

CHAPTER VI

GLOSSARY, BIBLIOGRAPHY AND APPENDICES



GLOSSARY OF TERMS

Abbreviations used in this document.-

ADC – Animal Damage Control Agency
ASQ – Allowable Sale Quantity of Timber
BE – Bitterroot Ecosystem
BEA – Bitterroot Evaluation Area
BLM – Bureau of Land Management
CMC – Citizen Management Committee
CYE – Cabinet-Yaak Grizzly Bear Ecosystem
DEIS – Draft Environmental Impact Statement
FEIS – Final Environmental Impact Statement
ESA - Endangered Species Act
EPA - Environmental Protection Agency
IDFG - Idaho Department of Fish and Game
IGBC - Interagency Grizzly Bear Committee
MDFWP - Montana Department of Fish, Wildlife, and Parks
MMBF - Million Board Feet of Timber
NCDE - Northern Continental Divide Grizzly Bear Ecosystem
PAA - Bitterroot Grizzly Bear Primary Analysis Area
RVD - Recreation Visitor Day
SE - Selkirk Grizzly Bear Ecosystem
USDA - United States Department of Agriculture
USFS - USDA Forest Service
USFWS - United States Fish and Wildlife Service
YE - Yellowstone Grizzly Bear Ecosystem

Alternatives.- Different ways that grizzly bears could be reintroduced to, or managed in the Bitterroot Ecosystem. Four alternatives were developed and considered in depth in this final EIS.

Allowable Sale Quantity.- A measure used in USFS Forest Plans. The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan. This quantity is usually expressed on an annual basis as the “average annual allowable sale quantity.”

Biodiversity (biological diversity).- The variety of life and its processes at genetic, individual, population, and species scales.

Bitterroot Ecosystem (BE).- A grizzly bear ecosystem (USFWS 1993) that is centered in the Selway-Bitterroot Wilderness Area. Historic grizzly bear range includes National Forest lands surrounding this wilderness and the Frank Church-River of No Return Wilderness Areas on both

sides of the Salmon River. The BE is one of the largest blocks of Federal land remaining in the lower 48 United States, with the Selway-Bitterroot and Frank Church-River of No Return Wilderness Areas as its core.

Bitterroot Evaluation Area (BEA).- A 5,500 square mile area within the BE (see Figure 3-6) that was delineated as a result of the Grizzly Bear Recovery Plan (1982) direction to evaluate and ascertain the suitability of the Bitterroot Ecosystem as a grizzly bear recovery area. The BEA includes the Selway-Bitterroot Wilderness Area, the Frank Church-River of No Return Wilderness and roadless areas south of the Selway-Bitterroot and north of the Salmon River. The BEA extends north of the Selway-Bitterroot Wilderness and includes mainly roadless areas to the crest of the Mallard Larkins Mountains in the North Fork of the Clearwater River drainage.

The eastern boundary is formed by the eastern edge of the Selway-Bitterroot Wilderness and the Fish Creek Road on the Lolo National Forest. The western boundary is drawn along the transition of roadless to roadless areas on the Clearwater and Nez Perce National Forests (Davis and Butterfield 1991). This area is the core of grizzly bear habitat in the BE.

Bitterroot Valley Exclusion Area.- Includes private lands lying within the experimental population area in the Bitterroot Valley, Montana, and outside the Bitterroot Forest boundary south of U.S. Highway 12 to Lost Trail pass.

Chronic Problem Grizzly Bears.- Grizzly bears that have been confirmed to have depredated on domestic animals at least once after an initial depredation and relocation because of depredations on domestic animals.

Citizen Management Committee (CMC).- The proposed Special Rule for the preferred alternative (Alternative 1- Restoration of Grizzly Bears as a Nonessential Experimental Population With Citizen Management) would authorize a 15 member Citizen Management Committee to be appointed by the Secretary of Interior in consultation with the governors of Idaho and Montana, and the Nez Perce Tribe. This committee would be authorized management implementation responsibility by the Secretary of Interior, in consultation with the governors of Idaho and Montana for the Bitterroot grizzly bear experimental population. The Committee shall be composed of 15 members serving 6-year terms. Appointments may initially be of lesser terms to ensure staggered replacement. Membership shall consist of seven individuals appointed by the Secretary of the Interior based upon the recommendations of the Governor of Idaho, five members appointed by the Secretary of the Interior based upon the recommendations of the Governor of Montana, one member representing the U.S. Forest Service appointed by the Secretary of Agriculture or his/her designee, and one member representing the U.S. Fish and Wildlife Service (Service representative) appointed by the Secretary of the Interior or his/her designee, and one member representing the Nez Perce Tribe appointed by the Secretary based on the recommendation of the Nez Perce Tribe. Members recommended by the Governors of Idaho and Montana shall be based on the recommendations of the interested parties and shall include at least one representative each from the appropriate State fish and wildlife agencies. If either Governor fails to make recommendations, the Secretary (or his/her designee) shall accept

recommendations from interested parties. The CMC would consist of a cross-section of interests reflecting a balance of viewpoints, be selected for their diversity of knowledge and experience in natural resource issues, and for their commitment to collaborative decision making.

The CMC would be selected from communities within and adjacent to the recovery and experimental population areas. The CMC would continue until the recovery objectives were met and the Secretary of Interior completed delisting. The specific duties and responsibilities of the CMC are listed in Appendix 13, the Special Rule.

Compensation.- Payment to owners of livestock that had livestock killed or maimed by grizzly bears to compensate for the lost monetary value of the livestock. There would be no federal compensation program, but compensation from private funding sources could occur.

Conservation.- As defined by the Endangered Species Act: to use, and the use of all methods and procedures which are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to (the Act) are no longer necessary.

Consultation (interagency).- A process required by Section 7 of the Endangered Species Act whereby federal agencies proposing activities in a listed species habitat confer with the U. S. Fish and Wildlife Service (or National Marine Fisheries Service) about the impacts of the activity on the species. Consultation may be informal, and thus advisory, or formal, and thus binding.

Critical Habitat.- As defined by the Endangered Species Act: the specific areas within or outside the geographical areas occupied by a species, at the time it is listed, on which are found the physical or biological features essential to the conservation of the species, and which may require special management considerations or protection. Critical habitat can not be designated for nonessential experimental populations.

Cumulative Effects / Impacts.- The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Delist.- To remove a species, subspecies, or population from the federal list of threatened species and endangered species and subsequent protection of the Endangered Species Act. This action, in effect, places the species, subspecies, or population under management authority of the states or tribes. Species can be delisted if they have gone extinct, recovered, or the original listing was in error.

Depredation.- The confirmed killing or maiming of lawfully present domestic livestock on federal, state, tribal, or other public lands, or private lands by one or more grizzly bears, accompanied by the likelihood that additional livestock will be killed or maimed by grizzly

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bears. The USFWS, ADC, or USFWS-authorized state or tribal agencies will confirm killing or maiming of domestic livestock.

Dispersal.- The act of leaving a birth area or home range and moving to a new area for an extended period of time.

Domestic Animals.- Any animal purposely raised (fed, cared for, and sheltered) by humans and usually dependent upon humans for its survival. This would include livestock, food/fiber animals, captive game animals, fowl, working animals, guarding animals, and pets.

Ecosystem.- An interacting set of organisms and their environment that persist, sustain life, and are bounded (at various scales), naturally of for study and management purposes.

Ecosystems (grizzly bear).- Large areas (several hundred square miles) that currently harbor a population of grizzly bears, or are thought to be suitable for reintroducing and recovery of grizzly bears.

Effects / Impacts.- Effects (or impacts) may be direct, which are caused by the action and occur at the same time and place, or indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

Endangered Species.- Any species which is in danger of extinction throughout all or a significant portion of its range and which is formally listed as endangered under the Endangered Species Act.

Endangered Species Act of 1973, as amended. 16 U.S. C. 1531 et. seq. (ESA) - Congressional Act which provides for the listing and protection of endangered and threatened fish, wildlife, and plants.

Environmental Impact Statement (EIS).- A document prepared by a federal agency proposing a major action, as mandated by the National Environmental Policy Act, that describes the environmental impacts of the action, alternative actions, the preferred alternative, a listing (summary) of public comments, and a Record of Decision.

Experimental Population.- A 1982 amendment to the Endangered Species Act established the experimental population designation [Section 10(j)] and defined an experimental population as:

“... any population (including any offspring arising solely therefrom) authorized by the Secretary for release under paragraph (2), but only when, and at such times as, the population is wholly separate geographically from nonexperimental populations of the same species.” The experimental population designation denotes more flexible management for introduced endangered species or threatened species.

Experimental Population Area.- Designation of an experimental population must include a description of the area in which such population will be found and where it will be identified as experimental. This establishes, in effect, the experimental population area, in which the experimental population rules apply. Outside those boundaries the grizzly bear in the lower 48 states is protected as a threatened species. The experimental population area must be geographically separate from areas containing existing grizzly bear populations. The boundaries of the Bitterroot Grizzly Bear Experimental Population Area are described in Chapter 2 under Alternative 1.

Experimental Population Rule (Special Rule, 10(j) Rule).- Designation of an experimental population includes the development of special rules to identify geographically the location of the experimental population and identify, where appropriate, procedures to be utilized in its management. The special rule for each experimental population is developed on a case by case basis. Development of the special rule includes publication of the proposed regulation in the *Federal Register*, public comment on the proposed regulations, and publication of the final regulations prior to reintroduction of an experimental population.

Extirpate.- The local disappearance of a species, as opposed to extinction, which is global disappearance.

Federal Lands.- Areas under the administration of a federal agency such as the USDA Forest Service, U. S. Fish and Wildlife Service, Bureau of Land Management, and National Park Service.

Federal Register.- A United States government publication where all major federal actions, rules, and regulations are announced.

Food-Conditioned (bear).- A bear that has learned to associate the presence of people and their activities or developments with food and may routinely seek food from these areas.

Forest Plan.- A document prepared under the National Forest Management Act by each national forest that generally describes how the resources in the forest will be managed for a 10-15 year period. The plans are subject to the National Environmental Policy Act and are accompanied by Draft and Final Environmental Impact Statements and a Record of Decision.

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Fragmentation (of habitat).- The dividing of large continuous areas of habitat by disturbances (usually man-made) in such a manner that the disturbed areas dominate that landscape and remnants of undisturbed habitat are surrounded by modified habitat.

Grizzly Bear Recovery Plan.- A document prepared by a team of individuals with expertise regarding the biological and habitat requirements of the grizzly bear, outlining the tasks and actions necessary to recover the species within parts of its former range in the lower 48 United States. The original plan was completed in 1982. The revised Recovery Plan was approved September 10, 1993. The Bitterroot Ecosystem Recovery Plan Chapter - Supplement to the Grizzly Bear Recovery Plan was finalized and signed on September 11, 1996.

Habituated (bear).- A bear that has little fear of humans, their activities, or developments, and largely ignores people if they do not get too close.

Harass.- According to the Endangered Species Act Regulations, harass is defined as "intentional or negligent act or omission which creates the likelihood of injury to the wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to breeding, feeding, or sheltering" (50 CFR 17.3).

Harassment Permitted under the Special Rule 10(j) (See Appendix 13).- For the purposes of this FEIS, permitted harassment and pursuing will be limited to pursuing adult grizzly bears (>6 months old) on foot, horseback, or nonmotorized or motorized vehicle (without approaching closer than 20 feet); discharging firearms or other projectile launching devices in proximity to but not in the direction of grizzly bears; throwing objects in the general direction of but not at grizzly bears; or making any loud noise in proximity to grizzly bears. The basic intent is to allow grizzly bears to be scared or chased from the immediate area without causing any physical injuries. The experimental population rule for the preferred alternative in this FEIS indicates that any livestock owner may be issued a permit by the U.S. Fish and Wildlife Service, the Idaho Department of Fish and Game, or the Montana Department of Fish, Wildlife and Parks and appropriate Tribal authorities to harass grizzly bears found in the area defined as the Bitterroot Grizzly Bear Experimental Population Area that are actually harming or killing livestock, provided that all such harassment is by methods that are not lethal or physically injurious to the grizzly bear and such harassment is reported to proper authorities within 24 hours as to date, exact location, and circumstances.

Home Range.- An area where an animal spends about 90% or more of its time during a specific time, such as winter, summer, or year-round.

Incidental Take.- (see below for full definition of "take" for this FEIS). The taking (killing, wounding, maiming, injuring, or physically harming) of grizzly bears, that which results from an otherwise lawful action but was not the purpose of the action. Within an experimental population area all grizzly bears incidentally taken under the conditions permitted by the

experimental population rule by agencies or the public will not be considered take under the Endangered Species Act. Any and all grizzly bears taken outside the provisions of the experimental population rule would be considered take under the Endangered Species Act.

Interagency Grizzly Bear Committee (IGBC).- A group of high-level administrators that represent the federal and state agencies involved in grizzly bear recovery. The IGBC coordinates the agencies efforts in implementing the Grizzly Bear Recovery Plan.

Land-Use Restrictions.- Restrictions on human activities on public lands. A wide variety of such restrictions are used for a wide variety of purposes. Relatively few such restrictions are required to successfully recover grizzly bear populations unless human-caused mortality of grizzly bears is unusually high. Examples of the types of restrictions that have been used by natural resource managers to assist in grizzly bear population management are seasonal road-trail closures to reduce human access to critical occupied grizzly bear habitat and prohibition on certain types of motorized access. Land-use restrictions also include restrictions on certain human activities in the habitat of an endangered or threatened species in order to comply with Section 7 of the Endangered Species Act of 1973.

Linkage (habitat or ecosystem).- A land classification scheme in which large, core protected areas (such as wilderness or national parks) are connected to each other by areas with similar or slightly lower protection standards. Linkage zones are combinations of landscape structural factors that allow wildlife to move through, and live within, areas influenced by human actions.

Listed species.- A species that has been classified as threatened or endangered by the USFWS under the Endangered Species Act.

Livestock.- Cattle, sheep, horses, and mules.

Metapopulation.- As originally developed, a population composed of smaller distinct local populations that occasionally went extinct but were re-established by members dispersing from the other local populations. Modern connotations embrace the more general idea of populations that are separated from one another with varying degrees of connectivity and chance of extinction. Wells and Richmond (1995) define it as, “a set of spatially disjunct populations, among which there is some immigration.”

Minimum Viable Population.- A MVP for any given species is the smallest isolated population having a given probability of survival for a given period of time despite the foreseeable effects of demographic, environmental, and genetic stochasticity, and natural catastrophes.

National Environmental Policy Act (NEPA).- An Act passed by Congress in 1969 which is the basic national charter for protection of the environment. NEPA established a process that

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requires consideration of environmental consequences for federal actions. Procedures ensure that high quality environmental information is available to public officials and citizens before federal decisions are made and actions are taken. Specifically, the responsible federal official must submit a detailed report on "major federal actions significantly affecting the quality of the human environment" prior to taking major federal actions. The EIS is a primary means of meeting NEPA requirements.

Nonessential.- Under the provisions of the 1982 amendment of the ESA [Section 10(j)] which authorizes reintroduction of experimental populations, experimental populations must be designated either "essential" or "nonessential." "Nonessential" refers to an experimental population whose loss would not be likely to appreciably reduce the likelihood of the survival of the species in the wild.

Nonexperimental Grizzly Bears.- Grizzly bears receiving all protections of the Endangered Species Act, as amended, as distinguished from grizzly bears that are members of an experimental population.

Nuisance Bear Guidelines.- Interagency Grizzly Bear Committee Nuisance Grizzly Bear Management Guidelines (IGBC 1986). Guidelines endorsed by the IGBC that address management options to deal with nuisance grizzly bears (see Appendix 15).

Omnivorous.- Eating both animals and plants.

Open Road.- A road with no motorized access restrictions.

Open Road Density.- Length of two-wheel drive accessible roads with unrestricted public access per given amount of area (i.e., miles of open road/square mile).

Primary Analysis Area (PAA).- The geographic area considered affected by a major federal action and thus receiving detailed evaluation of the potential effects of the action in this FEIS. The Bitterroot Grizzly Bear PAA is the area potentially affected by grizzly bear recovery in the BE, and the area in which a grizzly bear population is expected to have a measurable environmental impact. The approximately 16,686,596 acre (26,072 mi²) PAA is shown in Figure 3-1.

Private Land.- Areas owned by entities other than local, county, state, and federal governments, including individual home sites, farms, ranches, and industrial timberlands.

Preferred Alternative.- The "agency's preferred alternative" is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors, and which meets the purpose and need of the NEPA document.

Proposed Action (Proposal).- The proposed action or proposal exists at that stage in the development of an action when an agency subject to the Act (NEPA) has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated.

Public Land.- Lands under administration of federal agencies including but not limited to the National Park Service, USDI Fish and Wildlife Service, USDA Forest Service, USDI Bureau of Land Management, U.S. Department of Energy, and U.S. Armed Forces.

Recovery Goals.- A specific set of targets identified in a recovery plan such that when a listed species reaches those targets they will be considered recovered. These targets include both population variables and regulatory mechanisms to assure a sustained recovery. The recovery goals for the BE are outlined in the BE Recovery Plan Chapter (USFWS 1996).

Recovery Plan.- A document prepared by the USFWS for listed species describing why they were listed, their present status, the need for recovery, steps to be taken to achieve recovery, monitoring methods to assess recovery, and the point at which the monitoring indicates the species has recovered.

Recovery Zone.- The area in which recovery parameters are monitored. Alternatives 2 and 4 have recovery zones identified. For these two alternatives, this term carries a list of restrictions affiliated with fully threatened status.

Recovery Area.- The Special Rule for reintroduction of an experimental population (Alternative 1) identifies the BE Recovery Area (instead of a recovery zone) as the area where recovery would be emphasized. This term carries a list of restrictions as defined in the special rule for the experimental population.

Reintroduction.- The release of animals into an area that was part of their original geographic range, but from which they have declined or disappeared, for the purpose of establishing a new wild population.

Restricted Road.- A road in which the use of motorized vehicles is restricted seasonally or yearlong.

Roadless Areas.- Areas of western national forests greater than 5,000 acres that do not contain any roads and have been inventoried by the USFS in relation to their suitability as wilderness.

Rule (proposed, final).- Regulations developed by a federal agency which are published in the *Federal Register* for public comment, or as adopted.

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Scientific Committee.- Under Alternative 4 (Reintroduction of a Threatened Population with Full Protection of the ESA) a ten member Scientific Committee would be appointed by the Secretary of the Interior in cooperation with the National Academy of Sciences to define needs for additional research, develop strategies for reintroduction of bears, implement reintroduction of bears, and monitor results of the program.

Section 7(a)(2) of the ESA.- This ESA section requires that; "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (herein after in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action..." In nonessential experimental population areas, the Section 7(a)(2) requirements of ESA only apply inside National Parks and National Wildlife Refuges. Any potential land-use restrictions necessary for species recovery in other areas must be established as part of the experimental population rule.

Take.- The ESA defines "take" as: To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. See above definition of Harass. The experimental population rule (Special Rule) defines "take" as it would be applied under Alternative 1, the preferred alternative (see Appendix 13).

Threatened Species.- A threatened species is defined in the ESA as one that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Toxicants.- A poison or poisonous substance.

Ungulate.- A hoofed animal such as deer and elk.

Viable Population of Grizzly Bears.- The number, distribution, and persistence of grizzly bears considered necessary for a grizzly bear population to have a reasonable likelihood of survival for the foreseeable future. Grizzly bears in the BE will be viable when monitoring efforts indicate that recruitment and mortality are at levels supporting a stable or increasing number of bears, and reproducing females are distributed throughout the recovery area. See the BE Chapter of the Recovery Plan (USFWS 1996) for specific recovery goals (Appendix 14).

Wilderness Areas.- Areas in the National Wilderness Preservation System that were established by the U. S. Congress and are managed under the provisions of the Wilderness Act.

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APPENDIX 1. CHRONOLOGY OF GRIZZLY BEAR RECOVERY IN THE BITTERROOT ECOSYSTEM

Summary of Grizzly Bear Status and Recovery in the Bitterroot Ecosystem

- 1806 Grizzly bears were abundant in the Bitterroot Ecosystem (BE). Lewis and Clark killed at least 7 grizzly bears including 1 female and 2 cubs and numerous black bears while camped near present-day Kamiah, Idaho. With the assistance of the Nez Perce Indians, they correctly identified grizzly bears and black bears as 2 separate species.
- 1850 Extermination of ungulates and large predators began, including bison, wolves, and grizzly bears.
- 1900 Wild ungulate populations and large predators were decimated by unregulated harvest and settlement.
- 1920 For several years, as many as 25-40 grizzly bears per year were being killed in the BE by trappers and hunters.
- 1932 Last verified grizzly bear killed in BE.
- 1946 Last good evidence of grizzly bear track in the BE indicated by USFS District Ranger at Powell Ranger Station.
- 1950 Some scattered but unverified reports of potential grizzly bear sightings in the BE.
- 1975 Grizzly bear listed as threatened under the Endangered Species Act. Bitterroot Ecosystem recognized as one of the 3 recovery areas, along with the Bob Marshall and Yellowstone areas.
- 1979 Habitat research conducted to identify quantity and quality of grizzly bear foods in one study area in the Selway-Bitterroot Wilderness.
- 1982 Grizzly Bear Recovery Plan finalized. Bitterroot Ecosystem identified as an Evaluation Area to determine if grizzly bears still existed there, and if the habitat was of good enough quality to provide for grizzly bear population recovery.
- 1985 Research study to classify observation reports, and conduct ground searches for grizzly bears in the BE was finalized.
- 1985 Research study that evaluated grizzly bear habitat quality in the Selway-Bitterroot Wilderness was finalized.
- 1985 Further study initiated using landsat imagery and including all of the Bitterroot Evaluation Area (BEA), to better analyze quantity and quality of grizzly bear habitat.
- 1988 Continued efforts to verify grizzly bear presence in the BEA through quick response to observation reports and aerial verification efforts.
- 1990 Remote sensor camera study conducted to attempt to photograph and determine grizzly bear presence in the BEA.
- 1991 Continued attempts to photograph grizzly bears using remote cameras and to verify observation reports.
- 1991 Habitat study completed and researchers concluded the BEA was suitable habitat for grizzly bears.

Appendix 1 - Chronology of Bitterroot Grizzly Bear EIS

- 1991 Technical Review Team of independent bear biologists was organized to review available habitat data. The Team determined that the BEA could support between 200-400 grizzly bears.
- 1992 The Interagency Grizzly Bear Committee (IGBC) reviewed the determination and recommendations of the Technical Review Team and authorized the preparation of a Recovery Plan for the Bitterroot Ecosystem to include as a chapter of the Grizzly Bear Recovery Plan. An interagency team of biologists was organized to develop the plan.
- 1992 A Citizens Involvement Group (CIG) was organized to help guide the development of the Bitterroot Ecosystem Grizzly Bear Recovery Chapter. The CIG began with 50 people and ended in 1993 with 30 members.
- 1993 Revised Grizzly Bear Recovery Plan completed.
- 1993 Bitterroot Ecosystem Subcommittee branched off from Northwest Ecosystem Subcommittee to allow decision makers more involvement in planning and local input.
- 1993 Several public meetings were held to obtain information for the BE Recovery Chapter.
- 1993 The Idaho Legislature authorized the formation of a Grizzly Bear Oversight Committee for Idaho, consisting of the chairs of the Idaho Senate and House Resource committees, and representatives each from timber, mining, livestock, recreation, and wildlife. Committee held public meetings in Grangeville and Orofino.
- 1993 An interagency task force, working with a citizen's involvement group drafted a chapter on grizzly bear recovery in the Bitterroot Ecosystem. In response to public comments from local communities of central Idaho and western Montana, several changes were made in the final chapter. The BE Recovery Plan final draft was appended as a chapter to the Revised Grizzly Bear Recovery Plan, and listed for comment in the Federal Register. It called for an Environmental Impact Statement (EIS) to evaluate a full range of recovery alternatives.
- 1994 Open houses to provide public information on the draft BE Recovery Plan Chapter were held by the USFWS, CIG, interagency team, and legislative oversight committee in Hamilton and Missoula, MT, Salt Lake City, UT, and Lewiston, Grangeville, and Orofino, ID. USFWS recommended using an "nonessential experimental population" designation as identified in Sec. 10(j) of the ESA and releasing 4-6 bears per year for 5 years.
- 1994 IGBC authorized development of an Environmental Impact Statement to identify alternatives and issues, recovery area boundaries, and environmental consequences of implementing the BE Recovery Chapter.
- 1995 The USFWS continued public involvement and assembled an interdisciplinary team to begin the EIS process. Team members include specialists from the USFWS, USFS, IDFG, MDFWP, and the Nez Perce Tribe. Dr. Chris Servheen of the Fish and Wildlife Service is the EIS team leader.
- 1996 Bitterroot Ecosystem Recovery Plan Chapter - Supplement to the Grizzly Bear Recovery Plan finalized. Chapter signed 9/11/96.
- 1996 Interagency EIS Team continues to prepare draft EIS, and coordinate with agency partners.

Chapter 6 - Appendix 1

- 1997 Proposed Special Rule 10(j), Establishment of a Nonessential Experimental Population of Grizzly Bears in the Bitterroot Area of Idaho and Montana, is published in Federal Register for public review and comment.
- 1997 Draft EIS is released for public review and comment. Public comment period including 7 public hearing extended to 90 days.
- 1998 Content analysis of public comments on the DEIS, and preparation of Final EIS.
- 1999 Internal review of draft Final EIS, preparation of Final EIS, final naming of FEIS.
- 2000 Release FEIS and Record of Decision to public. Implement selected alternative.

Chronology of the Bitterroot Ecosystem Grizzly Bear EIS

See Chapter 5 “Consultation and Coordination in Development of the Proposal” for more information on the chronology of the EIS.

