery Plan also recommended considering a spring hunt (when females are less vulnerable) and dispersing the hunter density by use of special permits. That has been done where appropriate. The plan also recommended there be a set quota on man-induced female mortality. The MDFWP established its own quotas in 1983 and has fully abided by federal quotas since 1985. Additionally, MDFWP established its own female subquotas in an effort to distribute female mortality appropriately in the ecosystem. Finally, the plan recommended that consideration be given to closing the hunting season for grizzly bears in areas where a population segment might be stressed. The MDFWP has accommodated those concerns in areas such as the Mission Mountains where the season was closed even though legal hunting had long been a minor mortality factor in this area. In addition, the regulated hunt applies to only a portion of the ecosystem (approximately 55%). The remainder is closed to all grizzly bear hunting (Glacier National Park, Sun River Game Preserve, Mission Mountains, Blackfeet Indian Reservation, and portions of the Scapegoat and Swan Front density units).

Because of female subquotas in the years 1986 - 1990, hunters took only six adult females. This is an additional indicator of how conservative the hunt has been.

Another specific purpose of the regulated hunt is to remove nuisance animals. Information from Arizona studies (LeCount 1982) concerning black bear hunts over a period of years shows that 69% of the known nuisance bears were taken by hunters whereas only 14% of tagged "wild" bears were taken. The damage hunt can also be used as an expedient solution for removing nuisance animals in some situations.

Finally, since some hunting mortalities occur in relatively remote areas, removal of bears in a regulated hunt allows opportunities for young and subadult bears to establish home ranges in areas away from people, further reducing bear-human conflicts.

In summary, we continue to recommend a regulated hunting season for the following reasons:

1. An annual average of 2.6 grizzly bears were legally harvested between 1986-1990 in the NCDE. There is no evidence in the population structure or population trend data to suggest this level of legal harvest is detrimental to the population or has slowed recovery. This population was increasing despite being harvested at higher rates in the past (Dood et al. 1986).
2. Hunters have legally harvested problem bears and bear/human conflicts have been reduced through such harvest.

3. Hunting reduces the need for agency control of problem bears.
4. Hunting selects against unwary bears and causes bears to be wary of humans. This promotes long term survival of the bear population in areas they share with humans. Hunting promotes better acceptance of this large and potentially life threatening animal by the local public who are asked to live with grizzlies, and this acceptance is a key to long term survival of the bear. The key to continued recovery of the grizzly is local public acceptance of the animals and faith in a comprehensive management program. If the local publics feel threatened by grizzlies or the management program, they will defend themselves as necessary. This in turn can have detrimental effects on existing grizzly populations and clearly limits opportunities for expanded recovery efforts due to local resistance.
5. Hunting grizzlies may increase cub survival and recruitment providing for population increase. While there is currently some scientific disagreement on this possibility, there is no question that harvest levels in the NCDE have been so low that any effect of regulated take on increasing cub survival and recruitment would be impossible to measure.
6. Hunters have been and continue to be one of the strongest supporters of long-term conservation efforts. Hunters have purchased more habitat than any other group in the NCDE (over 100,000 acres) and returned them to wildlife use including grizzly bears. This strong connection between hunters and habitat is critical to continued successes at restoring wildlife including grizzly bears.
7. Hunting allows the grizzly to be a social asset instead of being considered by some groups as a liability. Hunting provides revenues to governmental entities for enforcement of wildlife management regulations as well as alleviating potential costs and risks associated with problem animals. Without a regulated hunt, these costs must be paid by the government and the positive effects of grizzly hunting are lost to society. In addition, the presence of licensed hunters serves as a deterrent to illegal take of grizzlies.

Regulated hunting has been used as only one tool among many to provide for the long term recovery and survival of grizzly bears. A regulated public hunt must therefore be evaluated in the context of an overall bear management program. A good example of the positive role hunting has played as well as an overall management program is available for the NCDE in northwest Montana (Dood et al. 1986). The role of hunting in this program was also recognized by the Interagency Grizzly Bear Committee (IGBC) when they unanimously passed the following resolution on August 27, 1991. The resolution states "That the IGBC go on record as being in support of Montana's Grizzly Bear Management Program, and specifically the use of hunting in the spring and fall as a sound biological approach to further the conservation and recovery of the grizzly bear in the Northern Continental Divide Ecosystem."

For these reasons, as well as others, it is imperative that efforts be directed at making necessary policy and statutory changes to ensure that regulated hunting remains available as an option for grizzly bear recovery and conservation programs.

A. CRITERIA FOR DETERMINING MANAGEMENT DIRECTION.

The MDFWP continues to recommend that future management actions in each ecosystem be based on the population status of each area as determined by reviewing criteria listed below. It should be recognized that population status will not be determined by any single criteria; rather, the best available information from all criteria will be used. Very few of these criteria allow for determination of population status in the short term (i.e. 1-5 years). They are more appropriate for determination of long term (i.e. 10 years) changes in status.

Several important factors were identified by Dood et al. (1986) that must be evaluated when determining population status. These criteria and a brief description of each are given below.

1. Federal Restrictions: Federal laws and regulations may have major influence on Department regulations. Specifically, the Endangered Species Act, the Code of Federal Regulations, and the Grizzly Bear Recovery Plan will be consulted. Observation of female with cubs and females with young will be compiled in reference to Recovery Plan criteria.
2. Results of grizzly bear population trend surveys. A systematic method to survey public and professional sectors will be developed. A survey has been developed for use in the Yellowstone area. The MDFWP is currently evaluating the applicability and necessity of this for the NCDE.
3. Professional opinion will be gathered at the annual meeting of the NCDE managers' subcommittee.
4. Public opinions and perceptions from biennial tentative season meetings will be solicited and evaluated.
5. Results of population and habitat research will be consulted. Specific changes in age structure, unreported mortality from marked bears, population densities, habitat use, and habitat quality will be considered.
6. Major changes in human use of management areas will be evaluated. Because Montana's grizzly bears are linked to those in Canada, Canadian land-use changes will be monitored as well.

7. Changes in the population status in Canada, and in U.S. and Canadian parks will be gathered through discussions with the appropriate management agencies.
8. Changes in state and federal road closure policies will be evaluated because they influence the susceptibility of grizzly bears to mortality.
9. Realized or perceived changes in the price of grizzly bear parts will be evaluated. Such changes may affect the level of profiteering.
10. Data, such as observations of and bear sign observations, will be gathered to document grizzly bear range expansions or contractions. This data will help evaluate changes in the population status.
11. Management areas or management unit boundaries will be evaluated using all available evidence.
12. The number of conflict situations will be recorded annually. If a trend is apparent in four or five years of data, the program will be re-evaluated.
13. Grizzly bear management policies in Glacier National Park, the Flathead Indian Reservation, and the Blackfeet Indian Reservation will be evaluated in relation to MDFWP policies.
14. The number of transplants from or into each ecosystem will also be documented. As further information is accumulated on transplant success, the opportunities and limitations of transplants will continue to be evaluated.
15. Examine population augmentation as an effective management tool.
16. Evaluate the following mortality statistics:
 - a. Sex ratio
 - b. Median age by sex.
 - c. Trends in total mortality should be evaluated in conjunction with other population statistics to determine if changes in mortality quotas are needed.
17. Record and evaluate litter sizes throughout the ecosystems each year.

18. Evaluate information from the annual hunter questionnaire to aid in the interpretation of population status.

B. REGULATIONS

Because the recommended management of the CYE population comes under Population Status A with a closed hunting season, no hunting regulations are recommended for the CYE at this time. However, because the NCDE population is judged as being under Status C (Dood et al. 1986) with the recommendation that the grizzly bear hunting season be open, the following new hunting regulations were recommended in 1986:

1. Bag limit of one grizzly in a lifetime. (Implemented)
2. Prohibit the taking of young and females accompanied by young. (Young are defined as two-year olds or younger). (Implemented)
3. The grizzly bear hunting season will close on 48-hours notice when the total mortality quota is reached, or it will be closed in areas where female subquotas have been met. (Implemented)
4. Hunters must retain the hide and head from each grizzly bear taken. Evidence of sex must remain intact on the skin or carcass. (In effect since 1967)
5. Prohibit all persons from removing any portion of a grizzly bear from the State of Montana without first purchasing a trophy license. (In effect since 1967)
6. Hunters taking a grizzly bear must report the kill within 48 hours to an officer of the MDFWP. Furthermore, the hunter must personally present the hide and skull within 10 days to the MDFWP for inspection, tagging, and recording of kill. (Implemented in 1967)
7. Adjust the total or female mortality quota annually. (Implemented)
8. Request that hunters not shoot any bear in a group. (Implemented)

C. GRIZZLY BEAR MANAGEMENT AREAS (BMAs)

The MDFWP prefers to treat the entire CYE as one management unit for mortality management purposes. Little population or habitat information is available to recommend any other alternative. Research currently in progress (Kasworm and Manley 1988 and 1990, Kasworm and Thier 1990 and 1991) may provide information that would

change this recommendation. The FWS currently recognizes 22 BMUs in the NCDE (Fig. 5). However, these were established for reasons other than population management.

Within the NCDE, the MDFWP recommended establishing five BMAs. However, practical concerns resulted in establishing three BMAs shown in Fig. 1.1.

D. RECOMMENDED MORTALITY RATE FOR THE NCDE

The total known human-caused mortality in the NCDE from 1986-1990 has averaged less than 12 bears annually. This is 4% of the current estimate of the minimum population (294) outside Glacier National Park. Based on this population estimate, calculated unreported man-caused mortality averages 1-3 bears a year for a total mortality of 13 to 15 bears or 4-5% of our estimate of the minimum population.

Harris (1984a, b) indicated that an annual mortality rate of 6.5% is sustainable based on efforts to model the NCDE population as of 1985. The assumptions, methods, results, and interpretations of this stochastic, density-dependent model were presented by Dood et al. (1986). It should be noted that his model is based on very conservative assumptions and has not been validated. The ten-year review will consider Harris' model in more detail and make recommendations on its future use in our program.

The current population status in the NCDE, the apparent trend of this population, and recommended and reported mortality rates in the literature indicate that a proposed total man-caused mortality rate (known and unreported) of 6.0% (18 bears) will not be excessive for the NCDE population and will allow for a continued population increase.

Although MDFWP has chosen to exclude GNP from management consideration, it is important to relate the proposed mortality rate to the entire NCDE. The estimate of the minimum population for GNP is 198 bears. Thus, the estimate of the minimum population for the NCDE is 492 bears. Under the present quota recommendation, a maximum of 18 deaths would be allowed from this population. The mortality rate for the entire NCDE is less than 4% which easily allows for continued population growth.

The female subquota is based on an allowable ratio of 40% females:60% males. Although it is important to minimize female mortality and MDFWP has worked to achieve this objective, such losses can not and do not need to be eliminated. Proposed harvest restrictions on females and relocation guidelines regarding females have reduced female mortality from that of previous years.

SECTION XVII. DISCUSSION OF EXTRAORDINARY CASE

Conservation as defined in the ESA includes the following, "and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved may include regulated taking."

Because the grizzly bear is listed as a threatened species under the Endangered Species Act, the MDFWP must demonstrate that the extraordinary case does exist before authorizing the taking of grizzly bears. Based on the past and current reviews, it is our judgement that the extraordinary case does in fact exist in the NCDE at this time and has since the 1975 listing of the bear. However, it is extremely important to realize that not only are biological considerations involved with the extraordinary case, but social concerns as well (see public perception discussion, page 76). Grizzly bears are extraordinary in that they do come into direct conflict with people (i.e. they do kill people and livestock and cause significant property damage). Therefore, it would be inappropriate to manage them in the same way as, for example, a peregrine falcon (also listed under the ESA). People will tolerate falcons in close proximity (in fact they nest on skyscrapers). However, the same cannot be said for grizzly bears. Most people are very uncomfortable in close proximity to grizzly bears, and many become very antagonistic where livestock depredation or property damage occurs. It is this underlying social difference that dictates different management strategies for different species listed under the ESA. A program which utilizes the best available biological and social information allows for the species to exist into the foreseeable future, allows for a continuing increase in numbers, and is designed to achieve recovery goals, does in fact meet the requirement of the Endangered Species Act and the test of the extraordinary case. With these thoughts in mind, some of the important specifics are addressed below:

A. CARRYING CAPACITY

The concept of carrying capacity as applied to population pressure has not been well-defined, and in the scientific community there is a difference of opinion as to its definition, application, and validity. However, the definition of carrying capacity and how it is applied is one that is critical to how the programs for grizzly bear recovery are perceived.

It has been suggested that to demonstrate that the NCDE is experiencing excessive population pressure, it is necessary to document that the ecological carrying capacity of the land has been met or exceeded. "Ecological carrying capacity" is only one of many definitions of carrying capacity. Ecological carrying capacity is a theoretical concept that has not been clearly defined for any wildlife population (Moen 1973). To measure ecological carrying capacity requires extensive data on the bioenergetics of all age and sex classes (Kcal expended per day) and an in depth measurement of habitat quality (Kcal available in the environment). In an area as large and rugged as the NCDE and with an animal as elusive as the grizzly bear, it is not possible in the foreseeable future to

measure ecological carrying capacity with any reasonable accuracy nor is it necessary for effective management. Picton (1983) has developed an index to ecological carrying capacity utilizing climate. However, it does not include human influences on the system. Obviously, humans are part of the NCDE and influence carrying capacity.

Caughley (1977) recognized four classes of overpopulation, the first of which occurs when "The Animals Threaten Human Life or Livelihood". This concept was further refined by Decker and Purdy (1988) and termed Wildlife Acceptance Capacity (see public perceptions discussion, page 76). This concept of "carrying capacity" is one which is most appropriately applied to grizzly bears in the NCDE.

When the concept of Wildlife Acceptance Capacity is considered in light of the current situation in the NCDE, there is no question but that grizzly bear "population pressures" exist and that these pressures must be handled in a reasonable way which will allow the State of Montana to continue to promote recovery of the species.

B. POPULATIONS

Federal regulations define population as "a group of fish or wildlife in the same taxon and below the subspecific level in common spacial arrangement that interbreed when mature." Applying this definition to the NCDE, it is clear that it contains one continuous bear population. The grizzly bear population in the NCDE is not isolated from the remainder of the North American population, and interchange occurs freely between those segments of the population north of the NCDE in Canada and those to the south in Montana. Research projects have demonstrated that grizzly bears have the ability to freely move across all portions of the NCDE and beyond in certain locations.

In addition to knowing carrying capacity, it has been suggested that it would be necessary to precisely determine existing population numbers. Wildlife management does not rely on precise determinations of populations, but instead commonly utilizes professional judgments based on the best data available. Some critics of the 1986 EIS have asked for a high level of statistical confidence on population estimates that is in fact unattainable. Although it appears that statistical confidence across ecosystems is not possible in grizzly bear research, it is possible to have reasonable confidence as managers using the approach described in the density estimation section, and we are refining our estimates to increase statistical confidence on our study areas.

The 1982 Grizzly Bear Recovery Plan (U.S. Fish and Wildlife Service 1982) estimated a population for the NCDE of 440-680 bears. The 1986 EIS, utilizing information which became available after 1982, estimated the population in the NCDE at a minimum of 549 bears and possibly as high as 813. These estimates indicated that the NCDE population was numerically at the levels required for recovery. Review of the best available information for this update (which uses more conservative estimates)

indicates the total population is currently 481-678 ($\bar{X} = 580$). The population continues to be above recovery levels required in the 1982 plan.

Population pressure should also be evaluated in light of the population trend. MDFWP recognizes that no single source of information is available that clearly indicates population trend in grizzly bears. For that reason, it has relied on a wide variety of indicators and analyses to make a determination of the status of the NCDE population. The population trend in the NCDE is stable to increasing. This conclusion, based on scientific evidence, is also supported by anecdotal information published in the Draft Revised Recovery Plan (U.S. Fish and Wildlife Service 1990) indicating that many ranchers raised in the foothill areas along the east and south borders of the NCDE have commented that present populations appear to be greater in recent years than they were in the 1920s and 1930s. Similarly, Keating (1986) states "trends and sighting rates and population estimates indicated Glacier National Park's grizzly population increased significantly about 1930 and 1965."

The only evidence of a decline in a segment of the NCDE population was presented in 1983 (Claar et al. 1986). Based on an estimate of 25 bears for the Mission subpopulation and the mortality rates which were occurring, that paper indicated that the mortality rate was excessive. However, current information from the South Fork Grizzly Bear Research Project shows that grizzly bears move freely between the Missions and other segments of the NCDE. This indicates that analysis and conclusions Claar et al. (1986) were incorrect because they were based on the false assumption of limited interchange between the Mission segment and the remainder of the ecosystem. In addition, the mortality of grizzlies in the Mission Mountains has been drastically reduced since 1985 (Appendix I), which should promote grizzly use of this area.

Grizzly bear population pressure can be demonstrated. The meaning of excessive population pressure, however, is not clearly defined. In our judgement, it is a social consideration, not solely a biological one. Many newspaper articles, meetings, and individual letters have expressed concerns about grizzly bear population pressures along the East Front. Therefore, the problem is that we must balance bear numbers with what society (especially those living with the bears) will accept while attaining recovery levels to meet the requirements of the ESA.

There is a finite amount of habitat available to grizzly bears in this area due to changes in the environment brought about by human settlement and occupancy of the land. Because of this, it is not possible to continually expand the zone of occupancy of grizzly bears into areas of human habitation. The finite nature of the ecosystem and increasing grizzly bear populations in some areas results in manifestations of population pressure. Manifestations of pressure may include, but are not limited to, one/all or a combination of the following: conflicts with human interest, range expansion, dispersal, home range contractions, natural mortality rates, intra-specific mortality, empirical data

from core areas, human social concerns, sex/age structure of the population, and reproductive parameters such as the number of females with cubs.

In the NCDE, these population pressures have been manifested in some of the following ways: data from core areas indicates an extensive population, demonstration of population expansion in some areas and dispersal as well, and the elevation of human/social concerns and conflicts in portions of the NCDE. These factors, and others, together with the population estimates and trend information clearly show that population pressure exists in the NCDE.

Before a regulated harvest may occur, the extraordinary case criteria requires that two conditions be met: 1) population pressure and 2) population pressure cannot be otherwise relieved. The MDFWP, in both 1975 and 1986 EISs, examined other possible ways to relieve population pressure. The following suggestions made by experts in the field were examined. Bears sent to zoos add nothing to the recovery of the species or to the wild population. Translocation of animals to other ecosystems offers no relief because the MDFWP receives no offers from any state in the historic range of the bear to take grizzly bears, problem or otherwise. Moving bears within the ecosystem does not relieve population pressure, even on a local basis, because bears often move back to their previous home range. Also, moving bears within the ecosystem may result in some negative impacts on the areas where the bears are moved, and many moved bears soon die despite the effort. Finally, capture of bears in the rugged back country of the NCDE is difficult and usually not possible.

The MDFWP is still firmly committed to utilizing surplus bears in the NCDE to augment populations in other areas or to reintroduce this species where recovery areas have been identified. The MDFWP program utilizes the best available biological and social information, allows for a continuing increase in numbers, is designed to achieve recovery goals, and meets the requirement of the Endangered Species Act and the test of the extraordinary case.

XVIII. RECOMMENDATIONS

The Preferred Alternative presented earlier and the recommendations presented here provide a reasonable and responsive grizzly bear management program for northwestern Montana.

A. HABITAT PRESERVATION, IMPROVEMENT, AND LAND ACQUISITION

The key to the continued survival of grizzlies in Montana lies in the amount and quality of habitat which remains available to this species. Therefore, it is recommended that MDFWP:

1. Address needs that provide for social acceptance of grizzlies
2. Lead in designating areas that will be required for grizzly bear survival
3. Monitor changes in these habitats
4. Pursue habitat acquisition, easement, and improvement in key areas
5. Work with federal, state, and local agencies to preserve key habitats.
6. Work with federal and other state and local agencies to develop standards and guidelines for:
 - a. Road densities
 - b. Logging activity
 - c. Subdivision/urbanization
 - d. Recreation activities
 - e. Sanitation
 - f. Mining
 - g. Snowmobiling
7. Develop an ecosystem habitat evaluation/monitoring program through research
8. The MDFWP continues to support an interagency program with our personnel routinely working with federal land management agencies to integrate MDFWP goals into federal programs.

Identified habitat areas of key importance are:

- a. CYE, primarily along the Bull River Valley and corridors between the Yaak and Cabinet mountains, and between these areas and Canada

- b. Rocky Mountain East Front
- c. North Fork of the Flathead River
- d. Swan River Valley
- e. Area between the towns of East Glacier and West Glacier along Highway 2
- d. The Mission Front.

The MDFWP will also encourage private conservation groups to acquire habitat and obtain conservation easements in these areas.

B. MANAGEMENT AREA CHANGES

MDFWP recognizes that grizzly bears can and do live outside the boundaries of management areas defined in the 1986 EIS. The presence of bears outside these boundaries will be encouraged as long as conflicts with humans do not occur. If a conflict occurs, the bear responsible will be treated according to MDFWP and interagency guidelines. If sufficient numbers of grizzlies occupy land outside current management area boundaries without conflict, MDFWP will evaluate modifying the boundary to include the newly occupied area(s). If new areas are incorporated, MDFWP will seek necessary changes from federal agencies which allow implementing the management program in those areas.

C. INTENSIVE RESEARCH

Research on grizzlies is difficult and requires a long-term commitment of funds. The MDFWP is committed to long-term (8 to 10 years) efforts in grizzly research. However, as long as the NCDE and CYE grizzly populations are federally listed as threatened, the MDFWP will need a stable funding source from the USFWS to conduct such work. Federal funding since 1986 has not been stable, and the MDFWP is working to change federal allocations to solve this problem.

D. POPULATION TRENDS

The ability to document long-term population trends is an important aspect of grizzly bear management. MDFWP is assisting in developing and evaluating new trend monitoring techniques, including systematic subjective surveys of professionals and various user groups. Surveys will be developed by professional surveyors to ensure statistical validity.

E. DAMAGE CONTROL

Because there is a need to actively deal with nuisance bears, it was therefore recommended that MDFWP employees in each region continue to be trained to deal with damage control and bear handling. Response to any grizzly bear damage complaints should be rapid and recorded accurately. MDFWP also recommends that other agencies expand the area into which relocation of bears may be permitted. The Department further recommends that if aversive conditioning of grizzly bears proves effective in preventing conflicts, the technique should be adopted as a management tool.

MDFWP has recommended and established a limited entry damage hunt for problem grizzlies. This hunt would be conducted anytime a damage situation occurred and conditions were appropriate for such a hunt. If a damage hunt is held, hunters successful in drawing a permit would be directed by MDFWP personnel to the nuisance site or be directed to a specific hunting location for the purpose of harvesting the nuisance bear(s). This recommendation from the 1986 EIS was implemented but is now on hold until legal issues can be resolved.

F. MORTALITY REPORTING

It is important that all known mortalities be reported and records maintained at one source. MDFWP should remain the sole mortality coordinator to which all mortalities for the state from all agencies and causes are reported.

G. ENFORCEMENT EFFORTS

Enforcement efforts by all agencies should be concentrated in those areas with the greatest potential for problems. These areas include the Mission Mountains, Badger-Two Medicine, the North Fork of the Flathead River and the entire CYE. Enforcement efforts should be directed toward roaded areas in the spring and summer and toward backcountry areas during the fall. Continued enforcement is important to minimize bear parts profiteering. MDFWP recommended in the 1986 EIS that a civil penalty for the illegal taking of grizzly bears be implemented, and this has occurred. This penalty serves as an additional deterrent to potential poachers.

H. UNREPORTED MORTALITY

The importance of this mortality factor dictates that it must be evaluated in the biennial season-setting process. Information from research projects, grizzly parts values, efforts to decrease conflict situations, undercover enforcement operations, etc. will be reviewed in these evaluations. Major changes in the level of unreported mortality would dictate changes in the management program. MDFWP will also review any new approaches to estimating this mortality source in order that the most accurate estimates are used.

I. HUNTER SURVEYS

In the 1986 EIS, MDFWP recommended and implemented an annual survey of all hunters obtaining a grizzly bear hunting license. Information obtained from these surveys primarily include hunter effort, but the number of bears or bear sign observed, dates hunted, areas hunted, hunter comments on regulations and season, etc. are also recorded (Appendix H,). Evaluation of these surveys will substantially aid in setting seasons and interpreting population data.

J. BEAR RELOCATIONS

All relocated grizzly bears should be radio collared and monitored for two years to determine transplant success. A thorough review of this technique will improve our understanding of its viability. The US Fish and Wildlife Service should support this effort until all grizzly bear populations are recovered.

It is important that all nuisance complaints, relocations, and other control actions be reported and records maintained at one source. MDFWP should be the coordinator to which all such actions by any agency and for any cause are reported. Further, MDFWP recommends that all agencies use the same form for recording such actions. This update presents a first attempt to summarize these complaints on an ongoing basis.

K. AUGMENTATION

Augmentation involves the transplanting of individuals from areas with a population surplus into areas with existing populations in need of bolstering. In the past, transplants have proven unsuccessful largely because they involved problem bears. To increase success, augmentation should involve bears in sex and age groups that have no history of conflicts (i.e. not nuisance bears) and are from remote areas. The USFWS and MDFWP have worked with the British Columbia Fish and Wildlife Branch to transplant bears from adjacent British Columbia into the CYE. Bears from British Columbia have had less contact with humans because there is less development in their range and the habitat there is similar to that in the CYE. Therefore, they are less likely to cause nuisances where transplanted. In addition, the further a bear is moved from its original capture site, the more likely the success of the transplant.

MDFWP recommends that augmentation or reintroduction through the use of transplanting be initiated in other identified ecosystems, especially the Bitterroot and North Cascades, on an experimental basis to determine its efficacy. Bears should be radio-instrumented and monitored for an extended period. There are currently sufficient numbers of bears in the NCDE to allow proactive removal and relocation of grizzlies to these other ecosystems. Bears removed from the ecosystem for augmentation would be subtracted from the ecosystem's annual mortality quota. Augmentation will require close coordination with land management agencies and extensive public review before

implementation. If it is determined to be unsuccessful, more extreme measures will be required to recover populations in other ecosystems.

L. NATURALLY OCCURRING FIRES

MDFWP will continue to encourage land management agencies to allow fires to burn in wilderness and other appropriate areas to maintain or improve habitat in a condition best suited for grizzly bears.

M. LEGAL MANAGEMENT BOUNDARIES

The boundary established in the Federal Register within which MDFWP may conduct grizzly bear hunting (i.e. Flathead National Forest, Bob Marshall, and Mission Mountains Wilderness areas) was in need of modification, and this was accomplished in 1986. MDFWP requires flexibility to implement seasons when and where appropriate within and adjacent to the present boundary.

N. FOCUS CONCERN FOR THE GRIZZLY BEAR TO OTHER ECOSYSTEMS

It is MDFWP's position that an effort must be made to focus concern for the grizzly to other ecosystems identified in the grizzly bear recovery plan. Accomplishment of this will require the cooperation of the public and all agencies dealing with grizzly bear management. MDFWP believes this is important because the grizzlies in the NCDE are biologically least vulnerable due to the size of the current population and its proximity to the rest of the population in Canada. In addition, bear habitat is most secure in the NCDE as a result of land already established as National Park and wilderness.

The same situation is not true of other ecosystems or bears in those areas. Populations in other areas are much lower and more isolated from areas with a healthy population. Suitable habitat is much less secure in most of these ecosystems than in the NCDE.

If agencies continue to focus so exclusively on the NCDE, vital opportunities to recover the bear in some of the other ecosystems may be lost. Once grizzlies are totally eradicated from an area, the record is clear that the support for their re-establishment is minimal. As progress is made toward recovery in other ecosystems, management will be more flexible and the public's support will increase.

It is very important for the public to recognize that continuing to focus on grizzly bears, a species that is not biologically threatened with extinction, increases the risk of extinction to other species which are endangered. Kellert (1985) reported that a majority of America's public would accept increases in energy costs to protect species with public appeal such as the eastern mountain lion (*Felis concolor*) but were unwilling to render

sacrifices for such species as the eastern indigo snake (*Drymarchon corais couperi*). The time, money, and other resources which are expended on grizzly bears removes those resources from species which are truly endangered. For the public to make valid decisions on grizzly management, they need to be aware of this risk.

O. MANAGEMENT PLANS BY AREA

To improve grizzly bear management, MDFWP will develop management plans for each bear management area (BMA) established under the preferred alternative. These management plans will identify specific problems and problem areas on a local level and develop strategies to deal with them. In this way, the program for the ecosystem can be more responsive to changing local conditions and needs while still maintaining the overall direction recommended in the EIS and this update.

These plans should address such things as land ownership patterns within the area, percentage of the area which is roaded, general habitat maps, problem areas, management zones for dealing with conflict situations, density goals, and local enforcement problem areas. These plans should also be subjected to local review and comment in order to generate support for bear management at the local level. Ultimately these plans will enable us to monitor changes in habitat and local problems more efficiently. Plans have been completed for the RMEF (Appendix I) and are underway for those areas west of the Continental Divide.

P. BLACKFEET INDIAN RESERVATION

The Blackfeet Indian Reservation represents a significant portion of the NCDE. Reservation management policies are critical to cooperative management of the grizzly bear in the NCDE. Since the early 1980s, the tribe has made significant progress on grizzly management, and MDFWP encourages the Blackfeet Tribe to continue to formulate their management program for their Reservation. MDFWP further offers its full cooperation in developing such a program and welcomes the opportunity for continued cooperation.