- 7/94 IGBC authorized the development of an EIS to identify issues and alternatives, recovery zone boundaries, environmental consequences, and other information necessary to recover grizzly bears.
- 1/95 Notice of Intent to prepare an EIS published in the Federal Register (Vol 60, No 5).
- 1/95 The USFWS assembled an interdisciplinary team to prepare the draft EIS. Team leader selected. Team members include specialists from the USFWS, USFS, IDFG, MDFWP, and the Nez Perce Tribe.
- 2/95 Core EIS team meeting. Develop initial EIS schedule.
- 5/95 BES meeting at USFS Powell Ranger District. Received 80 comments on NOI in Federal Register. Decide to contract with Responsive Management for survey of social attitudes regarding grizzly bear recovery in the BE.
- 5/95 Brochure developed by agencies, industry, and environmental groups reviewing questions and concerns about grizzly bear recovery in the BE.
- 5/95 Three preliminary alternatives were identified and published in a Scoping of Issues and Alternatives brochure, and mailed to 1100 people.
- 6/95 Formal scoping for issues and alternatives begins with notice in Federal Register for a 45-day comment period.
- 6/95 Citizens Involvement Group met to produce input on alternatives and issues.
- 7/95 Seven public open houses were held to identify issues and alternatives for the EIS, and over 300 people attended. Scoping sessions held in Grangeville, Orofino, Boise, ID, Hamilton, Missoula, Helena, MT, and Salt Lake City, UT.
- 7/95 Public survey to determine public attitudes toward grizzly bear recovery in the BE was finalized.
- 7/95 End 45-day public comment period on scoping of issues and alternatives.
- 7/95 Public comment period extended 30 days to August 21.
- 8/95 Issue scoping period closed. Written comments on the preliminary issues and alternatives were received from over 3,300 individuals, organizations, and government agencies.
- 9/95 Content analysis of public comments on scoping of issues and preliminary alternatives completed.

Appendix 1 - Chronology of Bitterroot Grizzly Bear EIS

- 9/95 Scoping results summarized in the document, "Summary of public comments on the scoping of issues and alternatives for grizzly bear recovery in the Bitterroot Ecosystem" (FWS 1995). Document distributed.
- 11/95 EIS Team meeting to identify contract descriptions and assign remaining writing duties.
- 11/95 Two new team members added after resignation of team leader.
- 1-10/96 Preparation of draft EIS. Team meetings held in March, May, July, August, and October to prepare document.
- 8-12/96 Draft DEIS completed and released to USFWS and then to agency partners (USFS, IDFG, MDFWP, Nez Perce Tribe) for internal review and comment.
- 1-2/97 Comments from USFWS and agency partners reviewed and incorporated into draft EIS.
- 2/97 Final draft of DEIS sent to Region 6 and Washington Office, USFWS for final review and comment.
- 3/97 Comments from USFWS Region 6 and Washington Office incorporated into draft EIS.
- 7/97 DEIS completed, released, and public review requested during a 90-day public comment period. Public comment period begins July 11 and ran through December 1, 1997.
- 7/97 Endangered Species Act, Proposed Rule 10(j) for Establishment of a Nonessential Experimental Population of Grizzly Bears in the Bitterroot Area of Idaho and Montana published in the Federal Register on July 2. Comment period July 11 through December 1.
- 9/97 9/30 - Comment period deadline extended from September 30 to November 1, based on numerous requests for more time to prepare comments.
- 10/97 Public hearings/open houses to gather public comments on the DEIS and Proposed Special Rule held in seven communities on the perimeter of the Bitterroot area. Approximately 1400 people attended these hearings and 293 individuals testified. The dates and locations for the public hearings were as follows: October 1, 1997: Challis, Idaho and Hamilton, Montana; October 2, 1997: Missoula, Montana and Lewiston, Idaho; October 3, 1997: Boise, Idaho and Helena, Montana; October 8, 1997: Salmon, Idaho.
- 11/97 Comment period deadline extended from November 1 to December 1, following a request from a member of the Idaho Congressional delegation
- 12/97 December 1 - Public Comment period ended.
- 12-3/98 Content Analysis of public comments on the Draft EIS and Proposed Special Rule. Report entitled, "Summary of Public Comments on the Draft EIS for Grizzly Bear Recovery in the Bitterroot Ecosystem" and Executive Summary Report released to public in April 1998.
- 4-12/98 EIS Team prepares draft Final EIS for internal review. EIS Team prepares draft Final EIS for internal review. Private contractor prepares Bitterroot Population Viability/Habitat Analysis for Congressionally-mandated study to be included in FEIS. Numerous EIS Team meetings occurred to write/review FEIS. EIS Team finalizes formal consultation with NMFS and internal review of USFWS Biological Assessment.
- 2/99 Internal USFWS review of draft Final EIS.
- 5/99 FWS internal review comments incorporated into FEIS.
- 6/99 Final internal review of final draft FEIS.
- 8-9/99 Comments received on final draft. Comments incorporated into final surname copy FEIS.
- 10/99 Final FEIS sent to Denver Region and Washington, D.C. offices for review and surname.
- 11/99 Final comments incorporated and FEIS sent to Denver Region and Washington Office for final review and surnaming process.
- 1-2/00 Final comments incorporated, and FEIS sent to printer.

3/00 Notice of Availability published in Federal Register, and FEIS released to public for 30-day final review period (March 24 through April 24). Comments will be reviewed, and a Record of Decision will be published and released to the public.

APPENDIX 2. TECHNICAL SUMMARY: GRIZZLY BEAR BIOLOGY AND ECOLOGY

Biology

Taxonomy and Evolution. -- The North American brown bears (*Ursus arctos*) include 2 subspecies; the grizzly bear (*Ursus arctos horribilis*) and the Kodiak bear (*Ursus arctos middendorffii*) (Rausch 1963). Recent taxonomic classifications consider the North American Brown Bears and the Eurasian Brown Bear to be the same species.

The evolutionary history of the family *Ursidae* encompasses a 20 million year period. The Etruscan bear (*Ursus etruscus*) which lived in the forests of Asia about 2 million years B.P. was ancestor to present day bears (Herrero 1972). Changes in environment from warm forest to a treeless landscape following repeated glacial periods gave rise to the cave bear (*Ursus spelaeus*) in Europe and the brown bear in Asia. Around 50,000 B.P. brown bears crossed the treeless Bering Land Bridge and spread across North America (Churcher and Morgan 1976). Brown bears occurred in North America south of the ice sheet during the late Wisconsinan (Kurten 1968). Archeological evidence suggests that the brown bear expanded its range into eastern North America by 11,000 B.P., however they were probably never abundant east of the Mississippi River.

A major trend in the early evolution of bears was the development of adaption that allowed a carnivore to feed relatively efficiently on vegetation (Kurten 1968). Bears began as small-bodied carnivores but eventually became large-bodied omnivores (Herrero 1985). The brown bear specifically evolved away from forest adaptations toward characteristics which allowed to bear to utilize a more open habitat. Brown bears developed morphological, physiological, and behavioral adaptations which enabled it to exploit the newly developed tundra-like habitat following glacial periods.

Physical Characteristics. -- Brown bears are large, plantigrade animals. There is considerable variation in size and color of local populations and individuals sometimes leading to problems in classification. Guard hairs are often silver-tipped to varying degree hence the name "grizzly." The muscle structure has developed for strength, quickness, and speed. Grizzly bears are often distinguished from black bears by their humped shoulders, longer and curved claws, smaller ears, and a concave face profile.

Grizzly bears are sexually dimorphic in body size with males considerably larger than females. In addition to variations between sexes, there is considerable variation in body size and weight between geographic regions. Weight data from various studies are available in IGBC (1987). There appears to be a clinal variation in weight with bears in coastal regions being heavier than

bears in the more interior regions of the continent (Bunnell and Tait 1981). Rausch (1963) noted that the larger size of coastal bears appeared to be related with the distribution of salmon and the luxuriant coastal vegetation. In all brown bear populations males are heavier than females (Glenn 1980).

The remaining grizzly bears in the lower 48 states are found in the interior regions. Blanchard (1986) analyzing data from Yellowstone National Park found adult (5+ years) male bears weighed an average of 423 lbs. and adult females 298 lbs. In the NCDE adult (5+ years) males averaged 384 lbs. and adult females averaged 243 lbs. (Aune et. al. Unpub data). Whole carcass weights from throughout Montana were 463 lbs. for adult males and 284 lbs. for adult females (Aune et al. Unpub. data).

Grizzly bears undergo an annual cycle in weight, gaining in summer and losing during the winter during denning (Pearson 1975, Kingsley et al. 1983). Grizzly bears can gain weight at the rate of 0.79 to 2.2 lbs./day during the spring to fall season (Blanchard 1983, Bunnell and Hamilton 1983). Blanchard (1986) found that males gained weight faster than female bears during the forage season. Kingsley et al. (1983) reported that male bears loose 22% of their fall weight over winter while females loose 40%. Blanchard (1986) found that males lost a greater percent of body weight over winter than adult females (18% and 8% respectively). Mature females cycle more weight annually than males since they are liable for the energy cost of reproduction (Kingsley et al. 1983).

Reproduction. -- There is clear evidence that the female grizzly bear exhibits delayed implantation (Craighead and Mitchell 1982). Although mating occurs during spring (generally May and June), and estrous may last 30 days, blastocyst do not implant in the uterine wall until autumn. Implantation is affected by the physical condition of the female. Grizzly bears are polygamous; a female may mate with several males during a single breeding period. Female grizzly bears are not sexually mature until age 4 or 5 and exhibit prolonged care of their young. Generally, females attend to their litter for 2 years. Litter size may vary from 1-4 cubs although 2 cubs is most common. Grizzly bears may live to be 40 years old (Storer and Tevis 1955).

Mortality. -- Grizzly bear mortality is categorized as either natural or man-caused. The extent of natural mortality is difficult to document although parasites and disease do not appear to contribute significantly. On occasion, bears do kill each other. Human-caused mortality tends to occur in one of several categories including: (1) Control actions - A grizzly bear legally killed or removed by state or federal government officials to defend against damage to property or potential injury to humans; (2) 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; (3) Vehicle Collision - A grizzly bear accidentally killed when struck by a train or motorized vehicle; (4) Unknown - A grizzly bear mortality caused by humans where the specific cause of death could not be determined; (5) Legal, Defense of Life - A grizzly bear

legally killed by a citizen acting in self-defense or in the defense of others; (6) Legal, Hunting - A grizzly bear legally harvested during a legal grizzly bear hunting season.

In the absence of legal hunting, illegal mortality and control actions are the major sources of mortality in North America (Peek et al. 1987, Brannon et al. 1988). However, natural mortality in some areas may be higher than expected (Mace et al. 1996).

Ecology

General. -- The population sizes and distribution of grizzly bear are a product of historical and current factors. Before human settlement, continental and local populations were influenced solely by natural factors. The historical distribution of brown bears shows that this species was able to exploit a wide variety of niches; from open dry prairie or desert habitats to moist mountain habitats. Human occupation and settlement have added additional factors that limit population growth and have influenced the distribution of grizzly bears. Post human settlement, human-induced mortality coupled with conversion of habitat has most directly limited population size and distribution.

The biological needs of the grizzly bear are fairly well understood from historical records and current research activities. Factors that limit population size and distribution of grizzly bears by contributing to elevated natural or human-caused mortality are a consequence of the bears' need for space and habitat conversion.

Space. -- Grizzly bears are a wide-ranging species and mobility is an important aspect of grizzly bear biology (Compendium p. 31). As such grizzly bear populations require large tracts of suitable habitat wherein individuals can move freely and establish home ranges. The grizzly has been termed a "wilderness species", although the species lives in areas not legally designated as wilderness or national park.

Rate of movement per day varies among ecosystems, individuals, and seasons. Grizzly bears are known to make abrupt long-distance movements quickly such as a 33.5 mile foray in 62 hours (Craighead 1976).

The home range size of grizzly bears depends on many factors such as the juxtaposition of seasonal habitats, population density, presence or absence of ecocenters, age and reproductive status, and social relationship with other members of the population (IGBC 1987, Nagy and Haroldson 1989). Home range size may also vary among years in relation to food abundance and may enlarge as the animal ages (Blanchard and Knight 1991). Generally males have larger home ranges than females. It is advantageous for male ranges to include as many female ranges as possible, and it is advantageous for females to rear young in relatively small, areas with maximum security and food resources. Home range size also varies by habitat zone with larger ranges in the drier habitats relative to mesic habitats. The degree of home range overlap is a

function of population density, social hierarchies, and distribution of food resources. Although range perimeters often overlap, use of core areas within ranges are often exclusive, especially for females (IGBC 1987, Mace and Waller 1997). Subadult males generally disperse from area of the maternal home range whereas females often establish ranges near their mother (IGBC 1987, Craighead and Mitchell 1982).

Habitat Conversion. -- There is very little overlap between occupied grizzly bear habitat and high human densities primarily because of niche differences and human intolerance (Mattson 1990). Humans have eliminated bears from many areas resulting in unoccupied but suitable habitat.

Grizzly bears are precluded by humans from using habitats in several ways. Large-scale habitat conversion to human settlement, hydroelectric development, and agriculture have reduced bear use of many inter-mountain valleys. Timber harvest and fire control policies have also contributed to a large-scale conversion of habitat by altering successional stages.

Forest roads affect grizzly bears in several ways (McLellan and Shackleton 1987, Mace et al. 1996). Bears may be either temporarily or permanently displaced from habitats near roads. Permanent displacement results in loss of habitat. Grizzly bears are also vulnerable to mortality in areas with roads.

Impacts to grizzly bear in areas where livestock are grazed include direct mortality through control actions and illegal kills, habitat loss or modification, displacement, or direct competition (IGBC 1987). Historically, conflict with livestock was a major cause of population decline or local extirpation throughout the bears former range (Storer and Trevis 1955). Depredation behavior is believed to be a learned process as not all bears in proximity to grazing allotments kill livestock.

Habitat Selection and Food Habits. -- Grizzly bear currently occupy coniferous forest habitats in the Rocky Mountain Cordillera. Aside from National Park and wilderness settings, grizzly bears are generally confined by human settlement to mountain and foothill habitats, and are not common in large inter-mountain valleys.

The grizzly bear is an omnivore, and as such displays great flexibility in its use of habitats and foods. Grizzly bears are opportunistic feeders and will scavenge or prey on most available prey species. Where prey is less abundant, vegetal matter, roots, and bulbs are important during spring (IGBC 1987). Depending on area, fish, fruit, insects, and nuts are important during summer and autumn. Some individual grizzly bears, especially females, may become habituated to human foods (Mattson 1990).

After leaving their dens during spring, bears may utilize relatively low elevation habitats although individual variation occurs. During spring, grizzly bears often forage in riparian areas,

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avalanche chutes, or winter ranges. As summer progresses, bears often move to higher elevations and shift to fruit or pine nuts.

Grizzly bears hibernate during winter months generally in high-elevation excavated dens. Bears generally enter their dens from late September to early November and remain in dens until early-March to early-May. During the denning period, body temperature is only slightly reduced while heart rate and respiration is more markedly depressed. Several weeks of lethargy occur prior to and subsequent to denning (Nelson 1973).

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APPENDIX 3. TECHNICAL SUMMARY: EVALUATION OF HABITAT QUALITY FOR GRIZZLY BEARS IN THE BITTERROOT ECOSYSTEM

A comprehensive review of pertinent literature and studies conducted in the Bitterroot Ecosystem (BE) provide the basis for this summary. Technical reviews of habitat information and research are included, as well as brief summaries of whitebark pine status (Keane and Arno 1996), and anadromous fish status (Brostrom 1996) in the BE.

Habitat Studies

Summary. -- The first study in the BE describing vegetation in relation to grizzly bear habitat was conducted by Scaggs in 1979. His study was conducted on a 40 square mile area within the Selway-Bitterroot Wilderness. Vegetation in ecological land types and forest habitat types of the subalpine and temperate zones were sampled to evaluate grizzly bear habitat. The evaluation was based on the abundance of grizzly bear food plants in relation to land area. The study area was rated as good grizzly bear habitat from the standpoint of vegetation and the vegetation was not a limiting factor affecting bear numbers according to the author. His study area however was small and represented only high elevational range. He indicated that further research was needed to better identify bear foods and relative nutritional values (Scaggs 1979).

Butterfield and Almack (1985) also evaluated grizzly bear habitat in the Selway-Bitterroot Wilderness Area. Their survey consisted of classifying floristically distinct plant communities identified in 5 sub-areas that represented the diversity of vegetation in the Selway-Bitterroot Wilderness Area. By intensive sampling, they described topographical and vegetal characteristics, and identified potential grizzly bear foods in each habitat class. They concluded that the, “area exhibits great environmental diversity”, and identified 25 habitat classes that provided a wide range of grizzly bear life requisites including; denning sites, cover, and a rich, consistent supply of seasonally available foods. They felt the BE satisfied the habitat criteria essential to the maintenance of a viable grizzly bear population, and rated the BE as an “ecologically superior area for grizzly bear recovery”. Based on the Craighead et al. (1982) essential criteria for grizzly bear habitat which consist of space, isolation, sanitation, denning, safety, vegetation types, and food, the authors stated “the BE more than satisfies these habitat criteria”.

Davis and Butterfield (1991) conducted the most comprehensive review of grizzly bear habitat in the BE to date. Their 5-year study was conducted to evaluate habitat quality within the 1.4 million hectare (5,500 square mile) Bitterroot Evaluation Area (BEA) of the Bitterroot Mountains in Idaho and Montana (see Figure 3-6). They constructed a geographic information system (GIS) containing 13 map layers: 1) evaluation area boundaries; 2) USDA Forest Service administrative units; 3) wilderness areas; 4) land ownership; 5) roads; 6) trails; 7) hydrology; 8) elevation; 9) aspect; 10) slope; 11) watershed basins; 12) potential spring habitat; and 13) land

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cover. Ecodata plots using USDA Forest Service sampling techniques were conducted across the BEA. These plot data were analyzed to classify three major ecological zones and 15 land cover classes, resulting in 37 ecological land cover classes and associated structural and vegetal characteristics. They discussed the suitability of the BEA for grizzly bear habitat using the Craighead et al. (1982) criteria, and concluded that biological factors related to space, isolation, denning, vegetation types, and food were adequate for grizzly bear recovery. The Davis and Butterfield (1991) conclusions are summarized below:

Space and Isolation - Davis and Butterfield concluded that the, “BEA falls well within the space requirements for grizzly bears when compared to other ecosystems with known grizzly bear populations”, and affords adequate isolation from human developments and activities from summer through winter. Because both humans and bears tend to use snow free, lower elevations during spring, however, the authors cautioned that spring grizzly bear range could present potential areas of bear-human conflicts. Davis and Butterfield estimated that the BEA contains substantial and adequate amounts (231,960 ha) of spring range mainly along the Selway, Lochsa, and North Fork of the Clearwater River valleys. Although access to the Selway River is restricted during spring, affording good isolation, spring range along the Lochsa River is bisected by U.S. Highway 12 presenting potential bear-human conflicts. The authors also recognized that substantial historic spring range exists adjacent to the BEA and caution that this area (i.e. Bitterroot and Clearwater Valleys) could also become areas of potential bear-human conflict in the future with a recovered grizzly bear population in the BE.

Vegetation types and foods - Davis and Butterfield, Butterfield and Almack, and Scaggs all identified a wide variety of vegetation types comparable to occupied habitat in other grizzly bear ecosystems, well distributed throughout the BEA. The authors concluded these habitats would support adequate sources of known grizzly bear foods including elk and deer, small mammals, herbaceous vegetation and tubers, and fruits and nuts. These studies showed that over 60% of known herbaceous, and nearly 80% of known fruit and nut food items consumed by grizzly bears still occur in the BEA.

Sanitation and safety - Davis and Butterfield identified three sources of artificial food for grizzly bears that would have to be addressed to reduce bear-human interactions: 1) recreational backcountry user camps; 2) hunting and outfitter camps; and 3) human habitations mainly along the Lochsa River.

Davis and Butterfield identified accidental killing of grizzly bears during the spring black bear and fall elk and deer hunting season, and direct poaching as potential mortality factors that could be detrimental to grizzly bear recovery. The authors identified the practice of hunting black bears over bait and chasing black bears with hounds could potentially lead to human-bear interaction, and represent a “major threat to grizzly bear recovery”. The authors recommend a committed hunter education effort to gain the cooperation of local hunters and other resource

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users, and cautioned that changes in some hunting practices may be necessary for successful grizzly bear recovery.

Technical Review of Habitat Studies

In 1991, a Technical Review Team (Servheen et al. 1991) analyzed the Davis and Butterfield (1991) report and other available information. The team was comprised of experienced grizzly bear biologists and habitat specialists with no direct involvement in the evaluation process. They were charged with evaluating habitat and space values of the BEA. It was the opinion of the Technical Team that the BEA contained the physical attributes to sustain a viable grizzly population of between 200-400 bears.

Concerns Related to Habitat Suitability

Salmon. -- Despite the availability of diverse and abundant bear foods, some believe that one reason for the demise of the grizzly bear population in the Bitterroot Ecosystem may have been the elimination of historic salmon runs (Moore 1984, 1996). Based on genetic sampling of 2 samples of grizzly bear material supposedly collected in the north central portion of Idaho between 1840 and 1940, fish apparently constituted 54 and 90 percent of the carbon and nitrogen absorbed in their diet (Hilderbrand et al. 1996). Obviously a larger sample size of bear material collected in Idaho would be necessary to determine the importance of fish to grizzly bears in the BE. Where fish were available they probably supplied a large portion of the bears dietary protein needs. However, based on studies in Alaska, even where salmon are locally abundant along coastal areas, not all bears use the fisheries resource. Schoen et al. (1986) indicated that a large segment of the bears inhabiting upper elevations on Admiralty Island never fished for salmon. Similar resource partitioning was probably apparent in the BE. Moore (1984, 1996) indicated that bears existed in the BE fully 20 years after the salmon had been cut off due to dams on the Clearwater River. Wright (1909) indicated that although he observed grizzly bears in the Selkirk Mountains ravenously consuming a specific plant, they didn't feed on it in the Bitterroot Mountains although it was readily abundant. He noted that bears in different areas fed on different plants. Current research supports these observations, and the theory that feeding on specific items is a learned behavior.

Brostrom (1996) indicated that although salmon are no longer widely available in the BE, other fish species such as cutthroat trout and kokanee salmon may provide some supplemental food for grizzly bears (see attached paper). However, anadromous fish would not be readily available every year, and would only be supplemental at best as spawner carcasses. Many populations of grizzly bears exist today that have never used anadromous fish runs as a dietary supplement. Hilderbrand et al. (1996) found that where fish were not readily available in Montana and Wyoming, plant and animal matter constituted the majority of protein requirements of grizzly bears.

Whitebark Pine. -- Whitebark pine status and distribution has been studied fairly extensively in the last decade. Keane and Arno (1996) summarized the status and distribution of whitebark pine in the Bitterroot Ecosystem (see attached paper). They indicated that historically whitebark pine was a major species across 12-15 percent of the forest landscape and was considered an

Appendix 3 - Habitat Quality in the BE for Grizzly Bears

important nutritional and structural component of wildlife habitat. In the Yellowstone Ecosystem, whitebark pine is a very important food component of the grizzly bear's diet (Mattson and Reinhart 1994). Whitebark pine has been reduced to about 20-40% of its original abundance in the BE and now is most prevalent in the southern half of the ecosystem. Due to whitebark pine blister rust, the authors felt that the species will probably continue to decline to about 5-10% of its historical abundance before leveling off and then increasing. Whitebark pine would become an increasingly insignificant food source for the grizzly bears in the BE for the next few decades in some areas, but would increase in abundance following proper fire management in other areas. Some researchers indicate that in areas like the BE that are strongly influenced by maritime climates, whitebark pine is not a significant food source for bears, and berry species are probably more valuable (Mattson and Rinehart 1994, Tisch 1961, and others).

Big Game. -- Big game numbers reached their peak through most of the BE during the late 1980's and have recently increased in the southern part of the Primary Analysis Area and decreased in the north (Kuck 1998). Based on historical accounts, elk and deer numbers in Idaho were considerably lower at the turn of the century than they are today. Game numbers have increased as a result of extensive fires, timber harvest, low snow winters, and controlled harvest. Because of the increased availability of game, grizzly bears may use protein provided by game carcasses during the spring and fall to constitute part of the necessary dietary nitrogen that may have been previously provided by anadromous fish during those critical periods. Big game winter range occurs within the boundaries of the wilderness, and early spring game die-offs that usually occur following average snow pack years would be available for bears upon den emergence. Hunter wounding losses during the fall hunting season may also provide some carrion, as would carcasses confiscated from other predators, and occasional animals predated upon by bears.

Other Research

Current habitat research continues and data are being collected and analyzed to more closely evaluate habitat quality in the BE. Merrill et al. (1999) are conducting research to rate habitat based on road densities, distance to population centers, and bear food quality and seasonal availability. Their mapping technique indicates suitable bear habitat exists within portions of the BE. Most of the identified suitable habitat is concentrated in the roadless central mountains.

Their research indicates grizzly bears have the greatest chances of surviving and reproducing in western portions of the Bitterroot Evaluation Area (BEA) and in the area stretching from the Sawtooth Mountains Range to the South Fork of the Salmon River. They caution their results are dependent on protection of reintroduced grizzly bears from direct mortality comparable to that provided bears in other recovery areas. Intensive GIS mapping efforts and ground truthing have been conducted throughout the central Idaho area by the University of Montana. These data are available and are being further analyzed by several different scientists for grizzly bear habitat quality in the BE. Appendix 21 contains results of the most current research studies pertaining to habitat quality and suitability for grizzly bear recovery in the Bitterroot Ecosystem.

Summary

Most authors agree that although the habitat appears to provide ample requirements for grizzly bears, the only way to determine true habitat effectiveness is to monitor bears using the habitat. Grizzly bears are remarkably adaptive and occupy a variety of habitats ranging from the high quality habitat available along the Alaska and British Columbia coastal zones, to the Gobi desert of China. Habitats vary considerably even within ecosystems and bears learn to adapt to those foods and their availability. Approximately 12,000 black bears are estimated to live within the BE Primary Analysis Area, and the known diets of black and grizzly bears are not that different. Most authors also agree that successful bear recovery will be determined by the level of human caused mortality. Grizzly bears can live within the boundaries of the BE, but their densities will likely be less than what could have been supported when both salmon and whitebark pine were common.

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APPENDIX 3A. Anadromous and resident fisheries status in the Bitterroot Grizzly Bear Ecosystem, Idaho.