Q. SOCIOLOGICAL ASPECTS OF GRIZZLY BEAR MANAGEMENT

The sociological aspects of grizzly bear management in Montana are very important to its success. Public perception, locally as well as nationally, of grizzly bear population status and of the management abilities of responsible agencies greatly influence management programs. People place different values on the preservation of endangered species (Kellert 1985), and this variation requires systematic consideration in determining preservation priorities and implementing effective recovery programs. Because social concerns are such an important aspect of grizzly bear management, MDFWP recommends that a study be initiated by the State of Montana (funded by the USFWS as long as the grizzly is listed as threatened) to determine public perceptions,

on a local and national level, concerning the status and management of grizzly bears in Montana. The results of such a study will indicate possible changes in direction which would make the program more effective.

R. FRAMEWORK FOR EVALUATION

It is recommended that all new information be evaluated annually and incorporated into the management program. A more thorough review of the management program every five years should also serve to incorporate new information. At these five-year intervals, indications of population changes for either the CYE or the NCDE will be evaluated to determine if management direction should be altered. The EIS will be reviewed and updated every ten years, and a determination of population status in both the CYE and NCDE will be made. The Wildlife Program EIS, to be completed in 1995, will serve as a further review of the grizzly bear management program and may sufficiently address the need for a revision of this EIS in 1996.

MDFWP, after reviewing input from wildlife professionals, the public, etc., maintains the option to change the management program at any time as is appropriate to better manage grizzly bears.

S. REGULATED HUNTING

It is our judgement that the use of regulated hunting is critical to the long term success of bear management efforts in Montana. If judicial interpretation of language in the Endangered Species Act or of congressional intent is such that we cannot regain the use of hunting as a conservation tool, the ESA should be amended to address this problem and MDFWP should assist in developing these amendments.

T. MISTAKEN IDENTITY

Although accidental killing of grizzly bears by black bear hunters is not a significant problem affecting the long term survival of the grizzly, it does receive public scrutiny. It is therefore recommended that MDFWP educational efforts to deal with this problem be continued.

U. DATA REPORTING FORMS

There is a great need for uniformity and coordination of reporting forms used for grizzly bear nuisance situations, relocations, mortalities, and trapping. Currently, each area has individualized forms. Leadership needs to be assigned for coordination and communication, and annual departmental coordination meetings would be beneficial. MDFWP will work with the IGBC and Canadian authorities to achieve more uniformity.

XIX. LITERATURE CITED

- Archibald, W. R., R. Ellis, and A. N. Hamilton. 1987. Responses of grizzly bears to logging truck traffic in the Kimsquit River Valley, British Columbia. *Intl. Conf. Bear Res. and Manage.* 7:251-258.
- Aune, K. 1991. Validation of the East Front cumulative effects model. *Mont. Dept. Fish, Wildl. and Parks, Helena.* 69 pp.
- Aune, K. and W. Kasworm. 1989. Final Report: East Front Grizzly Bear Study. *Mont. Dept. Fish, Wildl. and Parks, Helena.* 332 pp.
- Aune, K., R. Mace, and D. Carney. 1992. The reproductive performance of female grizzly bears in the NCDE. *Int. Conf. Bear Res. and Manage.* In press.
- Aune, K. and P. Schladweiler. 1991. Wildlife laboratory annual report. *Mont. Dept. Fish, Wildl. and Parks, Helena.* 52 pp.
- Aune, K., T. Stivers, and M. Madel. 1984. Rocky Mountain Front grizzly bear monitoring and investigation. *Montana Dept. Fish, Wildl. and Parks, Helena.* 239 pp.
- Bissell, G. N. and C. A. Yde. 1985. Wildlife and wildlife habitat mitigation plan for Hungry Horse hydroelectric project. *MDFWP, Helena. USDE BPA. Project 83-464.* 46 pp.
- Bureau of Land Management. 1987. Interagency Rocky Mountain Front wildlife monitoring/evaluation program. *Butte, Mt.* 63 pp.
- Brannon, R., R. Mace, and A. R. Dood. 1988. Grizzly bear mortality in the Northern Continental Divide Ecosystem, Montana. *Wildlife Society Bulletin, Vol. 16, No. 3:*262-269.
- Carney, D. and R. Skinner. 1988. Blackfeet grizzly bear study. *Ann. Rept. BIA, Blackfeet Tribe. Browning, MT.* 16 pp.
- _____. 1990. Blackfeet grizzly bear study. *2nd Ann. Rept. Browning, Mt.* 21 pp.
- Caughley, G. 1977. Analysis of vertebrate populations. *Wiley Press, London.* 234 pp.
- Claar, J., R. Klaver, and C. Servheen. 1986. Grizzly bear management on the Flathead Indian Reservation, Montana. Paper presented at the Sixth International Conf. on Bear Research and Management. *Grand Canyon, AZ.* Pp. 203-208.
- Contreras, G. P. and K. E. Evans. 1985. Proceedings - Grizzly bear habitat symposium. *Intermountain Res. Sta. Ogden, UT.* 252 pp.

- Curatolo, J. A., and G. D. Moore. 1975. Home range and population dynamics of grizzly bear in the eastern Brooks Range, Alaska. In : R.D. Jakimchuk, ed., studies of large mammals along the proposed Mackenzie Valley Gas pipeline route from Alaska to British Columbia. Artic Gas Biol. Rept. Ser. Vol. 32. 79 pp.
- Dean, F. C. 1976. Aspects of grizzly bear population ecology in Mount McKinley National Park. Int. Conf. Bear Res. and Manage. 3:111-119.
- Decker, D. J., and K. Purdy. 1988. Toward a concept of wildlife acceptance capacity in wildlife management. Wildl. Soc. Bull. 16:53-57.
- Diamond, S. 1991. The Beartree challenge: from conflict to collaboration. Rocky Mountain Ranger District, USFS, Choteau, Mt. 4 pp.
- Dood, A. R., R. Brannon, and R. Mace. 1986. Final programmatic environmental impact statement: The grizzly bear in northwestern Montana. Mont. Dept. Fish, Wildl. and Parks, Helena. 287 pp.
- _____ and H. I. Pac. 1988. Montana statewide grizzly mortality studies. July 1986-June 1988. Montana Dept. Fish, Wildl. and Parks, Helena. 30 pp.
- Elgmork, K. 1978. Human impact on a brown bear population (*Ursus arctos* L.). Biol. Conserv. 13:81-88.
- Ellig, L., R. Inman, L. Hancock, B. Christensen, R. Meyer, G. Brown, and L. Lewis. 1990. Final 1988 report and 1989/1990 updates of the Gateway Community Sanitation Task Force. Unpubl. Report, USFS, Bozeman, Mt. 43 pp.
- Gillin, C. M., F. M. Hammond, and C. M. Peterson. 1992. Evaluation of aversive conditioning techniques on grizzly bears in the Yellowstone Ecosystem. Int. Conf. Bear Conference 9:00-000. In press.
- Greer, K. 1971. Grizzly bear mortality and management programs in Montana during 1970. Job progress report W-120-R-2, Montana Dept. Fish and Game, Helena. 44 pp.
- _____. 1972. Grizzly bear mortality and management programs in Montana during 1971. Job progress report W-120-R-3, Montana Dept. Fish and Game, Helena. 30 pp.
- _____. 1973. Grizzly bear mortality and management programs in Montana during 1972. Job progress report W-120-R-4, Montana Dept. Fish and Game, Helena. 51 pp.
- _____. 1974a. Grizzly bear mortality and management programs in Montana during 1973. Job progress report W-120-R-5, Montana Dept. Fish and Game, Helena. 24 pp.

- _____. 1974b. Montana grizzly bear management and public harmony. Montana Dept. of Fish and Game, Helena. 46 pp.
- _____. 1975. Grizzly bear mortality and management programs in Montana during 1974. Job progress report W-120-R-6, Montana Dept. Fish and Game, Helena. 20 pp.
- _____. 1976a. Grizzly bear mortality and management programs in Montana during 1975. Job progress report W-120-R-7, Montana Dept. Fish and Game, Helena. 20 pp.
- _____. 1976b. Managing Montana's grizzlies for the grizzlies! Int. Conf. Bear Res. and Manage. 3:177-189.
- _____. 1977. Grizzly bear mortality and management programs in Montana during 1976. Job progress report W-120-R-8, Montana Dept. Fish and Game, Helena. 18 pp.
- _____. 1978. Grizzly bear mortality and management programs in Montana during 1977. Job progress report W-120-R-9, Montana Dept. Fish and Game, Helena. 13 pp.
- _____. 1979. Grizzly bear studies, statewide wildlife research. Job progress report W-120-R-10, Montana Dept. Fish, Wildl. and Parks, Helena. 22 pp.
- _____. 1980. Grizzly bear studies, statewide wildlife research. Job progress report W-120-R-11, Montana Dept. Fish, Wildl. and Parks, Helena. 22 pp.
- _____. 1981. Grizzly bear studies, statewide wildlife research. Job progress report W-120-R-12, Montana Dept. Fish, Wildl. and Parks, Helena. 20 pp.
- _____. 1982. Grizzly bear studies, statewide wildlife research. Job progress report W-120-R-13, Montana Dept. Fish, Wildl. and Parks, Helena. 29 pp.
- _____. 1985. Grizzly bear mortality studies, (1983-1984). Job progress report W-120-R-15. Montana Dept. Fish, Wildl. and Parks, Helena. 51 pp.
- Gunther, K. A. 1990. Visitor impact on grizzly bear activity in Pelican Valley, Yellowstone National Park. Intl. Conf. Bear Res. and Manage. 8:73-78.
- Hadden, D. and C. Jonkel. 1983. An inventory and evaluation of wildlife and wildlife habitat on the Big Mountain, Montana. Border Grizzly Proj., Univ. Mont., Missoula. Spec. Rep. No. 64. 129 pp.
- Hamer, D, and S. Herrero. 1987. Wildfire's influence on grizzly bear feeding ecology in Banff National Park, Alberta. Intl. Conf. Bear Res. and Manage. 7:179-186.

- Harris, R. B. 1984a. Harvest age-structure as an indicator of grizzly bear population status. M.S. thesis, University of Montana, Missoula. 204 pp.
- _____. 1984b. Grizzly bear population trend monitoring - a resource for decision makers. U.S.F.W.S. Tech. Note. Unpublished Report.
- Herrero, S. 1985. Bear attacks - their causes and avoidance. Nick Winchester Press, New Century Pub., Inc. Piscataway, NJ. 287 pp.
- Interagency Grizzly Bear Committee. 1987. Grizzly bear compendium. U.S. Dept. of Interior, Fish and Wildlife Service, Missoula, MT. 540 pp.
- Jonkel, C. and I. M. Cowan. 1971. The black bear in the spruce-fir forest. Wildl. Monogr. 27:1-57.
- Kasworm W., and T. L. Manley. 1988. Grizzly bear and black bear ecology in the Cabinet Mountains of northwest Montana. Mont. Dept. Fish, Wildl. and Parks, Helena. 122 pp.
- _____, and _____. 1990. Road and trail influences on grizzly bears and black bears in northwest Montana. Intl. Conf. Bear Res. and Manage. 8:79-84.
- _____, and T. J. Thier. 1990. Cabinet-Yaak ecosystem grizzly bear and black bear research. 1989 Prog. rept. USFWS. 62 pp.
- Keating, K. A. 1986. Historical grizzly bear trends in Glacier National Park, Montana. Wild. Soc. Bull. 14:83-87.
- Kellert, S. R. 1985. Social and perceptual factors in endangered species management. J. Wildl. Manage. 49:528-536.
- Kendall, K. C. 1985. Grizzly bear population trend studies Apgar Mountains, Glacier National Park. National Park Service Progress Report.
- _____. 1986. Grizzly and black bear feeding ecology in Glacier National Park, Montana. Progress Report. Glacier National Park Science Center, West Glacier, MT. 42 pp.
- _____, L. H. Metzgar, D. A. Patterson, and B. M. Steele. 1991. Power of sign surveys to monitor population trend. J. Wildl. Manage. In press.
- LeCount, A. L. 1982. Characteristics of a central Arizona black bear population. J. Wildl. Manage. 46:861-868.

- Lortie, G. M. 1978. A new management system for Yukon grizzly bear. Yukon Territory Wildl. Branch. 15 pp. Unpubl.
- Mace, R. D. 1985. Analysis of grizzly bear food resources in the valley bottom lands and avalanche tracts of the Bob Marshall Wilderness Area, Montana. Paper presented at the Grizzly Bear Habitat Symposium. April 30-May 2, 1985, Missoula, MT. Pp. 136-149.
- _____. and T. Manley. 1990. South Fork Flathead River grizzly project. Montana Dept. of Fish, Wildl. and Parks, Helena. 41 pp.
- _____, T. Manley, and K. Aune. 1990. Use of systematically deployed remote cameras to monitor grizzly bears. Montana Dept. Fish, Wildl. and Parks, Helena. 40 pp.
- _____. and C. Jonkel. 1980. Grizzly bear response to habitat disturbance. Pages 70-98 in: C. Jonkel ed., Annual Rep. 3. Border Grizzly Proj. Univ. Montana, Missoula.
- Madel, M. 1989. Rocky Mountain Front grizzly bear management program. Mont. Dept. Fish, Wildl. and Parks, Helena. 52 pp.
- Martinka, C. 1971. Status and management of grizzly bears in Glacier National Park, Montana. Pages 312-322 in: 36th North Am. Wildl. and Nat. Resour. Conf. Wildlife Management Institute, Washington, D.C.
- _____. 1974. Population characteristics of grizzly bears in Glacier National Park, Montana. Mammal. 55(1):21-29.
- Mattson, D. J., R. R. Knight, and B. M. Blanchard. 1987. The effects of developments and primary roads on grizzly bear habitat use in Yellowstone National Park, Wyoming. Intl. Conf. Bear Res. and Manage. 7:259-274.
- McLellan, B. 1984. Population parameters of the Flathead grizzlies. Canadian Border Grizzly project. 28 pp.
- _____, and D. M. Shackleton. 1988. Grizzly bears and resource-extraction industries: Effects of roads on behavior, habitat use, and demography. J. Applied Ecology 25,451-460.
- _____, and _____. 1989a. Immediate reactions of grizzly bears to human activities. Wildl. Soc. Bull. 17:269-274.
- _____, and _____. 1989b. Grizzly bears and resource-extraction industries: habitat displacement in response to seismic exploration, timber harvesting and road maintenance. J. of Applied Ecology 26: 371-380.

- _____. 1989a. Dynamics of a grizzly bear population during a period of industrial resource extraction. I. Density and age - sex composition. *Can. J. Zool.* 67:1856-1860.
- _____. 1989b. Dynamics of a grizzly bear population during a period of industrial resource extraction. II. Mortality rates and causes of death. *Can. J. Zool.* 67:1861-1864.
- _____. 1989c. Dynamics of a grizzly bear population during a period of industrial resource extraction. III. Natality and rate of increase. *Can. J. Zool.* 67: 1865-1868.
- _____. 1990. Relationships between human industrial activity and grizzly bears. *Intl. Conf. Bear Res. and Manage.* 8:57-64.
- Mealey, S., L. Marcum, R. Righter, C. Jonkel, and G. Joslin. 1976. Vegetation studies of disturbed grizzly habitat. Pages 5-34, in C. Jonkel ed., *Ann. Rept. 1. Border Grizzly Proj. Univ. Montana, Missoula.*
- Miller, S. D. and W. B. Ballard. 1982. Density and biomass estimates for an interior Alaskan brown bear, *Ursus arctos*, population. *Canadian Field-Nat.* 96(4):448-454.
- Moen, A. N. 1973. *Wildlife ecology: an analytical approach.* W.H. Freeman and Co., San Francisco. 458 pp.
- Montana Department of Fish and Game. 1975. Environmental impact statement on the sport hunting of the grizzly bear. Montana Dept. of Fish and Game, Helena. 7 pp.
- Mundy, K., and D. Flook. 1973. Background for managing grizzly bears in the national parks of Canada. *Can. Wildl. Serv. Rep. Ser.* 22. 35 pp.
- Nyberg, H. F. 1991. Montana wildlife mitigation program: Annual report FY91. Montana Dept. Fish, Wild. and Parks, Helena. 22 pp.
- Pac, H. I., and A. Dood. 1989. Grizzly bear mortality studies in the conterminous 48 states. Research Progress Report. Montana Dept. Fish, Wildl. and Parks, Helena. 28 pp.
- _____. 1990. Grizzly bear mortality studies in the conterminous 48 states. Research Progress Report. Montana Dept. Fish, Wildl. and Parks, Helena. 25 pp.
- Palmisciano, D. 1986. Montana statewide grizzly bear mortality studies. Montana Dept. Fish, Wildl. and Parks, Helena. 5 pp.
- Pearson, A. M. 1975. The northern interior grizzly bear. *Can. Wildl. Serv. Rept. Ser. No.* 34. 86 pp.

- _____. 1976. Population characteristics of the Arctic mountain grizzly bear. *Int. Conf. Bear Res. and Manage.* 3:247-258.
- Picton, H. D. 1983. Grizzly Link? Yellowstone and Glacier, its biology and dynamics. Paper presented at the Sixth Int. Conf. Bear Res. and Manage., Grand Canyon, AZ. 6:7-10.
- Reynolds, H. V. and J. Hechtel. 1980. North slope grizzly bear studies. Fed. Aid Wildl., Rest. Proj. W-17-11, Job. No. 4.14R. Alaska Dept. Fish and Game, Juneau. 66 pp.
- Riley, S. J., K. Aune, R. Mace, and M. Madel. 1992. Translocation of nuisance grizzly bears in northwestern Montana. *Int. Conf. Bear Res. and Manage.* In press.
- Risbrudt, C. D. 1989. The chief's perspective on fire policies and management strategies in wilderness and national parks. Presented at the Wilderness/Parks Fire Conference, Bozeman, MT. Unpubl.
- Roosevelt, T. 1902. Hunting trips on the prairie and in the mountains. G. P. Putnam's Sons, New York and London. 197-201.
- Russell, R. H., J. W., Nolon, N. A. Woody, and G. Anderson. 1979. A study of the grizzly bear in Jasper National Park, 1975 - 1978. *Can. Wildl. Serv. Rept.* 136 pp.
- Servheen, C. 1981. Grizzly bear ecology and management in the Mission Mountains, Montana. Ph.D. Diss. Univ. Montana, Missoula. 138 pp.
- Smith, R.B. and L.V. VanDaele. 1990. Impacts of hydroelectric development on brown bears, Kodiak Island, Alaska. *Intl. Conf. Bear Res. and Manage.* 8:93-104.
- Tomascak, W. 1989. The future of prescribed natural fire in wilderness management northwest Fire Council, Wash. Unpubl. 5 pp.
- Tompa, F.S. 1984. Grizzly bears in British Columbia - harvest must be reduced. *British Columbia Wildl. Branch*, 9 pp. Unpubl.
- Troyer, W. A., and R.J. Hensel. 1964. Structure and distribution of a Kodiak bear population. *J. Wildl. Manage.* 28(4):769-772.
- USDI Fish and Wildlife Service. 1982. Grizzly bear recovery plan. Missoula, Mt. 195 pp.
- USDI Fish and Wildlife Service. 1989. Conservation strategy for the grizzly bear Northern Continental Divide Ecosystem, Montana. USDI Fish and Wildlife Service, Helena, MT. 67 pp.
- USDI Fish and Wildlife Service. 1990. Grizzly Bear Recovery Plan. Missoula, MT. 152 pp.

- Van Drimmelen, B. 1984. Grizzly bear management plan for the Skeena Region. British Columbia Wildl. Branch. 20 pp. Unpubl.
- Wood, M. A. 1991. Northwest Montana wildlife mitigation program. Habitat protection, annual report. Montana Dept. of Fish, Wildl. and Parks, Kalispell. 15 pp.
- Woodgerd, W.R. 1974. Letter to Lynn A. Greenwalt. Montana Dept. of Fish and Game, Helena. 2 pp.
- Zunino, F., and S. Herrero. 1972. The status of the brown bear (*Ursus arctos*) in Abruzzo National Park, Italy, 1971. Biol. Conserv. 4(4):263-272.

APPENDIX A
IGBC Resolution Supporting Hunting of Grizzlies

Action/Decision Items and Observations
Interagency Grizzly Bear Meeting
Many Glacier, Montana
August 27, 1991

The IGBC unanimously passed the following resolution regarding support of the Montana Department's grizzly bear hunt: "That the IGBC go on record as being in support of Montana's Grizzly Bear Management Program, and specifically the use of hunting in the spring and fall as a sound biological approach to further the conservation and recovery of the grizzly bear in the Northern Continental Divide Ecosystem."

APPENDIX B

Grizzly Bear Policy MCA 12.9.103

MCA 12.9.103 GRIZZLY BEAR POLICY (1) Whereas, the Montana Fish and Game Commission has management authority for the grizzly bear, a resident wildlife species, and is dedicated to the preservation of grizzly bear populations within the state of Montana; and

Whereas the secure habitat for the grizzly has been greatly reduced as a result of the human development and population growth from 1850 through 1950 in the bear's traditional range in all western states; and

Whereas, a significant portion of the remaining grizzly bear habitat and population is located in Montana and these Montana populations occur in wildlands such as wilderness, primitive areas, de facto wilderness areas, national forests, national parks, Indian reservations, and seasonally, on adjacent private lands.

Now, therefore, in order to promote the preservation of the grizzly bear in its native habitat, the commission establishes the following policy guidelines for the Montana Department of Fish, Wildlife and Parks action when dealing with grizzly bear.

(a) Habitat. The department shall work to perpetuate and manage grizzly bear in suitable habitats of this state for the welfare of the bear and the enjoyment of the people of Montana and the nation. In performing this work the department should consider the following:

- (i) the commission has the responsibility for the welfare of the grizzly and advocates the protection of the bear's habitat;
- (ii) management of Montana's wildlands, including the grizzly bear habitat, is predominately, but not exclusively, a responsibility of various federal agencies and private landowners;
- (iii) land use decisions made by these agencies and individuals affect grizzly bear habitat, thus cooperative programs with these agencies and individuals are essential to the management of this species;
- (iv) preservation of wildlands is critical to the protection of this species and the commission advocates wildland preservation in occupied grizzly bear habitat; and

- (v) while some logging may not be detrimental to grizzly habitat, each logging sale in areas inhabited by grizzly bear should be carefully reviewed and evaluated.
- (b) Research. It is recognized by the commission that research on the habitat requirements and population characteristics of the grizzly bear is essential for the welfare of the species. Departmental research programs and proposals directed at defining those habitat requirements are encouraged and supported.
- (c) Hunting and recreational use. The commission recognizes its responsibility to consider and provide for recreational opportunities as part of a grizzly bear management program. These opportunities shall include sport hunting, recreational experiences, aesthetics of natural ecosystems, and other uses consistent with the overall welfare of the species.
 - (i) the department should consider the variability of values between individuals, groups, organizations, and agencies when management programs for various grizzly bear populations are developed.
 - (ii) sport hunting is considered the most desirable method of balancing grizzly bear numbers with their available habitat, minimizing depredations against private property within or adjacent to grizzly bear habitat, and minimizing grizzly bear attacks on humans.
- (d) Depredations. Contacts between grizzly bear and humans, or property of humans, require delicate handling and careful consideration. When these contacts reach the stage for definite action, the following actions should be carried out:
 - (i) grizzly bear, in the process of threatening or endangering human life, shall be captured or dispatched immediately.
 - (ii) where no immediate threat to human life exists, individual bear encounters with humans shall be evaluated on a case-by-case basis and when the attack is abnormal or apparently unprovoked, the individual bear involved shall be captured or dispatched.
 - (iii) when the attack is normal (e.g. a female defending her cubs, any bear defending its food, or any bear defending itself) but the situation leads itself to no reasonable possibility of leaving the bear in place, then the bear should be removed.
 - (iv) grizzly bear committing depredations that do not directly endanger human life but that are causing property losses shall be evaluated on an individual case basis.

(v) where removal is determined to be the best resolution to the problem, depredating or nuisance bear shall be trapped, and if determined to be suitable for transplanting, shall be marked and released in suitable habitat previously approved with appropriate land management agencies.

(vi) reasonable efforts shall be made to inform the public of the transplant program, fully explaining the reasons for the capturing and locations of the release area.

(vii) upon request by an authorized scientific investigative agency or public zoological institution, a captured bear may be given to that agency or institution, for appropriate nonrelease research purposes. A reasonable charge may be required to cover costs of handling.

(e) Depredating grizzly bear that are not suitable for release or research because of old age, acquired behavior, disease, or crippling, shall be killed and sent to the department's research facilities for investigation. The public shall be fully informed when these actions are taken and the reasons for these actions shall be fully explained.

(f) Coordination. The department shall consult with appropriate federal agencies and comply with applicable federal rules and regulations in implementation of this policy. (History: Sec. 87-1-301 MCA, IMP, 87-1-201, 87-1-301 MCA; Eff. 12/31/72; AMD, 1977 MAR p. 257, Eff. 8/26/77.)

APPENDIX C

NCDE Management Area Boundary Description

Occupied habitat in the NCDE is bounded on the west by U.S. Highway 93 from the U.S.-Canadian border, south to the junction with Montana Highway 82, then east along Highway 82 to the junction with Montana Highway 35 then south approximately along Highway 35 to its junction with Highway 93, then south approximately along Highway 93 to its junction with Interstate 90. The southern boundary approximately follows Interstate 90 east from this junction to the junction with Montana Highway 200, then approximately along Highway 200 east to a point on the highway at the confluence of Willow Creek and the Blackfoot River, then east approximately along a line from this point to the town of Wolf Creek. The eastern boundary follows north approximately along a line from Wolf Creek to Augusta then approximately along a line from Augusta to the confluence of Arnold Coulee and Pishkun Canal, then east along Pishkun Canal to Pishkun Reservoir, then east along the north shore of the reservoir to its northernmost point, then north approximately along a line from this point to the easternmost point on the shore of Eureka Reservoir, then approximately along a line from this point to the westernmost point on the shore of Bynum Reservoir, then approximately along a line from this point to Dupuyer, then approximately along a line from Dupuyer to East Glacier, then approximately along a line from East Glacier to Babb then approximately along a line from Babb to a point on the U.S.-Canadian border at the midpoint of Township 37 North, Range 14 West. The northern Boundary follows the international border west from this point to the intersection with U.S. Highway 93.

APPENDIX D

CYE Management Area Boundary Description

The western boundary follows the Montana-Idaho border south from the U.S. - Canadian border to the intersection this stateline and the Mineral County-Saunders County line. The southern boundary follows approximately along a line from this point to Thompson Falls, then along Montana Highway 200 east from Thompson Falls to the point on the highway approximately 1 mile north of Plains, then approximately along a line from this point to a point approximately 1 mile north of Plains on Montana Highway 28, then, from this point east along Highway 28 to the east end of Rainbow Lake. The eastern boundary follows approximately along a line from this point north to Bassoo Peak then approximately along a line from Bassoo peak to the USFS Bend Ranger Station, then approximately along a line from this ranger station to the confluence of Silver Butte Fisher Creek and Fisher River at U.S. Highway 2 then north along Highway 2 to Libby, then from Libby east along the Kootenai River and north along the west shore of Lake Koocanusa to the U.S. - Canadian Border. The northern boundary follows the international border from this point to the Montana - Idaho border.

APPENDIX E

NCDE POPULATION DENSITY JUSTIFICATIONS

APPROACH: Several assumptions were made regarding grizzly bear ecology, habitat use patterns, mortality patterns, and home-range size to estimate current population densities. These assumptions, which we feel generate reasonable and conservative estimates of the minimum and maximum population, are listed below.

1. Existing density estimates could be applied to areas of similar habitat features, food type, mortality patterns, and levels of human activity and encroachment (Zuninot and Herrero 1972, Martinka 1974, Pearson 1975, Lortie 1978, Reynolds and Hechtel 1980, Miller and Ballard 1982, Tompa 1984, van Drimmelen 1984).
2. Only annual densities were estimated. This annual density would correspond to the number of grizzlies living in an area year-round.
3. Home-range size, the degree of home-range overlap, and population density are partly related to habitat quality. As a result, areas of similar habitat quality should support similar numbers of grizzly bears. Furthermore, grizzly bears tend to limit their movements between the lowest available habitat and the closest major mountain divide (Mace and Jonkel 1980, Aune et al. 1984, Mace 1985). This home-range pattern would help define density unit boundaries.
4. There are a few areas in the NCDE with higher mortality, and population densities were adjusted to reflect this factor.
5. Although the habitat may be excellent, areas of high human activity would reduce a density estimate.
6. It is assumed that there are areas of high and low bear density resulting, at least partially, from the patchy distribution of important habitat components (Mealey et al. 1976). Bears are not uniformly distributed throughout a density unit.
7. It is assumed that movement of bears between density units is equal. Individuals do not remain within the boundaries of one unit.

RATIONALE BEHIND EACH DENSITY ESTIMATE

Density Unit No. 2 Red Meadow

Location: Eastern half of Whitefish Range from North Fork Flathead River to Tobacco Valley. USA-Canadian border to Red Meadows Creek. Habitat Unit Region 2.

Past Density Estimates: Jonkel and Cowan (1971) gave an estimate of $1/13 \text{ mi}^2$. Thier (USDA 1982) estimated $1/15 \text{ mi}^2$ for the area from Red Meadow Creek north to the International border based on instrumented bears and untagged bear observations.