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Historical Overview

The two major drainages in the Bitterroot Ecosystem, the Clearwater River and Salmon River, once contained an abundant and diverse community of fish resources. Anadromous species of fish present were three races of chinook salmon (*Oncorhynchus tshawytscha* (Walbaum)), steelhead trout (*O. mykiss*), coho salmon (*O. kisutch*), sockeye salmon (*O. nerka*) and Pacific lamprey (*Lampetra tridentata*). Resident native fish included cutthroat trout (*O. clarki*), rainbow trout (*O. mykiss*), bull trout (*Salvelinus confluentus*), mountain whitefish (*Prosopium williamsoni*), northern squawfish (*Ptychocheilus oregonensis*), reddsider shiner (*Richardsonius balteatus*), and several species of sculpin (*Cottus* spp.), dace (*Rhinichthys* spp.), and suckers (*Catostomus* spp.). All species still exist in the ecosystem, but many are at reduced or remnant levels, and chinook salmon, steelhead trout and bull trout have been eliminated from much of their historic range.

Idaho once produced an estimated 39% of the total spring chinook salmon, 45% of the total summer chinook salmon, 5% of the total fall chinook salmon, and 55% of the total summer steelhead in the Columbia River Basin (Mallet 1974). The Clearwater River drainage likely produced over 26% of Idaho's chinook salmon, and 28% of the summer steelhead entering Idaho. Chapman (1981) estimated that the number of adult spring chinook salmon entering the Clearwater River drainage in pristine conditions at 87,433.

The Nez Perce, primary inhabitants of the Clearwater River drainage prior to the arrival of European man, were predominantly a tribe of fisherman, and consequently the anadromous runs of chinook salmon and steelhead trout were able to support a large number of villages along the river corridor (Lane et al. 1981). Fish comprised 36-45% of the Nez Perce diet, and were also an important trade item. Salmon were the predominant species, but steelhead trout, salmon trout (probably large resident rainbow trout), other trout, lamprey and other fish were also used. As the influence of European man spread, the loss of other food sources such as camas root, big and small game occurred and fish became even more important for subsistence of the Nez Perce. Major fishing villages were along the mainstem Clearwater River corridor, but other important fishing sites were in headwater areas of the Selway, Lochsa and North Fork Clearwater rivers and used in conjunction with seasonal hunting and gathering trips (Lane et al. 1981).

The Salmon River drainage was inhabited or used for food gathering by the Nez Perce and the Shoshone tribes and the Bannock band of the Northern Paiute (Jones 1990). A Shoshone band known as the Sheepeaters were widely dispersed throughout the mountains surrounding the

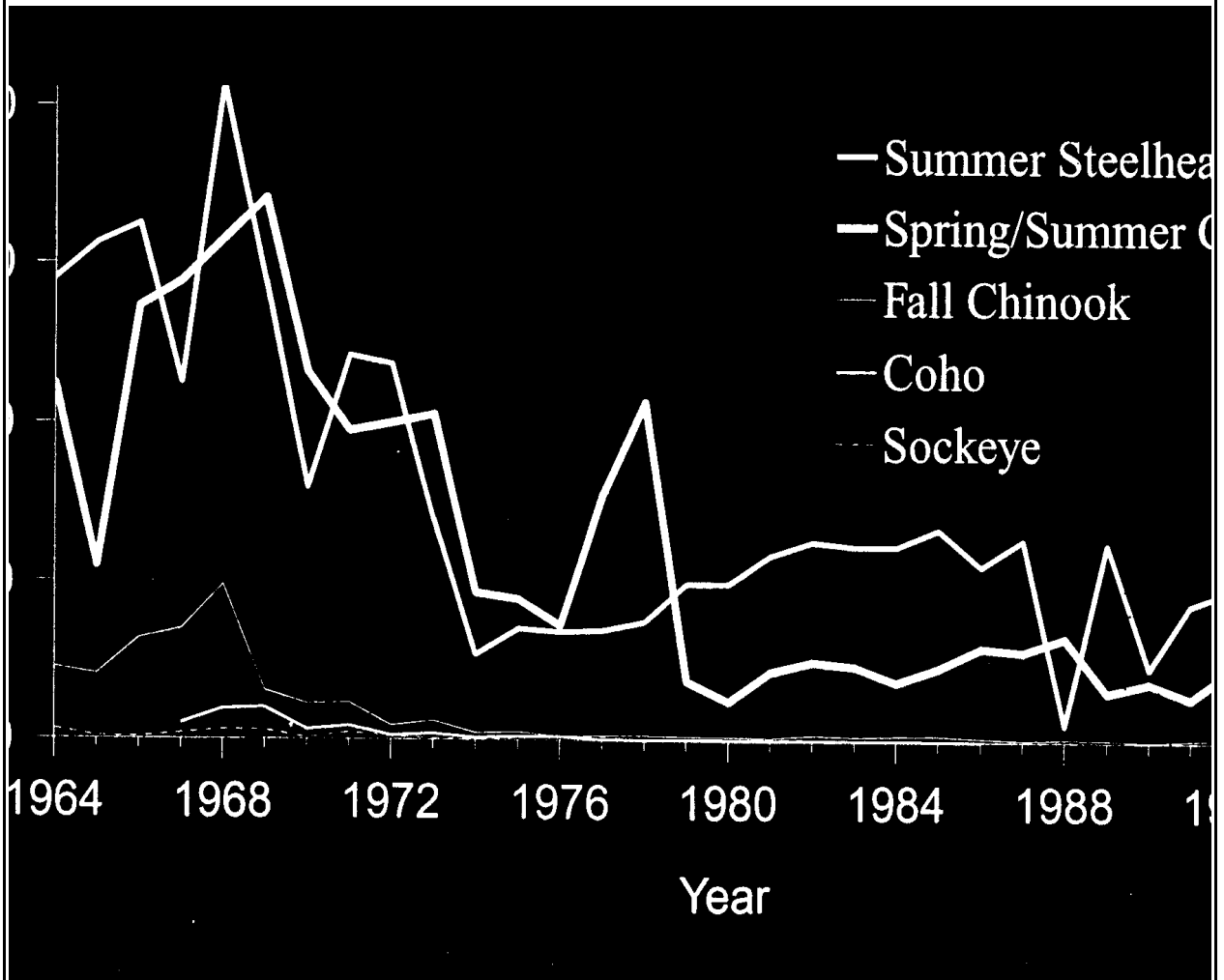
Salmon River. While primarily hunters, they occasionally wintered at the confluence of the Snake and Salmon rivers with the Nez Perce to fish. The Whitebird band of the Nez Perce used the Little Salmon River and the lower Salmon River as their primary fishing grounds. In early summer, Shoshone from the Boise-Weiser country, along with other Idaho tribes, traveled to the Camas Prairie to collect and dry roots and bulbs. Fish were taken in the fall and big game was hunted in the surrounding mountains as far as the headwaters of the Salmon River (Murphy 1960, in Jones 1990).

Settlers and miners arriving in Idaho also took advantage of the abundant fishery resources, and tales of spearing hundreds of fish with pitchforks were not uncommon. Salmon and steelhead provided sustenance for miners from the headwaters of the Salmon River, downstream to the Snake River, and in the South Fork Clearwater drainage.

Recent Impacts and Restoration Efforts

Habitat changes through land use activities, hydropower development, fish passage problems, drought, ocean conditions, commercial fisheries and exotic species introductions have all had a negative effect on the size of salmon and steelhead runs returning to Idaho over at least the last thirty years (Figure 6-1). These impacts have reduced the size of chinook salmon runs in Idaho to a remnant of their historic levels. While steelhead trout numbers have been bolstered by hatchery production, the number of wild steelhead has also severely declined. Fish numbers have remained at low levels since the last two Snake River dams were completed in the late 1960's and early 1970's. Spring and summer chinook salmon in the Snake and Salmon River drainages are listed as threatened under the Endangered Species Act (ESA), as are fall chinook statewide. Sockeye salmon are listed as endangered. All Idaho wild steelhead trout are listed as threatened under the ESA, as are bull trout. Coho salmon were declared extinct in Idaho in 1986. All native trout are considered species of special concern by the State of Idaho.

Sportfishing in streams within the Idaho portion of the Bitterroot Ecosystem are currently managed under a variety of regulations, depending on what species are present and the protection needed to maintain populations. The most liberal limit is 6 trout, no size or gear restrictions, and occurs in waters where hatchery fish are stocked. Most wild steelhead trout waters have a 2 trout limit or are catch and release. There has been no general harvest of chinook salmon allowed Idaho since 1978, and only a few special seasons allowing harvest of hatchery salmon have occurred since then.



Clearwater Drainage -- Dams built at Harpster in 1910 (South Fork Clearwater) and at Lewiston in 1923 (mainstem Clearwater) eliminated the chinook salmon runs into the Clearwater drainage, and severely impacted or eliminated steelhead trout runs during low water years. Dworshak Dam, completed in 1971 on the North Fork Clearwater River, eliminated 627 miles of productive salmon and steelhead trout spawning and rearing habitat (Mallet 1974). After the removal of the Harpster Dam in 1963, and the Lewiston Dam in 1973, efforts were made to restore chinook salmon and steelhead trout runs into the Clearwater Basin using hatchery stock. Presently, the Clearwater River drainage has 1,248 miles of stream available to anadromous fish, in various conditions of habitat quality (Mallet 1974). Two federally run hatcheries and one state run hatchery exist on the Clearwater River to help restore chinook salmon and steelhead trout numbers into the Clearwater drainage. The Nez Perce Tribe is actively trying to restore fall chinook and coho salmon into the lower portions of the Clearwater drainage.

After Dworshak Dam was completed, kokanee salmon (*O. nerka*) were stocked from 1971 - 1979 to provide a sport fishery in the reservoir. The population has fluctuated over the years due to changes in nutrient levels and hydroelectric power generation, but in some years spawner counts have totaled over 39,000 fish.

Salmon River Drainage -- The Salmon River drainage is the largest subbasin in the Columbia River drainage, excluding the Snake River, and has the most stream miles of habitat available to anadromous fish (IDFG et al. 1991). The total watershed is just over 14,000 square miles. With the exception of Sunbeam Mine Dam which blocked passage upstream of Yankee Fork from 1913-1934, the Salmon River has not been impacted by dams like the Clearwater River has. Although a majority of the habitat still available is high quality, logging, dredge mining, road building, intensive grazing and irrigation withdrawals have degraded many streams. Federal, state, tribal and private interests have recently come together in many areas to help restore the habitat quality through changes in agricultural practices, and instream and riparian enhancement. Several hatcheries raise both chinook salmon and steelhead trout for release into the Salmon River drainage to bolster natural populations.

Prospectus

Anadromous Fish -- Although habitat needs protection and improvement in localized areas, spawning and rearing habitat for natural production is of ample quantity and quality to allow for increased production. The Clearwater and Salmon drainage subbasin plans (1990) state that high juvenile mortality associated with eight downstream Snake and Columbia hydroelectric projects is a major factor inhibiting increased production of anadromous fish in Idaho. Until downstream migration problems are resolved, it is unlikely Idaho will ever have runs of historic size returning, and will continue to see numbers of fish at current or lower levels.

Resident Fish -- Resident fish populations have been impacted by the same land use activities as anadromous fish, with the exception of dams. State and federal management agencies continue to make efforts to restore and enhance habitat and prevent over harvest of populations. While native fish are not distributed as they once were historically, they are currently holding their own in most cases.

Food Potential For Grizzly Bears

Anadromous fish, particularly chinook salmon, likely once provided an abundant and important food source to grizzly bears in the Bitterroot Ecosystem. Concentrations of salmon adults at migration impediments and spawner carcasses throughout the ecosystem were ready sources of food during the summer and fall. Steelhead trout runs were probably of lesser values since their migration and spawning times coincided with high water levels. Runs of salmon at current levels would continue to provide a source of food through spawner carcasses, but these would be more on an incidental basis because spawners are widely distributed due to very low numbers. Anadromous fish would not be a readily available resource every year, and would only be supplemental at best.

It is unknown how large a role resident fish played in providing a food source. Bull trout and cutthroat spawners could be utilized by bears in the fall and late spring, respectively during their spawning runs. Distribution of these fish are mostly in the more pristine headwater areas of the ecosystem, and also would only be a supplemental part of the grizzly bear diet. Concentrations of kokanee salmon in the North Fork Clearwater River drainage may provide a more abundant food source if populations remain at current levels.

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APPENDIX 3B. Whitebark Pine (Pinus albicaulis) in the Selway Bitterroot Wilderness Complex: Ecology, Distribution and Health

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Introduction

Whitebark pine (Pinus albicaulis) is considered to be a keystone species of upper subalpine forests of the northern Rocky Mountains (Schmidt and McDonald 1990). It is an important nutritional and structural component of wildlife habitat (Arno and Hoff 1990; Schmidt and McDonald 1990). Its large, nut-like seeds are a major food source for many birds and mammals (around 105 species) including squirrels, black and grizzly bears, and Clark's nutcrackers (Hutchins and Lanner 1982). Whitebark pine protects watersheds by stabilizing soil and rock on the harshest sites and by catching and retaining snowpack. Historically whitebark pine was a major species on 10-15 percent of the forest landscape in western Montana and central Idaho (Arno 1986). Therefore its perpetuation is of concern for maintaining natural biodiversity and landscape structure. This paper will summarize the ecology, distribution, abundance for historical, present and future whitebark pine forests in the Selway-Bitterroot Wilderness Complex (SBWC) of central Idaho and west-central Montana. This summary will be in the context of reintroducing the grizzly bear into this diverse wilderness.

Ecology

Whitebark pine is typically a major seral species in the SBWC upper subalpine. In the absence of disturbance, whitebark pine is eventually replaced by the more shade-tolerant subalpine fir and Engelmann spruce in most of the area, but it can form nearly pure climax stands on many high, droughty ridgetops, especially above 8,000 feet elevation (Pfister and others 1977). The Clark's nutcracker (Nucifraga columbiana) plays a critical role in the whitebark pine regeneration process because this bird is essentially the only dispersal vector for the heavy, wingless, nut-like seed (Tomback 1982). A single nutcracker can store over 100,000 seeds in 8,000 to 15,000 caches of 1-22 seeds buried about 1-2 cm into the ground for distances up to 15 kilometers (Tomback 1982, Hutchins and Lanner 1982). The bird reclaims much of the seed but a large proportion are left to germinate. These seedlings eventually form the whitebark pine forests that were so prevalent on the landscape prior to 1960.

Large, stand-replacement fires are common in the SBWC. The great seed dispersal distances provided by the nutcracker allow whitebark pine a competitive advantage in colonizing the large areas burned by these fires (Tomback and others 1990). Also, Clark's nutcrackers prefer open, burned areas to cache whitebark pine seeds (Tomback and others 1990). Some whitebark pine

stands in higher and drier areas contain evidence of less severe, more frequent surface fires (Arno 1986). These low intensity fires tend to kill most competing conifer species, especially subalpine fir, thereby favoring the somewhat fire-resistant whitebark pine (Arno 1986). Whitebark pine is able to survive low severity fires better than its competitors because it has thicker bark, deeper roots and a high, open crown providing little fuel on the ground. Whitebark pine may also be more resistant to heat than fir or spruce.

Whitebark pine seeds are an important grizzly bear food where the two species coexist. Mattson and others (1991) found whitebark pine seed accounted for over 40% of the diet of Yellowstone grizzly bears. The size of the whitebark pine cone crop has been positively correlated to post-hibernation survival, number of twins, and pre-hibernation health of grizzly bears. Moreover, large whitebark pine cone crops have enticed the grizzly bear to spend the majority of the late summer in the high elevation areas away from the areas heavily used and occupied by humans. The bears obtain most whitebark pine seed from excavation of middens of whitebark pine cones cached by squirrels on the ground (Kendall 1980).

Distribution

Whitebark pine was the major component on the historical SBWC upper subalpine landscape. It was the principal forest component above 6800 feet elevation on most aspects and slopes. On this basis, it used to dominate 15-20 percent of the pre-1900 SBWC landscape. Today, whitebark pine occurrence has shrunk dramatically. It is rarely a major forest component north of 46°N latitude (north of Grangeville, ID and Darby, MT) in the SBWC. In the southern and eastern portions of the SBWC, blister rust-induced mortality is less severe, but successional replacement by subalpine fir and Engelmann spruce has generally pushed the lower elevational limit of the whitebark pine forest to 800 feet higher than it was in the early 1900's (Arno and others 1993).

Status and Health

Personal observations by the authors indicate whitebark pine is at approximately 20-40% of its pre- 1900 abundance in the SBWC. A rapid decline in whitebark pine has occurred during the last 60 years as a result of three interrelated factors: 1) epidemics of mountain pine beetle (*Dendroctonus ponderosae*); 2) the introduced disease white pine blister rust (*Cronartium ribicola*); and 3) successional replacement by shade-tolerant conifers, specifically subalpine fir (*Abies lasiocarpa*) and Engelmann spruce (*Picea engelmannii*), as a result of fire exclusion policies of the last 60-80 years (Kendall and Arno 1990, Keane and Arno 1993, Ciesla and Furniss 1986).

An extensive beetle epidemic occurred during the late 1920's and early 1930's across the SBWC (Arno 1970, Arno 1976). This epidemic killed most of the mature whitebark pine trees over large areas. The result was accelerated succession to subalpine fir (Keane and Arno 1993).

Appendix 3B - Whitebark Pine in the Selway Bitterroot Wilderness

Beetles also seem to play the role of secondary colonizer, attacking and killing already stressed pines, especially those pines being killed by blister rust or other agents.

The exotic white pine blister rust, introduced to the western US around 1910, has killed most of the mature whitebark pine in the northern and western portions of the SBWC (Keane and Arno 1993, Keane et al. 1993, Kendall and Arno 1990). This disease requires an alternate host of gooseberry or currant (*Ribes* spp.) shrubs to complete its life cycle (Colley 1918, McDonald et al. 1981). Whitebark pine cone production is severely reduced by a rust epidemic because blister rust kills the top-most, cone-bearing branches first before ultimately killing the entire tree after 10-20 years.

The current prescribed natural fire program for the SBWC, covering most of the area since 1979, allows fire to return to a more natural role in maintaining SBWC ecosystem integrity (USDA Forest Service 1990). However, historical fire management policies from the 1930's through 1978 excluded fire from most of the SBWC landscape. Moreover, Brown and others (1994) found that the SBWC prescribed natural fire program has not burned enough area in the whitebark pine forests to mimic historical fire occurrences. Fire is essential for whitebark pine regeneration because nutcrackers do not like to cache seed under a thick forest canopy (Tomback 1982) and whitebark pine is not a shade tolerant species. Therefore, fire is vital to the maintenance of whitebark pine on the SBWC landscape (Keane and others 1990).

Prognosis

Based on field data, personal observations and simulation model results, it can be assumed that the whitebark pine population in the SBWC will continue to decline because of the blister rust to perhaps 5-10% of its original extent (Keane and Arno 1993, Keane and others 1990, Arno 1986, Arno and others 1993). The combination of the three damaging agents (beetles, rust and fire exclusion) has and will continue to accelerate this decline of whitebark pine. High elevation ridgetops, constituting about 5% of SBWC whitebark pine forests, will probably experience slow rates of rust mortality, presumably because the rust has a difficult time completing its life cycle in the most severe microclimates. There seems to be between 1-8% rust resistance in northern Rocky Mountain whitebark pine populations so it is doubtful that whitebark pine will ever be entirely eliminated by blister rust (Hoff and others 1980). However, the removal of whitebark pine as important ecosystem component and wildlife resource has already occurred in much of the northern, western and central SBWC, and this decline appears to be advancing southward and eastward at a perceptible rate (Keane and Arno 1993). The suppression of wildland fire from the SBWC landscape will exacerbate the decline by decreasing the potential for whitebark pine regeneration from rust-resistant trees.

In summary, whitebark pine populations will probably be reduced to approximately 5-10% of their historical numbers. This could be disastrous to subsequent whitebark pine regeneration because nutcrackers will eat much more than they will cache when there are limited cone-bearing

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individuals (Tomback 1982, Tomback and others 1990). This may mean that whitebark pine will be an increasingly insignificant food source for grizzly bears because squirrels probably will not harvest substantial amounts of cones, and what little that are harvested will be utilized immediately by the squirrels and not stored in middens.

In conclusion, it would seem that a program to restore whitebark pine on the SBWC landscape would be extremely beneficial to a grizzly bear restoration program. Techniques currently being studied for restoring damaged whitebark pine communities include cutting trees that compete with whitebark pine, prescribed burning and planting of rust resistant seedlings. These studies are being conducted in areas near and adjacent to the SBWC (Keane and Arno 1996). However, the single most important action we can do to maintain this species on the landscape is to return fire to the landscape. This will create ideal nutcracker caching habitat thus insuring future whitebark pine regeneration. The ensuing whitebark pine regeneration will most likely come from trees that have some degree of rust resistance. This is especially true when most overstory trees have already been killed by the rust and thus the surviving trees are likely to be rust-resistant.

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APPENDIX 4. HISTORICAL EVIDENCE AND CURRENT STATUS OF GRIZZLY BEARS IN THE BITTERROOT ECOSYSTEM

Historical Status. -- Grizzly bears were once common in the Bitterroot Mountains. Historical evidence of their existence and abundance is clear in oral accounts of local Indian tribes including the Nez Perce Indians in the north and Shoban Indians in the southern part of the Primary Analysis Area, as well as numerous written accounts by explorers, hunters, and historians. Nez Perce dictionaries indicate the term for grizzly bear was Xaxat, and the grizzly bear is common in their stories and legends. Merriweather Lewis while traveling through and visiting with Nez Perce Indians wrote that the Indians considered the grizzly bear “tremendous animals to them; they esteem the act of killing a bear equally great with that of an enemy in the field of action”. Clark wrote: “ The Indians of this country seldom kill the bear they are very much afraid of them and killing of a White or Grizly bear is as great a feat as two of their enemy. The few of those animals which they chance to kill is found in the level open lands and pursued on horses and killed with their arrows. They are fond of the flesh of this animal and eat imoderately of it when they have a sufficiency to indulge themselves.” The local Nez Perce museum in Spalding, Idaho has many artifacts obtained from the local Indians by Reverend Spalding in the late 1800's. Included in these artifacts are necklaces of grizzly bear claws.

Because most versions of the Lewis and Clark Journals are heavily edited for space and content, it is difficult to clearly identify their descriptions of the wildlife encountered. However, the “Original Journals of the Lewis and Clark Expedition, 1804-1806, edited by Reuben Gold Thwaites, LL.D., Antiquarian Press LTD., New York, 1959, were much more complete in their descriptions of wildlife. This version was printed from the original manuscripts and notebooks of Lewis and Clark as well as other members of the expedition. Their journals were for the first time published in full and exactly as written.

While Lewis and Clark were in the “Upper Kooskooske” (Upper Clearwater River) in May and June, 1806, they spent several weeks waiting for the snows to melt before heading back over the Bitterroot Mountains. While camped near present-day Kamiah, Idaho, their hunters spent many days afield attempting to kill game for consumption. The salmon had not yet started their run and game was scarce. The expedition spent many days with the local Indians, and pursued game as far down river as Collins creek (Lolo Creek), and up on the benches above the Clearwater River. During their first few weeks at the camp, they killed many bears, but were confused as to how many different species of bears there were. They attempted to speciate by differentiating the bears by color of the pelage. In exasperation, Lewis indicated on May 15, 1806 that, “...if we were to attempt to distinguish them by their colours and to denominate each colour a distinct species we should soon find at least twenty” (Thwaites 1959). They did however identify the grizzly bear and called it the “grizzly, white, or variagated bear.” Their confusion came when trying to identify the black bear and its different color phases common in this part of the west. They felt it different than the common east coast and pacific coast black bear.

On May 31, 1806, their attempts to properly categorize the distinct species made a break through when Lewis recorded the following: "Goodrich and Willard visited the Indian villages this morning and returned in the evening. Willard brought with him the dressed skin of a bear which he had purchased for Capt. C. This skin was an uniform pale redish brown colour, the Indians informed us that it was not the Hoh-host or white bear. That it was the Yack-kah. This distinction of the Indians induced us to make further enquiry relative to their opinions of the several speceis of bear in this country. We produced the several skins of the bear which we had killed at this place and one very nearly white which I had purchased. The white, the deep and pale red grizzle, the dark brown grizzle, and all those which had the extremities of the hair of a white or frosty colour without regard to the colour of the ground of the poil, they designated Hoh-host and assured us that they were the same with the white bear, that they ascociated together, were very vicisious, never climbed the trees, and had much longer nails than the others.

The black skins, those which were black with a number of intire white hairs intermixed, the black with a white breast, the uniform bey, brown and light redish brown, they designated the Yack-kah; said they climbed the trees, had short nails and were not vicious, that they could pursue them and kill them with safety, they also affirmed that they were much smaller than the white bear. I am disposed to adopt the Indian distinction with respect to these bear and consider them two distinct speceis" (Thwaites 1959).

Based on this account and the descriptions of the hides separated by the Indians, and previous and following descriptions in the journals of bears killed, it is apparent that they killed at least 7 grizzly bears while camped near Kamiah, including a female with 2 cubs that Collins killed on May 14. Lewis writes: " the mail bear was large and fat the female was of moderate size and rather meagre. We had the fat bear fleaced in order to reserve the oil for the mountains. Both these bear were of the speceis common tho the upper missouri" (Ed. Note, they identified the grizzly as the only species of bear in the upper Missouri). Clark writes for the same day, May 14: "Collins returned in the evening with the two bears which he had killed in the morning one of them an old hee was in fine order, the other a female with Cubs was meagure" (Thwaites 1959).

Another interesting excerpt on May 15 by Lewis read: "the most striking differences between this species of bear and the common black bear are that the former are larger, have longer tallons and tusks, prey more on other animals, do not lie so long nor so closely in winter quarters, and will not climb a tree tho' ever so heardly pressed. The variagated bear I believe to be the same here with those on the missouri but these are not so ferocious as those perhaps from the circumstance of their being compelled from the scarcity of game in this quarter to live more on roots and of course not so much in the habit of seizing and devouring living animals. The bear here are far from being as passive as the common black bear they have attacked and fought our hunters already but not so fiercely as those of the Missouri. There are also some of the common black bear in this neighbourhood" (Thwaites 1959).

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Written accounts of grizzly bears are rare during the late 1800's. However, there are various records of grizzly bear hides being sold at the Lolo Creek Hudson Bay outpost near present-day Lolo, Montana (Bud Moore, pers. comm.) during the late 1800's. However, it is not clear how many of those bears came from the Idaho side of the Bitterroot Mountains.

William H. Wright, a hunter - naturalist wrote about hunting grizzly bears in the Bitterroot Mountains at the turn of the century in a book entitled "The Grizzly Bear", first published in 1909. During his first excursion he stated, "So one spring, having made up my mind to go after them (grizzly bears) and not return until I had one, I started out in May with a few pack-horses and went to the Bitter Root Mountains, which form the dividing line between Montana and Idaho. ...For nearly three months we cruised about this rugged wilderness and enjoyed life to the utmost. We killed plenty of black bears, but up to September had not bagged a grizzly. We found an abundance of their tracks and saw three bears, but they were so wild that we could not get near enough to them for a shot. ...We therefore left the divide we had been following and struck off to the right to reach a stream of considerable size flowing into the main north fork of the Clearwater River. We had been told by an old miner that there was a large lick on this stream about twenty miles from the trail, and he directed us as to where to leave the ridge, and...find the lick." Wright then explains his encounter with a grizzly at the lick while waiting for an elk, and how he proceeded to kill the grizzly following an exciting few minutes after his gun jammed (Wright 1909).

Wright also wrote of watching and hunting many grizzly bears while they were fishing in the Bitterroot Mountains. "In the streams tributary to the Clearwater River in Idaho there are two or three runs of salmon...between the middle of August and the middle of September, what are known as the dog salmon make their way up all the little streams...and the grizzlies gather to feast." Wright explains how they would catch the fish, and also how during one encounter he killed two grizzlies while they were fishing. Wright also wrote of an encounter in 1891 on the Middle Fork of the Clearwater River at an Indian fishing site, where he killed a grizzly with a hunting knife and help from a couple of dogs. While photographing in the Bitterroot Mountains with a Mr. W. E. Carlin, they spent the most of one summer and early fall on one of the divides between the South and Middle Forks of the Clearwater River. There he explains observing a bear feeding in a brushy meadow, and Carlin shot it with his .30-.40 bullet through the shoulders. The bear was a female and had two cubs that they also killed. They remarked that this was, "the first time that either of us had the opportunity of observing the effect of high-power bullets on living targets" (Wright 1909). Wright's book also contains a photograph of the female with cubs with the caption, "In the Bitter roots-the old grizzly and her two cubs" (Figure 6-2). Wright enjoyed hunting, photographing, and camping in the Bitterroot Mountains and detailed many more of his colorful hunts and numerous encounters with grizzly bears during his travels.

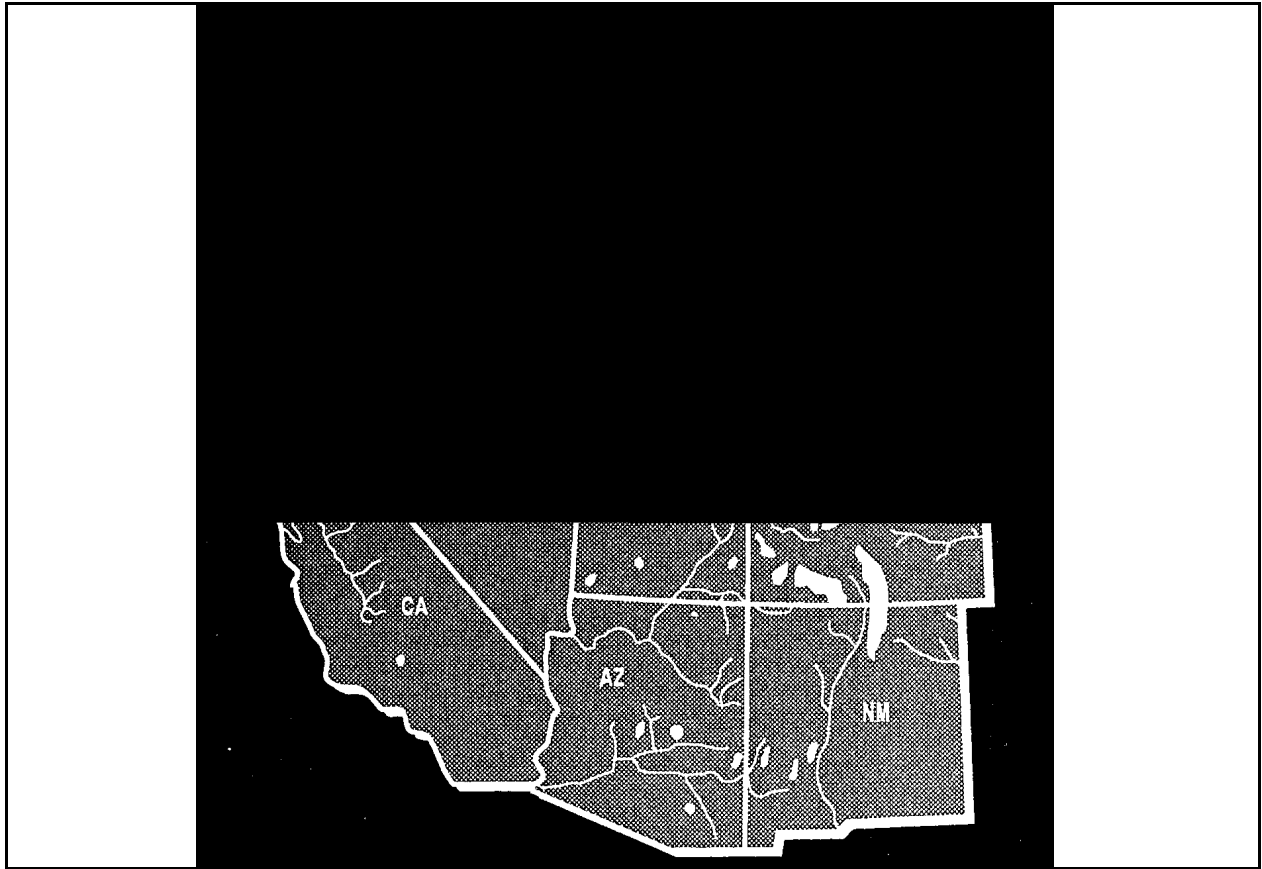
The now well-known Carlin party expedition into the Bitterroot Mountains in the fall of 1893 that resulted in the death of George Colgate has been documented in several publications including Conley (1982). Conley indicated that Carlin's party camped at Jerry Johnson flat on the Lochsa River and hunted a nearby mineral lick (now named for Colgate) for game. "Carlin

Appendix 4 - History and Current Status of Grizzly Bears in the BE

bagged an elk with rocking chair antlers after half-a-dozen shots, but much game was missed or wounded, including a grizzly bear with two cubs."



During the same time that Wright and Carlin hunted the Bitterroot Mountains, and into the early 1900's a famous taxonomist and zoologist by the name of Dr. C. Hart Merriam was classifying grizzly bears and attempting to speciate them. At that time he also developed a distribution map based on his samples and records of dead and live bear locations. Already by the year 1922, the grizzly bear had been reduced in distribution to the mountainous areas of national parks and remote and rugged wilderness ranges. Grizzly bears still existed in the Bitterroot Mountains and to the south of the Salmon River in Idaho (Figure 6-3).



By the mid 1920's grizzly bears were apparently becoming quite rare in the Bitterroot Mountains.

William (Bud) Moore, a longtime resident of the area, wrote a book on the history of the Bitterroot area. Moore was a trapper and hunter, and worked as a sheepherder, and later a USDA Forest Service Ranger in charge of the Powell Ranger Station, nestled in the middle of the Bitterroot area. He lived and worked in the Bitterroot area during the early and mid 1900's and interviewed many trappers, homesteaders, reviewed journals and historical records to obtain information on the Bitterroot grizzly bear. Moore described the typical trapper/hunter routine by describing trapper Wes Fale's routine. "During early March, 1908, Fale lugged his winter's catch marten, lynx, mink, and ermine from his home cabin at Big Sand Lake over Blodgett Pass and out of the mountains to Hamilton. He sold his furs, then returned to Big Sand Lake in late April to set bear traps. In six days he placed 10 sets at promising locations in the surrounding mountains. Some days he caught one bear some days none, and three times he caught two bears in the same day. During late May, on the last round of his trapline, Fales caught a large female grizzly below the Hidden Fork of Big Sand Creek. He wanted a photograph. While he waited for good light, a cub jumped up on a log followed by another and another, then all three ran along the log to the mother who fought for freedom from the trap. He photographed the trapped mother and her cubs" (Moore 1984, 1996). He killed the female and caught one of the cubs. Fales described the killing of five black bears and four grizzlies during the spring of 1908. He

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implied to Moore that he had killed several more. And he was one of 6 to 10 trappers who combed the Bitterroot Mountains each spring. By conservative estimate writes Moore, “trappers near the turn of the century killed 25 to 40 grizzly bears annually in the Bitterroot Mountains.”

Following the 1910 fires, sheep herders and cattlemen grazed their livestock in newly created meadows and open areas high in the Bitterroot Mountains. Although the Selway Game Preserve was created in 1919, grizzly bears and other predators were not protected. Livestock operators, homesteaders, hunters and trappers continued to kill grizzly bears whenever they were seen. Moore saw a grizzly bear in the upper Lochsa River area in 1930, and he and his father shot a big grizzly near a band of sheep they were tending in 1931. In 1932, Moore found nine bear scalps nailed on a tree at Packer’s Meadows, and some of those scalps according to Moore were grizzly bear. This was believed to be the last verified evidence of a dead grizzly bear in the Bitterroots. Moore reported some sightings of bears and tracks and a report of a dead bear during the 1930’s but he never saw it. The last track Moore saw was along the North Fork of Spruce Creek in 1946. “The mud had dried around the imprint of the big paw and long claws in what seemed to me an attempt by nature to preserve some sign of the great bear’s passing” (Moore 1984). Moore was attributed as having killed the last grizzly bear at Colt Creek in 1956 while stationed at Powell Ranger Station. However, Moore disclaimed that report saying he had killed a large black bear that someone saw and mistook for a grizzly bear.

Current Status - Current evidence suggests that grizzly bears no longer exist in the Bitterroot Ecosystem. Idaho Department of Fish and Game, the USDA Forest Service, and the U.S. Fish and Wildlife Service continue to receive sporadic reports of grizzly bears and continuously attempt to verify the sightings. All observation reports received are classified, documented, and investigated, if timely and of high quality. All verification attempts have resulted in either; various colored black bears that were misidentified as grizzly bears, or were inconclusive based on insufficient evidence or information. Verification efforts are typically conducted by trained bear biologists on the ground, with occasional aerial survey efforts following reception of likely reports.

Melquist (1985) conducted a preliminary survey to determine the status of the grizzly bear in the Clearwater National Forest. The survey consisted of ground and aerial searches, soliciting new grizzly bear observation reports, and compiling and evaluating 88 reports of grizzly bears recorded from 1900-1984. The survey failed to provide conclusive evidence of current presence of grizzly bears in the Clearwater National Forest. No sign of grizzly bears were found during aerial or ground searches and no observation reports received during the survey could be verified.

In reviewing the 88 records of grizzly bear observations, Melquist reported the last grizzly bear was killed in 1956 along Colt Creek near Powell. Subsequent verification efforts have shown that report to be erroneous.

Groves (1987) continued Melquist’s original work by compiling and reviewing a total of 175 historical grizzly bear reports for central and northern Idaho through 1986. Groves compiled 77

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reports of grizzly bears from within the Primary Analysis Area including all National Forests except the Sawtooth and Bitterroot National Forests. The majority (62) of reports were received for the Clearwater National Forest. Groves efforts could not document additional evidence to confirm any grizzly bear reports. See Appendix 23 for clarifying information from Melquist of Idaho Department of Fish and Game.

Based on historical reports of sightings, Servheen et al. (1990) and Kunkel et al. (1991) conducted surveys for grizzly bears in the North Fork of the Clearwater River drainage and a few other locations on the Clearwater National Forest during two consecutive summer field seasons (May - September). These surveys consisted of placing remote infrared sensitive cameras over bait, to photograph wildlife as they walked in front of the cameras and triggered the shutter. During a total of 480 camera days, 559 photographs of wildlife were taken, 265 of them were of bears. None of the photos were of grizzly bears.

The failure of all current verification efforts to produce a confirmed grizzly bear observation indicates that no grizzly bears are presently in the Bitterroot Ecosystem. Grizzly bears may occasionally travel through the area. However, the evidence strongly suggests that grizzly bear presence is nonexistent or so rare that despite thousands of visitors, hunters, management and research biologists in the Bitterroot Ecosystem annually, grizzly bears have not been verified either by a photograph, track, or hair sample since 1946.

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APPENDIX 5. PUBLIC ATTITUDES ABOUT GRIZZLY BEARS: A REVIEW OF RECENT SURVEYS

Research Overview

Many research studies have focussed on American's attitudes, beliefs and values of bears, few of them entail grizzly bears alone except in site-specific studies. The majority of American site-specific studies of people's relations with grizzly bears have been done in the pacific northwest states and Alaska. Several other studies of a similar scope have been done in Canada.

First, the attitudinal, belief, and value studies relevant to grizzly bears from the broader public perspective will be summarized. Then the same kinds of research done for site-specific populations of grizzly bears in the United States and Canada will be reviewed. Finally, a more detailed summary of the available information that is directly related to the U.S. Fish and Wildlife Service's proposal to augment or reintroduce grizzly bears in the northern Rocky Mountains will be covered. Locations include the Cabinet-Yaak ecosystem in northwestern Montana and the Selway-Bitterroot ecosystem in east central Idaho and west central Montana.

General Research

Views. -- Kellert (1994) wrote that attitudes toward bears, and more generally wildlife, result from,

“4 interrelated factors including: basic wildlife values, perceptions of particular species, knowledge and understanding of wildlife, and people-animal interactions.” Kellert describes several "demographic distinctions" regarding how people view or value wildlife species, and in particular their perspective of bears. These demographic distinctions include: 1) "human dependence on land and natural resources as reflected in rural residency, property ownership, and agricultural and other resource-dependent occupations"; 2) "socioeconomic status as measured by education and income"; and 3) "age and gender."

The first distinction is that people who can be described this way tend to have highly utilitarian and dominionistic wildlife values (e.g., would likely endorse bear exploitation and subordination for enhancing human interests and needs), while expressing little support for moralistic and humanistic wildlife values. The second distinction is that people who are highly educated and earn more than most, tend to express highly naturalistic and ecologicistic wildlife values (e.g., would likely endorse bear conservation and protection and have a pronounced interest in the outdoor recreational experience of bears). The third distinction is that younger and female respondents tend to have pronounced moralistic and humanistic wildlife values (e.g., would likely express strong affection for bears as well as strongly oppose consumptive use).

Kellert (1994) further asserts, “that knowledge and understanding of wildlife represents an additionally important influence on people's attitudes toward animals, although perhaps to a less

degree than often assumed...greater knowledge is often more a basis for reinforcing and rationalizing attitudes than a cause for attitudinal convergence or change."

The bear's actual "conservation status" (i.e., threatened standing as defined by the Endangered Species Act) has greatly affected North American attitudes (Kellert 1994). In a national survey (Kellert 1985), a significant majority of respondents expressed their willingness to protect millions of acres of national forests, despite job and timber losses to protect grizzly habitat. However, only a minority of elderly, rural, and lower socioeconomic Americans supported that degree of sacrifice nationwide.

An example of the application of Kellert's work comes from Alberta, Canada, where to determine the value of bears held by the population of Waterton National Park visitors, Maw (1989) took the responses to two questions and assigned each respondent to one of ten attitude groupings described by Kellert (1979). These questions were: 1) "In your opinion of what value, if any, is a bear?"; and 2) "What do you like most about bears?" The results of this assignment are reported in Table 6-1. The most common value indicated for bears was ecologicistic, which shows a strong concern that the bear is a part of the environment, and is related to other ecosystem parts. For the purposes of the analysis, Maw combined scientific with ecologicistic and also humanistic with moralistic.

Table 6-1. The value of bears as stated by visitors to Waterton National Park

Value Grouping	Number	Percent
Ecologicistic	127	34.4
Aesthetic	81	21.9
Naturalistic	62	16.7
Moralistic	43	11.6
Utilitarian	28	7.6
Negativistic	21	5.7
Humanistic	3	0.8
Scientific	2	0.5
Dominionistic	0	0
Neutralistic	0	0
Unknown	3	0.8
Total	370	100.0

MacCracken et al. (1994) address "value and cultural barriers" in regard to grizzly recovery in Idaho. They make an interesting observation: "Although federal agencies are required to listen to...competing views of how natural resources should be managed, their own professional value and bureaucratic cultural systems are sometimes disproportionately represented in policy decisions due to the lack of a public consensus on management direction or action."

But at the local level in Idaho; “fears of loss of livelihood and property, as well as possible attacks, can lead to deliberate killings of grizzlies. In addition, poaching grizzlies for valuable parts...may be viewed as a means to offset perceived job losses or decreased economic opportunities from protection and recovery actions” (MacCracken et al. 1994).

These authors also point out that within one generation, some local populations living near or in Idaho's grizzly country have seen the emphasis shift from trying to eradicate grizzly bears to their augmentation or reintroduction. Furthermore, in certain areas, religious teachings are used to justify promoting human welfare over other animals. They assert that; “information that would allow recovery teams to predict how cultural attitudes might influence the success of recovery efforts would be valuable, as it would suggest specific groups that could be targeted for education programs or enforcement efforts.”

Additionally, MacCracken et al. (1994) say that some people may resent grizzly bear protection and recovery as a means to restrict traditional land uses akin to what they perceive the designation of wilderness to be. Others believe the mining, logging and grazing of public lands are causing long term harm to natural systems and thus support grizzly protection and recovery because of the habitat management implications.

Values. -- Swanson et al. (1994) examined the economic value of grizzly bears in the greater Yellowstone area. They argued that two categories of economic value need to be defined when looking at the value of grizzly bears in the Yellowstone Recovery Zone (6 national forests and 2 national parks), namely economic impact and net economic efficiency. The former refers to expenditures and other economic activity generated in a region because the grizzly bears are there. Whereas the latter refers to the benefit received beyond the expenditures related to a resource - in other words, what would individuals be willing to pay beyond current expenditures if costs associated with bear-related activities increased or access fees were charged to view bears (Swanson et al. 1994).

Several different types of values are associated with the concept of net economic efficiency for grizzly bears, including use value, option value, existence and bequest values. Such values can be negative as well as positive, in that some people may be willing to pay to receive benefits derived from the absence of grizzly bears.

In 1983 a study of Wyoming hunters' willingness to pay for the future continuation of grizzly bear hunting (option value) and how much they'd pay to maintain grizzlies even if they could not hunt them in the future (existence value) was conducted (Brookshire et al. 1983).

Overall, Swanson et al. (1994, p. 579) contended that, “(t)here is virtually no information on the economic impact associated with threatened or endangered species”.

Site-specific Studies

Waterton National Park. -- In a random sample survey study of people's attitudes toward and knowledge of grizzly bears in Waterton National Park, Alberta, Maw (1989) describes several major findings:

- Nearly 80% of visitors thought grizzly bears were dangerous animals.
- More than half (54%), of these 80% who identified grizzlies as dangerous, failed to take precautions regarding possible encounters with bears.
- Half of the visitors perceived that the reason why people were injured by bears was due to their own fault or carelessness.
- "The value that the visitor held for bears was found to be related to the visitor's: 1) level of biological bear knowledge; 2) age; 3) educational level; 4) population size of current home area; and 5) type of user."
- "There was a relationship between higher levels of biological bear knowledge and ecological, aesthetic, and naturalistic values for bear, while the lower levels of biological bear knowledge were related to utilitarian and negativistic values."
- "In contrast to perceived opinions among park staff, there was strong support for bears to receive management priority for the use of a valley in the park. Many visitors indicated a willingness to give up their use of a valley in order to preserve bear populations."

Yellowstone National Park. -- Trahan (1987) conducted a mail survey in 1985 of backcountry hikers who had self-registered at trailheads in Yellowstone National Park. A total of 210 questionnaires were returned, yielding a 49% response rate.

When asked if having grizzly bears present had any effect on their decision to hike Yellowstone backcountry, 53% said no. Of those who said yes, their comments included they took more care with the choice of trail, they asked for or looked for more information, or they took precautions. Fifteen percent of all respondents said they felt "very safe," 67% felt "safe," 11% "did not think about" it, 12% felt "unsafe," and 1% felt "very unsafe." Fourteen percent felt that the amount of danger grizzly bears present to backcountry hikers was "significant" to "very significant." Two-thirds (66%) felt "some" danger, whereas 20% felt "insignificant" to "very insignificant" danger was presented.

Even though a two-thirds of respondents felt "some danger" was presented by grizzly bears to backcountry hikers, over half (56%) would still like to "view a grizzly from a great distance." A fifth (22%) wanted to "never encounter" one and another fifth (22%) wanted to be "close enough to get a good look." No one wanted to get "quite close." More than three-fourths (78%) felt that they were at least well informed versus 5% who felt that they were at least poorly informed about potential grizzly bear dangers in the backcountry of Yellowstone.

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Trahan (1987) reported some interesting relationships occurred among several of these variables that may be relevant for this review. Inexperienced hikers were more likely than experienced hikers to want to get close enough to "get a good look," although these inexperienced hikers were more likely to admit uncertainty as to what to do if they encountered a grizzly. Experienced hikers were more likely to report feeling very well informed than the less experienced ones.

Other studies dealing with possible courses of action to insure the safety of both visitors and wildlife, including grizzly bears have been conducted in the Yellowstone area (Compton 1993).

Glacier National Park. -- Braithwaite (1989) surveyed backcountry campers who visited Glacier National Park and Jewel Basin in 1987 about their perceptions of how social influences affected their backcountry behavior. She found that informational and social influences do affect certain types of backpackers. Those affected include groups composed of family members or family and friends, and relatively inexperienced or novice backpackers.

McCool and Braithwaite (1989) reported that Jewel Basin backpackers showed strong negativistic beliefs toward grizzly bears. Yet those backpackers with ecologicistic beliefs tended to participate more in appropriate behavior than those with negativistic beliefs. These authors then asserted that by sensitizing Jewel Basin visitors through written communication to an ecologically oriented perspective of the grizzly, behavioral compliance may have increased.

Mission Valley. -- Frost (1985) undertook a study in May 1984 of 154 Mission Valley (in northwestern Montana) residents' attitudes toward grizzly bears and many of the findings have relevance for consideration in the Bitterroot Mountains reintroduction proposal.

When asked if their neighbors had seen grizzly bears on their property, 88.5% of the population said yes, 56% of the population had observed grizzlies on their own land. When asked if neighbors or friends manage their property to maintain and protect grizzly bear habitat, only 4% answered a definitive yes, whereas 20% of the respondents said that they were managing their own property in this way. Seventy percent said that some of their local neighbors, friends, or relatives have had a problem which was caused by grizzly bears, while only 17% of the respondents indicated that they themselves had a problem with grizzlies. Forty percent said their nearby neighbors left food items around that could attract grizzly bears onto the property.

Other findings about respondent knowledge of grizzly bears and their behavior include:

- Only 34% knew that the Montana grizzly is "threatened."
- Their knowledge about the size of the grizzly population was poor - only 18% of the population was correct (between 16-32 bears).
- Three-fourths (74%) properly identified grizzly bear exploratory behavior correctly; 14% incorrectly interpreting it as a sign of imminent attack.
- Three-fifths (61%) properly identified huffing and teeth clacking as threat behavior, however, 39% were unaware that this was a threat display.

Findings about grizzly bears adding to the quality of life include:

- Over one half (55%) of respondents felt that having grizzly bears in the Missions added to their quality of life; 32% felt the presence of grizzly bears did not add to their quality of life, and 13% didn't know.
- Respondents who felt grizzly bears added to their quality of life had a higher overall knowledge of grizzlies and their behavior than those who felt the species didn't add to their quality of life. These respondents were also more likely to be younger, and were more likely to at least have seen a grizzly bear (the more encounters with grizzlies the more likely an individual felt the species added to their quality of life).

Overall, 61% of the respondents agreed that they liked grizzly bears; 27% disagreed, and 12% were uncertain. Those individuals who agreed were more likely to have higher grizzly bear scores. Those who disagreed that they liked grizzlies were more likely to: disagree that grizzlies are in danger of disappearing, agree that the disappearance of the grizzly bear is unavoidable if human needs are to be met, have had less encounters with grizzly bears, and be older in age.

Frost (1985) concludes that, "nurturing the active involvement of resident landholders is a necessity, to obtain a holistic protection of grizzly habitat on private, as well as federal, lands", especially in regard to the three grizzly bear ecosystems designated as "recoverable" in Montana.

Grizzly Bear Augmentation and Reintroduction Efforts

Cabinet-Yaak Augmentation Effort. -- In 1988, the FWS held a 60 day public comment period (2/1-3/31) for public response to the Draft Environmental Assessment (DEA) for grizzly bear population augmentation in the Cabinet-Yaak ecosystem. A total of 892 comments were received: 90% originated from Lincoln and Sanders Counties; 8% came from the rest of Montana, all of northern Idaho, and eastern Washington; 2% came from across the U.S. Ninety-five percent of the comments (843) were from individuals, 2% came from industry/business, 1% from community/civic organizations and 1% from environmental/ conservation groups (FWS 1988). Overall response to the augmentation proposal was negative, people were not in favor of increasing the grizzly bear population in the Cabinet-Yaak ecosystem.

The number of comments per issue and a summary of the comments by issue follows:

1. The effects on public safety - 131 comments.
Fear comments outweighed other comments almost 2 to 1 and ranged from not wanting bears in their back yards to not wanting to give up trips to the wilderness area due to fear of bear attacks.
2. The effects on recreational opportunities, public land uses, and public attitudes - 146 comments.
One-fourth of the comments made said that an increased bear population would decrease wilderness activities because of more road closures. A little more than a third of the

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comments made indicated that respondents lacked trust in land management agencies, their policies, and practices.