1986-Dept. FWP Density Estimate: $1/15\text{-}1/10 \text{ mi}^2$ (14-22 bears)

1991-Dept. FWP Density Estimate: $1/15\text{-}1/10 \text{ mi}^2$ (14-22 bears)

Unit Size: 215 mi^2

Discussion: It would be inappropriate to extrapolate the density estimate for Glacier National Park (Martinka 1974) to this area. McLellan's 1984 estimate of 1 per $3\text{-}6 \text{ mi}^2$ was essentially for floodplain and benchland habitats and could not be directly extrapolated to the U.S. side.

Our density estimate was based on the proximity of this Unit to Glacier National Park ($1/8 \text{ mi}^2$) and British Columbia ($5\text{-}7 \text{ mi}^2$), but lowered to account for mortality and habitat differences.

No additional information is available to change previous 1986 density estimates (Bruce Campbell, MDFWP, pers. comm. 1991), however bear mortality in this area has been very low since 1985 and, in all likelihood, density is increasing.

Density Unit No. 3. Southern Whitefish Range:

Location: Red Meadow Creek south to Columbia Falls, MT. Habitat Unit Region 2.

Past Density Estimates: None for this area.

1986-Dept. FWP Estimate: $1/25\text{-}1/18 \text{ mi}^2$ (33-46 bears)

1991-Dept. FWP Estimate: $1/25\text{-}1/18 \text{ mi}^2$ (33-46 bears)

Unit size: 831 mi^2

Discussion: Grizzlies are less commonly observed (or harvested) in the area south of Red Meadow Creek as compared to the Northern Whitefish Range (Hadden and Jonkel 1983). These authors reported an average of 5 grizzly bear sightings per year for the period 1980-1983 in an area at the southern extreme of the unit. However a seasonal

concentration of grizzly bears (to feed on huckleberries) occurs in the Apgar Mountains (Kendall 1985). Densities are considered to be less on the west side of the Whitefish Divide than on the east side, and recent sightings compiled by Manley (pers. comm. 1984) substantiate this. Mealey et al. (1976) graphically showed that the distribution of important grizzly bear habitat components decreased from north to south. Martinka (1971) stated that: "...the habitat within the Park is more suitable for the grizzly than it is adjacent to the Park, where we find extensive coniferous forests. This appears to be much more suitable habitat for the black bear and the number of grizzlies on those areas is less". No additional information is available to change previous 1986 density estimates (Bruce Campbell, MDFWP, pers. comm. 1991).

Density Unit No. 4. Glacier National Park:

Location: Glacier National Park, Northwestern Montana. Habitat Unit Region 2.

Past Density Estimates: Martinka's (1974) estimate of $1/8 \text{ mi}^2$ for a 390 mi^2 area within the park extrapolated to the entire Park.

1986-Dept. FWP Estimate: $1/8\text{-}1/6 \text{ mi}^2$ (198-264 bears)

1991-Dept. FWP Estimate: $1/8\text{-}1/6 \text{ mi}^2$ (198-264 bears)

Unit Size: 1583 mi^2

Discussion: The Department used Martinka's (1974) estimate of 1 grizzly per 8 mi^2 for the entire Park. Martinka's (1974) study area was selected to proportionately represent the habitats and physiographic features of the entire park. However, the Department did not feel it appropriate to extrapolate this figure directly to any other place in Montana. This estimate is reasonable for an un hunted population in apparently superior habitat and is consistent with other similar areas (Mundy and Flook 1973, Dean 1976, McLellan 1984). Glacier National Park is an un hunted population where human impacts are strictly controlled. No additional information is available to change previous 1986 density estimates (Kate Kendall, NPS, pers. comm. 1991). Density information from the N. Fork of the Flathead in British Columbia indicates high densities are possible and it may be that the current density estimates for this unit are overly conservative.

Density Unit No. 5. St. Mary:

Location: Western edge of the Blackfeet Indian Reservation, next to Glacier National Park. Habitat Regions 3 and 4.

Past Density estimate: None for this unit.

1986-Dept. FWP density estimate: $1/20\text{-}1/10 \text{ mi}^2$ (11-21 bears)

1991-Dept. FWP density estimate: $1/20\text{-}1/10 \text{ mi}^2$ (11-21 bears)

Unit size: 211 mi^2

Discussion: Current research confirms that the Blackfoot Indian Reservation is primarily seasonal grizzly bear habitat. Most of the bears that occupy the Reservation during their active season den in Glacier National Park. Most grizzly bears captured on the Reservation stayed in lower elevations during spring but spent from 25% to 100% of the summer and fall seasons in higher elevations of the Park. Population density data are still being gathered for analysis, but capture and sighting data suggest that current estimates of 1/20-1/10 mi² are probably accurate. Grizzly bear density varies depending on season but considering the amount of time bears spend in the Park vs. the Reservation, 1/20 mi² is probably the more appropriate estimate.

Density Unit No. 6. Badger-Two Medicine:

Location: Eastern front of Rocky Mountains. Unit includes Badger and Two Medicine Creeks on the Blackfoot Indian Reservation. Habitat Regions 3 and 4.

Past Density Estimates: None. Closest estimates are Martinka (1974), Aune et al. (1984), and Aune's reevaluation of his 1984 data discussed earlier (Aune and Kasworm 1989).

1986-Dept. FWP Estimate: 1/20-1/16 mi² (16-20 bears)

1991-Dept. FWP Estimate: 1/38-1/27 mi² (9-12 bears)

Unit site: 323 mi².

Discussion: Current low density estimate is based upon the average density of marked bears and attendant young within a modified composite polygon for three years of study (Aune and Kasworm, 1989). The composite polygon was generated with data from 4-6 marked bears radio monitored from 1984-1986. The high density estimate is derived by adding the marked bears and observed unmarked bears and assuming all unmarked bears occupy home ranges within the composite polygon derived for marked bears. The low density estimate is a very conservative estimate of bear density for this area since the study duration and intensity were limited. In addition, current bear management efforts in the Blackfoot Reservation have undoubtedly enhanced bear survival in this area.

Density Unit No. 7. South Fork:

Location: From Hungry Horse Reservoir south to Big Salmon Lake. Swan Mountain Crest east to the Continental Divide. Unit includes portion of the Bob Marshall and Great Bear wilderness areas. Habitat Region 2.

Past Density Estimates: Mace and Jonkel's (1980) density estimate of 1/10 mi² for a 128 mi² study area.

1986-Dept. FWP Estimate: 1/15-1/10 mi² (108-162 bears)
1991-Dept. FWP Estimate: 1/13-1/10 mi² (125-162 bears)
Unit Size: 1624 mi²

Discussion: Population estimates for the western side of Hungry Horse Reservoir were obtained in 1989 and 1990 using data derived from an intensive capture/recapture and telemetry study. Grizzly bear densities were derived by determining the percent of aerial telemetry locations within a 321 mi² study area for all age and gender classes. Percent use of each observed or photographed bear within the study area was summed (Mace and Manley 1990) using specific criteria described in "South Fork Grizzly Project Draft Population Update - January 1990" (FWP Region 1). In 1989, 24 marked bears (plus attendant young) were radio-monitored and 11-17 unmarked bears were detected on film. Percent use of the study area revealed 24.20 grizzly bears of all age/sex classes were present within this study area. In 1990, 28 marked (plus attendant young) and 7-10 unmarked bears were identified; 24.38 bears met the criteria. Using this information, a density estimate of a grizzly/13 mi² was derived each year.

Mace and Jonkel's (1980) estimate was based on 1 year's data in superior fall habitats; this may be considered a seasonal concentration area. They stated that their density should not be extrapolated to other areas (emphasis added). In 1986, a minimum density estimate for this area was recalculated using only tagged bears and their composite home range, yielding a density of 1/19 mi². We extended this density estimate into the Bob Marshall as far south as Big Salmon Lake. South of this, the habitat is drier and fewer bears are observed. As stated previously, this Unit includes both wilderness and non-wilderness acreage. Additionally, five grizzly bears were subtracted from the density estimate because habitat was lost when Hungry Horse Reservoir was inundated (Bissell and Yde 1985).

Density Unit No. 8: East Front:

Location: East of the Continental Divide from Birch Creek to Sun River. Includes part of Bob Marshall Wilderness and Sun River Game Preserve. Habitat Regions 3 and 4.

Past Density Estimates: Aune et al. (1984) gave a density range of 1/11.5 mi² in the spring to 22.2 mi² in the fall. Reevaluation of Aune's 1984 data (based on marked bears only) yielded a density of 1/22 mi².

1986-Dept. FWP Estimate: 1/18-1/12 mi² (62-93 bears)
1991-Dept. FWP Estimate: 1/31-1/25 mi² (36-45 bears)
Unit Size: 1,119 mi²

Discussion: Current low density estimate is based upon the density of marked bears and attendant young within a modified composite polygon for five years of study (Aune and

Kasworm, 1989). The composite polygon was generated with data from 12-26 marked bears radio monitored from 1981-1985. The high density estimate is derived by adding the marked bears and observed unmarked bears and assuming all unmarked bears occupy home ranges within the composite polygon derived for marked bears. The low density estimate is a very conservative estimate of bear density for this area because of the known and consistent observation of 7-14 additional bears each year within the unit. Most of the unmarked bears were observed repeatedly and clearly identified as residents within the unit. Little immigration into the unit was documented by telemetry studies while a substantial number of bears emigrated during the study.

Density Unit No. 9. Swan Front:

Location: This Unit extends from the northern end of Hungry Horse Reservoir through the Swan River Valley to approximately Beaver Creek. Habitat Region 2.

Past Density Estimate: None for this unit.

1986-Dept. FWP Estimate: $1/30$ - $1/20$ mi^2 (26-39 grizzlies)

1991-Dept. FWP Estimate: $1/30$ - $1/20$ mi^2 (26-39 grizzlies)

Unit Size: 780 mi^2

Discussion: Telemetry data from the Mission core and from the South Fork Unit show that bears in these two units do not use the valley to any great degree. None of 12 bears monitored in the South Fork used the Swan Valley (Mace and Jonkel 1980). Thus the estimate of $1/30$ for this area represents the number of bears living year-round (except denning). Although the riparian zone of the Swan River is excellent habitat, the level of human encroachment is substantial (78% growth in last decade, Lake County Land Services Department 1985). This unit is also adjacent to the higher density areas of the South Fork and Glacier National Park. Considering the above information and the pooled expertise of bear professionals and wildlife managers in the area we felt it was appropriate to apply a density of $1/30$ mi^2 for this unit.

No additional information is available to change previous 1986 density estimates (Shawn Riley, MDFWP, pers. comm. 1991).

Density Unit No. 10. Mission Mountains:

Location: This unit includes the Mission Mountains from the southern edge of the management area north between the Mission and Swan Valleys to Bigfork. Habitat Region 1.

Past Density Estimate: $1/19$ mi^2 (Servheen 1981) based on tagged and untagged observations in a core study area.

1986 - Dept. FWP Estimate: $1/45-1/25 \text{ mi}^2$ (23-42 grizzlies).
1991 - Dept. FWP Estimate: $1/45-1/25 \text{ mi}^2$ (23-42 grizzlies).
Unit Size: 1044 mi^2

Discussion: Servheen's (1981) estimate of $1/19 \text{ mi}^2$ for parts of the Mission Mountains was re-evaluated. To be consistent with other research density estimation procedures, a composite home range was developed from Servheen (1981). Using only marked grizzly bears within the composite range, the Department developed a minimum estimate of $1/56 \text{ mi}^2$. The Department recognizes that there are high and low density areas within this unit. There are recent sightings in the Rattlesnake Wilderness, and there is at least some movement from the northern Mission Mountains. An instrumented female with 1 yearling was known to den in the Rattlesnake (Servheen 1981). The Rattlesnake Wilderness is considered sparsely populated at present. Servheen (1981) reported a density of $1/80 \text{ mi}^2$ for the Rattlesnake area.

Servheen (1981) estimated the current grizzly population in the Mission Mountains at 25. The northern part of the Mission Mountains is felt to have a lower density than the core of the Missions. Servheen (1981) reported a density of $1/32 \text{ mi}^2$ from Lost Creek north. R. Klaver (pers. comm.) reports that black bear problems in cherry orchards are frequent, but grizzly bear problems are infrequent.

Based on comments received, professional consultations, and a reevaluation of Servheen's (1981) dissertation, the Department combined several units, and developed an estimate of 1 bear/45 mi^2 .

No new information is available to change the 1986 density estimate. However, decreased observations and complaints in the last 5 years indicate that the lower estimates are a more accurate indication of the density in this area (Dale Becker, pers. comm. 1991).

Density Unit No. 11. Scapegoat:

Location: Scapegoat Wilderness and southern portion of Bob Marshall Wilderness Area. Habitat Regions 3, 4, and 5.

Past Density Estimates: Data collected for 1984 (with a minimum of effort) by Aune (pers. comm.) documented 26-28 bears, distinct from his core area, on an area encompassing portions of the Sun River Game Preserve and the Scapegoat unit. This area is 672 mi^2 yielding a density of $1/26-1/28 \text{ mi}^2$.

1986-Dept. FWP Estimate: $1/30-1/18 \text{ mi}^2$ (63-106 bears)
1991-Dept. FWP Estimate: $1/112-1/56 \text{ mi}^2$ (17-34 bears)
Unit Size: $1,903 \text{ mi}^2$.

Discussion: The current low density estimate is based upon the density of marked bears and attendant young within a modified composite polygon for two years of study (Aune and Kasworm, 1989). The composite polygon was generated with data from 6-8 marked bears radio monitored from 1985-1986. The high density estimate is derived by adding the marked bears and observed unmarked bears and assuming all unmarked bears occupy home ranges within the composite polygon derived for marked bears. Consistent sightings of 12-15 bears in this unit suggests that the percent of marked bears in this unit was low. The low density estimate is extremely conservative in this unit because of the low proportion of marked bears and limited duration of intense study in this unit. The actual bear density of this unit is probably nearer the high density estimate for this unit (Keith Aune, pers. comm.).

Title 50 - Code of Federal Regulations

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS**Subpart A—Introduction and General Provisions**

- Sec.
17.1 Purpose of regulations.
17.2 Scope of regulations.
17.3 Definitions.
17.4 Pre-Act wildlife.
17.5 Alaska natives.
17.6 State cooperative agreements. [Reserved]
17.7 [Deleted]

Subpart B—Lists

- 17.11 Endangered and threatened wildlife.
17.12 Endangered and threatened plants
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Subpart C—Endangered Wildlife

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Subpart D—Threatened Wildlife

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17.32 Permits—general.
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17.34-17.39 Permits. [Reserved]
17.40 Special rules—inammals.
17.41 Special rules—birds.
17.42 Special rules—reptiles.
17.43 Special rules—amphibians. [Reserved]
17.44 Special rules—fishes.
17.45 Special rules—snails and clams [Reserved]
17.46 Special rules—crustaceans [Reserved]
17.47 Special rules—insects.
17.48 Special rules—common sponges and other forms. [Reserved]

Subpart E—Similarity of Appearance

- 17.50 General.
17.51 Treatment as endangered or threatened.
17.52 Permits—similarity of appearance

Subpart F—Endangered Plants

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17.64-17.69 [Reserved]

Subpart G—Threatened Plants

- 17.71 Prohibitions.
17.72 Permits—general.
17.73-17.78 [Reserved]

Subpart H—[Reserved]**Subpart I—Interagency Cooperation**

(Not Included)

Subpart J—Manatee Protection Areas

- 17.100 Purpose.
17.101 Scope.
17.102 Definitions.
17.103 Establishment of protection areas.
17.104 Prohibitions.
17.105 Permits and exceptions.
17.106 Emergency establishment of protection areas.
17.107 Facilitating enforcement.
17.108 List of designated manatee protection areas [Reserved].

Authority: Marine Mammal Protection Act of 1972, 86 Stat. 1027, as amended, §§ 101(a), 102(a)(2), 104, 105, 112(a) [16 U.S.C. §§ 1371(a), 1372(a)(2), 1374, 1375, and 1382(a)]; Endangered Species Act of 1973, 87 Stat. 884, as amended, §§ 4(d) and (f), 9(a)(1)(C), and 11(a)(1) [16 U.S.C. §§ 1533(d) and (f), 1536(a)(1)(C), and 1540(a)(1)].

Subpart A—Introduction and General Provisions**§ 17.1 Purpose of regulations.**

(a) The regulations in this part implement the Endangered Species Act of 1973, 87 Stat. 884, 16 U.S.C. 1531-1543, except for those provisions in the Act concerning the Convention on International Trade in Endangered Species of Wild Fauna and Flora, for which regulations are provided in Part 23 of this subchapter.

(b) The regulations identify those species of wildlife and plants determined by the Director to be endangered or threatened with extinction under section 4(a) of the Act and also carry over the species and subspecies of wildlife designated as endangered under the Endangered Species Conservation Act of 1969 (83 Stat. 275, 16 U.S.C. 688cc-1 to 6) which are deemed endangered species under section 4(c)(3) of the Act.

140 FR 44415, Sept. 26, 1975, as amended at 42 FR 10465, Feb. 22, 1977

§ 17.2 Scope of regulations.

(a) The regulations of this part apply only to endangered and threatened wildlife and plants.

(b) By agreement between the Service and the National Marine Fisheries Service, the jurisdiction of the Department of Commerce has been specifically defined to include certain species, while jurisdiction is shared in regard

to certain other species. Such species are footnoted in Subpart B of this part, and reference is given to special rules of the National Marine Fisheries Service for those species.

(c) The provisions in this part are in addition to, and are not in lieu of, other regulations of this Subchapter B which may require a permit or prescribe additional restrictions or conditions for the importation, exportation, and interstate transportation of wildlife.

(d) The examples used in this part are provided solely for the convenience of the public, and to explain the intent and meaning of the regulation to which they refer. They have no legal significance.

(e) Certain of the wildlife and plants listed in § 17.11 and § 17.12 as endangered or threatened are included in Appendix I, II or III to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The importation, exportation and reexportation of such species are subject to additional regulations provided in Part 23 of this subchapter.

140 FR 44415, Sept. 26, 1975, as amended at 42 FR 10465, Feb. 22, 1977

§ 17.3 Definitions.

In addition to the definitions contained in Part 16 of this subchapter and unless the context otherwise requires, in this Part 17:

"Act" means the Endangered Species Act of 1973 (16 U.S.C. 1531-1543, 87 Stat. 884);

"Alaskan Native" means a person defined in the Alaska Native Claims Settlement Act [43 U.S.C. section 1603(b) (85 Stat. 588)] as a citizen of the United States who is of one-fourth degree or more Alaska Indian (including Tsimshian Indians enrolled or not enrolled in the Metlakatla Indian Community), Eskimo, or Aleut blood, or combination thereof. The term includes any Native, as so defined, either or both of whose adoptive parents are not Natives. It also includes, in the absence of proof of a minimum blood quantum, any citizen of the United States who is regarded as an Alaska Native by the Native village or town of which he claims to be a member and whose father or mother is (or, if deceased, was) regarded as Native by any Native village or Native town. Any citizen enrolled by the Secretary pursuant to section 5 of the Alaska Native

why the applicant is justified in obtaining the permit, including:

(I) The details of the activities sought to be authorized by the permit;

(II) The details of how such activities will be carried out;

(III) The relationship of such activities to scientific objectives or to objectives enhancing the propagation or survival of the wildlife sought to be covered by the permit; and

(IV) The planned disposition of such wildlife upon termination of the activities sought to be authorized.

(b) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a) of this section, the Director will decide whether or not a permit should be issued. In making his decision, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(1) Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(2) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(3) Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed;

(4) Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit;

(5) The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application; and

(6) Whether the expertise, facilities or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application.

(c) *Permit conditions.* In addition to the general conditions set forth in Part 13 of this subchapter, every permit issued under this section shall be subject to the following special conditions:

(1) In addition to any reporting requirements contained in the permit itself, the permittee shall also submit to the Director a written report of his activities pursuant to the permit. Such report must be postmarked or actually delivered no later than 10 days after completion of the activity.

(2) The death or escape of all living wildlife covered by the permit shall be immediately reported to the Service's office designated on the permit.

(3) The carcass of any dead wildlife covered by the permit shall be stored in a manner which will preserve its use as a scientific specimen.

(d) *Duration of permits.* The duration of permits issued under this section shall be designated on the face of the permit.

140 FR 44415, Sept. 26, 1975, as amended at 41 FR 19226, May 11, 1976)

§ 17.33 [Deleted]

§§ 17.34-17.39 Permits. [Reserved]

§ 17.40 Special rules—mammals.

(a) *Kangaroo; Eastern Gray (Macropus giganteus), Red (Megalia rufa), and Western Gray (Macropus fuliginosus)*—(1) *Prohibitions.* The following prohibitions apply to the Eastern Gray, Red and Western Gray kangaroos:

(i) *Import.* (A) Except as permitted in paragraph (a)(1)(i)(B) of this section, or in paragraph (a)(2) of this section, it shall be unlawful to import any such wildlife for commercial purposes.

(B) Upon receiving from the Australian Government a certificate that (1) a particular Australian State has developed an effective sustained-yield program for such wildlife, and (2) the taking of such wildlife in that State will not be detrimental to the survival of the species or subspecies of which such wildlife is a part, the Director may, consistent with the purposes of the act, permit by publication of a notice in the FEDERAL REGISTER the commercial importation of any such wildlife originating from that State, upon proof that such wildlife is lawfully taken and exported from that State; Provided, That if the Director determines from all the evidence that a previously certified Australian State no longer maintains an effective sustained yield program for such wildlife, he may by regulation prohibit any fur-

ther commercial importation of such wildlife from that State.

(ii) *Unlawfully imported kangaroos.* It shall be unlawful, in the course of a commercial activity, to deliver, receive, carry, transport, or ship in interstate or foreign commerce any such wildlife imported unlawfully.

(iii) *Commercial transactions.* It shall be unlawful to sell or offer for sale in interstate or foreign commerce any such wildlife imported unlawfully.

(2) *Permits.* The following permits are available for the Eastern Gray, Red and Western Gray kangaroos:

(i) *Economic hardship.* (A) The Director may grant permits for the importation of such wildlife to prevent economic hardship. The provisions of § 17.23 (with the exception of §§ 17.23(b)(4), 17.23(b)(8), and 17.23(d)), shall apply to the issuance of such permits. In addition, the requirements of section 10(b) of the Endangered Species Act of 1973 (16 U.S.C. 1539(b)) regarding hardship exemptions for endangered species shall apply to applications for hardship exemptions under this section as if such wildlife were classified "endangered;" and the applicant for an exemption under this section must submit all information required by section 10(b).

(B) The duration of any economic hardship permit issued for such wildlife under this provision will be limited by section 10(b) of the Endangered Species Act of 1973 as if those species were listed as "endangered" under the act.

(b) *Grizzly bear (Ursus arctos horribilis)*—(1) *Prohibitions.* The following prohibitions apply to the grizzly bear

(i) *Taking.* (A) Except as provided in paragraphs (b)(1)(i) (B) through (F), of this section no person shall take any grizzly bear in the 48 conterminous states of the United States.

(B) Grizzly bears may be taken in self-defense, or in defense of others, but any such taking shall be reported in writing to the United States Fish and Wildlife Service, Division of Law Enforcement, P.O. Box 19183, Washington, D.C. 20036, and to appropriate State officials, within 5 days after it occurs.

(C) *Removal of nuisance bears.* A grizzly bear constituting a demonstrable but non-immediate threat to human safety, or committing significant depredations to lawfully present livestock, may be taken, but only if:

(1) It has not been reasonably possible to eliminate such threat or depredation by live-capturing and releasing unharmed in a remote area the grizzly bear involved; and

(2) the taking is done in a humane manner by authorized Federal or State employees; and

(3) the taking is reported in writing to the United States Fish and Wildlife Service, Division of Law Enforcement, P.O. Box 19183, Washington, D.C. 20036, and to appropriate State officials, within 5 days after it occurs.

(D) *Federal or State scientific or research activities.* Authorized Federal or State employees may pursue, capture, or collect grizzly bears for scientific or research purposes.

(E) *Northwestern Montana.* If it is not contrary to the laws and regulations of the State of Montana, a person may hunt grizzly bears in the Flathead National Forest, the Bob Marshall Wilderness Area, and the Mission Mountains Primitive Area of Montana: *Provided*, That if in any year in question, 25 grizzly bears have already been killed for whatever reason in that part of Montana, including the Flathead National Forest, the Bob Marshall Wilderness Area and the Mission Mountains Primitive Area, which is bounded on the north by the United States-Canadian Border, on the east by U.S. Highway 91, on the south by U.S. Highway 12, and on the west by Montana-Idaho State line, the Director shall post and publish a notice prohibiting such hunting, and any such hunting for the remainder of that year shall be unlawful: *Provided further*, That any taking of a grizzly bear, for whatever reason, in the above-described portion of Montana shall be reported in writing to the United States Fish and Wildlife Service, Division of Law Enforcement, P.O. Box 19183, Washington, D.C. 20036, and to the Montana Department of Fish and Game, within 5 days after the taking occurs; and except that any taking on an Indian reservation within the above-described area shall be so reported only to the United States Fish and Wildlife Service, Division of Law Enforcement, P.O. Box 19183, Washington, D.C. 20036.

(F) *National Parks.* The regulations of the National Park Service shall govern all taking of grizzly bears in National Parks.

(ii) *Unlawfully taken grizzly bears.*
(A) Except as provided in paragraph

(b)(1)(ii)(B) of this section, no person shall possess, deliver, carry, transport, ship, export, or sell grizzly bear taken unlawfully.

(B) Authorized Federal or State employees may for scientific or research purposes possess, deliver, carry, transport, ship, or export unlawfully taken grizzly bears.

(iii) *Import or export.* (A) Except as provided in this paragraph (b)(1)(iii)(A), below, no person shall import any grizzly bear into the United States.

(1) *Federal or State scientific or research activities.* Authorized Federal or State employees may import grizzly bears into the United States for scientific or research purposes.

(2) *Public zoological institutions.* Public zoological institutions (see 50 CFR 10.12) may import grizzly bears into the United States.

(B) Except for public zoological institutions (see 50 CFR 10.12), no person shall, in the course of a commercial activity, export any grizzly bear from the United States.

(iv) *Commercial transactions.* (A) Except for public zoological institutions (see 50 CFR 10.12), no person shall, in the course of a commercial activity, deliver, receive, carry, transport, or ship in interstate or foreign commerce any grizzly bear.

(B) Except for public zoological institutions (see 50 CFR 10.12) dealing with other public zoological institutions, no person shall sell or offer for sale in interstate or foreign commerce any grizzly bear.

(v) *Other violations.* No person shall attempt to commit, cause to be committed, or solicit another to commit any act prohibited by this paragraph (a)(1) of this section.

(2) *Definitions.* As used in paragraph (b) of this section the term "grizzly bear" means any member of the species, *Ursus arctos horribilis* of the 48 conterminous states of the United States, including any part, offspring, dead body, part of a dead body, or product of such species.

(c) *Primates.* (1) Except as noted in paragraph (c)(2) of this section, all provisions of § 17.31 shall apply to the Lesser slow loris, *Nycticebus pygmaeus*; Philippine tarsier, *Tarsius syrichta*; White-footed tamarin, *Saguinus leucopus*; Black howler monkey, *Alouatta pigra*; Stumptail macaque, *Macaca arctoides*; Gelada, *Theropithecus gelada*; Formosan rock macaque,

Macaca cyclops; Japanese macaque, *Macaca fuscata*; Toque macaque, *Macaca sinica*; Long-tailed langur, *Presbytis polenzani*; Purple-faced langur, *Presbytis senex*; Tonkin snub-nosed monkey, *Rhinopithecus avunculus*; Pigmy chimpanzee, *Pan paniscus*; and Chimpanzee, *Pan troglodytes*.

(2) The prohibitions referred to above do not apply to any live member of such species held in captivity in the United States on the effective date of the final rulemaking, or to the progeny of such animals, or to the progeny of animals legally imported into the United States after the effective date of the final rulemaking. *Provided*, That the person wishing to engage in any activity which would otherwise be prohibited must be able to show satisfactory documentary or other evidence as to the captive status of the particular member of the species on the effective date of this rulemaking or that the particular member of the species was born in captivity in the United States after the effective date of this rulemaking. Identification of the particular member to a record in the International Species Inventory System (ISIS), or to a Federal, State or local government permit, shall be deemed to be satisfactory evidence. Records in the form of studbooks or inventories kept in the normal course of business, shall be acceptable as evidence, provided that a notarized statement is inserted in such record to the effect that:

(i) The records were kept in the normal course of business prior to November 18, 1976, and accurately identify (by use of markers, tags, or other acceptable marking devices) individual animals; or

(ii) That the individual animal identified by the records was born in captivity on ———(Date).

The notarized statement in paragraph (c)(2)(i) of this section, shall be acceptable only if the notarization is dated on or before January 3, 1977. The notarized statement in (c)(2)(ii), of this section, shall be acceptable only if the notarization is dated within 15 days of the date of birth of the animal.

(d) Gray wolf (*Canis lupus*) in Minnesota—(1) *Zones.* For purposes of these regulations, the State of Minnesota is divided into the following five zones.

State Law 87-2-702 - Restrictions on Special Licenses

the rules of the commission, and at such places as may be designated in the license.

(2) Any person not a resident whose state of residence does not sell nonresident trapper's licenses to Montanans may not be issued a Class C-2 license under subsection (1).

History: En. Sec. 2, Ch. 256, L. 1979; amd. Sec. 3, Ch. 329, L. 1985.

87-2-604. Permission of landowner required. Every holder of a Class C-2 trapper's license shall obtain written permission from the landowner, leasee, or his agent before trapping or snaring predatory animals or nongame wildlife on private property.

History: En. Sec. 3, Ch. 255, L. 1978.