3. The effects on local economies - 62 comments.
 Nine-tenths of the comments perceived adverse effects on the local economy with any increase in grizzly bear numbers. Responses indicated that no logging or mining would occur with grizzlies present in larger numbers which would both jeopardize jobs and prohibit these industries from expanding.
4. The expense, coordination, complexity, and potential success of an augmentation program - 33 comments.
 All comments were opposed to the immediate and long term costs of the project.
5. Biological/ecological effects of moving bears from one area and placing more bears in the Cabinet Mountains - 265 comments.
 A fourth of the comments indicated that not enough area/habitat was available for more bears in the proposed augmentation area. The balance of the comments were related to concerns that were indirectly related to the augmentation.

The Public and Grizzly Bear Reintroduction in the Bitterroot Ecosystem

The USFWS and the Idaho Fish and Game Department (IDFG) authorized a survey of public opinion regarding the reintroduction of grizzly bears into the Bitterroot Ecosystem (Duda and Young 1995). The contractor, Responsive Management, conducted the random digit dial telephone survey in June, 1995. Nine hundred interviews were administered to randomly selected people selected from national, regional, and local samples. Tables 6-2 through 6-6 summarize the responses to several questions received from completed interviews. The type of response is further tallied by the three geographically defined groups. The balance of Duda and Young's (1995) findings are summarized within this section.

Attitudes. --

Table 6-2. In general, do you support or oppose reintroducing grizzly bears to the Bitterroot Mountains? (N = 919 respondents)

RESPONSE	LOCAL (%)	REGIONAL (%)	NATIONAL (%)
Strongly support	33	39	42
Moderately support	29	34	35
Neither	8	10	10
Moderately oppose	8	5	5
Strongly oppose	18	5	3
Don't know	4	7	4

Table 6-3. What is the main reason you support grizzly bear recovery in the Bitterroot Mountains? (N = 650 respondents)

REASON	LOCAL (%)	REGIONAL (%)	NATIONAL (%)
Save from extinction	34	28	41
Part of ecosystem	33	37	24
Aesthetic	6	5	4
Were here before we were	17	18	17
Preserve for future generations	3	4	6
Other	7	8	7

Table 6-4. What is the main reason you oppose grizzly bear reintroduction in the Bitterroot Mountains? (N = 137 respondents)

REASON	LOCAL (%)	REGIONAL (%)	NATIONAL (%)
Bears are dangerous	48	40	54
Will kill pets / livestock	7	7	8
No need for them	16	13	8
Reintroduction wouldn't work	9	7	N/A
Costs too much	3	3	4
Land restrictions	7	10	4
Other	10	20	23

Table 6-5. I would derive satisfaction from just knowing grizzly bears are present in the Bitterroot Mountains. (N = 919 respondents)

RESPONSE	LOCAL (%)	REGIONAL (%)	NATIONAL (%)
Strongly agree	30	37	33
Moderately agree	40	41	49
Moderately disagree	10	12	8
Strongly disagree	16	4	3
No opinion	5	7	7

Table 6-6. I dislike the idea of grizzly bears being present in the Bitterroot Mountains. (N = 919 respondents)

RESPONSE	LOCAL (%)	REGIONAL (%)	NATIONAL (%)
Strongly agree	15	6	3
Moderately agree	9	8	5
Moderately disagree	26	29	32
Strongly disagree	45	52	53
No opinion	4	6	8

Management Options. -- A range of management options for the reintroduction of grizzly bears were presented for consideration by the respondents. These options included: no special accommodations in land use were made for grizzly bears, such as logging or recreation; if grizzly bears were released only in areas already designated as Wilderness; if a State or Tribal wildlife manager was stationed in the area to help track bears, inform and educate people, and resolve conflicts; if costs for capture, release and monitoring were tightly controlled and kept at a minimum; if non-government groups covered some of the costs of the program; if local communities around the Bitterroot area had more input in grizzly bear management decisions; if a Citizen Conservation Council with local and national representatives of various interests, such as logging, ranchers, and conservationists were granted management responsibility; and if grizzly bears that lingered in areas of high human use, acted aggressively toward humans, or killed livestock were removed promptly.

Six of the eight ways resulted in a majority of local, regional and national respondents to state that they would be more supportive of bear reintroduction. Less than a majority said that they would be more supportive from all 3 samples; "if a Citizen Conservation Council with local and national representatives of various interests, such as logging, ranchers, and conservationists were granted management authority and no special accommodations in land use, such as logging or recreation were made specifically for grizzly bears" (Responsive Management, 1995).

Social Assessment of the Bitterroot Valley (of western Montana). -- In this study, 51 residents shared their opinions about important issues relative to natural resources management. Interviewees were classified based on their primary relationship with forest management and so were identified as the "amenities", "commodities", or "neutral" groups (Bitterroot Social Research Institute 1994).

Interviewees who were oriented to amenities most commonly mentioned; "their affinity for the forest and outdoors, observing that they spent a lot of time in the forest recreating and being close to nature." Those who are commodity oriented related forest management to their business and

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livelihood and commonly had; “concern for the Bitterroot Valley's economic stability, wilderness prescribed fire escapes, soil conservation, and water storage.” Those interviewees with a neutral outlook on amenity or commodity interests tended to have no particular interest in ecosystem management (EM) and fire management or they had a variety of personal interests in the way the forest was managed.

These three groups had specific comments about grizzly bears which were shared by respondents under the topic “threatened and endangered species.” The amenity group's response regarding grizzly bears follows: “Some support reintroduction because they want to know everything is in the system for now and the future. Supporters of reintroduction differed among themselves relative to the potential threat of grizzly bears to forest visitors. They acknowledged opponents of reintroduction feel personally and economically threatened by the proposed reintroduction” (Bitterroot Social Research Institute 1994).

Additionally, some specifically felt that the well-being of humans needs to be considered as much as the well-being of grizzly bears. The commodity group had several members who were willing to accept grizzly bears living in their current habitat, but didn't want their range expanded to the Bitterroot Ecosystem.

Many believed that direct conflicts would result from the reintroduction of a large number of bears (e.g., up to 250) into the Selway-Bitterroot Wilderness with visitors to the Bitterroot Forest which has had use increasingly encouraged by the USDA Forest Service over the past several decades. Furthermore, when an area, like the Bitterroot Valley has had agriculture for more than 100 years, respondents in this group wondered why the FWS was so determined to reintroduce grizzly bears.

Half of the neutral group (neither commodity nor amenity oriented) felt grizzly reintroduction was wrong and commented, “I can't see the benefit of reintroducing grizzlies”. These individuals believed that in the presence of grizzlies, stockmen were more likely to practice “the three S's rule” where one “shoots, shovels and shuts up”. Some neutralists, who perceived that the economic influence of agriculture in the Bitterroot Valley was declining, thought that if grizzly bears were reintroduced, the economic effect would be minimal. An argument was also presented, “...where humans ought to be the ones having to adapt to grizzlies...” (Bitterroot Social Research Institute 1994).

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APPENDIX 6. SCIENTIFIC TECHNIQUES FOR THE REINTRODUCTION OF GRIZZLY BEARS



TRANSPLANTING GRIZZLY BEARS *Ursus arctos horribilis* AS A MANAGEMENT TOOL — RESULTS FROM THE CABINET MOUNTAINS, MONTANA, USA

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Abstract

A study of grizzly bears *Ursus arctos horribilis* in the Cabinet Mountains, Montana indicated that the future of the population was in jeopardy, and population augmentation was recommended. The US Fish and Wildlife Service (USFWS) issued an augmentation plan in 1987. The first of four projected transplants was completed in July 1990. The first transplanted grizzly bear was a 5-year-old female that weighed 71 kg. The first bear remained in the Cabinet Mountains following release and was monitored for 13 months before the radio collar was lost. This bear was visually located in the target area on 15 May 1992 approximately 19 km from the release site. Her home range from July 1990 through May 1992 encompassed 555 km². Data regarding movements and habitat use were analysed and compared with native grizzly bears in the Cabinet Mountains. Trapping efforts in southeast British Columbia for additional bears to transplant were again conducted in 1991 and 1992. The effort resulted in the capture of eight different grizzly bears in 1991, but none met the sex and age criteria of 2–6-year-old females. Efforts in 1992 resulted in the capture of a second 71 kg 6-year-old female (bear 258) which was released at the same location as the first bear exactly 2 years later on 22 July 1992. Movements of bear 258 from July through November 1992 encompassed 388 km² in the target release area. This second bear emerged with a single cub in May 1993 and was radio-monitored until July 1993 when it was found dead in the target release area. No trace of the cub was found although it had been seen with its mother in late June. The cause of death is as yet unknown pending completion of toxicology reports. A third subadult female bear (286) was captured in July 1993 and released in the target area where she has remained through October 1993. Transplanting of bears can be a valuable tool in the conservation of small bear populations worldwide.

Keywords: grizzly bear, bear, management, Montana, transplant, *Ursus arctos*.

INTRODUCTION

In 1975, the grizzly bear *Ursus arctos horribilis* was listed as a threatened species in the 48 adjacent states under the provisions of the US Endangered Species Act. Six ecosystems were identified as supporting self-perpetuating or remnant grizzly populations (USFWS, 1982, 1993). The Cabinet/Yaak Ecosystem (CYE) was one of three ecosystems designated by the recovery plan for concentrated recovery efforts to restore viable populations of grizzly bears. The hunting of grizzly bears in the area had been suspended by the State of Montana in 1974.

Grizzly bear ecological research was conducted in the Cabinet Mountains from 1983 to 1988 (Kasworm & Manley, 1988) to determine habitat use and the status of the existing population. The study concluded that the continued existence of the population in the Cabinet Mountains was in serious doubt, and that the probability of the extinction of this population in the next few decades was high. This conclusion was based on the capture of only three grizzly bears despite an extensive trapping effort, the advanced age of the individuals captured, few additional sightings, only one observation of a female with young, and high mortality rates of marked bears.

The placement of grizzly bears into the Cabinet Mountains was proposed as a conservation effort in order to maintain this population. Two approaches for augmenting grizzly bears were proposed (USFWS, 1987). The first involved transplanting adults or subadults from higher density populations in other areas of similar habitat into the Cabinet Mountains. Transplants would involve bears from remote areas that would have no history of conflict with humans. The use of subadult females was recommended because they were thought most likely to remain in the target area rather than returning to the site of origin because of their smaller home ranges and potential reproductive contribution (Maguire & Servheen 1992). The second proposed approach relied on the cross-fostering of grizzly bear cubs to wild black bear (*Ursus americanus*) females

currently resident in the target area. Under this approach, grizzly bear cubs from zoos would replace black bear cubs in the maternal dens of black bear females during March or April. The fostering of orphaned black bear cubs to surrogate black bear females has been used successfully in several areas (Alt, 1984; Alt & Beecham, 1984). This approach was initially considered but was rejected due to lack of public support.

The objective of the study was to test grizzly bear transplant techniques in the Cabinet Mountains to

determine if transplanted bears would remain in the area of release and ultimately contribute to the population through reproduction.

STUDY AREA

The Cabinet Mountains (48° N, 116° W) constitute the southern portion of the CYE (Fig. 1). Approximately 90% of the study area is on public land administered by the Kootenai, Lolo and Panhandle National Forests.

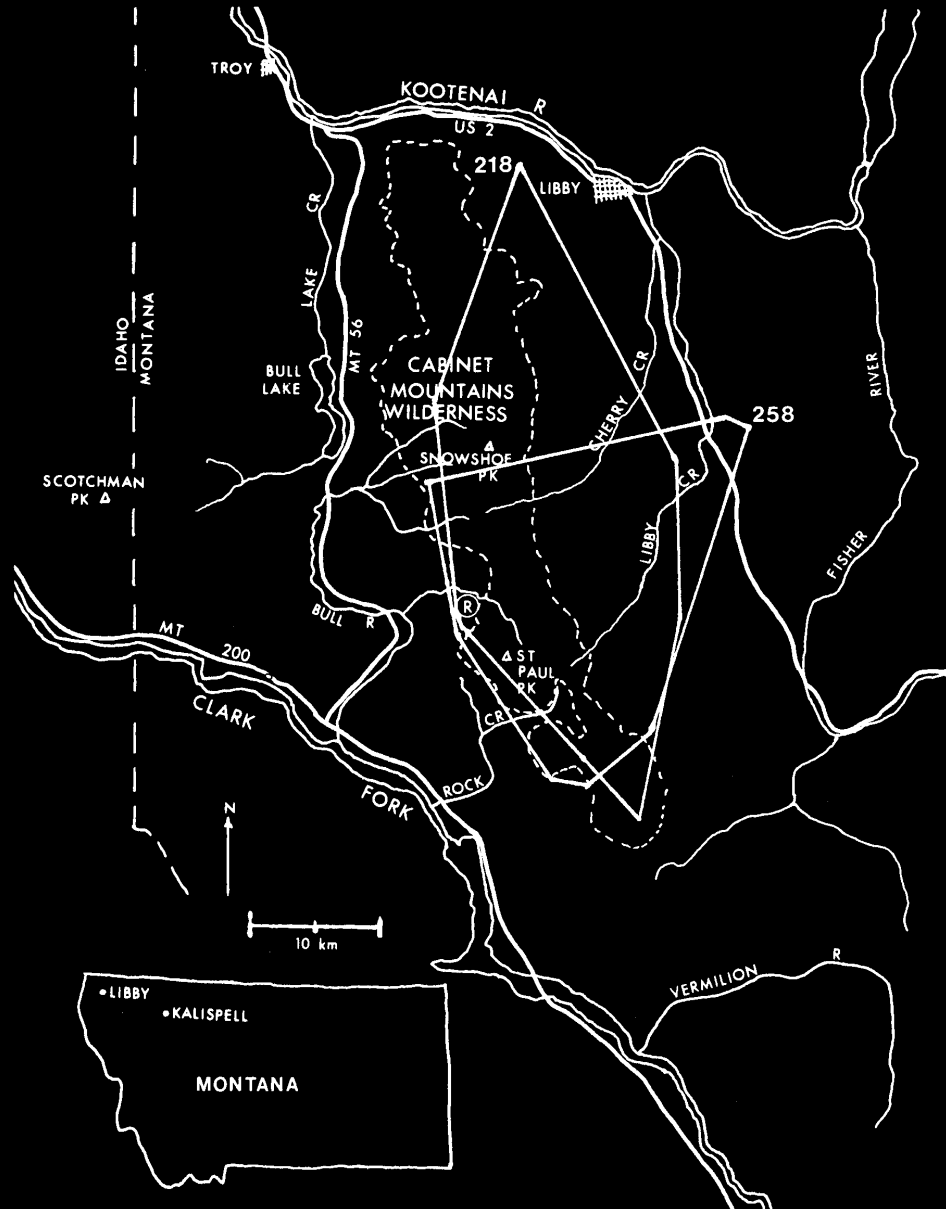


Fig. 1. Composite home ranges of grizzly bears 218 and 258 in the Cabinet Mountains, 1990-92 (R, release site).

Appendix 6. Techniques for Reintroduction of Grizzly Bears
Transplanting grizzly bears in Montana

Plum Creek Timber Company Inc. and Champion International are the main corporations holding significant amounts of land in the area. Individual ownership exists primarily along the major rivers and valley bottoms, and there are numerous patented mining claims along the Cabinet Mountains Wilderness boundary which encompasses 381 km² of the higher elevations of our study area in the East Cabinet Mountains.

The entire CYE encompasses 5,360 km² and is located in northwest Montana and northern Idaho. The Cabinet Mountains portion of the ecosystem is 3,960 km² and lies south of the Kootenai River, while the Yaak area borders Canadian grizzly populations to the north. Two 12-km-wide areas link the Yaak with the Cabinet Mountains.

Elevations in the Cabinet Mountains range from 610 m along the Kootenai River to 2,664 m at Snowshoe Peak. The study area has a Pacific maritime climate characterized by short, warm summers and heavy, wet winter snowfalls. The lower, drier elevations support stands of ponderosa pine *Pinus ponderosa* and Douglas-fir *Pseudotsuga menziesii*, whereas grand fir *Abies grandis*, western red cedar *Thuja plicata*, and western hemlock *Tsuga heterophylla* dominate the lower elevation moist sites. Mixed stands of subalpine fir *Abies lasiocarpa*, spruce *Picea engelmannii*, and mountain hemlock *Tsuga mertensiana* predominate between 1,500 m and the timberline. Mixed stands of coniferous and deciduous trees are interspersed with riparian shrubfields and wet meadows along the major rivers. Huckleberry *Vaccinium* spp. and mixed shrubfields are largely a result of the wildfires that occurred in 1910 and 1929. Effective fire suppression since then has virtually eliminated wildfire as a natural force in creating and maintaining berry-producing shrubfields.

Contemporary resource use by humans in the area includes mineral exploration and extraction, timber harvest, and recreation. ASARCO operated the Troy mine complex 20 km south of Troy from 1979 to 1992. Silver and copper were the primary minerals extracted. Mineral exploration activity currently centers on the southwestern portion of the Cabinet Mountains Wilderness Area. Noranda Minerals Corporation began construction of a similar facility in Libby Creek during 1990, and ASARCO has proposed a second mine near the community of Noxon.

Timber harvest is the principal land management activity over most of the CYE. A total timber volume of 935,856 m³ was harvested on the Kootenai National Forest from 1988 to 1991. Additional timber was harvested from private lands in the area.

Various forms of recreational use occur in the Cabinet Mountains. Summer recreation consists primarily of day hikes, overnight backpack trips, and fishing. Recreational and commercial huckleberry picking occurs during the fall and primarily outside the Wilderness. The West Cabinets (Scotchman Peak) and areas adjoining the Cabinet Wilderness are under consideration as additions to the wilderness system. Big-game

hunting and fishing provide seasonal recreation and are an important part of the local economy.

Trapping for this study in 1990 to 1993 was conducted in the upper North Fork of the Flathead River drainage and the Wigwam River drainage in British Columbia, approximately 20–40 km north and 15 km to the south of the US border. Subalpine fir was the indicated climax species throughout most of the area, with lodgepole pine *Pinus contorta* the most prevalent. Recent wildfires in the upper elevations have had more of an influence on habitat than in the CYE. An outbreak of pine bark beetles *Dendroctonus ponderosae* resulted in the logging of large areas at lower elevations during the 1980s. Large portions of the upper elevations had been logged earlier in response to a spruce bark beetle *Dendroctonus obesus* epidemic. Although roads were relatively common in the area trapped, very little public use was observed. Grizzly bears are considered an important game animal in this portion of British Columbia and are hunted under a system of limited entry.

METHODS

Bears were captured with foot snares (Aldrich Snare Company, Clallam Bay, Washington) (the use of trade names does not imply endorsement of such products by the US Fish and Wildlife Service) placed in and near wooden cubbies baited with road-killed deer and miscellaneous meat scraps (Johnson & Pelton, 1980). Scraps of bait were dragged along roads and trails to produce scent trails to attract bears to the trap sites. Human scent on the snares was reduced by boiling them for several hours with bark, needles, leaves, and paraffin, and then handling only with gloves. Signs were posted to warn humans of the snare sets. Snares were checked daily.

Captured grizzly bears were immobilized with tiletamine hydrochloride and zolazepam hydrochloride (Telazol), administered at a dose of 8 mg per kg of body weight. Captured black bears were immobilized with a mixture of ketamine hydrochloride (Ketaset or Vetalar) and xylazine hydrochloride (Rompun), administered at 4.4 mg per kg of ketamine and 2.2 mg per kg of xylazine. Drugs were delivered with either a Palmer Cap-Chur gun or jab stick. Dosages were based on estimated weights of bears by experienced personnel.

Rubberized button ear tags were used to mark captured bears. One numbered tag was placed in each ear. Colored streamers were attached to the ear tags of grizzly bears transplanted to the CYE. Physical measurements and estimates of body condition were recorded at each capture. The first premolar was extracted and used to determine the age of the individual by counting cementum annuli (Stoneberg & Jonkel, 1966).

Only independent unmarked female grizzly bears < 7 years and > 35 kg were deemed suitable for transplanting to the CYE. All other captured grizzly bears were released on-site. Females > 2 years old were fitted with radio collars (Telonics, Mesa, Arizona) prior to release,

in agreement with the British Columbia Fish and Wildlife Branch, to aid an ongoing grizzly bear study. All radio collars were attached with a canvas spacer to allow collar separation in 2–3 years (Hellgren *et al.*, 1988). Male grizzly bears were ear tagged but not collared.

Habitat values and bear food habits were carefully compared between the origin area and the target area to assure that the trophic resources available were similar in type and availability. This was done to assure that released bears would not have to learn new food sources in the target area. Timing of release was set for July, the time when food availability in the target area was highest, with shrub fruits, the major food source in the area, ripe and available for bears. Before July, shrub fruits were not ripe, and after July, the possibility of capture in the origin area dropped as bears moved into shrub-field areas and fed on shrub fruits almost exclusively.

Captured bears were immobilized at the capture site and fitted with radio collars and ear tags. They were then placed inside aluminum culvert traps for transport and release. Transplanted bears were moved to the release site during darkness to avoid the daytime heat. This method required only a single immobilization of each transplanted bear. Bears were released at the target area 24–28 h after capture at the origin site. They were given water in the holding cage but were not fed.

Monitoring of each bear was conducted from the air and ground beginning immediately after release. Locations were plotted on 1:24,000 US Geological Survey topographic maps by Universal Transverse Mercator (UTM) coordinates. Minimum convex polygons (Mohr, 1947) were calculated using a computer program (McPAAL; Smithsonian Institution). Radio locations were also classified by grizzly bear habitat component (Madel, 1982), US Forest Service management area (USFS, 1987), and elevation. Distance measurements from roads and trails to radio locations were used to examine their relationships to bear distribution (Kasworm & Manley, 1990). Closed roads were considered to be trails for analysis. If open roads were closer to locations than the nearest trail, the distance to the road was also entered as the measurement for the nearest trail. A random point sample was used to delineate distance-to-road categories (DRC) and distance-to-trail categories (DTC) in the area used by native grizzly bears (Kasworm & Manley, 1990). Twenty percentiles of randomly located points produced five DRCs: (1) 0–274 m; (2) 275–914 m; (3) 915–1,859 m; (4) 1,860–3,322 m; and (5) >3,322 m. Similarly, 20 percentiles of randomly located points produced five DTCs (1) 0–122 m; (2) 123–305 m; (3) 306–610 m; (4) 611–1,128 m; and (5) >1,128 m. Statistical analyses were performed through the use of the computer packages MSUSTAT (Lund, 1983) and SPSS/PC+ (SPSS Inc., 1988).

THE PUBLIC INVOLVEMENT PROCESS

Because the augmentation of the Cabinet Mountains grizzly bear population was a project that had an effect

on the environment, the project was subject to an environmental assessment under the US National Environmental Policy Act (NEPA). This process involved a series of public meetings to ask which type of augmentation procedure the public preferred and to be sure that public concerns about augmentation were addressed. During this review, many concerns were expressed which included human safety, conflicts with other land-uses, the effects on existing wildlife populations, and long-term grizzly bear population goals.

A citizens' involvement committee was formed to aid in information exchange between the public and the agencies, by asking the community to appoint 10–15 community leaders who represented a cross-section of local opinion ranging from those against bear conservation to those strongly in favor of conservation. This group was asked to work closely with the management agencies in developing a plan to answer the questions and concerns of the local public about the augmentation and to provide direct input to agencies on how to improve conservation efforts. Representatives of several local organizations donated their time to further this purpose.

The first product of this citizens' group was a question and answer brochure regarding grizzly bear conservation in the Cabinet/Yaak Ecosystem, mailed to every person in Lincoln and Sanders counties, Montana, some 14,000 mail box holders. In response to concerns expressed by the citizens' group, the augmentation proposal was modified to eliminate cross-fostering and to reduce total numbers of transplanted bears to four individuals over 5 years. The initiation of transplanting was also postponed for 1 year to allow for additional public information and education programs regarding the proposal.

An approach to the integration of general public knowledge into the augmentation process was described by Maguire and Servheen (1992). This method utilized decision analysis to select the best course of action when the best information was a combination of subjective and objective information. The result was the selection of the best possible alternatives given the level of uncertainty in such a management action like augmentation of a grizzly bear population.

RESULTS AND DISCUSSION

Trapping

In July 1990, a 5-year-old 71 kg female grizzly bear (bear 218) was captured and moved to the Cabinet Mountains as part of the augmentation effort. Bear 218 was trapped in the North Fork of the Flathead River approximately 15 km north of the international boundary on 21 July 1990 and released in Lost Girl Creek on the west side of the Cabinet Mountains wilderness on 22 July 1990. A total of four different grizzly bears were captured before the selected bear.

Trapping for candidate grizzly bears in British Columbia in 1991 began on 9 July and continued for 26 days ending on 7 August. Ten captures of eight individual

Transplanting grizzly bears in Montana

Table 1. Capture effort and trap success for grizzly bears in southeast British Columbia during July 1990, 1991 and 1992

Year	Trap nights	Grizzly bears captured	Trap nights/grizzly bear
1990	240	5	48.0
1991	310	8	38.8
1992 ^a	212	5	42.4
1993	73	2	36.5

^a1992 data include some trapping effort in northwest Montana in addition to British Columbia data.

grizzly bears occurred during the 310 trap nights (Table 1). None of the captured grizzly bears met the criteria for bears to be transplanted. All captured bears were released at the capture site. These included one adult male, three subadult males, three adult females, and one 1-year-old female (Table 1). The adult females were radio collared for research monitoring by Canadian biologists. The yearling female was judged too small to be a good candidate for transplanting. Twenty-one black bears were captured, ear tagged, and released.

Trapping activities began on 7 July 1992 in the North Fork of the Flathead River, both north of the border in British Columbia and south of the border in the US. Trapping concluded on 22 July in British Columbia and on 28 July in the US. Three grizzly bears were captured in British Columbia and two grizzly bears were captured in the US (Table 1). Four of the five grizzly bears captured in 1992 were subadults. The other individual was an adult female with yearlings. One of the subadult females, a 6-year-old 71 kg animal (bear 258), was trapped on 21 July 1992 and transferred to the Lost Girl Creek release site in the Cabinet Mountains.

Trapping activities began on 9 July 1993 in the North Fork of the Flathead River and concluded on 15 July. Two grizzly bears and five black bears were captured. A 2-year-old female grizzly bear (bear 286) was transferred to the Lost Girl Creek release site on 16 July 1993.

Monitoring

Radio location flights and ground monitoring of bear 218 were conducted from release in July 1990 to late August 1991 when the radio collar came off the animal. Forty-five specific radio locations were obtained during 1991. Forty-one of these were aerial and four were ground. Several additional general ground locations were obtained.

Movements of bear 218 as a 5-year-old during 1991 in the Cabinet Mountains encompassed 439 km², and its composite home range during 1990–92 was 555 km² (Fig. 1). This compared with a 1990 home range of 191 km². The home range size of bear 258 from 22 July to 30 September 1992 was 388 km² (Fig. 1).

Bear 218 emerged from her den during mid-April 1991. In late July she began using lower elevations on the east side of the Cabinet Mountains where huckle-

Table 2. Mean distance (m) and confidence interval between successive radio locations of grizzly bear 218 in the Cabinet Mountains, 1990–91

Time	Mean period	n	\bar{x} (m)	95% CI (m)
22–28 July	Weekly	5	1,176	671–1,682
29 July–4 August	Weekly	7	3,647	1,060–6,288
5–11 August	Weekly	8	5,811	2,378–9,244
12–18 August	Weekly	7	3,629	1,215–6,043
19–31 August	Monthly	7	4,870	0–9,818
1–30 September	Monthly	14	2,491	760–4,222
1–31 October	Monthly	6	4,803	1,144–8,462
15–30 April	Monthly	2	4,243	0–51,675
1–31 May	Monthly	10	3,571	1,552–5,589
1–30 June	Monthly	8	5,569	193–10,944
1–31 July	Monthly	11	7,556	2,823–12,289
1–31 August	Monthly	14	3,846	2,004–5,688

berries and serviceberries *Amelanchier alnifolia* were abundant. She stayed in this area until the first week of August at which time she moved south where the huckleberry crop also appeared good.

Distances between successive locations for bear 218 were analysed to quantify movements following release. During the first four weeks following release, daily aerial radio locations were attempted. Mean daily movements were calculated by weekly intervals and compared (Table 2). Mean daily movements were lowest during week 1 (1,176 m) and highest during week 3 (5,811 m), though none of the four weekly means were significantly different ($F = 2.47$; $p = 0.087$). Following week 4, monitoring frequency dropped to an average of three flight locations per week. Mean movements between successive locations were then computed on a monthly basis and compared (Table 2). Mean distance between successive locations was least during September and greatest during July for the period 19 August 1990–1 September 1991, though none of the eight monthly means were significantly different ($F = 1.24$; $p = 0.297$).

Bear 218 appeared to develop a geographical memory of specific sites. The vicinity of the release site was revisited during middle and late August 1990 and again in late June 1991. Several other small drainages or basins were used repeatedly during the 13 months she was monitored. Bear 218 was visually located on 15 May 1992 approximately 19 km from her release site.

Bear 218 was 5 years-old during the breeding season of 1991 and may have been reproductively fit. Although she was observed three times from the air during the May and June breeding period, no other bears were observed with her. Throughout the entire 1990–91 monitoring period, she was observed a total of 30 times during aerial monitoring flights. At no time were other grizzly bears observed accompanying her. During the 13 months of monitoring, she remained within the intended area of the transplant and had little reported contact with people. Her movement patterns and home range appear similar to native grizzly bears monitored from 1983 to 1989.

Radio location flights and ground monitoring of bear 258 were conducted from release on 22 July 1992 to den entry in early November. Thirty-nine aerial radio locations were obtained during 1992. This bear used a portion of the Cabinet Mountains south of the area used by bear 218 while she was monitored. Bear 258 denned in the Rock Creek drainage during early November 1992 at about 1850 m. She emerged in May 1993 with a single cub. Since she was captured in July and the breeding season is normally in late May and June, she likely bred in 1992 in Canada before capture. Her movements in 1993 were localized in high-elevation areas within 8 km of her den site prior to her death in July. This bear remained in the release area for 12 months during which time she was radio monitored and all movements and behaviors appeared to be normal. The cause of death is a mystery as her fat level and body condition appeared to be normal. No sign of acute injury was evident. The body was helicoptered out and examined at a veterinary pathology lab. Toxicology tests for arsenic, cyanide, and strychnine were negative. Additional toxicology tests are ongoing.

The production of a cub in 1993 indicated that this bear was not unusually stressed by the transplant and found sufficient food to complete her pregnancy. Nothing in the data available to date indicates that the transplant had a direct relationship to her death.

Habitat use characteristics

Habitat information from 131 specific aerial radio locations from bears 218 and 258 was summarized and compared with 233 specific aerial locations obtained from native grizzly bears in the Cabinet Mountains during 1983–88 (Kasworm & Manley, 1988).

Monthly mean elevations of radio locations from transplanted bears varied from a low of 1,327 m during May to a high of 1,839 m during September and ranged from a minimum of 853 m to a maximum of 2134 m (Fig. 2) The mean elevation of all radio locations from transplanted bears (1,664 m) during 1990–92

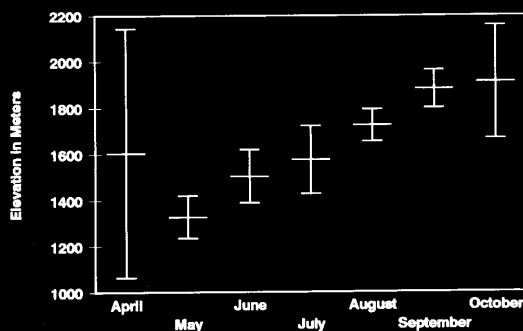


Fig. 2. Monthly mean elevation of grizzly bear radio locations in the Cabinet Mountains, 1990–92, for transplanted grizzly bears 218 and 258 at 95% confidence intervals. April, $n = 2$; May $n = 10$; June $n = 8$; July $n = 29$; August, $n = 58$; September, $n = 23$; October $n = 5$.

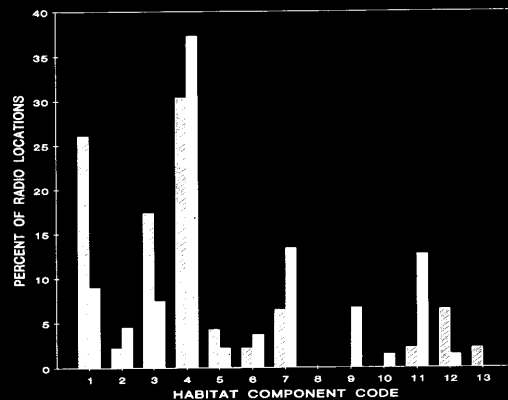


Fig. 3. Early-season habitat component use by transplanted grizzly bears during 1990–92 and native grizzly bears in the Cabinet Mountains, 1983–88. Shaded bars, transplant; solid bars, native. Transplant, $n = 46$; Native, $n = 134$. Habitat component key: 1, closed timber; 2, open timber; 3, timbered shrubfield; 4, shrubfield snowchutes; 5, shrubfield cutting units; 6, shrubfield burn; 7, alder shrubfield; 8, huckleberry shrubfield; 9, riparian; 10, drainage forbfield; 11, graminoid sidehill park; 12, beargrass sidehill park; 13, slabrock.

was greater than the mean elevation of all radio locations of native grizzly bears (1,591 m) during 1983–89 ($t = 2.47$, $p = 0.014$). This difference in elevational use may be related to spring sample size differences, the annual variation of food production and resultant habitat use that occurred during 1990–92, or it may reflect a greater avoidance of low-elevation areas used by people for transplanted bears as compared with native bears.

Two seasons were defined on the basis of bear food habits, an early season from den exit to 31 July, when bears are largely dependent on green vegetation other than berries, and a late season from 1 August to den entry when they are feeding heavily on berries. Grizzly bear radio locations were classified by habitat component (Madel, 1982) based on existing vegetation structure and composition.

Seventy-four percent of transplanted bear radio locations occurred in the closed timber, timbered shrubfield, and mixed shrub/snowchute habitat components during the early season (Fig. 3). Native grizzly bears monitored in the Cabinet Mountains from 1983 to 1989 had 54% of their radio locations in the same three habitat components and made greater use of *Alnus sinuata* shrubfields and graminoid sidehill parks than transplanted bears during the periods studied.

Seventy percent of transplanted bear radio locations occurred in timbered shrubfield, mixed shrub/snowchute, huckleberry shrubfield, and beargrass *Xerophyllum tenax* sidehill park habitat components during the late season (Fig. 4). Fifty-four percent of radio locations from native grizzly bears occurred in the same components. Transplanted bears made greater use of huckleberry shrubfields and beargrass sidehill parks than native bears, likely related to the distribution of

Transplanting grizzly bears in Montana

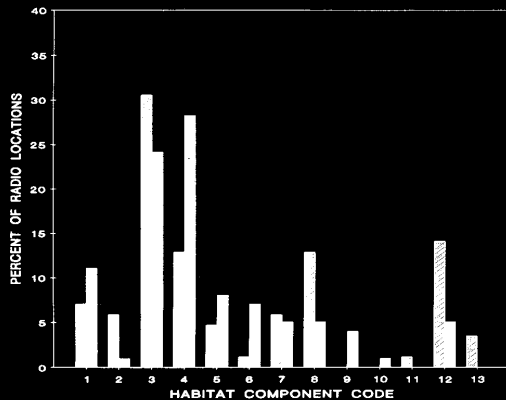


Fig. 4. Late-season habitat component use by transplanted grizzly bears during 1990-92 and native grizzly bears in the Cabinet Mountains, 1983-88. Shaded bars, transplant; solid bars, native. Transplant, $n = 85$; native, $n = 99$. See Fig. 3 for habitat component key.

huckleberries during the years monitored. Native bears made greater use of mixed shrubfield snowchutes and mixed shrubfield burns. Production of huckleberries in beargrass sidehill park components may be more variable than other components because these sites lack timber cover which may protect plants from frost damage. Likewise, a partial timbered overstory may provide shading to huckleberry bushes during dry conditions. Good production on these sites may be indicative of good overall production.

Relations to human activity

Ninety-eight percent of aerial radio locations obtained from transplanted bears were on US Forest Service administered lands. Classification of radio locations by US Forest Service management area indicated that 83%

of use by transplanted bears occurred in wilderness, proposed wilderness, or non-motorized recreational lands. Ninety-one percent of native bear locations occurred on US Forest Service administered lands and 85% of use occurred in either wilderness, proposed wilderness, or non-motorized recreational lands.

Aerial radio locations of transplanted bears were analysed to determine their relationship to open roads and trails (including closed roads). Use of five distance to open road categories (DRC) by transplanted grizzly bears was compared with use by native bears (Kasworm & Manley, 1990). Native grizzly bear use of the five DRCs was different from expected based on availability ($\chi^2 = 132.51$, $p < 0.001$). Native grizzly bears used DRCs 1 and 2 less than expected ($p < 0.05$) and DRCs 4 and 5 more than expected (Table 3). Use of DRC 3 was not different from expected. Native grizzly bear use of DRCs 1 and 2 combined was 20% of expected.

Transplanted grizzly bear use of the five DRCs was different from expected based on availability ($\chi^2 = 58.88$, $p < 0.001$). Transplanted bears used DRCs 1 and 2 less than expected and used DRCs 4 and 5 more than expected (Table 3). Use of DRC 3 was not different from expected. Combined use of DRCs 1 and 2 by transplanted grizzly bears was 26% of expected. Use of these DRCs by transplanted and native bears was identical.

Native grizzly bear use of the five distance to trail categories (DTC) was significantly different from expected based on availability ($\chi^2 = 70.56$, $p < 0.001$). They used DTCs 1 and 3 less, and DTC 5 more, than expected (Table 4). All other DTCs received use as expected.

Transplanted grizzly bears' use of the five DTCs was different from expected based on availability ($\chi^2 = 36.54$, $p < 0.001$). They used DTC 1 less, and DTC 5 more, than expected (Table 4). Use of DTCs 2, 3 and 4 was not different from expected, and DTC 1 36% of expected. Use of these DTCs by transplanted bears was thus similar to native bears.

Table 3. Proportional use (U) and availability (A) of distance to open road categories (DRC) for native and transplanted grizzly bears in the Cabinet Mountains, 1983-1992

Group	n	DRC 1 0-274 m	DRC 2 275-914 m	DRC 3 915-1,859 m	DRC 4 1,860-3,322 m	DRC 5 > 3,322 m
		U p ^a A	U p A	U p A	U p A	U p A
Native	233	0.009 < 0.205	0.073 < 0.201	0.202 = 0.198	0.296 > 0.198	0.421 > 0.198
Transplant	133	0.023 < 0.205	0.083 < 0.201	0.211 = 0.198	0.338 > 0.198	0.346 > 0.198

^aSignificant differences ($p < 0.05$): < less than, > greater than, = no difference.

Table 4. Proportional use (U) and availability (A) of distance to trail categories (DTC) for native and transplanted grizzly bears in the Cabinet Mountains, 1983-1992

Group	n	DTC 1 0-122 m	DTC 2 123-305 m	DTC 3 306-610 m	DTC 4 611-1,128 m	DTC 5 > 1,128 m
		U p ^a A	U p A	U p A	U p A	U p A
Native	215	0.098 < 0.234	0.172 = 0.166	0.144 < 0.213	0.177 = 0.189	0.409 > 0.198
Transplant	119	0.084 < 0.234	0.143 = 0.166	0.168 = 0.213	0.210 = 0.189	0.395 > 0.198

^aSignificant differences ($p < 0.05$): < less than, > greater than, = no difference.

CONCLUSION

Trapping for other candidate bears for transplant will continue. Additional locations for trapping will be examined. There are no plans to alter the sex and age criteria for candidate bears or time for release into the Cabinet Mountains.

Relocation of 2–6-year-old female grizzly bears has thus far proven to be a useful tool to increase the number of reproductively capable animals in a small population where reproduction and numbers are critically low. Important factors to the success of the effort include age, sex, and human-related history of the released animals, the timing of release, and the similarity of food resources between the origin and release sites. Public support is critical and to date has proved to be the main factor limiting the use of this technique. Significant efforts must be initiated to develop and maintain public understanding and support for bear conservation as part of any transplant effort. Continued success of the effort must be monitored with ultimate success being reproduction of the transplanted bears.

The future of many bear populations worldwide is precarious due in large part to habitat loss and fragmentation that produces small isolated populations (Servheen, 1990). The management of such populations isolates requires active, intrusive operations if they are to survive increasing human pressures. Many areas of potential bear habitat are currently unoccupied due to historical excessive human-caused mortality. Such areas have the potential again to have bear populations with the use of the technique described in this paper. Human actions such as transplanting bears will be required if bear populations are to be re-established and small populations are to survive.

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APPENDIX 7. BUDGET ESTIMATES FOR FEIS ALTERNATIVES FOR REINTRODUCTION AND MONITORING OF GRIZZLY BEARS IN THE BITTERROOT ECOSYSTEM

Alternative 1. Restoration of Grizzly Bears as a Nonessential Experimental Population with Citizen Management

Summary.-- A nonessential experimental population rule would be established by regulation. A minimum of 25 grizzly bears would be captured and moved to the BE during the first 5 years of the program. The capture and transport portion of this budget estimates costs for work that would be accomplished by USFWS personnel, and assumes availability of bears in areas that are accessible for trapping. Bears would be transported to the BE by vehicle from the capture site and transported to the release site by helicopter. All animals would be fitted with radio transmitters and monitored. Population monitoring would be accomplished through recapture and radio monitoring of instrumented animals. Funding for the Citizen Management Committee travel costs is included.

Table 6-7. Estimated Annual Costs of Implementing Alternative 1.

	Annual Cost for First 5 Years
Capture and Transport - U.S. Fish and Wildlife Service	
Salaries and Benefits	\$49,132
Vehicles and Travel	\$7,000
Trapping and Miscellaneous Supplies	\$20,000
Helicopter Release	\$7,500
Helicopter Capture (Canada)	\$7,000
<i>Subtotal of Annual Costs for Capture and Transport - U. S. Fish and Wildlife Service</i>	\$90,632
Monitoring and Management - IDFG Nez Perce Tribe. MDFWP ^a	
Salaries and Benefits	\$100,000
Aircraft Costs for Monitoring	\$20,000
Law Enforcement Assistance	\$10,000
Equipment (Collars, Receivers, Culvert Trap, Vehicle)	\$33,000
Operations (Travel, Supplies)	\$10,000
Citizen Management Committee (Travel and Expenses for CMC and Science Advisors)	\$20,000
<i>Subtotal of Annual Costs for Monitoring and Management -IDFG Nez Perce Tribe. MDFWP ^a</i>	\$193,000
Monitoring and Management - USDA Forest Service	
Annual Operating Cost for Sanitation, Information and Education, Law Enforcement, Etc.	\$150,000
Annual Cost for the 5-Year Reintroduction Period - All Agencies	\$433,632

Total Cost for the 5 - Year Reintroduction Period	\$2,168,160
Annual Cost for Monitoring & Citizen Management After the First 5 Yrs.	\$193,000

^a Monitoring and management through cooperative agreements with IDFG, Nez Perce Tribe, and MDFWP.

Alternative 1A. Restoration of Grizzly Bears as a Nonessential Experimental Population with USFWS Management

Summary.-- A nonessential experimental population rule would be established by regulation. A minimum of 25 grizzly bears would be captured and moved to the BE during the first 5 years of the program. The capture and transport portion of this budget estimates costs for work that would be accomplished by USFWS personnel, and assumes availability of bears in areas that are accessible for trapping. Bears would be transported to the BE by vehicle from the capture site and transported to the release site by helicopter. All animals would be fitted with radio transmitters and monitored. Population monitoring would be accomplished through recapture and radio monitoring of instrumented animals.

Table 6-8. Estimated Annual Costs of Implementing Alternative 1A.

	Annual Cost for First 5 Years
Capture and Transport - U.S. Fish and Wildlife Service	
Salaries and Benefits	\$49,132
Vehicles and Travel	\$7,000
Trapping and Miscellaneous Supplies	\$20,000
Helicopter Release	\$7,500
Helicopter Capture (Canada)	\$7,000
<i>Subtotal of Annual Costs for Capture and Transport - U. S. Fish and Wildlife Service</i>	\$90,632
Monitoring and Management - IDFG, Nez Perce Tribe, MDFWP^a	
Salaries and Benefits	\$100,000
Aircraft Costs for Monitoring	\$20,000
Law Enforcement Assistance	\$10,000
Equipment (Collars, Receivers, Culvert Trap, Vehicle)	\$33,000
Operations (Travel, Supplies)	\$10,000
<i>Subtotal of Annual Costs for Monitoring and Management -IDFG, Nez Perce Tribe, MDFWP^a</i>	\$173,000
Monitoring and Management - USDA Forest Service	
Annual Operating Cost for Sanitation, Information and Education, Law Enforcement, Etc.	\$150,000
Annual Cost for the 5-Year Reintroduction Period - All Agencies	\$413,632
Total Cost for the 5 - Year Reintroduction Period	\$2,068,160
Annual Cost for Monitoring & Management After the First 5 Yrs.	\$173,000

^a Monitoring and management through cooperative agreements with IDFG, Nez Perce Tribe, and MDFWP.

Alternative 2. The No Action - Natural Recovery of a Grizzly Bear Population

Summary.-- This alternative relies on natural recovery of grizzly bear populations through immigration from other bear populations and habitat protection for any grizzly bears that might exist in the BE. Population establishment would be monitored through sighting reports from agencies and the public.

Table 6-9. Estimated Annual Costs of Implementing Alternative 2.

	Estimated Annual Cost
U.S. Fish and Wildlife Service	
Salaries and Benefits	\$25,000
Operations (Travel, Supplies)	\$15,000
USDA Forest Service	
Sanitation, I&E, Law Enforcement, Permit Issuance, Etc.	\$100,000
TOTAL Annual Cost	\$140,000

Alternative 3. No Grizzly Bear Recovery

Summary. -- Special legislation would be prepared for action by congress and the states of Colorado, Idaho, Montana, Washington, and Wyoming. Grizzly bears would be removed from the list of threatened and endangered species in that region of the United States. Costs associated with this alternative include staff time and travel to develop the required legislation. The total cost would be spread over several years.

Table 6-10. Estimated Total Cost Over Several Years of Implementing Alternative 3.

	Estimated Total Cost
U.S. Fish and Wildlife Service	
Salaries and Benefits	\$400,000
Operations (Travel, Supplies)	\$100,000
Legislative, lobbying, and public relations effort	\$1,500,000
TOTAL Cost Over Several Years (minimum estimate)	\$2,000,000

Alternative 4. Restoration of Grizzly Bears as a Threatened Population With Full Protection of the ESA and Habitat Restoration

Summary. -- The grizzly bear population in the BE would be managed as a threatened population similar to management in other ecosystems. A minimum of 25 grizzly bears would be captured and moved to the BE during the first 5 years of the program. The capture and transport portion of this budget estimates costs for work that would be accomplished by USFWS personnel, and assumes availability of bears in areas that are accessible for trapping. Bears would be transported to the BE by vehicle from the capture site and transported to the release site by helicopter. All animals would be fitted with radio transmitters and monitored. Further monitoring of population changes is anticipated and would be accomplished through recapture and radio monitoring of instrumented animals. Funding for the Scientific Management Committee travel costs is included.

Table 6-11. Estimated Annual Costs of Implementing Alternative 4.

	Annual Cost for First 5 Years
Capture and Transport - U.S. Fish and Wildlife Service	
Salaries and Benefits	\$49,132
Vehicles and Travel	\$7,000
Trapping and Miscellaneous Supplies	\$20,000
Helicopter Release	\$7,500
Helicopter Capture (Canada)	\$7,000
<i>Subtotal of Annual Costs for Capture and Transport - U. S. Fish and Wildlife Service</i>	\$90,632
Monitoring and Management - IDFG Nez Perce Tribe. MDFWP ^a	
Salaries and Benefits	\$100,000
Aircraft Costs for Monitoring	\$20,000
Law Enforcement Assistance	\$10,000
Equipment (Collars, Receivers, Culvert Trap, Vehicle)	\$33,000
Operations (Travel, Supplies)	\$10,000
Scientific Committee (Travel and Expenses for entire Committee)	\$15,000
<i>Subtotal of Annual Costs for Monitoring and Management -IDFG Nez Perce Tribe. MDFWP ^a</i>	\$188,000
Monitoring and Management - USDA Forest Service	
Annual Operating Cost for Sanitation, Information and Education, Law Enforcement, Etc.	\$150,000
Annual Cost for the 5-Year Reintroduction Period - All Agencies	\$428,632
Total Cost for the 5 - Year Reintroduction Period	\$2,143,160

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Annual Cost for Monitoring & Management After the First 5 Yrs.

\$188,000

^a Monitoring and management through cooperative agreements with IDFG, Nez Perce Tribe, and MDFWP.

Alternative 4A. Restoration of Grizzly Bears as a Threatened Population With Full Protection of the ESA and USFWS Management

Summary. -- The grizzly bear population in the BE would be managed as a threatened population similar to management in other ecosystems. A minimum of 25 grizzly bears would be captured and moved to the BE during the first 5 years of the program. The capture and transport portion of this budget estimates costs for work that would be accomplished by USFWS personnel, and assumes availability of bears in areas that are accessible for trapping. Bears would be transported to the BE by vehicle from the capture site and transported to the release site by helicopter. All animals would be fitted with radio transmitters and monitored. Further monitoring of population changes is anticipated and would be accomplished through recapture and radio monitoring of instrumented animals. Funding for a Scientific Advisory Committee is included to cover travel and per diem.

Table 6-12. Estimated Annual Costs of Implementing Alternative 4A.

	Annual Cost for First 5 Years
Capture and Transport - U.S. Fish and Wildlife Service	
Salaries and Benefits	\$49,132
Vehicles and Travel	\$7,000
Trapping and Miscellaneous Supplies	\$20,000
Helicopter Release	\$7,500
Helicopter Capture (Canada)	\$7,000
<i>Subtotal of Annual Costs for Capture and Transport - U. S. Fish and Wildlife Service</i>	\$90,632
Monitoring and Management - IDFG Nez Perce Tribe. MDFWP ^a	
Salaries and Benefits	\$100,000
Aircraft Costs for Monitoring	\$20,000
Law Enforcement Assistance	\$10,000
Equipment (Collars, Receivers, Culvert Trap, Vehicle)	\$33,000
Operations (Travel, Supplies)	\$10,000
Scientific Advisory Committee (Travel and Expenses for entire Committee)	\$15,000
<i>Subtotal of Annual Costs for Monitoring and Management -IDFG Nez Perce Tribe. MDFWP ^a</i>	\$188,000
Monitoring and Management - USDA Forest Service	
Annual Operating Cost for Sanitation, Information and Education, Law Enforcement, Etc.	\$150,000
Annual Cost for the 5-Year Reintroduction Period - All Agencies	\$428,632
Total Cost for the 5 - Year Reintroduction Period	\$2,143,160
Annual Cost for Monitoring & Management After the First 5 Yrs.	\$188,000

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^a Monitoring and management through cooperative agreements with IDFG, Nez Perce Tribe, and MDFWP.

APPENDIX 8. GRIZZLY BEAR REINTRODUCTION TO THE BITTERROOT ECOSYSTEM AND EXECUTIVE ORDER 12630 (GOVERNMENT ACTIONS AND INTERFERENCE WITH CONSTITUTIONALLY PROTECTED PROPERTY RIGHTS)

Under Executive Order 12630, executive departments and agencies should review their actions carefully to prevent unnecessary takings of private property. Governmental actions, including federal regulations or proposed federal regulations, that may have an impact on private property should be scrutinized to avoid undue or unplanned burdens.

The proposed action to reintroduce grizzly bears into the Bitterroot Ecosystem (BE) has been designed to avoid affecting private property. If grizzly bears are released in the BE of central Idaho, they will be released and managed so the recovery actions are compatible with existing private land uses (principally ranching) so that the lifestyle and income are not negatively affected. Other wild predators such as gray wolves, coyotes, mountain lions, black bears, foxes, and golden eagles presently utilize lands in public and private ownership and are an accepted part of the natural environment. Private landowners are concerned that grizzly bears will depredate on livestock and that grizzly bear recovery will place restraints on their land management practices or reduce their incomes. Grizzly bears just like other large predators may occasionally attack livestock. Under the proposed action, people could kill grizzly bears in self-defense or in defense of other human life. Following the issuance of a permit by the FWS, the public would be allowed to harass a grizzly bear attacking livestock (cattle, sheep, horses, and mules). A livestock owner may be issued a permit to kill a grizzly bear that is killing or pursuing livestock on private land, if it has not been possible to capture such a bear through agency efforts. Designation of the released population as a nonessential experimental population means the released grizzly bears would be treated as though they are a proposed species. Private property would not be affected by land-use restrictions because of grizzly bear recovery.