87-2-605. Class C-3—youth trapping license. Except as otherwise provided in this chapter, a resident, as defined in 87-2-102, who is 6 years of age or older and less than 13 years of age, upon making application and payment of a fee of \$3 to the department, may receive a Class C-3 license, which authorizes the holder to trap fur-bearing animals, the trapping of which has not been restricted by the commission, within the state of Montana at such times and in such manner as may be lawful under the laws of the state and the regulations of the department, and at such places as may be designated in the license.

History: En. Sec. 1, Ch. 329, L. 1985.

Part 7

Special and Combination Licenses and Nongame Certificate

87-2-701. (Temporary) Special licenses. (1) Any applicant who will be 12 years of age or older prior to September 15 of the season for which the license is issued and is the holder of a resident wildlife conservation license or a nonresident wildlife conservation license may apply for a special license which, in the judgment of the department, is to be issued and shall pay the following fees therefor:

- (a) moose—resident, \$50; nonresident, \$320;
- (b) mountain goat—resident, \$50; nonresident, \$320;
- (c) mountain sheep—resident, \$50; nonresident, \$320;
- (d) antelope—resident, \$6; nonresident, \$120;
- (e) grizzly bear—resident, \$50; nonresident, \$300;
- (f) black or brown bear—nonresident, \$120.

(2) In the event a holder of a valid special grizzly bear license kills a grizzly bear, he shall purchase a trophy license for a fee of \$25 within 10 days after date of kill. The trophy license authorizes the holder to possess and transport the trophy.

(3) Special licenses must be issued in a manner prescribed by the department.

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87-2-701. (Effective March 1, 1992) Special licenses. (1) Any applicant who will be 12 years of age or older prior to September 15 of the season for which the license is issued and is the holder of a resident wildlife conservation license or a nonresident wildlife conservation license may apply for a special license which, in the judgment of the department, is to be issued and shall pay the following fees therefor:

(a) moose—resident, \$60 beginning March 1, 1992, and \$75 beginning March 1, 1994; nonresident, \$450 beginning March 1, 1992, and \$475 beginning March 1, 1994;

(b) mountain goat—resident, \$60 beginning March 1, 1992, and \$75 beginning March 1, 1994; nonresident, \$450 beginning March 1, 1992, and \$475 beginning March 1, 1994;

(c) mountain sheep—resident, \$60 beginning March 1, 1992, and \$75 beginning March 1, 1994; nonresident, \$450 beginning March 1, 1992, and \$475 beginning March 1, 1994;

(d) antelope—resident, \$9 beginning March 1, 1992, and \$11 beginning March 1, 1994; nonresident, \$145 beginning March 1, 1992, and \$150 beginning March 1, 1994;

(e) grizzly bear—resident, \$50; nonresident, \$300;

(f) black or brown bear—nonresident, \$120.

(2) In the event a holder of a valid special grizzly bear license kills a grizzly bear, he shall purchase a trophy license for a fee of \$25 within 10 days after date of kill. The trophy license authorizes the holder to possess and transport the trophy.

(3) Special licenses must be issued in a manner prescribed by the department. (Terminates March 1, 1996—sec. 3, Ch. 319, L. 1991.)

87-2-701. (Effective March 1, 1996) Special licenses. (1) Any applicant who will be 12 years of age or older prior to September 15 of the season for which the license is issued and is the holder of a resident wildlife conservation license or a nonresident wildlife conservation license may apply for a special license which, in the judgment of the department, is to be issued and shall pay the following fees therefor:

- (a) moose—resident, \$75; nonresident, \$455;
- (b) mountain goat—resident, \$75; nonresident, \$455;
- (c) mountain sheep—resident, \$75; nonresident, \$455;
- (d) antelope—resident, \$11; nonresident, \$130;
- (e) grizzly bear—resident, \$50; nonresident, \$300;
- (f) black or brown bear—nonresident, \$100.

(2) In the event a holder of a valid special grizzly bear license kills a grizzly bear, he shall purchase a trophy license for a fee of \$25 within 10 days after date of kill. The trophy license authorizes the holder to possess and transport the trophy.

(3) Special licenses must be issued in a manner prescribed by the department.

History: En. Sec. 1, Ch. 287, L. 1965; amd. Sec. 1, Ch. 16, L. 1967; amd. Sec. 1, Ch. 100, L. 1967; amd. Sec. 2, Ch. 39, L. 1969; amd. Sec. 1, Ch. 36, L. 1969; amd. Sec. 1, Ch. 66, L. 1969; amd. Sec. 1, Ch. 148, L. 1969; amd. Sec. 1, Ch. 9, L. 1969; amd. Sec. 1, Ch. 241, L. 1969; amd. Sec. 1, Ch. 316, L. 1967; amd. Sec. 1, Ch. 84, L. 1969; amd. Sec. 1, Ch. 129, L. 1971; amd. Sec. 1, Ch. 110, L. 1973; amd. Sec. 1, Ch. 139, L. 1973; amd. Sec. 2, Ch. 167, L.

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1973; amd. Sec. 1, Ch. 261, L. 1973; amd. Sec. 1, Ch. 408, L. 1973; amd. Sec. 1, Ch. 49, L. 1975; amd. Sec. 1, Ch. 91, L. 1975; amd. Sec. 1, Ch. 289, L. 1975; amd. Sec. 1, Ch. 417, L. 1975; amd. Sec. 1, Ch. 546, L. 1975; amd. Sec. 1, Ch. 169, L. 1977; amd. Sec. 2, Ch. 235, L. 1977; amd. Sec. 13, Ch. 417, L. 1977; R.C.M. 1947, 26-202.1(13); amd. Sec. 1, Ch. 100, L. 1979; amd. Sec. 14, Ch. 478, L. 1979; amd. Sec. 10, Ch. 554, L. 1981; amd. Sec. 8, Ch. 680, L. 1983; amd. Sec. 2, Ch. 568, L. 1985; amd. Sec. 7, Ch. 598, L. 1987; amd. Sec. 1, Ch. 401, L. 1991; amd. Sec. 13, Ch. 592, L. 1991.

Compiler's Comments

1991 Amendments: Chapter 401 deleted (1)(g) establishing wild buffalo license with resident fee of \$200 and nonresidential fee of \$1,000; and made minor changes in style. Amendment effective April 9, 1991.

(Version effective March 1, 1992) Chapter 592 in (1)(a) increased resident moose license fee from \$50 to \$60 beginning March 1, 1992, and to \$75 beginning March 1, 1994, and nonresident fee from \$320 to \$450 beginning March 1, 1992, and to \$475 beginning March 1, 1994; in (1)(b) increased resident mountain goat license fee from \$50 to \$60 beginning March 1, 1992, and to \$75 beginning March 1, 1994, and nonresident fee from \$320 to \$450 beginning March 1, 1992, and to \$475 beginning March 1, 1994; in (1)(c) increased resident mountain sheep license fee from \$50 to \$60 beginning March 1, 1992, and to \$75 beginning March 1, 1994, and nonresident fee from \$320 to \$450 beginning March 1, 1992, and to \$475 beginning March 1, 1994; and in (1)(d) in-

creased resident antelope license fee from \$6 to \$9 beginning March 1, 1992, and to \$11 beginning March 1, 1994, and nonresident fee from \$120 to \$145 beginning March 1, 1992, and to \$150 beginning March 1, 1994.

(Version effective March 1, 1996) Chapter 592 in (1)(a) increased resident moose license fee from \$50 to \$75 and nonresident fee from \$300 to \$455; in (1)(b) increased resident mountain goat license fee from \$50 to \$75 and nonresident fee from \$300 to \$455; in (1)(c) increased resident mountain sheep license fee from \$50 to \$75 and nonresident fee from \$300 to \$455; and in (1)(d) increased resident antelope license fee from \$6 to \$11 and nonresident fee from \$100 to \$130. Amendments effective March 1, 1992.

Extension of Termination Date: Section 3, Ch. 319, L. 1991, amended sec. 12, Ch. 598, L. 1987, to provide that the wildlife habitat acquisition program terminates March 1, 1996. Amendment effective April 2, 1991.

87-2-702. Restrictions on special licenses. (1) A person who has killed or taken any game animal, except a deer or an antelope, during the current license year is not permitted to receive a special license under this chapter to hunt or kill a second game animal of the same species.

(2) The commission may require applicants for special permits authorized by this chapter to obtain a valid big game license for that species for the current year prior to applying for a special permit.

(3) After March 27, 1987, a person may, during his lifetime, lawfully take only one grizzly bear in Montana with a license authorized by 87-2-701.

(4) A person who receives a moose, mountain goat, or limited mountain sheep license with the exception of an adult ewe license, as authorized by 87-2-701, is not eligible to receive another special license for that species for the next succeeding 7 years.

History: En. Sec. 2, Ch. 287, L. 1955; amd. Sec. 1, Ch. 65, L. 1963; amd. Sec. 1, Ch. 72, L. 1969; amd. Sec. 1, Ch. 48, L. 1971; amd. Sec. 3, Ch. 167, L. 1973; amd. Sec. 1, Ch. 195, L. 1973; amd. Sec. 28, Ch. 9, L. 1977; R.C.M. 1947, 26-202.2(1), (2); amd. Sec. 15, Ch. 478, L. 1979; amd. Sec. 11, Ch. 554, L. 1981; amd. Sec. 1, Ch. 241, L. 1987; amd. Sec. 3, Ch. 431, L. 1989; amd. Sec. 1, Ch. 57, L. 1991.

Compiler's Comments

1991 Amendment: Inserted (4) prohibiting a person who receives a certain special license from eligibility for receiving another license for

that species for 7 years. Amendment effective February 27, 1991.

87-2-703. Repealed. Sec. 16(1), Ch. 554, L. 1981.

History: En. Sec. 1, Ch. 287, L. 1955; amd. Sec. 1, Ch. 16, L. 1957; amd. Sec. 1, Ch. 100, L. 1957; amd. Sec. 2, Ch. 36, L. 1959; amd. Sec. 1, Ch. 36, L. 1963; amd. Sec. 1, Ch. 55, L.

APPENDIX H₁

Montana Department of Fish, Wildlife and Parks

SPRING GRIZZLY BEAR HUNTING SEASON JUSTIFICATION Office Memorandum

Date: 12/7/90

To: Graham Taylor

From: Michael Madel, John McCarthy, Gary Olson

Subject: Region Four 1991 grizzly bear hunting season recommendation.

Provided is the justification and supporting information for the addition of a limited entry spring grizzly bear hunting season within the boundaries of the Region Four Rocky Mountain East Front Bear Management Area.

Species Grizzly Bear, Ursus arctos Region Four Year 1991

Hunting District Rocky Mountain East Front Bear Management Area

1. Describe proposed season change and give summary of prior history.

1991 Season Proposed: The addition of an early spring grizzly bear season, beginning April 1 and running through the end of the first week of May (5/4/91). A limited entry hunt during the five week season with 50 permits would best provide for a recommended spring harvest level of 3 bears under the existing annual quota system. Furthermore, a spring season subquota of 2 females bears would protect the integrity of the RMEF BMA annual female subquota prior to the end of the year. The fall grizzly bear season would be maintained within the current season regulations with a beginning date of October 1, 1991.

1986 to 1990 Season History: The Northern Continental Divide Grizzly Bear Ecosystem (NCDE) is divided into 3 bear management areas of which the Rocky Mountain East Front Bear Management Area (RMEF BMA) is one. In 1986, the quota was set at a total of 14 grizzly bears with a subquota of 6 females taken by hunting or other human caused mortalities. All three BMAs are open to hunting October 1 for any grizzly bear license holder, and will continue until 48 hour notice in appropriate BMA if total mortality quota or female subquota are reached, but will close no later than the end of the general big game season.

2. Why is the proposed change necessary? What is the population and habitat objective and how does this change relate? Provide prior years of survey, harvest, or other related information that supports this change.

The objectives of the proposed season change are:

- a) Continue to manage for a viable, recovered grizzly bear population through an intensive management program and the use of restricted mortality quotas.
- b) To provide predictable hunter opportunity on an annual basis, while concentrating hunter effort in low effort in low elevation areas that experience grizzly-human conflicts.
- c) To minimize the possibility of female bears being taken in the harvest while increasing the potential for removing problem bears in the male and subadult classes.
- d) To maintain consistent hunting pressure on the RMEF grizzly population in order to retain a certain level of behavioral wariness towards people and property.

MDFWP goals for the NCDE are to manage for a recovered grizzly bear population, to maintain distribution in the management area, and to maintain the habitat in a condition suitable to sustain the population at an average density between 1 bear/30 mi sq to 1 bear/15 mi sq (excluding Glacier National Park) (Dood et al. 1986). Additionally, the proposed season would assist in meeting specific objectives established to remove the grizzly bear from its threatened status in the NCDE, which briefly are: to observe 12 adult female grizzly bear with cubs (10 FWC inside GNP) over a running ea year average, 20 of 23 BMUs occupied by females with young from a 3 year sum of observations, and known mortality outside GNP not to exceed 14 total or 6 females annually on a running 6 year average (USFWS 1990 draft).

The most current population estimates for the ecosystem vary from 440-680 bears (USFWS 1990 draft). Aune and Kasworm (1989) stated that trend data collected from the RMF core area (Deep Creek north to Birch Creek) indicated that a stable or slight increasing population existed during 1977-87. In addition, these data suggested that the population in the core area may have approached the carrying capacity of the habitat in which the bear is being allowed to exist. Grizzly bear densities varied geographically within the RMEF BMA. The estimated mean density of bears between the Badger-Two Medicine area (north Birch Creek drainage) and the core area was similar, but there was significant difference with the area south of the Sun River where the density was much lower (Aune and Kasworm 1989).

Under the constraints of the NCDE season structure, the annual grizzly bear hunting season over the past five years has become unpredictable in nature. Because of this and

season timing, hunter opportunity afield is unpredictable, hunter success has decreased (less than 2%), harvest rates have decreased, and the ratio of females in the harvest has increased (for 1986 to 1990); 38% males to 62% females compared with 1975-1985 of 63% males to 37% females). Season length has varied considerably for a minimum of six days in 1987 to 57 days in 1989 (Table 1). Annual harvest rates have declined from a mean 10.8 bears/year (1980-1985) to 2.6 bears/year (1986-1990). There has been expressed dissatisfaction by a significant proportion of bear hunters regarding the uncertainty of the grizzly season during this period. Specifically, the RMEF BMA average harvest rate has been 0.6 bear/year (86-90), with a mean 39 hunters afield/year and a success rate of 1.7 percent (1987-1990 for which data was available) (Fig. 1).

Although total problem grizzly bear situations (including human foods, carrion related, people-bear encounters, and depredations) have decreased since 1986 in the RMF area, livestock depredations have increased and the Department continues to respond to human-bear conflicts. Nuisance grizzly bears involved in recurring conflicts are predominately subadults and yearlings (79%). Aune and Kasworm (1989) found that of problem bears captured over a ten-year period on the RMF, 81% were males with subadults comprising 86%. Most problem bear situations occur prior to the beginning of the fall grizzly hunting season; consequently, bears captured on a second or third offense and considered poor candidates for the damage hunt must be removed from the population. Intensive control management actions are expensive and time consuming, and often oriented to lowland subadult bears that have become habituated to people, food conditioning, or preying on livestock.

An early spring hunting season would tend to concentrate hunting pressure on the male and subadult portion of the population using lower elevation habitat. More visible or less wary bears will have a higher probability of being harvested, and possibly a learned pattern of avoidance strengthened in other individuals. The indirect effects of hunting indicate that bears survive because of genetic selection and learned behavior in avoiding confrontation and withdrawing from human contact (Mysterud 1977, Sevheen 1981, Herrero 1985).

Hunting season dates influence sex ratio of bears in the harvest. Male bears are more vulnerable to harvest as affected by earlier emergence from dens and greater mobility (Nagy et al. 1983). Early fall and late spring seasons result in a higher percentage of females in the harvest (Dood et al, 1986, Troyer 1961). By adjusting season dates to coordinate with adult female grizzly denning chronology, the take of the most important sex-age class can be reduced. In the RMEF BMA, adult female median den emergence dates range from April 4 (with no cubs) to May 1 (with cubs) (Aune and Kasworm 1989). The average time interval between den emergence and movement away from the den was 10.1 days for females, giving median range of April 14 to May 11. Assuming that hunting pressure is relatively consistent over the season, a closing of the end of the first week of May should adequately protect adult female bears.

Table 1. Grizzly bear hunters and harvest rates for the RMEF¹ BMA and the NCDE², 1986-1990.

Year	RMEF Hunters	RMEF Harvest	NCDE Hunters	NCDE Harvest	Season Length
1985		0	306	6	30 days
1986		0	120	5	11 days
1987	28	1	188	3	6 days
1988	35	1	226	4	8 days
1989	55	0	114	0	57 days
1990		1	129	1	40 days

¹ Rocky Mountain Front Bear Management Area
² Northern Continental Divide Ecosystem

Figure 1. NCDE grizzly mortality, 1988-90.

The Waterton Bear Management Area of Alberta is ecologically similar to that of the RMF BMA with its eastern front of prairie and riparian habitat. The Alberta Fish and Wildlife Division operates a spring-only grizzly bear season from five to six weeks under a restricted permit system (Alberta F&W Div. 1989). Hunter success over an eight-year period in the Waterton unit averaged 6% with a 95% hunter participate rate (351 permits/21 bear harvest). During this same period, the mean sex ratio of the harvest was 85% males to 15% females (J. Gunson, pers. communication 1990). As it relates to harvest rates, Miller (1990) stated that under optimal conditions for reproduction, natural mortality, and with males twice as vulnerable as females, maximal sustainable hunting mortality was estimated as 5.7% of the total grizzly bear population. A harvest rate of 3-4% is a normally sustainable level of annual harvest as documented by several management agencies (LeFrance et al. 1987).

Based on this information, a spring harvest level of three bears in the RMEF BMA would be anticipated.. Oriented to the male segment, this harvest would be biologically sound and compatible with an average fall harvest rate of 0.6 bear. Total hunter harvest would then account for 3-4% of the minimum RMF grizzly bear subpopulation estimated by Dood et al. (1986). Assuming 100% hunter afield participation at 6% success rate allows for a total of 50 permits in the spring hunt to meet the three-bear harvest rate. Although the NCDE fall hunter success rate has been between 2-3% (1985-1990), spring bear hunting is generally more successful because of vulnerability of bears on low elevation habitat (Troyer 1961). Greater hunter participation can also be expected under a limited entry permit system compared with a general license hunt. A female subquota (two) is applied to the spring season, which upon being reached would close in 48 hours notification, will further assure that the annual RMF subquota (three) is not met prior to the end of the year.

3. Provide pertinent information related to any weather or habitat factors that have relevance to this change.

Due to the timing of the proposed spring season, all the MDFWP Wildlife Management Areas located along the RMF (Blackleaf, Ear Mountain, and Sun River WMAs) will be closed to bear hunting until May 15, and thus will generally provide geographically spaced islands of habitat security. Certain patterns of private land ownership containing spring grizzly bear habitat will preclude any bear hunting. This is particularly relevant in the area south of the Sun River where large tracts of private land are closed to bear hunting. This will likely distribute much of the early spring hunting effort, which occurs before vegetation greenup in the foothills on low elevation lands north of the Sun River to Birch Creek. A certain amount of hunting effort will occur on lower elevation U.S. Forest Service lands depending on seasonal weather variations.

4. Briefly describe the contacts you have made with individual landowners or sportsmen, public groups, or organizations regarding this proposal and highlight their comments.

The idea of a spring grizzly bear season on the RMEF has been discussed with many local landowners and interested bear hunters over the past three years. In general, there has been overall support for a more reliable spring season even though there may be fewer bears available to hunt at this time of the year. Following is a partial list of landowners, groups, and agencies contacted regarding the proposed season.

Mr. and Mrs. Jack Hayne, Dupuyer Legislative Representative
Mr. John Schuler, Dupuyer
Mr. and Mrs. Mark Taliaferro, Dupuyer
Mr. and Mrs. Bill Jones, Bynum
Mr. Earl Perkins, Bynum
Mr. Chip McGillis, Choteau
Mr. Roy Jacobs, Choteau
Mr. Stan Rasmussen, Choteau
Mr. and Mrs. John Cobb, Augusta Legislative Representative
Mr. Richard Jackson, Outfitter/Guide, East Glacier
Mr. and Mrs. Norm McDonough, Wolf Creek
The Nature Conservancy
Great Bear Foundation
U.S. Forest Service
U.S. Fish and Wildlife Service
U.S. Bureau of Land Management

Most landowner and sportsmen contacts supported the spring season as it is proposed. Agency and private groups listed above supported the concept of a limited entry spring season, but commented that the fall grizzly season would need to be reduced, started at a later date, or eliminated on the RMF in order to have beneficial results from a spring season and to further assure protecting females on an annual basis.

LITERATURE CITED

- Alberta Fish and Wildlife division. 1989. Grizzly bear management plan. Alberta Fish and Wildl. Div., Edmonton.
- Aune, F., and W. Kasworm. Final report East Front grizzly bear study. Montana Dept. of Fish, Wildl. and Parks. 332 pp.
- Dood, A., B. Brannon, and R. Mace. 1986. Final programmatic EIS: The grizzly bear in northwestern Montana. Montana Dept. Fish, Wildl. and Parks, Helena. 287 pp.
- Gunson, J. 1990. Personal communication. Edmonton, Alberta.
- Herrero, S. 1985. Bear attacks - their causes and avoidance. Nick Winchester Press, New Century Pub., Inc., Piscataway, NJ. 287 pp.
- LeFrance, M. N., Jr., M. B. Moss, K. A. Patnode, and W. C. Sugg, III, eds. 1987. Grizzly bear compendium. Interagency Grizzly Bear Comm., Bozeman, Montana. 540 pp.
- Mysterud, I. 1977. Problems in research management of the brown bear in Norway. *Viltrapport* 4:19-51.
- Nagy, J., R. Russell, A. Pearson, M. Kingsley, and C. Larsen. 1983. A study of grizzly bears on the Barren Grounds of Tuktoyaktuk Peninsula and Richards Island, Northwest Territories, 1974 to 1978. Canadian Wildlife Service. 135 pp.
- Reynolds, H. V. 1975. Big game investigations. Movements and population discreteness of North Slope grizzly bears. Fed. Aid Wildl. Rest. Project W-17-6, Final Report, 1973-1975. Alaska Dept. of Fish and Game, Juneau. 21 pp.
- Servheen, C. 1981. Grizzly bear ecology and management in the Mission Mountains, Montana. Ph.D. Diss., University of Montana, Missoula. 139 pp.
- Tompa, F. S. 1984. Grizzly bears in British Columbia - Harvest must be reduced. Annual Conference West, Assoc. Fish and Wildl. Agencies, July 1984, Victoria, B.C. 9 pp.
- Troyer, W. A. 1961. The brown bear harvest in relation to management on the Kodiak Islands. *Trans. North Am. Wildl. and Nat. Resour. Conf.* 26:460-468.
- U.S. Department of Interior, Fish and Wildlife Service. 1990. Draft grizzly bear recovery plan. U.S. Fish and Wildlife Service. 117 pp.

APPENDIX H₂

Summation of 1991 Spring Season Grizzly Bear Questionnaire.

A questionnaire (at end of this Appendix) was developed and all 50 permittees were contacted by phone. The following information was obtained by the survey: Fifty permits were issued. Forty-eight permittees bought licenses. A total of 47 permittees hunted. These hunters spent 488 man-days hunting for an average of 10.4 man-days per hunter. One hunter used the services of an outfitter, others hunted on their own (Questions 1, 2, and 3).

Figure 1 displays hunting pressure (man-days of hunting) according to logical geographic areas and boundaries along the RMF. The three most popular hunting spots were Blackleaf Creek-Cow Creek area, the Dupuyer Creek drainage and the Teton River bottom and its forks. These three spots had 149, 98 and 74 man-days respectively, and accounted for 66% of all hunting effort. Sixty-six percent of the effort occurred on private lands; the remainder on public lands (primarily National Forest) (Question 4).

Each hunter was asked if he had any problem obtaining access on private lands. Seven hunters stated that they were turned down by landowners, however two of these hunters said that they did not actually receive a "no" and that the landowner simply said that there were no bears present on their lands at that time. Twenty-six hunters stated that they had no problems with obtaining access. This was also emphasized in the comment section where nine hunters stated that landowners were great, happy and cooperative (Question 4).

Eighteen grizzly bears were observed by hunters. Three of these bears were killed. Three sows were observed with young: one with 2 yearlings (Lubec Ridge), one with 2 cubs (So. Fork of Birch Creek), and one with a cub (Blackleaf Creek). In addition, tracks of a sow and two yearlings were observed on the Lower Teton River bottom. The remaining 10 bears were loners. All grizzly bears observed are plotted in Figure 2 (Questions 5 and 6).

Twenty-nine hunters observed grizzly bear tracks. Figure 3 displays, by location, all grizzly bear track locations. Both the bear observations and observations of tracks indicate that the late spring and deep snowpack did not prevent a significant number of bears from emerging from their dens (Question 7).

Three hunters shot at a grizzly bear and each of these hunters killed the bear they shot at; no bears were wounded. Two hunters passed up an opportunity to shoot a grizzly bear in hopes of seeing a larger bear. The three grizzly bears killed during the hunt were all adult males (see attached bear records) (Questions 8, 9, 10).

Twelve hunters observed 17 black bears and three black bears were killed by grizzly bear permit holders during the spring grizzly season. Only one black bear sow with cubs was observed (Questions 11, 12).

Hunters were asked for their comments regarding this spring hunt and/or bear management programs in Montana. The following is a summary of their comments:

- a) The largest response was made by 35 hunters who thought that the season was a great or a good idea. Nine hunters specifically supported this season and the Department by their comments and volunteer of assistance. Four hunters stated that everyone was very cooperative, including FWP personnel, and four hunters felt that the season was set up in a professional manner. Five hunters said that landowners were helpful and happy with the season. One hunter said all landowners he met disliked the season.
- b) The second-most frequent comment was hunter thoughts on anti-hunters and the Department's "fight" with anti-hunters and grizzly hunting. Six hunters didn't like the anti-hunters: "Tell Easterners to stay out of our business". Four hunters wanted the Department and K. Cool (MDFWP Director) to fight these people, and two were very happy that K. Cool took a strong position and stood up against them. One hunter volunteered his services in establishing a trust fund to combat "anti-" sentiment.
- c) Five hunters thought 50 permits were too many and two said 50 permits were the right amount.
- d) Four hunters said the season timing was just right and three more stated that it was a great time to be out. Eight hunters said that the season should be later; one suggested a month longer. Four of these eight hunters wanted a later hunt because of the late spring weather (snow) experienced this year.
- e) Three hunters did not like the carcass disposal program conducted by MDFWP, independent of this spring season. One hunter said that if we have a carcass disposal program then we should open the WMAs. Three more hunters and one landowner wanted the WMAs open.
- f) One hunter stated that there are now more grizzly bears everywhere in the Northern Continental Divide Ecosystem, and one hunter was disappointed that he saw no grizzly bear sign.
- g) Three hunters saw 4 wolves while hunting grizzly bears.

History of three grizzly bears killed during the 1991 Spring Grizzly Bear Season.

- #1. The first bear killed was a huge male, known age 21 years old. He was killed April 13, 1991, on the Teton River. This bear had a lip tattoo (#218) from when he was captured in 1978 at an age of 8 years. This old bear had no previous history of causing trouble, however circumstantial evidence indicates that he may have killed a calf just before he was killed.
- #2. The second bear killed was a large male, known age 5 years old. He was killed April 21, 1991, in Harrison Basin. This bear was captured in 1987 as a yearling while using the Dupuyer community garbage dump. He was relocated west of the Continental Divide on the Spotted Bear River. He returned to the Dearborn River area where he spent much of his time staying in the lower foothills of the Dearborn River drainage adjacent to the National Forest.
- #3. The third bear killed was a large male, estimated to be 4 years old. He was killed May 4, 1991, on Little Skunk Creek. This bear had no previous history of causing problems and he was unmarked. The area he was killed in has been the site of several incidents of grizzly bears killing livestock during recent years.

Date of Survey _____

Surveyor Name _____

Spring Season Grizzly Bear Questionnaire 1991

1. Did you hunt Grizzly Bear in Montana during the spring season in 1991?.....yes no
2. Who did you hunt with? (Outfitter, other grizzly bear hunter, friend?) _____
3. How many days did you hunt grizzlies?....._____days
4. Please describe the specific area you hunted in (if you hunted in more than one area, how many days did you hunt in each area?): _____
 - (a) Was it on private or public land? How many days on each? If on private land, did you have any access problems? _____
5. Did you see any grizzly bears?.....yes no
If so, describe them the best that you can (Age, sex, color, tags or collars, cubs/yearlings present with sow, etc.):

6. Please describe the general location of each grizzly bear you observed. (Interviewer - indicate locations on enclosed map with an X).

7. Did you observe grizzly tracks or scat?.....yes no
If so, please describe the general location of the grizzly sign. (Interviewer - indicate locations on enclosed map with O's).

8. Did you shoot at a grizzly bear?.....yes no
 - (a) Did you wound a bear that subsequently escaped?.....yes no
9. Did you kill a grizzly bear?.....yes no
10. Did you pass up an opportunity to shoot a grizzly bear in hopes of seeing a larger bear?.....yes no
11. Did you observe any black bears while hunting grizzlies?.....yes no
If so, how many? _____
12. Did you kill a black bear while hunting grizzlies? yes no Describe location. (Indicate location of kill on map with BB). _____
13. Please provide below any comments you may have on the spring bear hunting season or bear management programs in Montana:

MANDAYS OF HUNTING WITHIN DELINEATED AREA

16 MD
+++++

ROCKY MOUNTAIN EAST FRONT BEAR MANAGEMENT AREA

1. Mark an X where the hunter observed each grizzly.
2. Mark an O where the hunter observed grizzly sign (tracks, scat).

FIGURE 2. - GRIZZLY BEARS OBSERVED

ROCKY MOUNTAIN EAST FRONT BEAR MANAGEMENT AREA

1. Mark an X where the hunter observed each grizzly.

ROCKY MOUNTAIN EAST FOOT HILL
MANAGEMENT AREA

FIGURE 3.- GRIZZLY TRACKS OBSERVED

ROCKY MOUNTAIN EAST FRONT BEAR
MANAGEMENT AREA

2. Mark an O where the hunter
observed grizzly sign (tracks, scat).

The map shows the Rocky Mountain East Front Bear Management Area (B.M.A.) in Idaho. The area is bounded by the Snake River to the north and the Snake River Canyon to the south. The town of Condon is located in the center of the area. The map includes numerous 'O' marks indicating observed grizzly tracks. The tracks are concentrated in the central and southern parts of the area, particularly along the Snake River Canyon. The map also shows the boundary of the B.M.A. and the location of the Snake River Canyon.

APPENDIX I

Individual Grizzly Bear Mortalities in the NCDE, 1986-1990

Location Ownership Codes:

FIR - Flathead Indian Reservation

BIR - Blackfeet Indian Reservation

GNP - Glacier National Park

FNF - Flathead National Forest

LCNF - Lewis and Clark National Forest

PR-MT - Private land - Montana

MDFWP - Montana Department of Fish, Wildlife and Parks land

Table I.1. Individual grizzly bear mortalities in the NCDE, 1986.

Ref. Number	Bear ID	Date	Sex	Age	Weight (lbs.)	Location	Location Ownership	UTM	Status	Details of Mortality
N86-1	179396	March-April 1986	F	2	115	Post Creek	FIR	3814-52568	Known	Illegal
N86-2	179397	March-April 1986	F	3	165	Post Creek	FIR	3814-52568	Known	Illegal
N86-3 ¹	179490	5/7/86	M	11		Many Glacier Hotel	GNP	3049-54081	Known	Accidental - Bear hung himself- Garbage
N86-4	031986 #341	5/9/86	F	2	205	Deep Creek	PR - MT	3995-52867	Known	Management control - sent to zoo - Detroit, MI). Bear was under porch
N86-5 ²	179403 #410	5/20/86	M	3		Smith Creek, East Front	LCNF	3728-52481	Known	Natural Death: Abdominal and skull injuries inflicted by Bear No. 412 (male)
N86-6	011986 #101	June 1986	F	4		Two Medicine River	BIR	3669-53702	Known	Illegal - collar found in river with bullet hole in it (July, 1986). Trapped on 5/16/86 at Ford Creek - transplanted to Hungry Horse. Wt. at capture = 265 lbs.
N86-7	041986 #498	6/3/86	M	7		Poole Creek - N. Fk. Badger Ck.	LCNF	3400-53400	Known	Accidental - Handling Death - Carcass found 1/4 mile from trap.
N86-8 ³	021986 #326	6/23/86	M	3		Bear Creek	FNF	3200-53500	Known	Unreported mortality - illegal - collar found cut off, under a bank; no sign of carcass. Previously had been trapped at Ear Mountain in 1985. (Wt. = 235 lbs. in 1985)
N86-9	179470	10/1/86	M	2		S. Fk. Flathead	FNF	3200-52850	Known	Legal kill - hunter
N86-10	179474	10/2/86	M	3		Miner Creek	FNF	3250-53300	Known	Legal kill - hunter
N86-11	179472	10/5/86	F	5		Tanner Creek	FNF	3200-53250	Known	Legal kill - hunter
N86-12	179471	10/8/86	F	15		Tunnel Creek	FNF	3000-53700	Known	Legal kill - hunter
N86-13	179473	10/10/86	M	6		Addition Creek	FNF	3100-53050	Known	Legal kill - hunter

Ref. Number	Bear ID	Date	Sex	Age	Weight (lbs.)	Location	Location Ownership	UTM	Status	Details of Mortality
N86-14	179632 #106	10/11/86	M	4		Blackleaf Game Range	MDFWP	3759- 53153	Known	Unknown - illegal(?) or possible cripple loss - bullet wound found; had been trapped 10/9/86 as problem bear feeding on carcasses at feed lot.
N86-15	179500	11/19/86	M	Cub		Java	FNF	3150- 53460	Known	Vehicle kill - Hit by train

¹ Quotas for known, man-caused mortality have been established only for the bears outside of Glacier National Park. Therefore, mortalities of bears within the park do not count against established quotas.

² This bear is not included in man-caused mortalities since it died of natural causes inflicted upon it by another male adult grizzly bear.

³ This mortality would not have been documented if the bear had not been radio-collared. Therefore, it is classified as an unreported mortality. Because these are already taken into account when establishing allowable quotas, the mortality does not count against the know mortality quota established for 1986.

The 1986 grizzly bear hunting season opened on October 1 and ran through 1/2 hour after sunset on October 11.

Summary (Northern Continental Divide Ecosystem) - Human-caused Mortalities:

Quotas: 14 total, 6 female

Actual kill: 12 total, 6 female

Table I.2. Individual grizzly bear mortalities in the NCDE, 1987.

Ref No.	Bear ID	Date	Sex	Age	Weight (lbs.)	Location	Location Ownership	UTM	Status	Details of Mortality
N87-1	179641	6/24/87	M	14		South Fork Cutbank Creek, BIR	PR - MT	3490-53850	Known	Management control - livestock depredation
N87-2	179644 #108	7/30/87	M	1		Dupuyer Creek	PR - MT	3749-53380	Known	Management control - nuisance bear
N87-3	179676 #4039	8/3/87	F	8-12 (est.)	250	Fatty Creek	PR - MT	2870-52875	Known	Management control - nuisance bear - had 2 cubs.
N87-4		8/3/87	F	Cub		Fatty Creek	PR - MT	2870-52875	Known	Management control - to research facility. (Live removal.)
N87-5		8/3/87	F	Cub		Fatty Creek	PR - MT	2870-52875	Known	Management control - to research facility. (Live removal.)
N87-6	Cub of 179670 ¹	8/12/87	M	Cub		Many Glacier	GNP	2997-54045	Known	Accidental trapping casualty - bear was being moved as a family unit - dart entered chest cavity. People habituated. Mother and cub transplanted
N87-7		8/12/87	F	Cub		Pinchot Creek	GNP	3056-53736	Prob.	Unknown cause - transplant related. Cub of N87-9.
N87-8	179672 #316	9/19/87	F	5		Deep Creek	PR - MT	3800-52862	Known	Legal kill - Hunter (damage hunt).
N87-9	179670	10/1/87	F	9-10	242	Kiowa - Hanlon	BIR	3325-53794	Known	Illegal (sow and cub were transplanted - cub's fate is unknown) - other cub was the mortality on 8/12/87.
N87-10	179706 Hunter #518	10/6/87	F	Adult		Cox Creek	FNF	3450-53300	Known	Legal kill - Hunter
N87-11	#355	10/6/87	M	Adult	640 in 1984	Ayres Creek	FNF	3490-52480	Known	Legal kill - Hunter
N87-12	#467 ²	Fall 1987	M	4		Swift Dam	LCNF	3620-53323	Known	Unknown - Possible illegal - carcass found May 30, 1988.

¹ The quota is only for bears outside of Glacier National Park, so this bear did not count against the quota.² Does not count against man-caused mortality quota.

The 1987 hunting season opened on October 1; the season closed on October 6 because the female subquota was met.

Summary (Northern Continental Divide Ecosystem) - Human-caused Mortalities:

Quotas: 14 total, 6 female

Actual kill: 10 total, 6 female

Table I.3. Individual grizzly bear mortalities in the NCDE, 1988

Ref No.	Bear ID	Date	Sex	Age	Weight (lbs.)	Location	Location Ownership	UTM	Status	Details of Mortality
N88-1	#1, #391 179736	5/13/88	F	11		Fatty Creek	FNF	2880- 52930	Known	Illegal kill-Poacher tried and convicted. Est. Wt 350 lbs. Bear had been relocated, had two yearlings at time of death.
N88-2	412 179860	7/13/88	M	27	535	East Front (Harrison Basin)	PR-MT	3856- 52409	Known	Management control - livestock depredation
N88-3 ¹	719747	7/16/88	F	7	218	Granite Park	GNP	2960- 54053	Known	Accidental handling death - possibly due to adverse drug reaction. Habituated to people.
N88-4	97 179809	9/18/88	F	27	202	Quintonkin Creek	FNF	2919- 53226	Known	Natural - killed by another grizzly bear
N88-5	179785	9/26/88	M	Ad		Youngs Creek	FNF	3235- 52380	Known	Illegal - mistaken for black bear
N88-6	179807	9/28/88	F	7		White River	FNF	3320- 52720	Known	Illegal - mistaken for black bear
N88-7	179808 #363 blue	10/1/88	F	14		Wheeler Creek	FNF	2870- 52720	Known	Legal hunter kill
N88-8	179835	10/1/88	F	3		Dry Creek	PR - MT	3550- 52140	Known	Legal hunter kill
N88-9	179805	10/1/88	F	1		Stanton Creek	FNF	2915- 53600	Known	Legal hunter kill
N88-10	#335	10/6/88	F	10.5		East Front Gansman Coulee	PR - MT	4011- 53174	Known	Legal hunter kill

¹ Only man-caused mortalities outside Glacier National Park count toward established quotas.

The 1988 hunting season in the Northern Continental Divide Ecosystem opened on October 1 and closed on October 9.

Summary (Northern Continental Divide Ecosystem) - Human-caused Mortalities:

Quotas: 14 total, 6 female

Actual kill: 8 total, 6 female

The 1987 hunting season opened on October 1; the season closed on October 6 because the female subquota was met.

Summary (Northern Continental Divide Ecosystem) - Human-caused Mortalities:

Quotas:	14 total, 6 female
Actual kill:	10 total, 6 female

Table I.3. Individual grizzly bear mortalities in the NCDE, 1988

Ref No.	Bear ID	Date	Sex	Age	Weight (lbs.)	Location	Location Ownership	UTM	Status	Details of Mortality
N88-1	#1, #391 179736	5/13/88	F	11		Fatty Creek	FNF	2880- 52930	Known	Illegal kill-Poacher tried and convicted. Est. Wt 350 lbs. Bear had been relocated, had two yearlings at time of death.
N88-2	412 179860	7/13/88	M	10	535	East Front (Harrison Basin)	PR-MT	3856- 52409	Known	Management control - livestock depredation
N88-3 ¹	719747	7/16/88	F	7	218	Granite Park	GNP	2960- 54053	Known	Accidental handling death - possibly due to adverse drug reaction. Habituated to people.
N88-4	97 179809	9/18/88	F	27	202	Quintonkin Creek	FNF	2919- 53226	Known	Natural - killed by another grizzly bear
N88-5	179785	9/26/88	M	Ad		Youngs Creek	FNF	3235- 52380	Known	Illegal - mistaken for black bear
N88-6	179807	9/28/88	F	4		White River	FNF	3320- 52720	Known	Illegal - mistaken for black bear
N88-7	179808 #363 blue	10/1/88	F	14		Wheeler Creek	FNF	2870- 52720	Known	Legal hunter kill
N88-8	179835	10/1/88	F	3		Dry Creek	PR - MT	3550- 52140	Known	Legal hunter kill
N88-9	179805	10/1/88	F	4		Stanton Creek	FNF	2915- 53600	Known	Legal hunter kill
N88-10	#335	10/6/88	F	10.5		East Front Gansman Coulee	PR - MT	4011- 53174	Known	Legal hunter kill

¹ Only man-caused mortalities outside Glacier National Park count toward established quotas.

The 1988 hunting season in the Northern Continental Divide Ecosystem opened on October 1 and closed on October 9.

Summary (Northern Continental Divide Ecosystem) - Human-caused Mortalities:

Quotas: 14 total, 6 female

Actual kill: 8 total, 6 female

Table I.4. Individual grizzly bear mortalities in the NCDE, 1989

Ref No.	Bear ID	Date	Sex	Age	Weight (lbs.)	Location	Location Ownership	UTM	Status	Details of Mortality
N89-1		5/12/89	F	24-26		Java Creek	FNF	3090-53460	Known	Legal - Defense of Life.
N89-2		5/15/89	M	8		Paola Creek	FNF	3030-53570	Known	Illegal - Mistaken ID for black bear.
N89-3		5/25/89	M	Sub AD		Canyon Creek	FNF	7030-53770	Known	Illegal - Poaching
N89-4		6/12/89	F	1	65	Mid Fork Flathead	FNF	3160-53460	Known	Vehicle kill - Injured by train. Euthanized by officials.
N89-5	BIR #51-52	Mid-July	F	2		East Glacier	BIR ^b	3370-53680	Known	Illegal - Radio cut off bear, no carcass found. Indications are that mortality occurred on Blackfoot Indian Reservation and collar was disposed of in Paola Creek.
N89-6		7/19/89	M	est. 10-12		Devil Creek Campground/ Snowslip snow shed	FNF	3170-53470	Known	Vehicle kill - Train.
N89-7 ^a		7/29/89	M	est. 2		S.E. Palookaville	BIR	3480-53550	Known	Legal - defense of life.
N89-8 ^c	MDFW P #98	first wk Sept.	M	2.5		Jewel Basin	FNF	2790-53370	Known	Unreported mortality - illegal. Radio found cut off bear, no carcass found, wt. 128 lbs. on June 23, 1989.
N89-9	BIR #53-54	9/9/89	F	2		Dupuyer Sheep Creek	PR-MT	38020-533785	Known	Under investigation. Killed by rancher while bear was attacking sheep.
N89-10	MDFW P #13	9/29/89?	M	Ad.		Young's Creek	FNF	3300-52480	Known	Legal - defense of life.
N89-11	MDFW P #12	10/1/89	F	2.5		Slick Creek S. Fk. Flathead	FNF	31760-52891	Known	Illegal kill.
N89-12	MDFW P #148	10/2/89	M	8.5		Little Salmon Fork	FNF	3215-52793	Known	Legal - defense of life.
N89-13		8/26/89	Unk	Cub		Battery Mtn. area	FNF	Unk	Prob.	Natural mortality. Not seen with mother in 1990.

¹ East Front Area does not include the Blackfeet Indian Reservation.

² This bear does not count toward the mortality quota of 14 total and 6 female because it is accounted for when the total quota is lowered from 21 to 14 to accommodate unreported mortalities (MDFWP EIS 1986).

The 1989 grizzly bear hunting season opened on October 1 and closed November 26. No grizzly bears were harvested legally by hunters in 1989.

Summary (Northern Continental Divide Ecosystem) - Human-caused Mortalities:

Summary human-caused quotas: 14 total 6 female

Actual kill: 11 total 5 female

Table I.5. Individual grizzly bear mortalities in the NCDE, 1990

Ref No.	Bear ID	Date	Sex	Age	Wt.	Location	Location Ownership	UTM	Status	Details of Mortality
N90-01	FG #144	4/30	M	13	498 lbs.	East side Flathead Valley Labrandt Rd.	PR-MT	7175-53373	Known	Under investigations. Poss. self defense - killed by landowner near dog pen.
N90-02	unmarked	5/21	F	3-4 est.	under 200 lbs.	Mid. Fk. Stanton Creek	FNF	2992-53644	Known	Vehicle kill - Train - cut in half
N90-03 ¹	FG #43	6/1	M	1	45 lbs.	Posey Creek	FNF	2901-53288	Known	Natural mortality - Killed by another grizzly bear within 24 hrs. after being trapped and released
N90-04 ²	unmarked	6/3	F	15 +	over 250 lbs.	Mid. Fk. Bear Creek	FNF	3104-53455	Known	Vehicle kill - Train
N90-05	BIA #55	6/5	M	4	225 lbs.	West of Browning	BIR	3500-53700	Known	Under investigation. Bear shot after walking past private residence - case under investigation
N90-06 ¹	FG #44	6/8	F	8-10 est.	225 lbs.	Slide Creek	FNF	3005-53218	Known	Unknown; bear marked on 6/3 by research team with no apparent problems - located on 6/5 .8 miles from capture site - located 6/8 1.18 miles from capture site - found dead at this location - cause of death could not be determined
N90-07	unmarked	6/9	M	cub	15 lbs.	5-6 miles east of Marias Pass	BIR	3349-53651	Known	Vehicle kill - Train - (Sow was also hit but her fate is unknown)
N90-08	unmarked	6/9	M	cub	12 lbs.	5-6 miles east of Marias Pass	BIR	3349-53651	Known	Management control - Live removal - injured by train with 90-07 - taken to veterinarian in Conrad - then transported to zoo
N90-09	FG Eartag #C2335	6/18	M	4	unknown	Bear Creek	FNF	3165-53472	Known	Management control - Live removal to research facility. Nuisance bear - threatening workers at BN corn spill

Ref No.	Bear ID	Date	Sex	Age	Wt.	Location	Location Ownership	UTM	Status	Details of Mortality
N90-10 ¹	FG #47	Between 6/17-28	F	2	70 lbs. est.	Ball Creek	FNF	2945-53194	Known	Natural mortality: when this bear was captured (6/6) it had very severe recent bites from another bear - no body fat - protruded rectum - heavy tick infestation - bear ultimately died from these wounds
N90-11	FG #117	8/7	M	3.5		Teton River - near Choteau	PR-MT	4155-52926	Known	Live removal - mgt. control: to research facility. Nuisance bear - sheep depredation
N90-12		8/10	M	3.5		Teton River - near Choteau	PR-MT	4155-52926	Known	Live removal - mgt. control: to research facility. Nuisance bear - sheep depredation
N90-13	unmarked	10/19	F	1		3 mi. east of Java underpass	FNF	3131-53457	Known	Vehicle kill - Train - grain spill area
N90-14	unmarked	10/21	M	Adult		N. Fork Sun River	LCNF	3592-52930	Known	Legal - hunter kill
N90-15	MDFWP ear tags 5 and 6	11/4	M	2½	215 est.	Polebridge	PR-MT	6997-54047	Known	Live removal - mgt. control: to research facility. Nuisance bear

¹ Although bear N90-03 could be classified as a natural mortality and the cause of death for bear N90-06 could not be determined (there is no proof it was man caused), the department counted both of these bears against established quotas to ensure a conservative approach to mortality management in the NCDE.

² The second female grizzly killed by a train in the Middle Fork drainage filled the female subquota for the Flathead Bear Management Area. Therefore, there will not be a hunting season on grizzlies in the Flathead Area in 1990.

The 1990 grizzly bear hunting season opened on October 1 and closed on November 9.

Summary (Northern Continental Divide Ecosystem) - Human-caused Mortalities

Summary human caused quotas: 14 total 6 female

Actual kill: 10 total 4 female

Appendix J. Individual records of grizzly bear monitored in the NCDE, 1975-1990.

Fate codes are:

- A = alive in that year
- I = known illegal
- L = legal: hunter kill/self defense
- U = unreported death
- R = relocated or control kill
- N = natural
- D = dead
- C = capture related death

Study areas are:

- NF = North Fork Flathead River
- SF = South Fork Flathead River
- EF = East Front
- MM = Mission Mountains
- BIR = Blackfeet Indian Reservation

1975

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
75	101	M	3.5	NF	A
75	106	M	3.5	NF	A

Total = 2

U = 0

1976

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
76	106	M		NF	A
76	179	M	1.5	NF	A
76	113	F	3.5	NF	A
76	102	M	2.5	SF	U
76	127	M	1.5	SF	U
76	129	M	6.5	SF	A
76	108	M	1.5	SF	A
76	171	M	3.5	SF	A
76	119	M	11.5	SF	A
76	114	M	5.5	SF	A

Total = 10

U = 2

1977

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
77	113			NF	A
77	227	M	16.5	NF	A
77	284	F	8.5	NF	A
77	257	F	8.5	EF	A
77	271	M	1.5	EF	A
77	273	F	3.5	EF	A
77	129			SF	A
77	108			SF	A
77	171			SF	A
77	119			SF	A
77	114			SF	A
77	145	M	9.5	SF	A
77	230	F		MM	A
77	206	M		MM	U
77	229	M		MM	A
77	116	F		MM	A

Total = 16

U = 1

1978

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
78	358	F	4.5	NF	A
78	257			EF	A
78	271			EF	A
78	273			EF	A
78	218	M	8.5	EF	A
78	282	M	2.5	EF	A
78	229	M	5.5	MM	A
78	119			SF	A
78	114			SF	A
78	375	F	6.5	SF	A
78	297	F	8.5	SF	A
78	230			MM	A
78	116			MM	A
78	305	F		MM	A
78	297	F	8.5	SF	A
Total = 15					
U = 0					

Appendix J. Individual records of grizzly bear monitored in the NCDE, 1975-1990.

Fate codes are:

- A = alive in that year
- I = known illegal
- L = legal: hunter kill/self defense
- U = unreported death
- R = relocated or control kill
- N = natural
- D = dead
- C = capture related death

Study areas are:

- NF = North Fork Flathead River
- SF = South Fork Flathead River
- EF = East Front
- MM = Mission Mountains
- BIR = Blackfeet Indian Reservation

1975

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
75	101	M	3.5	NF	A
75	106	M	3.5	NF	A

Total = 2

U = 0

1976

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
76	106	M		NF	A
76	179	M	1.5	NF	A
76	113	F	3.5	NF	A
76	102	M	2.5	SF	U
76	127	M	1.5	SF	U
76	129	M	6.5	SF	A
76	108	M	1.5	SF	A
76	171	M	3.5	SF	A
76	119	M	11.5	SF	A
76	114	M	5.5	SF	A

Total = 10

U = 2

1977

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
77	113			NF	A
77	227	M	16.5	NF	A
77	284	F	8.5	NF	A
77	257	F	8.5	EF	A
77	271	M	1.5	EF	A
77	273	F	3.5	EF	A
77	129			SF	A
77	108			SF	A
77	171			SF	A
77	119			SF	A
77	114			SF	A
77	145	M	9.5	SF	A
77	230	F		MM	A
77	206	M		MM	U
77	229	M		MM	A
77	116	F		MM	A

Total = 16

U = 1

1981

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
81	?	?	?	NF	A
81	452			NF	A
81	453			NF	A
81	454			NF	A
81	?	F	AD	NF	L
81	230			MM	A
81	028/029	M		MM	A
81	420			MM	A
81	305			MM	A
81	257			EF	A
81	273			EF	A
81	218			EF	A
81	282			EF	A
81	220			EF	A
81	333			EF	A
81	203			EF	A
81	335			EF	A
81	223			EF	A
81	297	F		SF	A
81	363	F		SF	A

Total = 20

U = 0

1982

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
82	453			NF	A
82	257			EF	A
82	273			EF	A
82	218			EF	A
82	282			EF	A
82	220			EF	A
82	333			EF	A
82	203			EF	A
82	335			EF	A
82	223			EF	A
82	529	M	1.5	EF	L
82	518	F	1.5	EF	A
82	519	M	0.5	EF	L
82	544	M	2.5	EF	A
82	548	F	10.5	EF	A
82	230			MM	A
82	028/029			MM	A
82	117	M		MM	A
82	420	F		MM	A
82	305			MM	A
82	297	F		SF	A
82	363	F		SF	A

Total = 22

U = 0

1983

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
83	257			EF	A
83	273			EF	A
83	218			EF	A
83	282			EF	A
83	220			EF	A
83	335			EF	A
83	518			EF	A
83	544			EF	A
83	548			EF	A
83	500	F	9.5	EF	A
83	498	M	3.5	EF	A
83	485	M	6.5	EF	A
83	333			EF	A
83	GARY			NF	A
83	ETHYL			NF	A
83	SUE			NF	A
83	230			MM	A
83	028/029			MM	A
83	305			MM	A
83	420			MM	A
83	297			SF	A
83	363			SF	A

Total = 22

U = 0

1984

Year	Tag No.	Sex	Age at Capture	Study Area	Fate
84	GARY			NF	A
84	ETHYL			NF	A
84	SUE			NF	A
84	257			EF	A
84	273			EF	I
84	282			EF	L
84	220			EF	A
84	333			EF	A
84	335			EF	A
84	518			EF	L
84	544			EF	I
84	548			EF	A
84	500			EF	A
84	498			EF	A
84	485			EF	A
84	328	M	2.5	EF	A
84	313	F	3.5	EF	A
84	366	F	5.5	EF	A
84	355	M	8.5	EF	A
84	317	F	3.5	EF	A
84	392	M	0.5	EF	A
84	326	M	1.5	EF	A
84	305			MM	A
84	028/029			MM	N
84	420	F		MM	A
84	297	F		SF	A
84	363			SF	A

Total = 27

U = 0

<u>1985</u>					
Year	Tag No.	Sex	Age at Capture	Study Area	Fate
85	316	F	3.5	EF	A
85	346	M	6.5	EF	A
85	301	F	12.5	EF	A
85	257			EF	A
85	220			EF	A
85	548			EF	A
85	498			EF	A
85	485			EF	A
85	313			EF	A
85	366			EF	A
85	355			EF	A
85	317			EF	A
85	392			EF	A
85	305			MM	D
85	ETHYL			NF	A
85	SUE			NF	A
85	500			EF	R
85	335			EF	R
85	326			EF	R
85	420	F		MM	U
85	297	F		SF	A
85	363			SF	A

Total = 22

U = 0

<u>1986</u>					
Year	Tag No.	Sex	Age	Study Area	Fate
86	412	M	7.5	EF	A
86	466	F	15.5	EF	A
86	464	F	CUB	EF	A
86	?	?	CUB	EF	A
86	467	M	3.5	EF	A
86	316			EF	A
86	346			EF	A
86	301			EF	A
86	257			EF	A
86	220			EF	A
86	548			EF	A
86	498			EF	C
86	485			EF	A
86	313			EF	A
86	366			EF	A
86	355			EF	A
86	317			EF	A
86	392			EF	A
86	341	F	2.5	EF	R
86	101	F	3.5	EF	I
86	106	M	4.5	EF	D
86	410	M	3	EF	N
86	326	M	3	EF	R
86	500	F		EF	A
86	297	F		SF	A
86	363	F		SF	A

Total = 26

U = 0

<u>1987</u>					
Year	Tag. No.	Sex	Age at Capture	Study Area	Fate
87	466			EF	A
87	464			EF	A
87	?(466's yearling)			EF	A
87	467 (slipped collar, 7/87)			EF	D
87	316			EF	L
87	301			EF	A
87	257 (observed)			EF	A
87	313(slipped collar)			EF	A
87	366			EF	A
87	355 (hunter killed 10/87)			EF	L
87	50	F	3-4	BIR	A
87	1	F	11.5	SF	A
87	2	F	1.5	SF	A
87	3	F	1.5	SF	A
87	4	F	7.5	SF	A
87	107	M	1.5	EF	A
87	108	M	1.5	EF	R
87	110	M	1.5	EF	D
87	117	M	cub	EF	A
87	412	M	10.5	EF	A
87	49-50	F	4	BIR	A
87	500	F		EF	A
87	297	F		SF	A
87	363	F		SF	A

Total = 24

U = 0

<u>1983</u>					
Year	Tag No.	Sex	Age at Capture	Study Area	Fate
88	412	M	10.5	EF	R
88	107	M		EF	A
88	117	M		EF	A
88	301	F		EF	A
88	366	F		EF	A
88	466	F		EF	A
88	257+132	F		EF	A
88	500+138	F		EF	A
88	49-50	F		BIR	A
88	44-46	F	14	BIR	A
88	47-48	F	2	BIR	A
88	11-12	M	18+	BIR	A
88	35-36	M	4	BIR	A
88	9-10	M	3	BIR	A
88	94	F	8.5	SF	A
88	96	F	15.5	SF	A
88	97	F	15.5	SF	N
88	98	M	1.5	SF	A
88	136	M	6.0	SF	A
88	137	F	1.5	SF	A
88	139	F	4.5	SF	A
88	143	F	5.5	SF	A
88	144	M	11.5	SF	A
88	146(381)	M	4.5	SF	A
88	147	F	2.5	SF	A
88	148	M	8.5	SF	A
88	149	M	8.5	SF	A
88	150	M	6.5	SF	A
88	297	F		SF	A
88	1	F	11	SF	I
88	335	F		EF	D
88	363	F		SF	D
88	4-5	F		SF	A

Total = 33

U = 0

1989					
Year	Tag No.	Sex	Age at Capture	Study Area	Fate
89	51	F	2	BIR	I
89	53	F	2	BIR	I
89	55	M	3	BIR	A
89	57	F	6	BIR	A
89	62	M	6	BIR	A
89	257+132	F	22	EF	A
89	134	M	1	EF	A
89	317	F	8	EF	A
89	135	F	CUB	EF	A
89	136	F	CUB	EF	A
89	137	F	CUB	EF	A
89	500+138	F	11	EF	A
89	139	M	CUB	EF	A
89	140	F	CUB	EF	A
89	107	M	3	EF	A
89	301	F	20	EF	A
89	117	M		EF	A
89	13	M	7	SF	D
89	147	F	3	SF	A
89	14	F	11	SF	A
89	12	F	3	SF	I
89	137	F	2	SF	A
89	3	F	3	SF	A
89	4-5	F	9	SF	A
89	5A	unk	CUB	SF	Natural
89	139	F	5	SF	A
89	143	F	5	SF	A
89	42	M	CUB	SF	A
89	43	M	CUB	SF	A
89	150	M	7	SF	A
89	144	M	12	SF	A
89	146	M	6	SF	A
89	148	M	9	SF	D
89	136	M	7	SF	A
89	98	M	2	SF	U
89	18	F	2	SF	A
89	94	F	10	SF	A
89	94A	unk	CUB	SF	A
89	297	F		SF	A
89	149	M		SF	A
89	50	F		BIR	A
89	44	F		BIR	A
89	48	F		BIR	A
89	35	M		BIR	A
89	10	M		BIR	A
89	96	F		SF	A

Total = 46

U = 1

Year	Tag No.	Sex	Age	1990		Comments
				Study Area	Fate	
90	71-72	F		BIR	A	
90	60-59	M		BIR	A	
90	464	F		BIR	A	
90	25-23	M		BIR	A	
90	50	F		BIR	A	collar fell off summer 1990
90	44	F		BIR	A	collar fell off summer 1990
90	48	F		BIR	A	recaptured & retagged spring 1990
90	10	M		BIR	A	collar fell off summer 1990
90	57	F		BIR	A	
90	55	M		BIR	L	killed in reported self defense on Res. 1990
90	134	M		BIR	A	signal died summer 1990
90	62	M		BIR	A	
90	500 + 138	F		EF	A	
90	117	M		EF	R	sheep depredation, live removal
90	144	F		EF	L	possible self defense
90	137	F		EF	A	radioed animal
90	135	F		EF	A	
90	136	F		EF	A	
90	147	F		SF	A	
90	14	F		SF	A	
90	144	M		SF	L	defense of life
90	43	M	subadult	SF	C	snare mortality
90	47	F	subadult	SF	N	natural mortality
90	297-45	F		SF	A	
90	25	M		SF	A	
90	48	F		SF	A	
90	22	M		SF	A	
90	96	F		SF	A	
90	143	F		SF	A	
90	71	M	2	SF	A	
90	4-5	F		SF	A	
90	42	M		SF	A	
90	149	M		SF	A	
90	136	M		SF	A	
90	137	F	subadult	SF	A	
90	139	F		SF	A	
90	150	M		SF	A	
90	146	M		SF	A	
90	94	F		SF	A	
90	44	F		SF	D	
90	18	F		SF	A	
90	1-2	F		MM	A	
90	5-6	M	2.5	NF	R	live removal, mgmt. control
90	317	F		EF	A	
90	257-132	F		EF	A	
90	C2325	M		SF	R	
90	228	M	2.5	SF	A	

Total = 47

U = 0

Appendix K

Nuisance Grizzly Bear Incidences in the NCDE and Glacier National Park, 1986-1990

Table K.1. Nuisance grizzly bear incidences in the NCDE, 1986.