We anticipate that grizzly bears would initially be viewed as a novelty by the local community and attract considerable attention. Eventually, however, we believe grizzly bears would be viewed as a normal part of the local resident's natural environment and the bears would receive diminishing attention from the local populace.

The U.S. Fish and Wildlife Service foresees no need to purchase lands as part of this grizzly bear recovery effort. If such a need should arise, acquisition would be only from willing sellers. Land values in northwestern Montana and northern Idaho have not been noticeably affected by grizzly bears recently recolonizing those areas, and there is no reason to suspect that grizzly bear presence would negatively affect land values in other parts of Montana and Idaho.

The reintroduction would undoubtedly attract the interest of wildlife viewers throughout the United States as well as other areas. Tourism is becoming a major industry in central Idaho and western Montana and some tourists would likely include visits to these areas if grizzly bears were present. Federal public land on National Forests, Wildlife Refuges, Bureau of Land Management lands, and National Parks would provide the public with opportunities to visit areas where grizzly bears would be present. Visitors are unlikely to be a trespass nuisance on private lands.

APPENDIX 9A. INTRA-SERVICE SECTION 7 EVALUATION FOR THE RESTORATION OF GRIZZLY BEARS TO THE BITTERROOT ECOSYSTEM OF CENTRAL IDAHO AND WESTERN MONTANA

Description Of Proposed Action

The Revised Grizzly Bear Recovery Plan (U. S. Fish and Wildlife Service 1993) calls for evaluation of the Bitterroot Ecosystem as a potential recovery area. Section 10(j) of the Endangered Species Act grants authority to the U. S. Fish and Wildlife Service (Service) to release animals of a threatened or endangered species outside its current range, such as an area of former range that is currently unoccupied by the species. The area for the introduced population is to be designated along with details regarding the management of the population and its habitat.

The Bitterroot Ecosystem Grizzly Bear Recovery Chapter of the Revised Grizzly Bear Recovery Plan (U. S. Fish and Wildlife Service 1996) directed development of an Environmental Impact Statement (EIS) to consider a range of alternatives, including a Section 10(j) alternative to reintroduce grizzly bears.

The preferred alternative of the final EIS proposes to reintroduce a minimum of 25 grizzly bears, of both sexes, over a 5-year period into the Bitterroot Ecosystem of east central Idaho and a portion of western Montana. Grizzly bears would be reintroduced into the Selway-Bitterroot Wilderness portion of the recovery area. A Citizen Management Committee (CMC) would determine if reintroduction is appropriate for the Frank Church-River of No Return Wilderness. Grizzly bears would be captured in Canada and the United States from areas with healthy populations of grizzly bears and habitat similar to the Bitterroot Ecosystem. Three sources of grizzly bears for the Bitterroot Ecosystem have been identified: Southeastern British Columbia, the Northern Continental Divide Ecosystem population in northwestern Montana, and the Yellowstone Ecosystem population. Capture and reintroduction would occur during periods when optimal food supplies exist for the Bitterroot Ecosystem. Each grizzly bear would be radio-collared and monitored to determine individual movements, use of habitat, and to inform the public of grizzly bear locations and recovery efforts.

The USFWS has determined, based upon the best scientific evidence available, there are no grizzly bears in the Bitterroot Ecosystem at this time (U. S. Fish and Wildlife Service 1997, U. S. Fish and Wildlife Service 1996). Based on habitat analysis of the area, the Bitterroot Ecosystem should provide suitable habitat for more than 200 bears (Davis and Butterfield 1991, Servheen et al. 1991, U. S. Fish and Wildlife Service 1997).

Location

The project area is defined as the Bitterroot Ecosystem of central Idaho and western Montana in the Northern Rocky Mountains. The analysis area considered in the preferred alternative of the final EIS is referred to as the Bitterroot Grizzly Bear Experimental Population Area. The experimental population area includes Forest lands or portions thereof within the Bitterroot, Boise, Challis, Clearwater, Nez Perce, Payette, Sawtooth, Salmon, and Panhandle National Forests in Idaho and the Bitterroot and Lolo National Forests in Montana. A few scattered parcels of private and state land occur within the recovery area, but total acreage is minor.

The experimental population area is bounded by U.S. Highway 93 from Missoula, Montana to Challis, Idaho; Idaho Highway 75 from Challis to Stanley, Idaho; Idaho Highway 21 from Stanley to Lowman,

Idaho; Idaho Highway 17 from Lowman to Banks, Idaho; Idaho Highway 55 from Banks to New Meadows, Idaho; U.S. Highway 95 from New Meadows to Coeur d'Alene, Idaho; and Interstate 90 from Coeur d'Alene to Missoula, Montana.

The center of the experimental population area is characterized by 3 wilderness areas, the Frank Church-River of No Return, the Selway-Bitterroot, and the Gospel Hump Wilderness Areas. The Bitterroot Grizzly Bear Recovery Area was identified as the area of recovery emphasis, and includes the Selway-Bitterroot and Frank Church-River of No Return Wilderness Areas of east central Idaho and western Montana. Grizzly bears would likely be introduced into the Selway-Bitterroot Wilderness portion of the recovery area, north of Moose Creek Station.

Listed Species Or Critical Habitat Considered (see Species List in Project File)

Gray wolf (<i>Canis lupus</i>)	LE ¹ , XN ²
Grizzly bear (<i>Ursus arctos horribilis</i>)	LT ³
Bald eagle (<i>Haliaeetus leucocephalus</i>)	LT
Peregrine falcon (<i>Falco peregrinus</i>)	LE
Macfarlane's four-o'clock (<i>Mirabilis macfarlanei</i>)	LT
Water howellia (<i>Howellia aquatilis</i>)	LT
Ute's ladies tresses (<i>Spiranthes diluvialis</i>)	LT
Bull trout (<i>Salvelinus confluentus</i>)	LT
Lynx (<i>Felis lynx canadensis</i>)	PT ⁴
Northern Idaho ground squirrel (<i>Spermophilus brunneus brunneus</i>)	PT

Candidate Species Considered (see Species List in Project File)

None

List Of Species Of Concern Considered (see Species List in Project File)

Mammals

Long-legged myotis (<i>Myotis volans</i>)	Long-eared myotis (<i>Myotis evotis</i>)
Fringed myotis (<i>Myotis thysanodes</i>)	Townsend's big eared bat (<i>Plecotus townsendii</i>)
Yuma myotis (<i>Myotis yumannensis</i>)	Pygmy rabbit (<i>Brachylagus idahoensis</i>)
Wolverine (<i>Gulo gulo luscus</i>)	

Birds

Northern goshawk (<i>Accipiter gentilis</i>)	Harlequin duck (<i>Histrionicus histrionicus</i>)
Ferruginous hawk (<i>Buteo regalis</i>)	Black tern (<i>Chlidonias niger</i>)
Columbia sharp-tailed grouse (<i>Tympanuchus phasianellus columbianus</i>)	

¹ Listed as endangered.

² Experimental population designation.

³ Listed as threatened.

⁴ Proposed for listing as threatened.

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Fish

Interior redband trout (*Oncorhynchus mykiss gairdneri*)

Westslope cutthroat trout (*Oncorhynchus clarki lewisii*)

Plants

Clustered lady's slipper (*Cypripedium fasciculatum*)

Howell's gumweed (*Grindelia howellii*)

*⁵ Lemhi penstemon (*Penstemon lemhiensis*)

Hazel's prickly phlox (*Leptodactylon pungens ssp. hazeliae*)

Jessica's aster (*Aster jessicae*)

Broad-fruit mariposa (*Calochortus nitidus*)

Palouse goldenweed (*Haplopappus liatrifolius*)

Clearwater phlox (*Phlox idahonis*)

Crenulate moonwort (*Botrychium crenulatum*)

Salmon River fleabane (*Erigeron salmonensis*)

Spalding's silene (*Silene spaldingii*)

Hapeman's sullivantia (*Sullivantia hapemanii* var. *hapemanii*)

Tobias' saxifrage (*Saxifraga bryophora* var. *tobiasiae*)

* Salmon twin bladderpod (*Physaria didymocarpa* var. *lyrata*)

* Bartonberry (*Rubus bartonianus*)

* Aase's onion (*Allium aaseae*)

* Idaho douglasia (*Douglasia idahoensis*)

* Slickspot peppergrass (*Lepidium papilliferum*)

Payson's milkvetch (*Astragalus paysonii*)

White Cloud's milkvetch (*Astragalus vexillifex* var. *nubilus*)

Douglas' wavewing (*Cymopterus douglassii*)

Guardian buckwheat (*Eriogonum meledonum*)

Stanley whitlow-grass (*Draba trichocarpa*)

* Wavy-leaf thelypody (*Thelypodium repandum*)

* Alkali primrose (*Primula alcalina*)

Invertebrates

Columbia pebblesnail (*Fluminicola columbianus*)

Idaho pointheaded grasshopper (*Acrolophitus pulchellus*)

Idaho banded mountainsnail (*Oreohelix idahoensis*)

Boulder pile mountainsnail (*Oreohelix jugalis*)

Whorled mountainsnail (*Oreohelix vortex*)

Mission Creek Oregonian (*Cryptomastix magnidentata*)

Lava rock mountainsnail (*Oreohelix waltoni*)

Carinated striate banded mountainsnail (*Oreohelix strigosa goniogyra*)

⁵ The original list of plant species is located on the Species List in the FEIS Project File. Plant species with an asterisk (*) have subsequently been determined to be outside of the analysis area boundaries.

Explanation Of Impact Of Action On Listed Species Or Critical Habitat

Gray wolf - Not likely to adversely affect. Grizzly bears and wolves coexist throughout the northern Hemisphere and would be expected to coexist in the proposed experimental area. Research on wolf and grizzly bears in and near Glacier National Park indicates only minor interaction between bears and wolves, other than that both species kill ungulates (U. S. Fish and Wildlife Service 1994). Grizzly bears will occasionally usurp wolf-killed prey by driving the wolves away. Wolves and grizzly bears have been documented to kill each other in some areas where they coexist in North America, but such instances are uncommon even in areas with high densities of both grizzly bears and wolves (U. S. Fish and Wildlife Service 1994). Wolves and grizzly bears usually avoid direct contact with one another. Wolves may both provide and compete for ungulate carcasses with grizzly bears, but such competition should be insignificant in terms of effect on population levels (U. S. Fish and Wildlife Service 1994).

Grizzly bear - Beneficial effect. This action will lead to recovery of grizzly bear populations in the Bitterroot Ecosystem, enhancing recovery of the species (U. S. Fish and Wildlife Service 1997). Genetic diversity of grizzly bears will be increased as a result of reintroduction. Reintroducing grizzly bears may result in some individual bears being killed, relocated, or removed from the area because of conflicts with humans, livestock, ungulate populations, and listed salmonid populations. Such losses of individual bears have been considered as part of the bear recovery-reintroduction program and are not expected to significantly affect bear population growth to recovery. There have been occasional, but unverified, sightings of grizzly bears in the Bitterroot Ecosystem for decades, however the last verified evidence of grizzly bears was in 1946 (U. S. Fish and Wildlife Service 1997). The USFWS has determined, based upon the best scientific evidence available, there are no grizzly bears in the Bitterroot Ecosystem at this time (U. S. Fish and Wildlife Service 1997, U. S. Fish and Wildlife Service 1996). If native grizzly bears were subsequently identified in the recovery area, they may become more vulnerable to mortality under an experimental population rule than currently, because these bears would be subject to the same removal criteria as reintroduced animals. However, any increased vulnerability would be mitigated by reintroduction because of increased chances of finding mates and producing young.

Bald eagle - No effect. Grizzly bears are not known to prey on bald eagles or their nests, which are located primarily in trees in the potentially affected areas. Bald eagles could scavenge carrion killed by grizzly bears but are primarily a fish-eating species. Bald eagles and grizzly bears have coexisted in other parts of North America without apparent effect on one another.

Peregrine falcon - No effect. Grizzly bears are not known to prey on peregrine falcons or their nests which are typically located on cliffs. Grizzly bears do not usually prey on small birds or waterfowl and therefore will not compete for food with peregrine falcons (Mattson et al. 1991; Craighead et al. 1995). Peregrine and other falcons and grizzly bears have coexisted in other parts of North America without apparent effect on one another.

Macfarlane's four-o'clock (*Mirabilis macfarlanei*), **Water howellia** (*Howellia aquatilis*), and **Ute's ladies tresses** (*Spiranthes diluvialis*) - No effect. Although grizzly bears do eat plants, they primarily eat vegetation that is high in nutritional value such as fleshy fruits, nuts or bulbous roots (Craighead et al. 1995; Alberta Forestry, Lands and Wildlife 1990). Neither Macfarlane's four-o'clock, water howellia, nor Ute's ladies tresses are likely desirable food species for grizzly bears (Edna Vizgirdas, US Fish and Wildlife Service, pers. comm. 1996). Both water howellia and Macfarlane's four-o'clock are located on the northern and western edges (respectively) of the experimental population area. Ute's ladies tresses is

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located on the southern edge of the experimental population area. Due to the large expanse of area and varied land uses between the experimental area and the locations of all three species, it is unlikely that grizzly bears will encounter any of the plant species. These plant species and grizzly bears have likely coexisted in the past without apparent effect on one another.

Lynx (*Felis lynx canadensis*) - Not likely to adversely effect. The experimental population area occurs in the southern limits of lynx distribution (Idaho Department of Fish and Game et al. 1995). Contrary to predator-prey fluctuations documented between lynx and snowshoe hare populations in northern reaches of lynx range, southern reaches do not appear to respond in this cyclic fashion (Ruggiero et al. 1994). This may be due to a greater diversity of predators and competitive species of snowshoe hare in the southern portion of lynx range, thus keeping snowshoe hare populations at a lower level that does not cycle (Idaho Department of Fish and Game et al. 1995). Due to low levels of snowshoe hare and diversity of prey in southern reaches of lynx range, it is unlikely that competition for prey with grizzly bears would adversely affect lynx populations. Natural predation of lynx has been documented to occur but appears to be in low numbers and has been determined to be a non-threat to the species (Idaho Department of Fish and Game et al. 1995).

Bull trout (*Salvelinus confluentus*) - Not likely to adversely affect. The USFWS is unaware of any literature documenting grizzly bears utilize bull trout as a food resource. Grizzly bears have been documented to feed on cutthroat trout (U. S. Fish and Wildlife Service 1997), but this source of food represents only a minor portion of the grizzly bear's main diet if other food sources are available (Mattson et al. 1991; Craighead et al. 1995). It is possible that reintroduced grizzly bears could feed on bull trout; however, the above finding would seem to indicate that effects to bull trout populations would be minimal.

Bull trout could be used by grizzly bears during late summer-fall spawning migration, but due to low population numbers of grizzly bears in the early years of reintroduction and generally dispersed distribution of the bull trout in the recovery area, it is unlikely that grizzly bears will have an adverse effect on bull trout population levels (Steve Duke, U. S. Fish and Wildlife Service, pers. comm. 1996).

Northern Idaho Ground Squirrel (*Spermophilus brunneus brunneus*) - No effect. Most populations of the Northern Idaho ground squirrel lie outside the experimental population area boundary, with one possible extant population occurring just inside the western boundary of the experimental area (USDA Forest Service and U. S. Fish and Wildlife Service 1997). It is unlikely that given the distance and land use practices between the experimental area and the single colony site near the experimental population area, that grizzly bears would encounter this species.

Long-legged myotis (*Myotis volaris*), **Long-eared myotis** (*Myotis evotis*), **Fringed myotis** (*Myotis thysanodes*), **Townsend's big eared bat** (*Plecotus townsendii*), and **Yuma myotis** (*Myotis yumannensis*) - Not likely to adversely affect. All referenced bat species are insectivorous, especially on beetles and moths (Groves 1996). While feeding behaviors may overlap (Groves 1996) between time of day and insect species of choice, grizzly bears are not likely to adversely affect the prey base required for these species. There is no documentation available to indicate that bats or their roosting habitats have been affected by the presence of grizzly bears in the past.

Wolverine (*Gulo gulo*) - Not likely to adversely affect. Wolverines are scavengers, mainly dependent on large mammal carrion (Ruggiero et al. 1994). Due to this scavenging nature, wolverines are dependent on the presence of other predators to provide carrion, but can also become prey of these predators (Ruggiero et al. 1994). However, current wolverine distribution (Idaho Department of Fish and Game et al. 1995)

Appendix 9A - Intra-Service (USFWS) Section 7 Evaluation

indicates that it is widely distributed and is unlikely that either competition for carrion during the spring or direct predation would adversely affect the population as a whole. Grizzly bears and wolverines likely have coexisted in the experimental area (Idaho Department of Fish and Game et al. 1995) prior to the loss of grizzly bears without known adverse effects.

Pygmy rabbit (*Brachylagus idahoensis*) - Not likely to adversely affect. Pygmy rabbits are found primarily in big sagebrush (*Artemisia tridentata*) habitats (Green and Flinders 1980a; White et al. 1982) distributed throughout most of the Great Basin and portions of the intermountain West (Green and Flinders 1980b). Although pygmy rabbits could be eaten by grizzly bears, predation events will likely be incidental and are not likely to adversely affect this species. Only the northeast corner of the range of the pygmy rabbit (as shown in Green and Flinders 1980b) occurs within the experimental population area for grizzly bears. This overlap comprises less than 20 percent of pygmy rabbit distribution. The primary food of pygmy rabbits is big sagebrush, although they may consume grasses (*Agropyron* spp. and *Poa* spp.) during mid to late summer (Green and Flinders 1980b). Although in some areas pygmy rabbits and grizzly bears could utilize the same forage species, such competition for food is not likely to adversely affect their continued survival.

Northern goshawk (*Accipiter gentilis*) - Not likely to adversely affect. Northern goshawks use a variety of forested habitats during the nesting period, which is generally from April to August (Braun et al. 1996). Northern goshawks prefer to nest in large trees 30 to 40 feet above ground, where clear access is afforded by a stream or other opening (DeGraaf et al. 1991). Goshawks may hunt prey (primarily birds and small mammals) in woodlands, clearings, and open fields (DeGraaf et al. 1991). Goshawks in central Idaho (Boise National Forest) have been known to consume grouse and snowshoe rabbits (Burleigh 1972). Because grizzly bears do not climb trees (Craighead and Mitchell 1982), it is unlikely that they will consume goshawk eggs or individuals. Although goshawks and grizzly bears may eat similar prey items, competition with grizzly bears for food is unlikely to affect populations of this widespread raptor species.

Ferruginous hawk (*Buteo regalis*) - Not likely to adversely affect. Ferruginous hawks feed primarily on birds and mammals including rabbits, ground squirrels, mice, rats, and gophers (DeGraaf et al. 1991). They prefer tall trees for nesting, but will use a variety of sites including low hills, buttes, small cliffs, powerlines, and riverbed mounds (DeGraaf et al. 1991). Tree nests are generally located in the upper canopy, ranging from 6 to 55 feet above ground (DeGraaf et al. 1991). Although grizzly bears do not climb trees (Craighead and Mitchell 1982), they may occasionally consume ferruginous hawk eggs or juveniles when nests are located at or near ground level. Ferruginous hawks and grizzly bears may eat similar prey items; however, competition with grizzly bears for food is unlikely to affect populations of this fairly common raptor species.

Harlequin duck (*Histrionicus histrionicus*) - Not likely to adversely affect. Breeding harlequin ducks are generally dependent on rough, turbulent streams, and feed mainly on crustaceans, molluscs, and insects (Ehrlich et al. 1988). Most known breeding sites in Northern Idaho occur in the Clearwater drainage and north (Cassirer and Groves 1990). The species is known to occur as far north as Alaska and includes British Columbia, Alberta, Idaho, Montana, Washington, and Oregon (Idaho Department of Fish and Game 1996). Given current distribution of the species in North America, and that breeding sites occur mainly in the northern most reaches of the grizzly bear experimental area, it is unlikely that grizzly bears would adversely affect harlequin duck populations. It is also unlikely that given the specific and unique habitat requirement for breeding harlequin ducks, that grizzly bears would utilize similar habitats for foraging.

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Black tern (*Chlidonias niger*) - Not likely to adversely affect. Burleigh (1972) considers black terns to be a fairly common, local summer resident over much of Idaho. Black terns require aquatic habitats with extensive stands of emergent vegetation and large areas of open water (DeGraaf et al. 1991). Black terns usually nest on islands or over water two or more feet in depth on top of cattails, reeds, and other vegetation (Burleigh 1972). In migration, black terns can occur along marshes, rivers, lakes, and nearby cultivated fields (DeGraaf et al. 1991). Although it is possible that grizzly bears could disturb black tern nesting sites and consume eggs or juvenile birds, such impacts would tend to be localized and are not likely to affect survival of this wide-ranging species.

Columbia sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) - No effect. After closer review of the final recovery area delineation, it is determined that current known range of Columbia sharp-tailed grouse is outside of the experimental area (Ulliman et al. 1996).

Interior redband trout (*Oncorhynchus mykiss gairdneri*) and **Westslope cutthroat trout** (*Oncorhynchus clarki lewisii*) - Not likely to adversely effect. Grizzly bears have been documented to feed on resident spawning salmonids, but this source of food represents only a minor portion of the grizzly bears main diet if other food sources are available (Mattson et al. 1991; Craighead et al. 1995). Interior redband trout and westslope cutthroat trout both occur within the Bitterroot Ecosystem (Behnke 1992). Grizzly bears could feed on these fish during spawning runs. However, it is unlikely that grizzly bears would adversely affect local or regional populations of interior redband trout or westslope cutthroat trout as a whole.

Broad-fruit mariposa (*Calochortus nitidus*) - Not likely to adversely affect. Although grizzly bears may consume the bulbs of the broad-fruit mariposa, overall effect of consumption on the population by grizzly bears would likely be negligible. This species likely evolved with grizzly bear consumption and is more widespread than originally thought (Edna Vizgirdas, U. S. Fish and Wildlife Service, pers. comm. 1996). In addition, the Cottonwood Resource Area for the Bureau of Land Management has black bears within the proposed experimental population area where broad-fruit mariposa occurs, and there is no evidence that the species is declining due to black bear activity.

Other plant species of concern (see Species List in Project File) - No effect. Although grizzly bears are strongly herbaceous, incidental consumption of any of the remaining plant species of concern is unlikely to affect overall population levels. None of these plants has been documented to be overgrazed by grizzly or black bears to date (Jeri Wood, U. S. Fish and Wildlife Service, pers. comm. 1996). All of the plant species of concern have coexisted with bear species in the past with no apparent effect on plant populations.

Invertebrate species of concern (see Species List in Project File) - No effect. Available documentation indicates that grizzly bears may consume large quantities of ants and moths when available (Mattson et al. 1991; Craighead et al. 1995), however there is no evidence that grizzly bears consume molluscs or grasshoppers. None of the invertebrate species of concern has been documented to be overgrazed by bear species to date (Jeri Williams, U. S. Fish and Wildlife Service, pers. comm. 1996). Invertebrate species of concern and grizzly bears have likely coexisted in the past without adverse effects on invertebrate population levels.

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File: 1264 - Bitterroot Recovery Zone

March 29, 1999

Christopher Servheen, Grizzly Bear Recovery Coordinator
U.S. Fish and Wildlife Service
University Hall, Room 309
University of Montana
Missoula, Montana 59812

Dear Mr. Servheen:

This is in response to your February 11 letter requesting that the Fish and Wildlife Service (Service) review the biological assessment pertaining to Federally listed endangered and threatened species for the proposed grizzly bear reintroduction into the Bitterroot Ecosystem of Idaho and Montana. The Montana Field Office received your request on February 16.

The Service has reviewed the biological assessment and concurs with the determinations that the proposed action will benefit the threatened grizzly bear (*Ursus arctos horribilis*), is not likely to adversely affect non-essential experimental or endangered gray wolves (*Canis lupus*), threatened bull trout (*Salvelinus confluentus*), or proposed lynx (*Lynx canadensis*), and will have no effect on the threatened bald eagle (*Haliaeetus leucocephalus*), Macfarlane's four-o'clock (*Mirabilis macfarlanei*), water howellia (*Howellia aquatilis*), Ute's ladies tresses (*Spiranthes diluvialis*), or the endangered peregrine falcon (*Falco peregrinus anatum*), or proposed northern Idaho ground squirrel (*Spermophilus brunneus brunneus*). Therefore, pursuant to section 402.13(a) of the 50 CFR, formal consultation is not required.

If, after public review and comment, the final project design is changed so as to have effects on threatened or endangered species other than those described in your biological assessment, a revised biological evaluation will be necessary. The Service will then issue a letter of concurrence or nonconcurrence for the revised biological evaluation.

If you have questions regarding this letter, please contact Anne Vandehey of my staff at the addresses or phone provided above. Your cooperation and assistance in meeting our joint responsibilities under the Endangered Species Act are appreciated.