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
Outside Glacier National Park										
86-1	4/21/86	East	unk	2	young of #500	Dearborn/Elk BMU 25 Ford Ck. LF Ranch		Livestock-cattle kill (\$100) Traps set, no capture.	FWP	
86-2	4/25/86	East	unk unk	2 2	young of #500	S. Teton BMU 20		2 bears involved in Beehive Depredation (\$1000). Traps set, no capture.	FWP FWP	
86-3	4/30/86	East	unk unk	sub ad sub ad		Dearborn/Elk BMU 25		2 bears involved in livestock (cattle) depredation (\$100). Traps set, no capture.	FWP	
86-4	5/9/86	East	F	2	341	Deep Creek		Mortality. Bear at residence, sent to zoo	FWP	To Detroit zoo: 5/9/86
86-5	5/10/86	East	unk unk	sub ad sub ad		Elk Ck. BMU 25		2 bears involved in livestock (cattle) depredation (\$400). Traps set, no capture.	FWP	
86-6	5/12/86	East	unk unk	sub ad sub ad		Elk Ck BMU 25		2 bears involved in livestock depredation (\$50)	FWP ²	
86-7	5/15/86	East	unk	unk		Johnston-LF Ranch Elk/Dearborn BMU SW of Augusta		Bear on back porch of ranch. Destroyed garbage container.	FWP ³	
86-8	5/16/86	East/West	F	4	101	Ford Ck, Augusta	Wheeler Ck. West of Hungry Horse Reservoir	Livestock-cattle kill (\$650). Transplant. Returned to E. Front and collar was found in Two Medicine River. Illegal mortality	FWP	Illegal mortality: 6/86
86-9	5/22/86	East	M	2.5	338	So. Teton, BMU 20 Teton-Spring Ck.	Game Preserve	Beehive property damage (\$300).	FWP	
86-10	5/25/86	East		sub ad		Teton-Spring Ck. Preserve. 1 mile N. Choteau		Bear near occupied homes. Aircraft reconnaissance flight was conducted.	FWP ³	
86-11	6/27/86	East	unk unk	sub ad sub ad		1 mi. south of Birch Ck.		Sheep depredation (\$250) - 2 bears involved.	ADC FWP ³	

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
86-12	6/30/86	East	unk	unk		Pendroy		Sheep depredation (\$330)	ADC FWP	
86-13	7/2/86	East	unk	sub ad		Blackleaf Ck. W. Bynum		Sheep depredation (\$180)	ADC FWP	
86-14	8/5/86	West	unk	unk		Codette Creek. South end Helena F.		Sheepherder shot at a grizzly	FWP FWP	
86-15	9/2/86	East	unk	sub ad		Dearborn/Elk BMU 25 SW Augusta		Livestock (cattle kill) \$500. Traps set, no capture.	FWP	
86-16	9/5/86	East	unk	unk		BIR		Cow depredation (\$550)	ADC	
86-17	9/7/86	East	unk	ad		South Teton BMU 20 Miller Hutterite Colony		Livestock (sheep kill) \$100. Traps set, no capture.	FWP	
86-18	9/11/86	East	unk	unk		Bynum		Sheep depredation (\$75)	ADC	
86-19	9/24/86	East	unk unk	unk unk		Smith Creek, SW of Augusta		2 bears broke into home	FWS	
86-20	9/86	West	F	5.5	155	Mission Mountains	Unknown	Transplant	FWP	Retagged 7/11/87 near Ferndale
86-21	10/2/86	West/West	F	8-12	4039	Fatty Creek	So. Fork of Flathead	Nuisance at residence, eating horse pellets. Previously trapped 10/16/83 W. Glacier dump	FWS, FWP	Management control mortality 8/3/87
86-22	10/9/86	East	M	4	106	Teton	Blackleaf (within home range)	Nuisance in garbage. Transplant, (preventative action) illegal mortality	FWP	Illegal mortality 10/11/86
86-23	10/31/86	West	unk	unk		McCabe Pt.		Grizzly attacked a hunter	FWP	

Inside Glacier National Park

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
86-24	4/30/86	GNP	M	11		Many Glacier Hotel		Two workers charged by adult grizzly. Bear died during trapping relocation attempt; was in garbage and accidentally hung himself.	GNP	mortality-5/7/86-accidental
86-25	6/11/86	GNP	F	Ad unk subad unk subad unk subad		Red Gap Pass		Four grizzlies charged hikers	GNP	
86-26	6/18/86	GNP	F	Ad unk cub		1.5 miles below Park Creek Patrol Cabin		Horse party charged by sow with cub	GNP	
86-27	6/19/86	GNP	F	Ad		St. Mary Lodge		Three hikers charged by female with two yearlings. Not trapped.	GNP	
86-28	6/22/86	GNP	F	Ad unk subad		Avalanche Lake		Sow and subadult charged rangers	GNP	
86-29	6/28/86	GNP	F	Ad unk cub		Hidden Lake Trail		Sow on dead goat, charged two hikers.	GNP	
86-30	7/7/86	GNP	unk	unk		Siyeh Pass		Hiker mauled by grizzly	GNP	
86-31	7/30/86	GNP	unk unk	ad ad		Iceberg Lake		Two grizzlies charged and treed hiker.	GNP	
86-32	9/8/86	GNP	F unk cub unk cub	ad cub cub		Siyeh Pass trail		Sow and two cubs charged ranger. He used "counter attack" spray and bears didn't press charge.	GNP	
86-33	9/11/86	GNP	unk	ad		Granite Park		Two persons mauled and severely injured by a grizzly	GNP	

Table K.2. Grizzly incidences in the NCDE, 1987

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
Outside Glacier National Park										
87-1	4/13/87	East	unk	sub ad		S. Teton		Property damage beehives (\$200) Preventative control.	FWP	
87-2	4/23/87	East	unk	unk		Eureka Lake		Beehive depredation. Scaregun placed in yard.	FWP	
87-3	5/87	West	unk	ad		Rainey Lake		Responded several times in 3 weeks, bear left.	FWP	
87-4	5/8/87	East	M	1	unmarked	Browning	Released where trapped	Accidentally caught in wolf trap.	ADC	
87-5	5/87	East/West	M	1.5	109	Dupuyer	Lodgepole Creek - Spotted Bear River	Moved from relocation site to Helmsville area - recaptured as a preventative action, transplanted to Bunker Creek (8/87)	FWP	unknown, not radio marked 110-Poss. mortality - '87
	6/2/87	East/West	M	1.5	107-Deaborn	Dupuyer	Lodgepole Ck, Spotted Bear River		FWP	107 - Hunter kill 4/91
	7/30/87	East	M	1.5	108			Mortality: #108 was killed as management control, livestock related		108-mgt. control mort.
87-6	6/24/87	East/West	M	14	unmarked	Cutbank Creek, BIR	N. Fk. Bunker Ck.	Mortality: cattle depredation, killed in relocation attempt.	ADC, FWP, FWS	mgt. control: mort. 6/29/87
87-7	7/6/87	East	unk	unk		Badger Ck		Damage to cabin reported (\$100).	FWP	
87-8	7/11/87	West/West	F	adult	155	NE of Bigfork	Trapper Creek, Puzzle Ck (Middle Fk of Flathead)	Previously trapped near Post Ck. Mission Mtns, sheep depredations, bear returned home, transplanted again.	FWP, FWS	

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
87-9	7/30/87	East	unk	ad		Dearborn/Elk Ck Falls Ck and Dearborn River Canyon		Livestock-cattle kill (\$650) traps set, no capture.	FWP	
87-10	7/31/87	West	F F F	8-12 cub cub	4039	Fatty Creek	Mortality Washington State University Washington State University	Mortality: Lethal injection (on 8/3/87). Entered and damaged residence. Had been transplanted in 1983 and 1986. History of human confrontation.	FWP, FWS	Mortality 8/3/87 live removal 8/3/87 live removal 8/3/87
87-11	8/4/87	East	unk	unk		Badger- Two Medicine Ck		Damage to cabin reported (\$20).	FWP	
87-12	8/5/87	East	unk	ad		Dearborn/Elk Ck Cuniff Ck Basin		Livestock-cattle kill (\$1700). Traps set, no capture.	FWP	
87-13	8/12/87	East	unk	ad		Dearborn/Elk Ck Hay Coulee		Livestock-cattle kill (\$850). Traps set, no capture.	FWP	
87-14	8/31/87	West	unk unk	unk unk		Ovando Mtn.		Bears in Hay Meadow	FWP	
87-15	9/6/87	East	unk	unk		S. Teton		Livestock-sheep kill (\$160). Traps set, no capture.	ADC	
87-16	9/9/87	East/West	F	5	316	near Augusta (Lead Gulch)	Paola Creek	Cattle depredation (\$600) (3 calves, 2 cows bitten) on 7/10 and 7/24/87. Returned 72 air miles within 10 days to E. Front. Mortality: Selectively removed from population with first damage hunt.	ADC	Hunter kill 9/87
87-17	9/11/87	East	F unk	ad cub		Badger Ck		Raid on Hunter camp reported (\$150).	FWP	
87-18	9/15/87	East	unk	ad		Dearborn/Elk Ck		Livestock-cattle kill (\$650). Traps set, no capture.	FWP	

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
87-19	9/20/87	East	unk	ad		Moose Ck		Raid on Hunter Camp reported (\$150).	FWP	
87-20	9/25/87	East	unk	sub ad		North Fk Sun		Raid on Hunter Camp reported (\$50).	FWP	
87-21	9/28/87	East	unk unk	ad cub		S. Teton		Nuisance. Near people and homes. Preventative control. Also sheep depredation (\$160) report in area (Leys Ranch) of 2 grizzlies on same date.	FWP	
87-22	9/29/87	East	unk	ad		South Teton Miller-Hutterite Col.		Livestock - sheep kill (\$190). Traps set, no capture.	FWP	
87-23	10/3/87	East	M F	1 ad	117 unmarked	Teton	Teton (within home range)	Transplant (preventative action), livestock related.	FWP	Live removal 8/7/90
Inside Glacier National Park										
87-24	4/25/87	GNP	F unk unk unk	Ad 1½ 1½ 1½		Elk Mountain		Human fatality. Photographer pursuing bears in back country.	GNP	
87-25	7/2/87	GNP	F unk unk	Ad 1½ 1½		Little Dog Mountain UTM:3233 53564		Hiker mauled by an adult sow with two yearlings.	GNP	
87-26	7/23/87	GNP	unk	unk		Appelkunny Cirque		Human fatality. Probably caused by a grizzly.	GNP	
87-27	8/12/87	GNP	M F F	cub 9-10 cub		Many Glacier	Pinchot Creek	Family group was transplanted: Male cub died due to dart entering chest cavity, female adult and cub were moved. Female was shot illegally, cub is probably dead.	FWP	Accidental - mortality 8/12/87 Illegal - mort. 10/1/87 Unk. prob.- mort. 8/12/87

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
87-28	9/17/87	GNP	unk	unk		Piegan Pass Trail UTM:3044 53992		Hikers were charged and bitten by a grizzly. Bear could not be located after incident.	GNP	

Table K.3. Grizzly incidences in the NCDE, 1988.

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source
Outside Glacier National Park									
88-1	4/7/88	unk	unk	unk		unk		Bear tore up shed.	FWP
88-2	4/9/88	East/ West	M	10.5	412	Near Augusta, Harrison Basin	Danaher Creek on 4/17/88	Cattle (calf) depredation	ADC, FWP
	6/2/88	East	M	10.5	412	Dearborn		2 grizzlies at residence yard. Mortality: 7/13/88	FWP
	7/13/88	East	M	10.5	412	Harrison Basin		#412 was killed as management control.	FWP
88-3	4/28/88	East	F	2	47-48	Browning	Livermore Creek (within home range)	Trapped accidentally in wolf trap.	ADC
88-4	5/1/88	East	F	8	44-46	Browning	Cutbank Creek (within home range)	Culvert trap near buildings.	ADC
88-5	5/13/88	West	F	11	1 2385	Fatty Creek		Illegal mortality. Bear had previously been transplanted in 1985 in a nuisance relocation.	FWP
88-6	6/27/88	West	F	adult	unmarked	Codette Ck So. Helena F.		Feeding on dead carcass.	FWP
			unk	Cub	unmarked				
88-7	8/1/88	East	unk	unk		Dearborn		Nuisance on rancher's land.	FWP
88-8	8/5/88	East	unk	unk		near Augusta		Cattle (calf, \$400) depredation.	ADC
88-9	9/20/88	West	unk	unk		Alice Creek		Grizzly killed a cow.	FWP
Inside Glacier National Park									
88-10	6/14/88	GNP	unk	unk		Camas Lake Campground		Grizzly frequenting campground. Destroyed signs and outhouse.	GNP

88-11	7/7/88	GNP	unk	unk	Bike trail between headquarters and Apgar		Small grizzly frequenting trail. Trap set, no capture.	GNP	
88-12	7/16/88	GNP	F	7	Granite Park		Bear died during relocation attempt - possibly due to adverse drug reaction. Habituated to people.	GNP	Mortality: 7/16/88
88-13	8/27/88	GNP	F unk	Ad cub	Snyder Lake Trail		Female with one or two cubs charged a ranger.	GNP	

Table K.4. Grizzly incidences in the NCDE, 1989.

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source	Fate
Outside Glacier National Park										
89-1	5/3/89	East	F	2	51-52	Milk River	Cutbank Ck (BIR) (within home range)	Sheep depredation (\$810 - 18 sheep).	ADC, FWP	Illegal kill 7/89
	5/12/89	East/West				Heart Butte (BIR)	South Fork, Flathead	Collar later retrieved in Paola Ck - Mortality.		
89-2	5/3/89	East	F	2	54/53	Heart Butte (BIR)	BIR (within home range)	Calf depredation and nuisance around boneyards.		
	9/9/89	East				Dupuyer - Sheep Ck		Mortality. Killed by rancher while bear was attacking sheep.	FWP	Illegal kill 9/9/89
89-3	5/12/89	West	F	24-26	unmarked	Java Ck		Mortality. Shot in self defense (not a nuisance bear).	FWP	Mortality - 5/12/89
89-4	5/20/89	unk	unk	unk		unk		Nuisance at residence.	FWP	
89-5	6/26/89	West	unk	unk	Blond-large	North Fork	No action	Human safety - involved in incidence with mushroom pickers.	FWP	
89-6	7/20/89	West/West	M	3	17-18 c-2335	Polebridge	Puzzle Ck (Middle Fork Flathead)	Had been previously trapped by McClennan (1988) in B.C. Nuisance around chicken-rabbit coops.	FWS, FWP	
89-7	7/29/89	East	M	2	unmarked	S.E. Palookaville		Mortality. Human safety. Legal - defense of life.	FWP	Mortality: 7/29/89
89-8	8/7/89	West	F	Ad cub cub	unmarked	West Glacier		Residence.	FWS	
89-9	8/27/89	East/West	F	20.5	257/132	Dupuyer Ck	S. Fk Flathead-Bunker Ck.		FWP	Alive in 1991, returned to E. Front
89-10	9/4/89	West/West	F	10-15	518/519	Columbia Falls	Beaver Ck - Missions	Nuisance around homes - threat to human safety - consumed buried dead horse.	FWS, FWP	Alive in 1991

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source	Fate
89-11	9/13/89 10/21/89	East/West	M	1	134	Sheep Ck Mission Lake, Mission Mtns.	Unawah Ck, Hungry Horse Res. Dog Gun Lake (BIR)	Originally trapped in Sept. - released in S. Fk. Flathead.	FWP	Alive in 1990
89-12	9/22/89	East	unk	unk		Choteau		Sheep depredation (\$140).	ADC	
89-13	9/28/89	West/West	M	12-15	6	Columbia Falls	Frozen Lake - Trail Ck (N. Fork)	Damage to home and chicken coop.	FWS, FWP	Last observed: No. Fk. Flathead Canada, 7/90
89-14	9/29/89	West	M	12-14	13	Youngs Ck		Mortality. Possible self defense.	FWP	Self defense kill 9/89
89-15	9/20/89	East	F F F F	8.5 cub cub cub	317 135 136 137	Muddy Ck	Ear Mountain (within home range)	Transplant, preventative, bears near residence.	FWP	Alive in 1990 Alive in 1990 Alive in 1990 Alive in 1990
89-16	10/1/89- 10/13/89	East/ West	F M F	10 cub cub	500/138 139 140	Teton Area	Frozen Lake (North Fork), B.C.	Sheep depredation-(500 returned to East Front with no cubs).	FWP	Observed in 5/90 E. Front
89-17	10/2/89	West	M	8.5	148	Little Salmon Ck		Mortality. Human safety: legal - self defense.	FWP	Defense of life kill - 10/89
89-18	10/5/89	West/West	M	15	18230/18231 164,660	Dipsy Doodle Lane, Whitefish	Youngs Pk, Monture Ck	Residential area.	FWP	Collar found Spring '90 Monture Ck.
89-19	10/10/89	West	unk	unk		Meadow Ck, Spotted Bear		Grizzly bear on elk carcass near firefighters.	FWP	
89-20	10/13/89	East/West	M	7	62/61	BIR	Packrat Mtn (S. Fk. Flathead)	Cattle depredation, 1 cow killed.	BIR	Collar quit winter 89/90
Inside Glacier National Park										
89-21	7/23/89	GNP	unk	unk		Lost Lake		Bear charged fisherman.	GNP	

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source	Fate
89-22	7/29/89	GNP	F unk unk	Ad cub cub		Baring Basin		Female with cubs charged 2 hikers.	GNP	
89-23	8/12/89	GNP	F unk unk	Ad cub cub		Two Medicine Lake		Ranger charged by grizzly sow with two cubs.	GNP	
89-24	8/18/89	GNP	F unk unk	Ad yrl. yrl.		Loop Trail to Granite Park		Female bit hiker. Bear was not trapped.	GNP	
89-25	10/9/89	GNP	unk	Ad		Harrison Lake Jct.		Bear charged horse party.	GNP	

Table K.5. Grizzly incidences in the NCDE, 1990.

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
Outside Glacier National Park										
90-1	4/30/90	West	M	13	144	Flathead Valley LeBrandt Road		Mortality. Killed by landowner near dog pen.	FWP	Self defense kill 4/90
90-2	5/24/90	West	unk	unk		Shaeffer Meadows		Grizzly eating on carcass, warden used aversive conditioning - bear left area.	FWP	
90-3	5/29/90	West	F	ad	unmarked	Essex		Bears were near cabin area but left.	FWP	Trapped in 1991
			M	1.5	unmarked					Died in 1991, mgmt control
			F	1.5	unmarked					Returned to Middle Fk, 5/91
90-4	5/29/90	West/ West	F	20	1-2	Middle Fork Flathead	Big Bill Ck	Caught incidental to trapping effort for a problem bear.	FWP	
90-5	6/5/90	East	M	4	55	West of Browning		Mortality. Bear shot near residence.	FWP	Under invest. kill 6/5/90
90-6	6/12/90	East	F	1.5	137	North Montana Feed Lot	Blackleaf WMA (within home range)	Feeding on carcass (preventative action).	FWP	
			F	1.5	135					
90-7	6/15/90	East	unk	unk		Choteau		Sheep depredation (\$320).	ADC	
90-8	6/18/90	West	M	4	C-2335	Bear Ck - Corn spill	Washington State University	Mortality. Aggressive to railroad workers, previous history of problem bear.	FWP	Live removal 6/18/90
90-9	7/6/90	East	unk	unk		Choteau		Sheep depredation (\$60.00).	ADC	
90-10	8/4/90	East	M	3.5	117	Choteau	Washington State University	Two mortalities. Sheep depredation (\$100) removed from ecosystem.	ADC	Live removals 8/4/90

Number	Date	Area	Sex	Age	Bear ID Number	Location	Release Site	Explanation	Source ¹	Fate
90-11	8/11/90	West	unk unk	unk unk		West Glacier		Outfitter's camp - physical safety of humans - broke into cooler.	FWS	
90-12	8/22/90	East/ East	F	3.5	144	Teton River - East Front	Sun River WMA	Incidental capture in sheep depredation case.	FWP	
90-13	8/23/90	West	unk	unk		Monture Ck		Grizzly bear on horse carcass.	FWP	
90-14	9/10/90	East	unk	unk		Dupuyer		Sheep depredation (\$350).	ADC	
90-15	9/17/90	East	unk	unk		Dupuyer		Sheep depredation (\$200).	ADC	
90-16	10/17/90	East/West	F	4	464	BIR	Upper Beaver Ck Mission Mtns - Swan	Depredation on 1 cow.	FWP	
90-17	10/25/90 11/4/90	West	M	2.5	5-6	Frozen Lake Polebridge	North Fork Flathead Washington State University	Nuisance related. Mortality Removed from ecosystem due to aggressive behavior.	FWP FWP	Live removal 11/4/90
90-18	11/2/90	West	M	2.5	228	Polebridge	Paola Ck - Middle Fork Flathead	Caught incidental in trapping effort for #5/6.	FWP	
Inside Glacier National Park										
90-19	6/14/90	GNP	unk	unk		Upper Bowman Campground		Grizzly charged 2 hikers, deer carcass nearby.	GNP	
90-20	6/29/90	GNP	unk	unk		Upper Kintla Lake Campsite		Grizzly charged 2 backpackers and rummaged through belonging.	GNP	
90-21	7/5/90	GNP	unk	subad		Iceberg-Piarmigan Trail		Grizzly treed hiker and rummaged through pack.	GNP	
90-22	7/13/90	GNP	F unk unk	Ad 2 2		Flatop Mountain Trail		Female grizzly with two 2-year-old offspring charged 2 hikers.	GNP	
90-23	7/31/90	GNP	unk	unk		Iceberg Lake Trail		Human injury. 2 hikers attacked by a grizzly. Could be bear #57-BIR.	GNP	

¹ FWP - Montana Department of Fish, Wildlife and Parks Records
FWS - U.S. Fish and Wildlife Service Records
ADC - Animal Damage Control Records
GNP - Glacier National Park Records

APPENDIX L

Glacier National Park Summary Accounts of Bear Activity, 1985-1990.

1985

Visitors to Glacier National Park in 1985 were well-received by the very substantial population of resident bears. No bear-caused injuries or deaths were recorded for the first time since 1973. The excellent behavior of the bears is also reflected by the very low incidence of property damage (one case) and relatively low level of temporary trail or backcountry campgrounds closures. The 29 temporary closures were the third lowest in the last ten years. The positive statistics were achieved during a year which recorded 1,781 bear sightings, only exceeded by 1983's 1,977 sightings.

Gary Gregory, Glacier's Resource Management Specialist, believes Park visitors deserve much of the credit for the lack of problems. "The fact that we averaged 26 incidents of property damage each year, prior to 1975, compared to only one this year, strongly indicates that today's Park visitor is doing a much better job of clean camping", Gregory said. "We have fewer bears conditioned to associate people with food or garbage than we had in the past, and it is the conditioned bear which causes most problems." All six of the Park's fatal grizzly attacks appear to have involved conditioned bears. There have been no fatal grizzly attacks since 1980 when three campers were killed in two incidents. There have been ten injuries due to bears the past five years; however, there were twelve injuries and deaths the previous five years (1976 to 1980).

Most injuries are caused by bears surprised at close range. "I feel very strongly that this number could be brought down if people would make bears aware of their presence. Bear bells help", he said.

"I am convinced that Glacier is safer today than it was 15 years ago. However, it is in a tenuous situation because garbage problems still remain in communities surrounding the Park", Gregory said.

1986

The 2,796 bear sightings marks a 57% increase and is the highest number of sightings ever recorded in Glacier National Park. This increase is not indicative of an increased number of bears but probably indicates that the park visitor and park employees are doing a better job of reporting sightings or the bears utilized more visible habitat. The low incidence of property damage continues to show that the park visitor is doing a good job of clean camping and storing food properly.

1987

Two human fatalities, resulting from separate incidences of grizzly attacks, were recorded in 1987. One was of a wildlife photographer who approached a family group of grizzly bears too closely. This death was very similar to a recent human fatality in Yellowstone, which has led to a program of warning not only wildlife photographers, but all visitors to give all bears a wide berth and use telephoto equipment at long range to photograph them. The second fatality was a lone hiker, who was apparently the victim of a surprise attack. His body was found five weeks after he was reported overdue. Glacier also continued its active management program temporarily closing 36 trails and/or backcountry campgrounds to reduce bear/human conflicts on trails and in backcountry campgrounds.

1988

The accidental death of a sub-adult female grizzly occurred during helicopter transit to the relocation site. Efforts to revive the bear failed. An autopsy indicated a probable adverse drug reaction.

A concession employee received a puncture wound to the foot when bitten by a bear. It could not be determined whether it was a grizzly or a black bear. The man was jogging when he ran into the female bear with cubs on the Mt. Brown trail.

The 2,162 bear sightings is the lowest total since 1985. Part of this 25% decline was due to a park-wide closure of all trails for eleven days during the September fire emergency. Other unknown factors also contributed to the decline.

1989

Gregory indicated that 1989's total of 2,935 bear sighting is the highest total on record, with the next highest total having occurred in 1987. Visitor reports are a large portion of the total sighting numbers. He added, "We need visitors to report all bear sightings. By ensuring that each sighting is recorded, our bear monitoring system will not only improve our awareness of bear locations, but also assist bear management personnel in anticipating movements and help prevent interactions with visitors."

Two backpackers were injured on July 17 after surprising a female grizzly with two cubs near Cracker Lake in the Many Glacier Valley. Another hiker was bitten on the leg while hiking down from Granite Park on August 18. A female grizzly with two cubs was also involved in this incident.

Three black bears were killed in management actions due to their conditioning to human food and resultant aggressiveness. These bears sought to obtain human food and posed a threat to visitor safety. Two of these bears, Gregory stated, had entered parked cars on the Going-To-The-Sun Road. He added, "The need to properly store food and garbage and to avoid feeding bears is clearly demonstrated by these incidents." A fourth

food-conditioned black bear was sent to Washington State University to be used in a metabolism research project.

As part of Glacier National Park's bear management program, four black bears were moved within the park during 1989.

1990

Gregory indicated that 1990's total of 1,909 bear sightings is the lowest total since 1985. This year's total is 35% lower than last year's record number of 2,935. Many of the jurisdictions around Glacier also reported lower numbers of sightings. Gregory added, "One shouldn't conclude that there were fewer bears. Environmental factors cause variations in the number of bears sighted. The bears seemed to move around less this year, perhaps because of plentiful supplies of berries and other bear foods."

Bear incidents and management actions were also low this year. Two hikers were injured on July 31, after surprising what was probably a grizzly bear on the Iceberg/Ptarmigan Trail near Many Glacier. The hikers were on the trail after dark, a practice not recommended in bear country.

According to Gregory, "No bears were killed in management actions and only one black bear was moved within the park during 1990." He concluded that, "The 20 trail/campground closures were the fewest in the last sixteen years".

APPENDIX M

Rocky Mountain East Front Management Plan

Montana Dept. of Fish, Wildlife & Parks

I. INTRODUCTION

DEFINITION

A LONG - TERM REGIONAL WILDLIFE PROGRAM REPRESENTING A LOCALIZED APPLICATION OF MEASURES NECESSARY FOR THE CONSERVATION OF THE GRIZZLY BEAR (*URSUS ARCTOS*), WITHIN AN AREA WHERE FREQUENT CONFLICTS BETWEEN BEAR AND MAN OCCUR.

DEVELOPMENT

DEVELOPED FROM GRIZZLY BEAR RESEARCH INFORMATION COLLECTED DURING TEN YEARS OF INTENSIVE STUDY (1977 - 1986) IN THE ROCKY MOUNTAIN FRONT AREA (RMF).

RESEARCH DATA WERE COLLATED WITH REGIONAL SOCIAL FACTORS (LAND OWNERSHIP, OCCUPANCY, AND USES) TO PRIORITIZE HUMAN - BEAR CONFLICT AREAS, AND EFFECTIVELY ALLOCATE MANAGEMENT OBJECTIVES AND ACTIVITIES.

OVERALL PROGRAM GOAL

TO SECURE AND MAINTAIN A RECOVERED GRIZZLY BEAR POPULATION IN THE RMF AREA WHILE MINIMIZING CONFLICT BETWEEN BEARS AND PEOPLE.

SPECIFIC MANAGEMENT GOALS

1. TO MAINTAIN A VIABLE, SELF-SUSTAINING GRIZZLY SUBPOPULATION IN THE RMF AREA.
2. TO MINIMIZE THE RATE OF, AND POTENTIAL FOR HUMAN - BEAR CONFLICTS; ESPECIALLY ON PRIVATE LANDS ALONG THE FRONT WHERE COMPETITION FOR RESOURCES IS MOST INTENSE BETWEEN PEOPLE AND BEARS.
3. MONITOR AND MAINTAIN HABITAT VALUES IN CONDITIONS SUITABLE TO SUPPORT A VIABLE GRIZZLY POPULATION.

AS PART OF THE NORTHERN CONTINENTAL DIVIDE GRIZZLY BEAR ECOSYSTEM, THE RMF MANAGEMENT PROGRAM SUPPORTS THE GOALS OF THE GRIZZLY BEAR RECOVERY PLAN (USDI 1982), AND MEETS THE OBJECTIVES OUTLINED IN THE PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR NW MONTANA (MDFWP 1986).

II. PROGRAM MANAGEMENT STRATEGIES

1. HUMAN-BEAR CONFLICT MANAGEMENT

- INFORMATION AND EDUCATION
- PREVENTATIVE ACTIONS
- CONTROLS ACTIONS
- MANAGEMENT ACTION ALLOCATION

2. POPULATION MANAGEMENT

- GRIZZLY POPULATION CHARACTERISTICS
- POPULATION DISTRIBUTION
- POPULATION TRENDS
- MORTALITY
- HUNTING

3. HABITAT MANAGEMENT

- MONITOR HABITAT CONDITIONS
- HABITAT IMPROVEMENTS
- HABITAT ACQUISITION AND LAND EASEMENTS

4. PROGRAM EVALUATION

- PERIODIC PROGRAM REVIEW
- CURRENT RESEARCH INFORMATION
- PROGRAM REVISION
- BUDGET ANALYSIS

III. STRATEGY DIRECTIVES

HUMAN-BEAR CONFLICT MANAGEMENT

A. Information and Education

Management Objectives and Methods

- Active public relations: inform and cooperatively work with private landowners and local communities on ways to coexist with bears.
- Systematic education program: scheduled group presentation to public and private land users.
- Interagency cooperation in disseminating bear information; U.S. Forest Service (USFS), Bureau of Land Management (BLM).
- Sample and evaluate local public attitudes towards grizzly bears and the RMF Management Program.

B. Preventative Actions

Management Objectives and Methods

- Removal or control of unnatural food sources
 1. garbage storage and disposal
 2. reduction of livestock boneyards
 3. carcass redistribution
 4. apiaries - electric fencing beeyards
- Limited access or area closure on public lands
 1. Interagency cooperation: FS, BLM, MDFWP
 2. information dissemination
 3. campsites, trails, other recreational facilities
- Aversive conditioning: use of deterrent or repellent techniques to alter bear behavior
- Enforcement: regulations and patrol

C. Control Actions

Management Objectives and Methods

- Determination of problem bear status.
 1. Interagency Plan for Determining Grizzly Bear Nuisance Status (1986)
 2. Cooperative Interagency effort between MDFWP, U.S. Fish and Wildlife Service (USFWS), Animal and Plant Health Inspection Service (APHIS), and Blackfeet Indian Reservation.
 3. Immediate action response
- Capture of problem bear(s) to resolve conflict.
 1. stationary: culvert traps and leg-hold snares
 2. mobile: helicopter immobilization
- Aversive conditioning: use of conditioning agents to control conflict reoccurrence, and alter undesirable bear behavior.
- Relocation to preselected sites.
 1. Interagency Plan guidelines
 2. evaluation of relocations and monitor problem bears

- Removal of problem bear from ecosystem.
 1. destroy offending bear
 2. acceptance to zoological garden
 3. limited-entry grizzly damage hunt

D. Conflict Management Allocation

Management Objectives

1. Delineate and prioritize human-bear conflict areas.
2. Effectively allocate and direct conflict management activities to meet program goals.
3. Quickly respond to, and resolve human-bear conflicts.
4. Reduce the potential for human-bear conflicts while encouraging grizzly bear use of seasonal or yearlong habitat essential to population recovery.

Grizzly Bear Management Zones

Four Bear Management Zones have been developed, each with distinct habitat conditions and conflict management prescriptions that range from zone allocations favoring grizzly bear use to those that discourage bear presence.

Management Zone A (Green Zone)

Essential year-long grizzly bear habitat

Management Zone B (Yellow Zone)

Essential seasonal grizzly bear habitat

Management Zone C (Red Zone)

High levels of human use within zones A and B

Management Zone D (White Zone)

Areas not essential for grizzly bear recovery

MDFWP Bear Management Zones are similar in scope to the Interagency Grizzly Bear Management Situations (IGB Guidelines, 1986), but major emphasis and application is directed to private lands where management opportunities are limited. On Federal lands, Zone boundaries coincide with Management Situations and support stratified objectives and management direction.

Management Zone A

Description / Management Direction

- The area contain year-long grizzly bear habitat essential to maintaining a recovered population.
- The area encompasses federal, state, and private lands with low levels of human occupancy or activity.
- Management direction will favor grizzly bear presence and use throughout the year.
- Management priority will be to minimize human-bear conflicts with rural landowners and public land users.

Conflict Management

- Active public relations with rural landowners
- Cooperative interagency information programs
- Removal of unnatural food sources, limiting access, and enforcement.
- Control actions taken only in the case of livestock depredation or human-bear conflicts (aggressive or unnatural behavior displayed).
- Aversive conditioning; carcass redistribution.

Management Zone B

Description / Management Direction

- The area contains seasonal grizzly bear habitat essential to maintaining a recovered population.
- The area encompasses private lands with moderate levels of human occupancy and activity.
- Management direction will favor seasonal grizzly bear use, but discourage the presence of bears for extensive periods.
- Management priority will be to minimize human-bear conflicts with landowners.

Conflict Management

- Active public relations with landowners.
- Cooperatively work with landowners to remove or limit access to unnatural food sources and attractants.
- All bear sightings will be investigated upon request.
- Control actions taken in the case of human-bear conflicts, or as preventative measures to correct a highly probable conflict from occurring.
- Livestock boneyard program/carcass redistribution; grizzly damage hunt; aversive conditioning.

MANAGEMENT ZONE C

Description / Management Direction

- The area contains high levels of human occupancy, use, or activity within management zones A and B resulting in conditions which make grizzly bear presence untenable.
- Includes developed campgrounds, resorts, summer homes, and subdivisions.
- Management direction will be to actively discourage grizzly bear presence and factors contributing to their presence.
- Management priority will be to prevent human-bear conflicts.

Conflict Management

- Cooperative interagency information program
- Intensive efforts to assure adequate removal of bear attractants.
- An immediate response to all bear sightings reported.
- Control actions taken in the case of any bear frequenting an area.
- Preventative actions; capture of problem bears; relocation or removal.

Management Zone D

Description / Management Direction

- The area is not essential for grizzly bear recovery or population maintenance.
- The area encompasses private lands with moderate to high levels of human occupancy.
- Management direction will be to actively discourage the presence of grizzly bears.
- Management priority will be to prevent grizzly use or movement in the area.

Conflict Management

- Immediate control actions will be taken in the case of any grizzly bear frequenting an area.
- Highest priority areas are applied within a three mile area surrounding local communities.
- Capture; relocation or removal; aversive conditioning; limited entry grizzly damage hunt.

POPULATION MANAGEMENT

Management Objectives

1. Manage for a recovered grizzly bear population at an average density between 1 bear/30 mi² to 1 bear /15 mi².
2. Seek to maintain bear population distribution throughout the RMF Management Area.
3. Monitor grizzly population characteristics, mortality, distribution, and long-term trends on an annual basis.

A. Population Characteristics

- Age, sex, reproductive, and survival data will be collected from all grizzly bears handled and monitored for management purposes.
- Reproductive characteristics (female with cubs, litter size, reproductive rate and cycle) will be computed from capture and observation data.
- Population numbers and density will be estimated from capture data and observation information gathered from aerial transect surveys and systematic report surveys.

B. Population Distribution

- Grizzly population distribution will be evaluated from information gathered through total observation, human-bear conflict locations, and mortality patterns.
- Seasonal, annual, and long-term changes in the distribution of grizzly bears will be documented, and corrective measures identified and implemented.
- Range expansions or contractions will be documented.

C. Population Trends

- Document and monitor long-term grizzly bear population trends by evaluating a combination of subjective observation data, systematic counts, and population estimates.
- Trend monitoring methods:
 1. systematic bear observation survey of professional agency personnel, outfitters, landowners, other user groups.
 2. systematic sampling counts in seasonal concentration areas, including;
 - a. helicopter survey transects in preselected low elevation riparian shrubfield corridors, during the spring prior to full canopy development.
 - b. helicopter surveys in high elevation digging - foraging areas during the summer

D. Mortality

- Compilation and analysis of grizzly bear mortality information.
- Document annual total mortality, man-caused mortality, and unreported illegal mortality.
- Determine male/female sex harvest ratio, median age of harvest, and distribution patterns of nonhunting/hunting mortality in the RMF area.

E. Hunting

- Hunting will be used as a management tool to preserve yet regulate the NCDE grizzly bear population. Evidence suggests that hunting maintains a certain wariness in the grizzly population by removing the most aggressive and bold animals, and through learned behavior in avoiding human confrontation.
- Hunting season and quota recommendations will be based on population characteristics and trend data.
- Limited - entry damage control hunts will be used to selectively remove nuisance grizzly bears determined unsuitable for further relocation.

HABITAT MANAGEMENT

Management Objectives

1. Monitor and maintain habitat conditions suitable to support a recovered grizzly population.
2. Identify and conduct habitat improvement projects which would positively increase the grizzly habitat base.
3. Delineate seasonally important areas to grizzly bears for potential habitat acquisition or conservation easements.

A. Habitat Maintenance

- Interagency workgroup participation in developing and updating a Cumulative Effects Analysis Process for the RMF (USFS, BLM, USFWS, MDFWP).
- This process will quantitatively and qualitatively assess the cumulative effects of human activity on grizzly bear habitat and bear use (USFS 1986).
- The CEM process will be used as a management tool for evaluating habitat conditions, monitoring changes in habitat components, and assessing overall habitat effectiveness.

B. Habitat Improvements and Acquisition

- Field reconnaissance will be made within essential seasonal grizzly habitat to identify and delineate potential land areas for habitat improvements, habitat acquisition, and land easements.
- Possible improvement projects include burning decadent or conifer encroached fruit-producing shrubfields, planting fruit-producing shrubs, protecting important riparian areas from livestock, encouraging aspen (*Populus tremuloides*) regeneration.
- Work closely with private conservation organizations, groups, and agencies to secure critical grizzly habitat for future protection.

MANAGEMENT PROGRAM EVALUATION

- The RMF Grizzly Bear Management Program will be reviewed annually, and evaluated for its effectiveness in meeting program goals and objectives.
- New research information will be reviewed as it becomes available, and relevant data incorporated into the Management Program.
- Every five years the Management Program shall be subject to complete revision based on updated management direction, goals, and social concerns.

APPENDIX

SPECIFIC PROGRAMS PLANS

1. Livestock Boneyard Reduction and Carcass Redistribution

A cooperative agreement with private landowners and ranch operations to phase out and control livestock boneyards. Animal carcasses will be removed from sites in Management Zones B and D, and redistributed randomly in isolated low-conflict areas in Zone A, including MDFWP Wildlife Management Areas and Nature Conservancy lands.

2. Grizzly Bear Damage Control Hunts

A limited entry hunt for the purpose of removing grizzly bears, considered as nuisance animals and unsuitable for further relocation, by licensed hunters accompanied by MDFWP personnel. Hunters are notified from a randomly drawn roster as bear damage situations arise.

3. Grizzly Bear Population and Reproductive Characteristics for RMF, 1980 - 1986

Population Density (marked plus observed)	1 bear / 20.0 mi ² (1 / 51.0 km) ²
Mean Litter Size Cubs	2.29 cubs
Mean Age First Litter	5.5 years
Litter Frequency	2.1 years

4. Age Structure of the RMF Grizzly Bear Population, 1980 - 1986

APPENDIX N

Memorandum of Understanding Between MDFWP and ADC Regarding Animal Damage Control Program

REVISED
July 6, 1990

COOPERATIVE ANIMAL DAMAGE CONTROL PROGRAM IN THE STATE OF MONTANA for Grizzly, Black Bear & Mountain Lion

ARTICLE 1

The purpose of this Memorandum of Understanding (MOU) is to initiate a cooperative relationship between FWP and ADC for planning, coordinating, and implementing animal damage control programs developed to prevent or minimize damage caused by wild animal species, including threatened and endangered species, to agriculture, animal husbandry, forestry, wildlife, and public health and safety.

ARTICLE 2

FWP is authorized to control wildlife damaging livestock or property or for public health and safety by Montana Codes Annotated, Sections 87-1-201 Powers and duties of the department and 87-1-225 Regulation of wild animal damaging property.

ADC is authorized by the Animal Damage Control Act of March 2, 1931 (7 U.S.C. 426-426b), and the Rural Development, Agriculture and Related Agencies Appropriations Act, 1988 (p.L. 199-202) to cooperate with States, local jurisdictions, individuals, and public and private agencies, organizations and institutions.

ARTICLE 3

FWP and ADC agree that:

A. Both parties will cooperate by providing facilities, equipment, personnel and funds to conduct a joint program in the state of Montana which will prevent or minimize the economic effects of depredations caused by wild animals.

B. ADC will be responsible for capture of grizzly bears, black bears and mountain lions which are involved in livestock depredation including bees and beehives. All livestock depredation

complaints will be referred to ADC. ADC will notify the FWP of any grizzly bear complaints prior to initiating control activities. ADC will notify FWP of black bear complaints occurring in grizzly habitats along the Rocky Mountain Front. Grizzly bear control activities will follow the action procedures for determining grizzly bear nuisance status and for controlling nuisance grizzly bears in the Interagency Grizzly Bear Guidelines (attached) and 50CFR 17.40(b).

C. FWP will be responsible for responding to non-livestock complaints involving grizzly bears, black bears and mountain lions. All non-livestock complaints will be referred to FWP.

D. Control activities and field investigations conducted pursuant to this MOU will emphasize sound management practices and due regard for the protection of the public domestic animals, beneficial or nontarget wildlife, endangered species and the environment.

E. Both parties encourage notification of the other party of this agreement of any complaints involving the above species. All depredation complaints will be responded to in 48 hours. Assistance may be requested of either party when necessary.

F. Both parties will consult as often as necessary to review the number of depredation complaints received and the actions taken to resolve the complaints. Contact should be made at the local level. FWP regional supervisors will coordinate with ADC district supervisor.

G. ADC will submit an annual report of activities conducted. In addition ADC will continue to provide the FWP a copy of all Bear and Lion Justification Reports.

H. Salvaging of animals will be reported on the ADC Bear/Lion Justification Report. Carcasses and/or parts will be turned over to FWP. In cases where it is impractical to turn in carcasses or all parts, those parts that remain salvageable will be turned in.

I. Both parties agree to identify areas and notify the other party where preventative measures may be taken to minimize or prevent animal damage. Cooperative preventative efforts will be undertaken whenever possible.

J. Both parties will encourage joint participation at training sessions involving animal damage control.

ARTICLE 4

All animal damage control activities will be conducted in

accordance with the applicable Federal, State, and local laws and regulations.

ARTICLE 5

This agreement and any continuation thereof shall be contingent upon the availability of funds appropriated by the Congress of the United States and the State of Montana. It is understood and agreed that any monies allocated for the purpose of this agreement shall be expended in accordance with its terms and in the manner prescribed by the fiscal regulations and/or administrative policies of the agency making the funds available.

ARTICLE 6

Pursuant to Section 22, Title 41, United States Code, no member of our delegate to Congress shall be admitted to any share or part of this MOU or to any benefit to arise therefrom.

ARTICLE 7

This MOU shall supersede all existing memorandums of understanding and supplements thereto relating to the conduct of animal damage control programs with FWP. All cooperative animal damage control programs now in progress shall be incorporated and continued under this MOU for the purposes of being consistent.

ARTICLE 8

This MOU shall become effective upon date of final signature and shall continue indefinitely. This MOU may be amended at any time by mutual agreement of the parties in writing. It may be terminated by either party upon 60 days written notice to the other party.

MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

Director, FWP

Date

USDA APHIS ADC

Administrator

Date

APPENDIX O

Habitat Protection for Grizzly Bears: The Rocky Bar O Ranch

Introduction

The Rocky Bar O Ranch, which includes 2,598 acres, is the largest block of privately owned land along the North Fork of the Flathead River (Figure 3). The property is bounded on the east by Glacier National Park, on the north and south by the Flathead National Forest and on the west by Coal Creek State Forest. The ranch is owned by Tom and Joan Ladenburg as part of the Rocky Bar O Corporation and represents 20 percent of all private lands in the North Fork area.

Portions of the ranch are located within the designated Wild and Scenic River Corridor and includes four miles of river frontage, one mile of Coal Creek, and several sections of adjacent low elevation bottom lands.

Besides the exceptional scenic and recreational values, the property has very high values for both wildlife and fishery resources. Three threatened or endangered species are known to occupy the area: grizzly bears, wolves, and bald eagles. The North Fork drainage has been identified a part of the grizzly bear recovery area for the Northern Continental Divide Ecosystem. The only known den for the Rocky Mountain Grey Wolf in the lower 48 states occur across the river in Glacier National Park (Ream et al. 1990). Bald eagles winter in the area and a nest site is located approximately 3 miles to the southeast. Many other species of wildlife use the habitats found within the Rock Bar O Ranch, including elk, moose, mule deer, white tailed deer, and numerous non-game species.

Coal Creek provides critical rearing habitat for bull trout as well as a critical migratory route for upstream spawning adults. In addition, this stream also has a documented population of pure strain Westslope cutthroat trout. Both are considered species of special concern by MDFWP and the U.S. Forest Service.

Previous Protection Efforts

In 1976, the North Fork of the Flathead River was designated as part of the Wild and Scenic River system. Within two years, the Flathead National Forest had developed plans to protect the scenic values along the river. These plans identified the scenic river corridor boundaries and outlined the strategies to protect the scenic values on private lands within the corridor boundaries. Where possible, conservation easements were to be purchased to protect the scenic values on these private lands.

Two of the properties identified in the plan were the Rocky Bar O Ranch with 1,000 acres and the adjacent 2,000 acres owned by the Silver Bow Realty Company. In 1979, The Nature Conservancy and the Flathead National Forest became involved in a land exchange for the Silver Bow property but the negotiations failed. In 1983, the Ladenburg's purchased the Silver Bow property. The Ladenburg's intended to trade for timber or sell the parcels within the scenic river corridor to the Forest Service and repay the loan.

By 1986, the Forest Service acquired approximately 350 acres south of Coal Creek. Later that year, the limited Land and Water Conservation Funds appropriated by Congress were withdrawn. At the same time, the timber market dropped so further land exchanges were not possible. In 1987, foreclosure action was initiated foreclosure action on the Rocky Bar O Ranch. The Nature Conservancy and the Trust for Public Lands attempted to negotiate a complicated plan to protect the property, but funds were not available to complete any of the purchase agreements. During the development of mitigation plans for Hungry Horse and Libby dams, MDFWP was approached by local landowners, the Forest Service, and conservation organizations requesting funding support to secure the property. At that time, no funds were available.

Figure 3. General location of the Rocky Bar O Ranch, North Fork of the Flathead River, Montana.

In the fall 1987, MDFWP was approached by both the landowner and the Flathead National Forest requesting financial assistance to secure conservation easements over portions of the ranch. After initial review it was determined that the potential loss of wildlife habitat by not taking action was great enough to warrant entering into discussions to try and keep the ranch intact.

In January 1988, the Ladenburg's filed for bankruptcy to protect their interests in the property and to allow them some time to develop a reorganization plan. The fate of the land was in question and interest by developers to subdivide the ranch provided the need to act quickly to secure the property. The fate of the Ladenburg property was viewed as a key to future development in the North Fork as it represented 20 percent of all private lands.

This pilot project was established to protect the wildlife and open space values of the Rocky Bar O Ranch. The primary objectives were to:

1. Protect habitat to benefit mitigation species including grizzly and black bears.
2. Demonstrate opportunities for cooperative projects with private conservation organizations and federal agencies.
3. Demonstrates the steps required to obtain a conservation easement on private lands and any agreements necessary between cooperative entities.

Summary of Current Protection Efforts

The primary objective of the protection plan was to protect the most critical wildlife habitat by fee-title acquisitions or conservation easements. The core areas identified included the bottomlands along the Flathead River and east of the North Fork road, and the riparian areas associated with Coal Creek. The uplands adjacent to Coal Creek were also considered important to the integrity of the protection plan.

A complex purchase agreement was developed which identified the specific parcels to be acquired by fee-title, conservation easements or land exchange. Table 3 summarizes the acreage of wildlife habitat protection, the type of instrument, and the acquiring entity. The acreage figures reflect all land transactions to date on the Rocky Bar O Ranch, including purchases made by the Forest Service prior to the 1988 purchase agreement.

Conservation easements were acquired on approximately 512 acres of floodplain habitat adjacent to the North Fork of the Flathead River. The basic scenic easement format had been tentatively agreed to by the Forest Service and the landowner when the federal funds were frozen. Similar easements have been conveyed on several other private parcels within the Wild and Scenic River boundary. These documents typically place restrictions on types of developments which may affect the scenic values on private property along a designated Wild and Scenic River. However, in order for MDFWP to support acquiring an easement with mitigation funds, the scenic easement was modified to include restrictions to protect grizzly and black bear habitat (Appendix I).

Specific conditions added to the scenic easement prohibited:

1. Further subdivision of the property;
2. Boneyards of dead domestic animals;
3. Keeping of some types of domestic livestock such as pigs, sheep, and goats;
4. Beehives;
5. Filling or draining of wetland areas.

Table 3. Summary of wildlife habitat protected on the Rocky Bar O Ranch.

<u>PROTECTION TOOL</u>	<u>ACREAGE</u>		<u>COOPERATOR</u>
Fee Purchase	216 acres south of Coal Creek	1984	\$380,000 USFS
	132 acres south of Coal Creek	1986	\$231,500 USFS
	234 acres Coal Creek	1988	\$495,000 Conservation (exch. value) Buyer
	582 acres total		
Conservation Easements	408 acres Flathead River	1988	\$400,000 BPA
	54 acres Flathead River	1988	\$52,500 USFS
	50 acres Flathead River	1988	Exchange of USFS 160 acres benchlands
	512 acres total		
	1,094 acres total protected		

Additional Easements Assoc. with Project	640 acres Lindberg Lake	1988	Conservation buyer exchanged for Coal Creek parcel

The conservation easements were purchased with a combination of BPA funds, Forest Service funds and exchange for Flathead National Forest lands (Table 3).

All conservation easements will be administered by the U.S. Forest Service. An administrative plan was cooperatively developed by the Flathead National Forest, MDFWP, and the Ladenburgs. The plan is on file in the Flathead National Forest Supervisor's Office.

The objectives of the administrative plan are:

1. To describe the existing uses of the land and rights retained by the landowner that are compatible with the intent of the easement.
2. To document the existing biological and physical conditions as a baseline for monitoring future changes.
3. To describe the important wildlife values protected by the easement.
4. To prescribe management guidelines for enhancing wildlife values on the easement area.
5. To outline the procedure for administering the easement.

A total of 582 acres was purchased in fee (Table 3). Of that total, the Forest Service purchased 348 acres in 1984 and 1986 using Land and Water Conservation funds. In 1988, a conservation buyer purchased 234 acres along the mouth of Coal Creek. This parcel was ultimately transferred to the Forest Service in exchange for 640 acres of national forest lands in the Swan Valley. This section of land was encumbered by a conservation easement before the exchange was completed. This easement prohibited further development and also contained restrictions to protect grizzly bear habitat, wetlands, and white-tailed deer summer range.

Summary of the Protection Process for the Rocky Bar O Ranch

The following summarizes the actions necessary to develop and implement complete a protection plan for the Rocky Bar O Ranch:

1. **Field Review/Biological Assessment**
Field review to determine existing wildlife benefits and habitat values, and identification of easement restriction conditions necessary to protect those values.
2. **Identification of Priority Areas**
Identified areas necessary to protect critical habitat values for target wildlife species.
3. **Draft Easement Document**
Develop a conservation easement acceptable to USFS, MDFWP, and the landowner.
4. **Purchase Agreement**
Develop a purchase agreement that identifies the parcels involved, the estimated costs, and the type of protection tool.
5. **Coordination with Conservation Organizations**
During initial negotiations with landowners, met with The Trust for Public Lands, Flathead Land Trust, and The Nature Conservancy to coordinate cooperative actions.

6. Negotiate Purchase Conditions
Negotiations held between landowners, Flathead National Forest, MDFWP, Whitefish Credit Union, and the bankruptcy court.
7. Coordinate with the Wildlife Mitigation
Project first recommended during mitigation planning 1986. Reviewed by Advisory Committee in spring 1988. Proposal developed and submitted to BPA for funding.
8. Purchase Administration
Obtain legal descriptions, title reports, surveys, and appraisals.
9. Interagency Agreements
Develop agreements between U.S. Forest Service and BPA to acquire and administer easements.
10. Administrative Plan
Draft an administrative plan in cooperation with U.S. Forest Service, MDFWP, and the landowners to document baseline information on current land use and conditions, further define easement intent, and outline the monitoring requirements.
11. Public Involvement
Meet with agencies and organizations including county commissioner, North Fork Inter-local Association, Chamber of Commerce, and service clubs.

Summary of Habitat Protected

A total of 1,094 acres of wildlife habitat on the Rocky Bar O Ranch was protected using a variety of protection strategies (easements, fee purchase, exchanges). It is important to note that any protection on the ranch required the involvement of the mitigation program and the conservation buyer. These commitments allowed the U.S. Forest Service to proceed with a purchase plan approved by the bankruptcy court with only limited Forest Service funds.

This project also demonstrated the levels of cooperation possible on mitigation projects. Mitigation funds were used only on direct acquisition of a conservation easement to protect critical wildlife habitat. The U.S. Forest Service provided funds to complete all the acquisition costs including title reports, land surveys, and appraisals.

In addition, as a result of re-programmed funds for the Rocky Bar O Ranch, the Flathead National Forest was able to purchase an additional 1,537 acres with significant scenic and wildlife values along the North Fork Flathead River (M. Conner, pers. comm.). The 1,537 acres of additional land acquired with the re-programmed Rocky Bar O funds cost \$1,456,000. Federal funds were appropriated to complete purchases along Coal Creek; however, the U.S. Forest Service and the Ladenburgs were not able to reach agreement on the purchase price. To fulfill the obligation in the Interagency Agreement with BPA, the Flathead Forest requested the available funds be re-programmed to acquire the next largest ranch on the North Fork. These lands are outside the Wild and Scenic Corridor but contain valuable wildlife habitat and will add to habitat protection for grizzly and black bears.

THE BEARTREE CHALLENGE:
FROM CONFLICT TO COLLABORATION

THE BEARTREE CHALLENGE: FROM CONFLICT TO COLLABORATION

OVERVIEW

The Beartree Challenge on the Lewis and Clark National Forest will restore about 1,000 acres of prime foraging habitat for grizzly bears over the next 5 years through integrated management using tree harvest, planned fires, and planting of forage trees. Innovative partnerships with the timber industry, State agencies, and private conservation groups are key to the project.

THE BEARTREE CHALLENGE

The Setting:

The Rocky Mountain District of the Lewis and Clark National Forest is in north-central Montana. It includes 771,000 acres stretching 100 miles south from the southern border of Glacier National Park to Highway 200. The district begins in the east where the High Plains meet the Rockies and continues west to the Continental Divide. Extensive mountain grasslands, subalpine and alpine forests, and spectacular limestone "reefs" combine to create a remarkably diverse landscape.

The Rocky Mountain District is one of the Forest Service's premiere wildlife districts. Large populations of most of North America's big-game animals are present, including the largest herd of bighorn sheep in the lower 48 States and the world-famous Sun River Elk herd. There are four threatened or endangered animal species on the district: grizzly bear, gray wolf, bald eagle, and peregrine falcon. The 80 to 100 grizzlies represent 20 percent of the population in the Northern Continental Divide Ecosystem.

Ranching and farming are the economic foundations of the nearby towns of Choteau (pop. 1,700) and Augusta (pop. 350). Because half the District is in the Bob Marshall Wilderness Complex and the remainder is designated as roadless by the forest plan, grazing and tourism are the major sources of community revenues from National Forest System lands.

Until the early 1900's, fire maintained high-quality grizzly foraging habitat on the east side of the Northern Rockies. Frequent wildfires prevented forests from replacing buffaloberry shrubfields and perpetuated stands of whitebark pine, which produce pinenuts that are an important grizzly food. For the last 80 years, fires have been suppressed. Shrubfields have been replaced by forest, and whitebark pine by climax fir and spruce species. The grizzlies' food base has been substantially reduced.

The last grizzlies using the prairies live in the Rocky Mountain District. This situation regularly produces grizzly-livestock conflicts, especially on adjacent private lands. Because ranchers are unable to control depredating bears, hostility towards Federal land managers has developed.

In the past two decades, ranchers, loggers, and energy developers have confronted wildlife and wilderness advocates over grizzly management, with the Forest Service frequently in the middle. Within the Rocky Mountain District, the controversy has been particularly heated because numerous large private ranches are located in grizzly habitat.

The Challenge:

Reverse the decline in grizzly habitat quality as part of the recovery of the species and resolve the social and political conflicts surrounding grizzly bear management.

The Approach:

Habitat

The Beartree Challenge is designed to counter the effects of eight decades of fire suppression using: 1) harvest of trees in 1 to 4 acre patches to restore buffaloberry shrubfields, 2) planned burns to kill small trees invading buffaloberry shrubfields, and 3) plantings of whitebark pine seedlings. Five shrubfield restoration projects, five whitebark pine plantings, and three planned burns will create 1,000 acres of prime grizzly foraging habitat during the 5-year life of the program.

Patch timber harvests are designed to release stunted buffaloberry shrubs. Shade from the forest canopy prevents these shrubs from producing berries. State-of-the-art mechanical logging equipment removes overstory trees without disturbing the soil or road construction.

Planned burns are used to revitalize buffaloberry shrubfields invaded by small trees. These projects kill competing trees and stimulate buffaloberry production. Target burns are between 80 and 500 acres.

Five to ten-acre patches of whitebark pine are planted each year. Cones are collected on the district and grown to 2-year-old seedlings at a Forest Service nursery. Whitebark plantings are designed to maximize cone production. Seedlings are widely spaced to increase crown size and often 2 to 3 seedlings are placed in the same hole to mimic natural regeneration.

All Beartree Challenge projects incorporate a rigorous monitoring strategy. Berry and cone production are measured annually. Grizzly use is monitored with remotely operated cameras.

Social

Grizzly-livestock conflicts are reduced by improving grizzly forage on the national forest to keep bears from wandering onto ranchlands in search of food.

Timber management-bear conflicts are reduced by forming partnerships to design and carry out habitat improvements that meet local timber needs. A partnership was developed with seven timber industry organizations: Louisiana Pacific, Montana Logging Association, Brand S Corporation, Timberjack, Montana Wood Products Association, Columbia Falls Forest Products, and Jones Equipment. Between 1990 to 1994, these cooperators will contribute \$100,000, technical expertise, and equipment to the challenge.

In addition, conservation organizations, including The Nature Conservancy, Defenders of Wildlife, National Wildlife Federation, and Montana's wildland organizations have maintained liaisons with the district. Their assistance enabled the Beartree Challenge to garner wide-based support.

To share the vision of the Beartree Challenge, an education component was built into the program. This outreach effort targets all sectors of the public and gives special emphasis to elementary and high school students. Each year the public is invited to tour projects while they are being implemented. These tours are designed to convey the ecological and technological underpinnings of the Beartree Challenge.

APPLYING THE PRINCIPLES OF NEW PERSPECTIVES

Sustaining Desired Ecological Conditions - The Beartree Challenge is driven by the goal of maintaining the grizzly bear, a key element of the Northern Continental Divide Ecosystem. To accomplish this goal, the Challenge reverses the adverse effects of fire suppression in the ecosystem. Creating buffaloberry shrubfields and whitebark pine stands will produce a landscape that more closely approaches its natural state. The logging systems used in the Beartree Challenge insure that the ecological potential of the project area is maintained by minimizing ground disturbance and eliminating road construction.

Participation - By providing funds, equipment, and technical support, the seven timber industry partners "purchase stock" in grizzly habitat improvement. Key wildlife organizations, state legislators, and Montana's congressional delegation helped gain the support of state conservation groups. The efforts of these organizations and individuals added a new dimension to the Beartree Challenge's fundamental partnership.

Integration - The Beartree Challenge integrates wildlife, timber, fire, and livestock management goals into a cohesive "ecosystem management" package. Foresters and biologists jointly develop harvest strategies to accomplish wildlife objectives. As a by-product, shrubfield creation projects provides timber that meets 50 to 75 percent of the local annual demand. Planned burns are designed by fire specialists. Because of their location, these projects typically create fuelbreaks between National Forest System lands and adjoining lands in other ownerships. Enhancing national forest grizzly habitat should reduce the potential for grizzly-livestock conflicts on private lands and allow ranchers greater flexibility in managing their rangelands.

Collaboration - Beartree Challenge projects are based on the latest wildlife and ecological research. State and Federal scientists have been involved in the program from its inception. The State of Montana bear management specialist helped design the program by selecting habitat improvement sites and serving on the interdisciplinary team. The Intermountain Research Station provides expertise on whitebark pine plantings. The Research Station also conducts regeneration studies on all planting sites. The outreach and education component of the Challenge has led to collaboration with leaders in the field of outdoor education, including Project Learning Tree and Project Wild.

THE RESULTS

The Beartree Challenge has produced a solid partnership between the Forest Service and Montana's timber industry to improve 1,000 acres of grizzly habitat. One shrubfield project and a whitebark pine planting have already been completed. In 1991, a planned burn will be implemented along with the second shrubfield restoration and whitebark projects. Of equal importance has been the development of strong partnerships between the Forest Service, timber industry, and State of Montana. These bonds have helped transform the grizzly from a symbol of conflict to a symbol of collaboration.

Appendix Q. Law Enforcement cases involving illegally taken grizzly bears in the Northern Continental Divide Ecosystem 1986-1990.

1. 4/30/90 Adult male killed near Big Fork, Montana, while eating dog food in a pen. Defendant was assessed a \$1500 civil penalty.
2. 9/15/89 Adult male killed in Young's Creek in self defense. No prosecution.
3. 9/9/89 Adult female shot by rancher near Dupuyer, Montana. Rancher has been assessed a \$10,000 civil penalty.
4. 7/89 Two year old female shot near East Glacier. Bear was radio collared as #51. Investigation is still open.
5. 7/29/89 Sub-adult male shot by rancher at Heart Butte, Glacier County, Montana. Acquitted by jury in Federal Court. Assessed a civil penalty of \$7,500.
6. 5/12/89 20 year old sow shot in self defense on Java Creek (near Essex corn spill). Prosecution declined.
7. 9/21/88 Adult male shot by black bear hunter on Young's Creek, Montana. This is in the South Fork of the Flathead River. Hunter posted \$500 bond to Montana Fish, Wildlife and Parks.
8. 5/13/88 Adult female killed on Fatty Creek, Lake County. Bear was killed by black bear hunter. Defendant paid \$500 in Justice Court.
9. 7/86 Adult female shot at Two Medicine River on Blackfeet Reservation. Investigation is still open.
10. 1/16/86 Remains of sub-adult male #306, were located five miles east of Heart Butte, Montana, on Blacktail Creek. Investigation is still open.

APPENDIX R

Information and education efforts on grizzly bears by the MDFWP, 1986-1990.

BEAR HUNTERS—Know Your Target!

Look for a combination of characteristics

Color and size are sometimes misleading

Be Sure Before You Shoot!!!

BLACK or GRIZZLY BEAR?

BLACK BEAR

1. Highest point of back is well back of shoulders. No prominent shoulder hump.

2. In profile muzzle is long and straight.

3. Front claws dark colored; relatively short and well-curved.

GRIZZLY BEAR

1. Highest point of back is muscular hump over front shoulders.

2. In profile, brow gives "dished" look to face. Not as well defined in yearlings.

3. Front claws up to 4" long or longer, slightly curved. Front claws light colored and can sometimes be observed from great distances.

COLOR Color and size are not good identifying characteristics. Color of both species may range from light brown (blonde) to very dark black. Many grizzlies have light tipped hairs which give them a distinctive sheen.

RUBBING During spring, rubbed spots make the hide poor quality. Look for rubbed spots and that the bear is not a grizzly.

BE SURE BEFORE YOU SHOOT

Montana Department of Fish, Wildlife & Parks

It is not always easy to distinguish between the black and grizzly bears. Color and size are not dependable criteria, so other features must be looked for.

If you are hunting black bears in an area that may be inhabited by grizzlies, take your time and be sure what you're shooting at. Better to pass a shot at a black bear than kill a grizzly.

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AIDS TO IDENTIFICATION OF SPECIES

Look for a combination of characteristics to make identification

BLACK BEAR

1. No prominent shoulder hump. Highest point of body is the back.
2. In profile muzzle is straight and long. Frontally, head and face appear round.
3. Claws dark, much shorter and more curved than grizzly claws.

GRIZZLY BEAR

1. Highest point of back is a muscular hump over the front shoulders.
2. In profile distinct brow gives "dished" look to face. The brow is not as well defined in yearlings.
3. Front claws are long, very prominent, and often light colored. Can sometimes be observed from great distances.

TRACKS

Hind foot tracks of bears seldom show claw marks, and front tracks of black bears seldom show claw marks, but when they are evident, length of front foot claw marks from toe pads can help distinguish grizzly from black bears. Claws of adult grizzlies are rarely less than 1 3/4" long. Claws of black bears seldom exceed 1 1/2".

Grizzly front foot Black

Grizzly back foot Black

COLOR

Color of both black and grizzly bears may range from light brown (blonde) to very dark black. Color is not an indicator of the species. Many grizzlies have light-tipped hairs which gives them a distinctive sheen, and the nickname "silvertip".

PELT QUALITY

In spring when bears emerge from hibernation their pelts are prime for tanning. As they begin to shed they rub away patches of old hair and the pelts are no longer fit for trophies until shedding has been completed, about mid-August.

HUNTER

WHAT KIND OF BEAR IS THIS?

Montana Department of Fish Wildlife and Parks

APPENDIX S

Grizzly Bear Program: Habitat Protection Program

Introduction

The Fish and Wildlife Program authorized BPA to fund projects to protect 8,950 acres of riparian habitat and travel corridors for grizzly and black bears in northwestern Montana. Habitat protection was identified as the preferred alternative because enhancement techniques for enhancing bear habitat on public lands (USFS) is of limited success or value. The mitigation plans specified that mitigation should occur on lands where secure habitat is at risk.

The Environmental Impact Statement on grizzly bear management (Dood et al. 1985) recommended habitat preservation as the key to the survival of the grizzlies. Human encroachment increases vulnerability and the probability of conflict. Improved access and development reduce the acreage of secure habitat for both grizzly and black bears.

The intent of this mitigation program will be to protect important bear habitat within the defined areas specified in the Grizzly Bear Recovery Plan (USDI 1982). This core habitat includes both the Northern Continental Divide Ecosystem and the Cabinet-Yaak Ecosystem where occupied habitat includes federal, state, and private ownership. The focus of the mitigation activities will be on areas where the current ownership or existing management provides less than 100 percent habitat effectiveness. Habitat effectiveness refers to the ability of the site to provide secure habitat for grizzly bear use. Habitat effectiveness of less than 100 percent indicates that some human-related aspect of the site reduces the quality of the area for grizzly bear use (e.g. low cover of preferred foods, limited hiding cover, presence of human development, etc.).

Specific objectives of the bear mitigation program are:

1. Provide open space or secure habitat for bear use and to minimize the potential for human-bear conflicts.
2. To protect low elevation riparian areas and associated uplands to provide important forage areas.

These objectives are consistent with the Grizzly Bear Recovery Plan which identified strategies for maintaining a viable population of grizzlies. The mitigation objectives are compatible with the Grizzly Bear Management Plan which is currently being drafted for Region One of Montana Department of Fish, Wildlife and Parks.

Several areas within the Northern Continental Divide Ecosystem and The Cabinet Yaak Ecosystem contain private land where subdivision is presently occurring. Most of these private lands are located in low elevation riparian areas attractive to both bears and humans. The extent of land development in the NCDE was assessed by the Border Grizzly Project (Jonkel 1983). For instance, in the North Fork of the Flathead River, grizzly bears still have the opportunity to use low elevation river bottom habitat with relatively low levels of human encroachment. However, this area also had the fastest growing development potential. Between 1950 to 1984, 584 parcels changed hands in the NCDE, of these 66 percent were located in the North Fork.

A similar situation is occurring in the Swan Valley. Between 1970 and 1980, an 86 percent increase in housing units and a 78 percent increase in population had occurred.

Technical Committee

The Grizzly Bear/Black bear Technical Committee is composed of agency personnel familiar with bear habitat requirements or with responsibilities for managing publicly owned lands within occupied habitat. During 1988 to 1990, the following agencies were involved:

U.S. Fish and Wildlife Service
U.S. Forest Service
Montana Department Fish, Wildlife and Parks
Glacier National Park

Meetings were held to develop overall objectives of the bear program, identify areas of focus, ranking process, and to develop easement restriction guidelines.

Based on discussions during the meetings, the following recommendations were made:

1. Mitigation projects must occur within the NCDE or the CYE.
2. Low elevation riparian areas or associated benchlands will be selected.
3. The sites must: (a) provide secure habitat through large acreages of undisturbed habitat; (b) minimize the potential for human-bear conflicts, and; (c) protect or enhance the forage quality.
4. Areas of focus will include: (a) the North Fork of the Flathead; (b) the Middle Fork of the Flathead; (c) the Swan Front; (d) the Swan Valley, and; (e) the Bull River.

In order to identify higher priority projects, several factors were considered. An evaluation form was developed which allowed several projects to be compared to help identify where efforts should be focused (Appendix D). This method is similar to a process developed by the Kootenai National Forest and MDFWP to identify mitigation priorities to address impacts of mining activities in the Cabinet Mountains (B. Summerfield, pers. comm.).

Rating Criteria:

1. Habitat Quality: Higher priority is given to sites which have the greater percentage coverage of quality bear habitat (including wet meadows, streams or river habitat, shrub or berry fields).
2. Bear Use: The known or estimated use of a site by bears is ranked.
3. Size of Tract: The site is rated by the acres available, with 1 point given for every 10 acres.
4. Existing Human Influence: Points are subtracted for the presence of any disturbances which may reduce the habitat effectiveness of the site.
5. Development Potential: This criteria measures the degree of threat to property and rates the type of threat or disturbance.
6. Adjacent Land Use: Sites are ranked according to adjacent land uses.

High priority sites should have rating scores which reflect areas that have high proportions of quality habitat, receive year-round use, are large in size, have limited or no human development but may be seriously threatened with changes, and are surrounded by areas with compatible grizzly bear management.

Low priority sites will have scores which reflect areas that have little bear habitat, receive little or no use by bears, etc.

Protection Strategies

Conservation easements on private lands will be the primary tool for protecting bear habitat. However, in some cases fee title acquisition will be pursued if the site is considered a high priority and/or the landowner is only interested in selling the property.

A list of potential easement restrictions was developed which addresses bear habitat concerns and provides a framework for easement negotiations.

Intent of the Easement:

1. To provide secure habitat;
2. To minimize existing and potential human/bear interactions;
3. To protect important habitat features such as forage areas, security cover, and travel corridors.

Examples of restrictions relevant to protection of open, secure habitat:

- No subdivision of the property
- Development is prohibited (homesites, cabins)
- Additional homesites or other structures can be limited in number, space, or location
- No commercial, professional, or industrial activities allowed.

Examples of restrictions relevant to minimizing human/bear conflicts:

- Bee keeping activities not allowed
- Orchards not allowed or limited to personal use only
- Keeping of pigs, sheep, or goats not allowed
- Garbage must be disposed regularly to avoid attracting bears
- Pet food, livestock food, and human food must be kept in a secure manner.
- Dead animals from livestock operations will not be placed in boneyard situations, nor placed near public access points
- Large calving operations or feedlot operations are not allowed
- Recreational developments that encourage long-term concentrated human use are not allowed
- Seasonal cabins must be bear-proof, including all food items (attractants) must be removed during vacancy

Examples of restrictions to protect habitat:

- Development of mineral and hydrocarbon rights may be prohibited
- Surface occupancy for mineral development is not allowed
- Specific restrictions on timing of activities, road placement, drill site placement, and on-site activities can be controlled
- Timber harvest practices must be compatible with currently recognized management guidelines for bear habitat
- Timber harvest plans must receive prior written approval by the appropriate management agency
- Livestock grazing practices which do not maintain bear habitat conditions are prohibited
- Wetland and riparian habitats are protected from draining, filling, or permanent flooding
- Additional roads which concentrate public access are not allowed

Summary of the Copper Creek Project

In November, 1989, MDFWP was approached by Mr. Charles Evans of Libby regarding protection of wildlife values on his property near the Bull River valley. Mr. Evans wished to donate a conservation easement on 107 acres in the Copper Creek drainage. The property is completely surrounded by the Kootenai National Forest and is located approximately three-fourths of a mile from the Cabinet Wilderness boundary (Figure 2). The Cabinet Wilderness area is the site of extensive mineral development by the Asarco and Noranda corporations. Development associated with the mine is expected to impact several drainages. The landowner desired to protect his property from any future developments.

The property includes timbered slopes, open pastures, and riparian habitat along Copper Creek. A number of wildlife species occupy the property (J. Brown, pers. comm.). The timbered bottomlands provide white-tailed deer winter range and habitat for ruffed grouse and mink in the riparian areas. Elk occupy the grassy areas in spring and use the south-facing slopes during winter. The area is extensively used by black bears. It is assumed that grizzly bears will also occupy the property as their numbers increase with the U.S. Fish and Wildlife Service augmentation efforts (USDI 1987).

The Cooper Creek project was reviewed by both the Grizzly Bear/Black Bear Technical Committee and the Habitat Protection Advisory Committee. Both committees recommended pursuing the conservation easement.

The project involved cooperation of the landowners (The Copper Creek Conserve), MDFWP, and The Nature Conservancy (Table 2). In exchange for the donated conservation easement, MDFWP agreed to fund the easement appraisal and the documentation report. The independent appraisal was completed on June 30, 1990, and is on file in the Region One headquarters of the Montana Department of Fish, Wildlife and Parks. The appraisal was purchased with MDFWP general funds (\$3,200). A contract to prepare the documentation report was awarded to an independent consultant familiar with this type of report and is expected to be completed by August 15, 1990. The documentation report provided baseline information on the existing conditions of the property, and identified easement conditions necessary to protect the wildlife values.

A conservation easement was jointly developed by MDFWP and The Nature Conservancy (Appendix E). The easement limits further development on the property and contains restrictions that reduce the potential for human/bear conflicts. The Nature Conservancy agreed to administer the conservation easement. Since the easement term is "perpetuity", this represents a significant contribution to the project. Generally, The Nature Conservancy requests one-time donations to establish a stewardship fund to monitor the easement. The Conservancy generally estimates stewardship costs at ten percent of the easement value (B. Hall, personal communication).

Recommendations for Future Actions

1. The mitigation project should continue to explore cooperative projects with the Flathead National Forest's Wild and Scenic River program on the north and middle fork of the Flathead River. Opportunities to protect important bear habitat, as determined by the ranking process, should be coordinated with ongoing efforts by the Forest Service. Priority sites should be identified for these areas.
2. Habitat protection strategies should be coordinated with the management plans currently being developed for other areas where human encroachment is occurring. These areas include the Mud Lake area of the Swan Front, Haskill Basin, and the Blakenship bridge area. Conservation easements to

Figure 2. General location of the Copper Creek conservation easement project.

Table 2. Summary of cooperative efforts to protect bear habitat with the Copper Creek project.

Activity	Responsible Entity	Costs
Easement Donation on 107 acres	Copper Creek Conserve (landowners)	(\$48,000) donated
Documentation Report	MDFWP - Mitigation Funds	\$ 2,200
Easement Appraisal	MDFWP - General Funds	\$ 3,200
Title Report	Copper Creek Conserve	\$ 150
Filing Fees	The Nature Conservancy	\$ 200

Easement Monitoring	The Nature Conservancy 10% of easement value	\$ 4,800/ year est.

prohibit further development in addition to educational programs will be necessary to reduce the potential for human-bear conflicts.

3. The habitat protection program should also be coordinated with the mitigation plans currently being developed for the Noranda and Asarco mining activities in the Cabinet Wilderness area. Where mitigation objectives overlap, cooperative projects should be identified and pursued.
4. Opportunities to facilitate land trades advantages to protection of bear habitat should be pursued. Plum Creek, Inc. and the Department of State Lands are currently negotiating land swaps that would involve numerous sections of land in the Swan Valley. Parcels containing important bear habitat should be identified and, where possible, facilitating the trade from Plum Creek to State Lands ownership should be attempted.

APPENDIX T

Burlington Northern Management Agreement

BURLINGTON NORTHERN ENVIRONMENTAL STEWARDSHIP AREA (BNESA) OPERATING PROTOCOL

Marias Pass from East to West Glacier

WHEREAS, in the spirit of fostering a positive working between industry, government, and conservation interests, Burlington Northern Railroad Company (BNRR) and the signatory state and federal agencies (Agencies) mutually desire to create an operationally and environmentally safe and compatible rail corridor through portions of Marias Pass, Montana;

WHEREAS, BNRR and the Agencies acknowledge the importance of balancing the interests of commerce, farmers, users of rail passenger service, natural resources and wildlife and also acknowledge the areas underlying nationally significant qualities and their importance to the region;

WHEREAS, in the past certain portions of the corridor have been sites of accidental railroad derailments causing spillage of agricultural commodities;

WHEREAS, working with appropriate officials of the United States Forest Service, the National Park Service, the U.S. Fish and Wildlife Service and the Montana Department of Fish, Wildlife & Parks, BNRR has made reasonable and aggressive efforts to remove the spilled commodities from the derailment sites and the Agencies recognize their significant progress to date;

WHEREAS, the Agencies acknowledge the efforts and investments already made by BNRR to improve train operations in this area, including, but not limited to, the installation of concrete ties and welded rail, the undercutting of ballast, the hiring of contractors to vacuum and hand-pick spilled corn, etc;

WHEREAS, BNRR has voluntarily agreed to initiate and implement special management practices to minimize the disposal of waste or garbage within the special corridor;

WHEREAS, the parties desire to establish an annual review process for this Protocol whereby the implementing measures may be modified from those attached hereto;

WHEREAS, the parties desire to minimize train / bear incidents through the implementation of the measures identified herein.

NOW, THEREFORE, BNRR and the Agencies agree as follows:

SPECIFIC POINTS

1. The rail corridor between milepost 1138, East Glacier Park and milepost 1196, Belton is designated by BNRR as a special environmental stewardship area (BNESA). Within this area, particular attention will be paid to the operation and maintenance of the railway system because of the area's importance to several threatened and endangered species, including grizzly bears, wolves, and bald eagles. Affected federal, state, county and local governments will work with BNRR in this zone to assure cooperation and necessary agreements in furtherance of the goals established for the area. The area designated by BNRR will coincide with their existing rights of way and ownership within the area. The Agencies will also support the intent of this agreement within lands which they own or administer.
2. BNRR will work cooperatively with adjoining jurisdictions in planning for emergency response to derailments, should they occur. This includes the provision of emergency equipment necessary for response to spills. Equipment will be placed so as to expedite response times and prevent materials from entering rapidly flowing bodies of water. BNRR agrees to continue to work cooperatively with adjacent agencies and Flathead and Glacier Counties in this regard.
3. Within the BNESA, wildlife biologists from the FWP will determine specific sections (zones) of track (by milepost) where hazards exist to grizzly bears or where animals are noted to be crossing in large numbers or on a frequent basis. These specific zones will be reviewed and updated each year based on evaluation of results (reduction of bears killed) and information on bear locations passed on to FWP by train engineers and crews (noted by milepost). A meeting in January or February of each year, which will be open to the public, will be held between the signers of this document to conduct the above review and modify procedures when necessary.
4. BNRR agrees to educate and instruct train crews to exercise special care in the BNESA including strict adherence to speed restrictions and sounding of train whistle within the zone so as to attempt to reduce the number of bear / train incidents in the zone. As necessary, special electrified fencing will be erected by BNRR to either keep bears away from attractants and food sources created by train derailments or to direct their movements into or away from specific areas. Fences will not be placed in a manner or location that will interfere with normal railroad operation.

Special operating procedures and protocols will be adopted by BNRR within the BNESA and shall include at a minimum:

- a. Expedited response to spills within the area.
- b. Placement of environmental spill cleanup material at key points within the BNESA to assist with spills.
- c. Strict adherence to a speed limit, within specified zone(s) which will maximize the safe operation of trains in the corridor consistent with reduction of grizzly bear mortality. Such zone(s) will be reviewed each year and established by milepost designation. Such speed will not be changed without consulting with the Agencies. The Agencies will work to achieve the cooperation of Amtrak in this effort as well.
- d. Continued use of continuous welded rail, welded turnouts and concrete ties between Belton and East Glacier. As technology improves, quality and efficiency of new track components will be pursued and utilized.
- e. Erection of fences at locations mutually agreed to and at key zones identified by FWP's personnel.
- f. Special training and educational programs for all BNRR personnel operating in the area, to be conducted by appropriate personnel from the Agencies.
- g. Control of all human waste, litter and track debris within the corridor with the goal of a total clean-up of the area and elimination of all attractants for bears.
- h. The parties agree to work with AMTRAK in controlling human waste disposal within the area, spillage of gray water and other bear attractants. BNRR will cooperate and facilitate in negotiations and discussions with AMTRAK.
- i. Special goals regarding these issues will be developed by Burlington Northern Railroad and routinely communicated to all work crews and personnel who operate within the area.

6. The Burlington Northern Environmental Stewardship Area (BNESA) will be recognized with an appropriate plaque placed at Marias Pass and with other plaques or displays placed at the Belton and East Glacier train depots. These plaques will depict a visual representation of the area, the name of the area and the goals established for the area.
7. A conservation trust fund with a minimum goal of \$1,000,000 will be established with an initial donation by BNRR. Burlington Northern Railroad will entertain requests to the BN Foundation for the funding of items discussed in this protocol as the trust fund grows to a self-sustaining amount. The remaining portion of funds shall be raised through other corporations and institutions. The trust fund will be administered by a board comprised of invited representatives from Flathead County, Glacier County, the U.S. Forest Service (USFS), the National Park Service (NPS), the Blackfeet Tribe, the Montana Department of Fish, Wildlife and Parks, (FWP), the Flathead Land Trust, BNRR, the National Wildlife Federation, the Montana Department of Highways, The Great Bear Foundation, and four citizen members residing in Flathead or Glacier Counties.

Proceeds of the trust fund can be used for, including but not limited to, the following program elements:

- a. Protection of critical grizzly bear habitat and movement corridors through the purchase of conservation easements or acquisition of fee title within the area and adjacent to the main transportation corridors, including the rail corridor and Highway 2.
- b. Placement of a qualified Grizzly Bear Management Biologist to serve as Coordinator for the area who, through implementation of a proactive management plan, would serve to educate the public and resolve bear management issues within the BNESA.
- c. Experimental research to determine the effectiveness of operational changes and new techniques in the prevention of grizzly bear mortalities.
- d. Provision of an NPS and/or USFS seasonal interpreter to travel on east and west bound AMTRAK trains (from East Glacier to Belton and return) to interpret the area as primary grizzly bear habitat and what the BNESA represents. Such services would only be provided from June 1 to October 1 of each year. The parties will cooperate to obtain Amtrak authorization for this seasonal interpreter.

8. In furtherance of the BNESA and its goals, BNRR agrees to sell and the Glacier Natural History Association (GNHA) agrees to buy both the Belton and East Glacier train depots for the sum of \$1.00. The market value of both stations will be considered in establishing the total value of this agreement. The property upon which the depots are constructed will be leased by GNHA and maintained as required by BNRR and Amtrak.

The Belton train depot will be used by GNHA for administrative and educational purposes and for such other purposes as they may deem appropriate and fit. The East Glacier Park train depot will be administered by GNHA for educational purposes and in cooperation with other entities such as the Blackfeet Nation, Blackfeet Community College, town of East Glacier and agencies and parties to this agreement. GNHA shall, unless otherwise authorized by Amtrak, agree to maintain space for AMTRAK ticket sales and service in both stations through normal methods of leasing and permitting as a condition of the sale.

9. The parties recognize that there is active litigation concerning the grizzly bear issue at Maria Pass. The parties have attempted to initiate mitigation measures before the court process began. Should the court order mitigation inconsistent with the agreements contained herein, the parties will adjust the agreement accordingly.

DENNIS G. ANDERSON Date
Division General Manager
Burlington Northern Railroad

H. GILBERT LUSK 9/24/91 Date
Superintendent Glacier National Park
National Park Service

JOEL HOLTROP 10/1/91 Date
Supervisor Flathead National Forest
U.S. Forest Service

DAN VINCENT 10/2/91 Date
Supervisor
Montana Fish, Wildlife, and Parks

J. DALE GORMAN 10/1/91 Date
Supervisor Lewis & Clark National Forest
U.S. Forest Service