Sincerely,

Kemper M. McMaster
Field Supervisor

**APPENDIX 9B. ESA SECTION 7 EVALUATION OF IMPACTS
TO ANADROMOUS FISH FROM THE RECOVERY OF GRIZZLY BEARS
IN THE BITTERROOT ECOSYSTEM OF CENTRAL IDAHO AND
WESTERN MONTANA**

Endangered Species Act - Section 7
Consultation

BIOLOGICAL OPINION

Grizzly Bear Recovery in the Bitterroot Ecosystem

Agency: U.S. Fish and Wildlife Service, Region 6

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region

Date Issued: May 12, 1998

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I. Background

The U.S. Fish and Wildlife Service (USFWS) contacted National Marine Fisheries Service (NMFS) for initial review of the draft proposed action in November 1996. The USFWS anticipated needing Endangered Species Act (ESA) consultation with NMFS on the proposed grizzly bear reintroduction program, because reintroduced grizzly bears may eat ESA listed Snake River salmon. The agencies met January 27, 1997, and April 17, 1997, to discuss the potential effects of the proposed action and to determine what information would be needed in a biological assessment (BA). The BA was submitted for consultation July 21, 1997. The USFWS provided supplemental information for the BA on September 18, 1997. The NMFS was delayed in consulting on the proposed action due to the listing of steelhead (August 18, 1997, effective October 17, 1997) which necessitated a large scale programmatic consultation on U.S. Forest Service (USFS) and Bureau of Land Management (BLM) land management plans. The NMFS and USFWS resumed discussions of the proposed action with a March 25, 1998, teleconference. This was followed by numerous communications (between Johnna Roy, USFWS, and Ken Troyer, NMFS) including an April 14, 1998, meeting in Orofino, Idaho. On May 1, 1998, NMFS provided a draft copy of this biological opinion (Opinion) to USFWS for comments. Comments were received from USFWS on May 7, 1997.

The objective of this Opinion is to determine whether the grizzly bear recovery program is likely to jeopardize the continued existence of ESA listed steelhead and salmon species or result in the destruction or adverse modification of their designated critical habitat.

II. Proposed Action

The USFWS proposes to release four to six grizzly bears⁶ per year over five years in the Selway-Bitterroot Wilderness. Additional bears may be reintroduced if needed to replace bears lost to human-induced mortality. The Selway-Bitterroot Wilderness is part of a broad historic range of grizzly bears in Idaho, and was identified as a potential recovery area for the species in USFWS' grizzly bear recovery plan (USFWS 1993). The bears will likely be released within an 8-mile radius of the confluence of Moose Creek and the Selway River. In the short term, the USFWS expects the bears to occupy the Selway-Bitterroot Wilderness. A large proportion of the streams in this area provide habitat for ESA listed steelhead, whereas a small proportion (those accessible streams that flow into the Salmon River) provide habitat for listed salmon. If the bear recovery plan is successful, the population might eventually expand into other areas, including the Salmon River basin, which contains designated critical habitat for Snake River sockeye, spring/summer chinook, and fall chinook salmon, as well as habitat for Snake River steelhead.

The USFWS proposes to radio-collar each released bear and determine locations of the bears approximately each week, depending on weather conditions for aerial tracking. Progeny of the released bears would not necessarily be radio-collared. The USFWS would locate non-collared progeny through a combination of means including monitoring radio-collared adults with their progeny, aerial and ground-based reconnaissance surveys, and through information provided by other agencies and the public.

⁶The words "bears" and "bear" throughout this Opinion are used to mean grizzly bears; black bears will be referred to by full common name.

Appendix 9B - Section 7 Evaluation for Anadromous Fish

The USFWS proposes to avoid conflicts (such as with some human activities, and with the survival and recovery of listed fish species) by keeping bears away from certain areas using hazing methods and, if necessary, relocation. Hazing methods may include the use of noise and other devices. Electric fencing may also be used to exclude bears from certain areas, as this method has proven effective in some cases (Chuck Schwartz, Alaska Department of Fish and Game (ADFG), July 21, 1997, electronic mail to Wayne Kasworm, USFWS).

III. Biological Information and Critical Habitat

The NMFS has listed four anadromous fishes in the Snake River basin under the ESA. These include: Snake River steelhead, sockeye salmon, spring/summer chinook salmon, and fall chinook salmon. These species occur in watersheds where grizzly bears were found historically and where they may become re-established because of the proposed action. The action also may affect designated critical habitat for Snake River spring/summer and fall chinook salmon, and Snake River sockeye salmon (December 28, 1993, 58 FR 68543).

An action area is defined (50 CFR § 402.02) as: "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The reintroduced grizzly bears may harass and kill listed anadromous fish, and thus will tend to have direct, rather than indirect effects on the survival of listed fish in the action area. In the short term, the action area containing both grizzly bears and listed anadromous fish will likely include several watersheds of the upper Clearwater River subbasin and a few watersheds on the north side of the middle Salmon River subbasin. In the long term, the action area may include other parts of the Snake River basin accessible to anadromous fish.

A. Snake River Steelhead

The NMFS' status review of west coast steelhead (Busby et al. 1996), summarizes biological information on several Evolutionarily Significant Units (ESUs) of steelhead, including Snake River steelhead. Snake River steelhead are listed as threatened under ESA (August 18, 1997, 62 FR 43974). Critical habitat for this species has not yet been proposed. Snake River steelhead are an anadromous form of redband trout (*Oncorhynchus mykiss*) (Behnke 1992). Part of their life history is spent in the ocean, and spawning occurs in freshwater streams. Snake River steelhead are primarily summer-run fish which enter freshwater nine or ten months prior to spawning. They are described as either "A" or "B" run fish, depending on when they pass over Bonneville Dam on the mainstem Columbia River.

Snake River steelhead spawn from March to July, and enter streams several months before spawning. Juvenile steelhead have a variety of migration patterns that vary with local conditions; control mechanisms range from mostly genetic to mostly environmental (Behnke 1992). In some populations, steelhead may remain in natal streams before migrating to the ocean, but in others they migrate upstream or downstream soon after emergence to enter other rearing areas. In some watersheds, perhaps depending upon water temperatures and subsequent growth rates, parr remain in freshwater for up to seven years (Mullen et al. 1992).

Wild and naturally-reproducing stocks of steelhead have declined dramatically in the interior Columbia River Basin (Lee et al. 1997). Their decline is due to a variety of factors, but construction of dams along the Snake and Columbia Rivers is a primary cause (Meehan and Bjornn 1991). Loss and degradation of

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spawning and rearing habitats as well as the introduction of non-native fishes have also contributed to declines. Smolt-to-adult survival has declined from more than 4% in 1968 to approximately 1.5% during the early 1970s and to less than 1% in recent years (Raymond 1979; and Lee et al. 1997). The current known distribution of steelhead in the interior Columbia River basin includes approximately 41% of their historical range and they are classified as “strong” within only 1.3% of the remaining range (Lee et al. 1997).

As noted in section III. above, the distribution of Snake River steelhead overlaps that of ESA listed Snake River spring/summer and fall chinook salmon, and Snake River sockeye salmon. The area unique to steelhead is the Clearwater River subbasin upriver from Lolo Creek.

Only three subbasins within the range of the Snake River basin ESU have wild steelhead that are unaffected by hatchery production (Idaho Department of Fish and Game (IDFG) 1996). These sub-basins are the Selway River (HUCs 17060301 and 17060302), a Clearwater River tributary; the South Fork Salmon River (HUC 17060208), and the Middle Fork Salmon River (HUC 17060205 and those portions with the Middle Fork watershed of 17060206), both tributaries to the Salmon River. These subbasins are of a large enough size (about 750,000 acres or larger) to sustain genetically diverse subpopulations of wild steelhead. Thurow (1985 and 1987) documented genetic divergence among subpopulations in various tributaries to the Middle Fork Salmon River and South Fork Salmon River. Lee et al. (1997) identified smaller watersheds with strongholds of steelhead that would form the nucleus of a more widespread distribution of steelhead with little or no influence of non-indigenous stocks.

Low run sizes over the last 10 years are most pronounced for naturally-produced steelhead, and average parr densities recently have dropped for both A and B run steelhead. Declines in abundance have been particularly serious for B-run steelhead, increasing the risk that some of the life history diversity may be lost. Recently obtained information indicates low smolt survival and poor ocean production for Snake River steelhead in 1992-1994.

Although steelhead populations have declined greatly and are at risk of further declines from a variety of factors, their life history makes them less vulnerable than salmon species to predation by grizzly bears. The spring timing of steelhead spawning overlaps partly with the period of hibernation for grizzly bears, and also typically coincides with high flows and increased instream turbidity, reducing the likelihood that grizzly bears would capture spawning steelhead. Although steelhead spawning sites can overlap with those used by salmon, steelhead are often more widely dispersed and select steeper, more turbulent sites.

B. Snake River Salmon and Critical Habitat

Three Snake River salmon populations listed as threatened or endangered under the ESA occur in the recovery area which may be re-inhabited by grizzly bears over the long term. Snake River sockeye salmon (*Oncorhynchus nerka*) are listed as endangered (November 20, 1991, 56 FR 58619). Snake River spring/summer chinook salmon (*O. tshawytscha*) and Snake River fall chinook salmon (*O. tshawytscha*) are listed as threatened species (April 22, 1992 57 FR 14653). The NMFS designated critical habitat for Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon on December 28, 1993 (58 FR 68543), effective on January 27, 1994.

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A brief description of the life history and status of each salmon species is provided below. For more detailed information on the Snake River salmon species, refer to Attachment 1 of this Opinion, Waples et al. (1991), Matthews and Waples (1991), NMFS (1991), and *U.S. v Oregon* Technical Advisory Committee (1998).

Snake River sockeye salmon use the mainstem Snake River and mainstem Salmon River as a migration corridor to and from Redfish Lake, Idaho. Redfish Lake supports the only remaining run of sockeye salmon in the Snake River basin. Arrival of adult fish at Redfish Lake peaks in August, and spawning occurs primarily in October (Bjornn et al. 1968). Eggs hatch in the spring between 80 and 140 days after spawning. Fry remain in the gravel for three to five weeks, emerge in April through May and move immediately into the lake; there, juveniles feed on plankton for one to three years before they migrate to the Pacific Ocean (Bell 1986). Migrants leave Redfish Lake from late April through May (Bjornn et al. 1968), and smolts migrate almost 900 miles to the ocean.

Very few adult sockeye salmon have returned to Redfish Lake in recent years, with counts of 0-10 fish each year since 1988. A program to enhance the Snake River sockeye salmon using captive broodstock has been underway since the early 1990s. Adult sockeye salmon produced under this program are expected to begin returning to Redfish Lake in 2000 at a rate of several hundred fish per year (Tom Flagg, NMFS Northwest Fisheries Science Center, July 7, 1997, personal communication). Adult sockeye salmon would be vulnerable to capture by grizzly bears in Redfish Lake Creek and other shallow streams in the area. This area is, however, approximately 150 miles south of where the bears will be reintroduced, and USFWS does not anticipate that grizzly bears would occupy this area during the next 50 years (the prediction of bear distribution is described in more detail in section V, below).

The present range of spawning and rearing habitat for naturally-spawned Snake River spring/summer chinook salmon is primarily limited to Asotin Creek and the Salmon, Grande Ronde, Imnaha, and Tucannon River subbasins. Most Snake River spring/summer chinook salmon enter individual subbasins from May through September. Juvenile Snake River spring/summer chinook salmon emerge from spawning gravels from February through June (Perry and Bjornn 1991). Typically, after rearing in their nursery streams for about one year, smolts begin migrating seaward in April and May (Bugert et al. 1990; and Cannamela 1992). After reaching the mouth of the Columbia River, spring/summer chinook salmon probably inhabit nearshore areas before beginning their northeast Pacific Ocean migration, which lasts two to three years.

Snake River spring/summer chinook salmon populations have continued to decline since the ESA listing of the species. Escapement counts of natural spring/summer chinook salmon at Lower Granite Dam averaged approximately 8000 fish in the 5-year period ending in 1992, and approximately 4800 fish in the subsequent 5 years. Returns of 1000 or fewer fish are predicted for 1999 and 2000, whereas escapement levels averaging approximately 30,000 fish would be needed to recover the species.

Adult Snake River fall chinook salmon enter the Columbia River in July and migrate into the Snake River from August through October. Fall chinook salmon spawning is primarily limited to the Snake River below Hells Canyon Dam and the lower reaches of the Clearwater, Grand Ronde, Imnaha, Salmon, and Tucannon Rivers. Fall chinook salmon generally spawn from October through November and fry emerge from March through April. Downstream migration generally begins within several weeks of emergence

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(Becker 1970; and Allen and Meekin 1973), and juveniles rear in backwaters and shallow water areas through mid-summer prior to smolting and migration to the ocean.

Fall chinook salmon populations have remained at very low levels for many years, with estimates of natural-origin fish at Lower Granite Dam ranging from 78 to 797 fish per year over the last 20 years. Because fall chinook salmon spawn in mainstem reaches of large rivers, where the water is relatively deep and fast, they would not likely be susceptible to predation by grizzly bears. Effects on fall chinook salmon therefore will not be further considered in this Opinion.

Of the listed species considered in this Opinion, Snake River spring/summer chinook salmon are the most vulnerable to predation by grizzly bears. These salmon are vulnerable to capture because they spawn during August and September (typically low water periods) in primarily shallow, low gradient stream reaches. When populations are healthy, spawning fish are often found concentrated in relatively short stream reaches. The nearest listed spring/summer chinook salmon are approximately 25 miles south of the area where bears would be reintroduced, and USFWS does not expect the bears to occupy this area during the next 20 years (the prediction of bear distribution is described in more detail in section V, below) .

IV. Evaluating Proposed Actions

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 C.F.R., Part 402 (the consultation regulations). NMFS discusses the analysis necessary for application of these standards in the particular contexts of the listed species of Pacific salmon in Attachment 2. This analysis involves the following steps: (1) Define the biological requirements of the listed species; (2) evaluate the relevance of the environmental baseline to the species' current status; (3) determine the effects of the proposed or continuing action on listed species; (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the environmental baseline and any cumulative effects, and considering measures for survival and recovery specific to other life stages; and (5) identify reasonable and prudent alternatives to a proposed or continuing action that is likely to jeopardize the continued existence of the listed species.

A. Biological Requirements

The relevant biological requirements are those necessary for the listed species to survive and recover to naturally reproducing population levels at which protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stocks, enhance their capacity to adapt to variable environmental conditions, and allow them to become self-sustaining in the natural environment.

When considering the status of the listed species in all its life stages, biological requirements are expressed in terms of cohort replacement ratios and numerical escapement goals. Refer to Attachment 2 of this Opinion for a discussion of these requirements for Snake River salmon. A similar document for Snake River steelhead is not yet available; however, the general guidance and information for chinook salmon concerning critical habitat, life cycle and historical population trends, biological requirements, species status under the environmental baseline, and the effects on the environmental baseline, are expected to be similar for steelhead. It is not possible, based upon currently available scientific data and analysis, to prescribe life-stage specific numerical survival rates necessary to achieve the combined life-stage

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requirements described above. However, NMFS' Proposed Recovery Plan for Snake River Salmon (NMFS 1995) notes that survival must improve in all life stages, given current critically low population levels.

For actions that influence spawning and rearing habitat quantity and quality, biological requirements include increasing spawning success and survival of early life history stages (egg-to-smolt stages), as well as protecting or improving those habitat characteristics that function to support successful spawning and survival of early life history stages. The relevant habitat characteristics are well-known and are documented in the scientific literature (e.g., Raleigh et al. 1986; and Bjornn and Reiser 1991). For example, fine sediment levels should not be so high that incubation and overwintering survival are affected significantly.

The precise number of adults needed to maintain adequate subpopulation levels is also not known with absolute certainty, but best available evidence suggests that subpopulation production should range between 200-250 and 1,100-1,375 based on escapement levels from 1962-1967, which are considered relatively healthy (NMFS 1995). The Biological Requirements Working Group (BRWG 1994) suggested that the figure of 50% of the 1962-1967 index area redd counts for subpopulations be used as a target. A similar target may be reasonable for steelhead; however, recovery estimates have not yet been developed.

B. Environmental Baseline

The current rangewide status of the listed species under the environmental baseline is described in Attachment 1. The biological requirements of the listed species are currently not being met under the environmental baseline. Their status is such that there must be a significant improvement in the current conditions of the critical habitat. Any further degradation of these conditions would have a significant impact due to the amount of risk the listed salmon presently face under the environmental baseline.

Declines in salmon production in the action area have resulted from a variety of activities including hydropower, harvest, artificial propagation, and land management activities. Land management activities that contributed to degraded habitat and egg-to-smolt mortality included water withdrawals, unscreened water diversions, small hydropower development, road construction, timber harvest, mining, livestock grazing, outdoor recreation, and associated activities. In general, land management actions that disturb ground and remove vegetation have: (1) Reduced connectivity (i.e., the flow of energy, organisms, and materials) between streams, riparian areas, floodplains, and uplands; (2) significantly elevated watershed sediment yields, leading to pool filling and elimination of spawning and rearing habitat; (3) reduced or eliminated instream replenishment of large woody debris that traps sediment, stabilizes streambanks, and helps form pools; (4) reduced or eliminated vegetative canopy that minimizes temperature fluctuations; (5) caused streams to become straighter, wider, and shallower, which has the tendency to reduce spawning and rearing habitat and increase temperature fluctuations; (6) altered peak flow volume and timing, leading to channel changes and potentially altering fish migration behavior; (7) altered water tables and base flows, resulting in riparian wetland and stream dewatering; and (8) contributed to degraded water quality by adding toxicants through mining and pest control (Eastside Forests Scientific Society Panel 1994; McIntosh et al. 1994; Rhodes et al. 1994; Wissmar et al. 1994; and Quigley and Arbelbide 1997).

Since the listing of the Snake River salmon species, broad-scale efforts have been initiated to improve the environmental baseline conditions which contributed to the decline of those species. For example, the

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adoption of an interim salmonid conservation strategy (PACFISH) by the U.S. Forest Service and Bureau of Land Management has helped reduce impacts of Federal land management activities and reduced hindrances to natural recovery processes. PACFISH and related guidance have resulted in widely applied protections of riparian areas, decreased rates of construction of new roads, and increased rates of road obliteration on Federal lands in the Snake River basin. Also, Bonneville Power Administration (BPA) and the Army Corps of Engineers have developed or are developing interim measures to improve survival of listed salmon and steelhead through the migration corridor, specifically hydropower facilities and impoundments. These efforts do correlate with significant increases in survival in several cases; however, data are not yet available to fully evaluate the effectiveness of these interim measures. Longer- term strategies for conservation and recovery of listed species (e.g. HCPs with non-Federal entities, Interior Columbia River Basin Ecosystem Management Project (ICBEMP), Federal Columbia River Power System Power System 1999 Decision, etc.) are being developed for implementation within the next few years.

The environmental baseline includes some level of predation on adult salmon and steelhead in the Snake River basin by black bears, otters, eagles, and other animals. Information was not available to quantify this existing level of predation; however, because of the presently low numbers of anadromous fish, salmon and steelhead are likely uncommon in the diets of these species and are not target food items on which the species depend. These inland predators are not noted among the factors for the decline of the anadromous fish species (NMFS 1991b; NMFS 1996).

V. Analysis of Effects

A. Effects of Proposed Action

The effects of the grizzly bear recovery project on listed anadromous fishes are likely to be different in the short term versus the long term. The BA noted that there is very little risk to listed anadromous fish species in the short term, due to the location of bear release sites, slow expansion expected of the bear population, lack of fishing experience among the bears to be released, low numbers of the listed fish species, and timing and location of spawning which minimizes availability of certain species (steelhead and fall chinook salmon) to bears. Those factors are described in more detail below. The “likely to adversely affect” determination in the BA was based on assumptions that, in the longer term, bear populations would expand into areas with listed salmon, that salmon population sizes would have increased, and some individual salmon would eventually be killed or harassed by the bears. The NMFS discusses short- and long-term effects of the action below.

Short Term

The USFWS estimated that the grizzly bears would not occupy areas with listed salmon within 20 years following the bear reintroduction (Wayne Kasworm, USFWS, May 7, 1998, personal communication). The USFWS estimated bear population growth assuming a 4% growth rate, which USFWS considered optimistic, and predicted that over 20 years the population may grow from 25 to approximately 60 bears (Draft Environmental Impact Statement, p. II-11). The USFWS further predicted that if bear densities were sparse (one bear per 22 square miles), within 20 years the population may occupy a 20-mile radius area around the release sites (USFWS Biological Assessment, page 35). The nearest area with listed salmon is the upper reaches of Bargamin Creek, approximately 25 miles away from the proposed release sites. If the geographic expansion of the bear population is in less of a circular pattern and more linear,

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bears may be farther from the release sites in that timeframe. Also, according to the BA, male bears tend to wander more than the females, and it is possible one or more of these males could wander outside of the area the USFWS expects the bears to occupy during the first 20 years. The NMFS considers the 20-year period in this analysis of the action's short-term effects, and assumes (given the possibilities of a more linear geographical expansion and straying of some bears) that bears could establish ranges within a 30-mile radius of the release sites in the 20-year period.

The USFWS compiled information on both the possible locations of salmon concentrations, and factors influencing bear fishing success, to allow NMFS to better understand where listed salmon may be most vulnerable to predation by bears in the short and long terms. The USFWS submitted a list of maps of recent and historic concentrations of Snake River spring/summer chinook salmon. These areas include spawning areas and partial barriers to migration where salmon may congregate, such as at waterfalls and other steep gradient stream reaches, diversion dams, and weirs operated for fisheries research or propagation. The USFWS also provided information (from bear biologists experienced with bear fishing behavior) on the physical dimensions of streams associated with successful fishing by bears.

Wildlife biologists with USFWS and ADFG noted that bears fish successfully at waterfalls and in shallow, low gradient stream reaches where salmon are concentrated (electronic mails to Wayne Kasworm, USFWS, from: Chuck Schwartz, ADFG, July 22, 1997; Sterling Miller, ADFG, July 21, 1997; and Vic Barnes, USFWS, July 22, 1997; and Dick Sellers, ADFG, May 2, 1997, personal communication with Ken Troyer, NMFS). These biologists noted that bears were either substantially less successful or did not fish where stream dimensions allowed escape routes for fish due to depths (pool depths of 3 feet or greater), high flows, undercut banks, or other structures. Anecdotal information from the Clearwater River basin in the early 1900s indicates that grizzly bears caught salmon at a few cascade areas where fish were numerous (Herb Pollard⁷, NMFS, April 22, 1997, personal communication relating information from the bear hunting journals of William Wright). Wildlife biologists with ADFG indicated that black bear fishing behavior in Idaho will give some indication of where grizzly bears may fish. Little information was available to NMFS on black bear fishing; however, black bears were observed fishing successfully in Big Creek (Middle Fork Salmon River tributary) and in the Poverty Flats section of the South Fork Salmon River in the 1970s (Dave Burns, USFS, April 28, 1998, personal communication). In fish surveys of Bear Valley Creek in the 1960s, nearby black bears were observed feeding on a small percentage of available salmon carcasses, as the bears apparently were utilizing mainly other foods (Herb Pollard, NMFS, April 22, 1998, personal communication).

Based on this information on bear feeding behavior and areas of salmon concentrations in the Salmon River basin, NMFS asked fishery biologists familiar with these sites to assess where salmon may be most vulnerable to predation. The fisheries biologists provided a list of sites included in Tables 1 and 2 below. Table 1 includes areas within 30 miles of the release sites; that is, where salmon and steelhead⁸ could be vulnerable to capture by bears in the short term. Table 2 includes areas outside the 30-mile radius, where salmon and steelhead may be vulnerable over the long term (see discussion of Long Term, below).

⁷Herb Pollard, currently with NMFS, is the former director of the IDFG Lewiston, Idaho Office and in that position was involved in the interagency coordination on the proposed action.

⁸Because of the timing of their spawning in the spring, steelhead would be less available to bears; however, fisheries biologists noted that at certain partial barriers, steelhead may be vulnerable to capture by bears.

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Table 1. Areas within 30 miles of the grizzly bear release sites where listed salmon or steelhead may be vulnerable to predation by bears (information from fishery biologists with USFS, IDFG, and Tribes).

Subbasin/Watershed	Location	Comments
Selway River/ Moose Creek	diversion dam in North Fork	Steelhead move through in April, may be concentrated here
Lochsa River/Fish Creek	weir	Steelhead concentrated here (approx 25 miles from bear release area); human presence may deter bears
Lochsa River/Squaw Creek	culvert in West Fork partial barrier	Steelhead move through in April; not clear if densities would be sufficient to attract bears
Lochsa River/Papoose Creek	cascade in West Fork 1/4 mile above mouth	Steelhead move through in April; not clear if densities would be sufficient to attract bears
Lochsa River/Boulder Creek	weir	Steelhead move through in April; not clear if densities would be sufficient to attract bears
Salmon River/ Bargamin Creek	upper meadows	Salmon spawning area, potential densities of fish not known; physical dimensions of stream (small, shallow) could enable fish capture

Information on locations of bears will enable USFWS to determine if bears may be taking listed salmon, and thus allow USFWS to implement measures to minimize the take. The USFWS will likely have information on the locations of individual bears during the first several years of the project, because released bears will be radio-collared and any non-collared progeny will likely accompany the collared adults for approximately three years. According to USFWS, non-collared female progeny are expected to eventually establish their own territories adjacent to, or not far from their mother's territory. Male bears would also tend to stay in these areas; however, in a small percentage of the cases males may wander away from the rest of the population. If non-collared bears have not been located, the USFWS will attempt to locate the bears with aerial and ground-based reconnaissance. Information on bear locations will also likely be available from public users of the wilderness, and from personnel with other agencies working in the area.

The risk to listed salmon in the short term appears to be very low. According to the USFWS estimates of population growth, it is highly unlikely that grizzly bears would occupy sockeye salmon spawning areas (150 miles south of the bear release sites) in the next 20 years. Spring/summer chinook salmon in Bargamin Creek are within 25 miles of the bear release sites; however, as with other spring/summer chinook salmon populations in the basin, there have been few if any salmon found in Bargamin Creek in recent years. While the physical dimensions of Bargamin Creek may allow bears to catch some salmon, it appears unlikely that salmon would be available in sufficient concentrations to attract bears. Wildlife biologists with ADFG and USFWS have noted that bears eat primarily other foods in areas where salmon are either unavailable or available in low densities (electronic mails to Wayne Kasworm, USFWS, from: Chuck Schwartz, ADFG, July 22, 1997; Sterling Miller, ADFG, July 21, 1997; and Vic Barnes, USFWS, July 22, 1997; and Dick Sellers, ADFG, May 2, 1997, personal communication with Ken Troyer, NMFS).

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In the short term, bears will depend on foods other than fish (e.g., vegetation, insects, rodents, and wild ungulates), but may encounter salmon in the course of foraging for other foods.

It is not clear that bears would fish successfully during the short term, even if they have an opportunity to catch salmon. The USFWS noted that fishing behavior appears to be learned through maternal training and that the released bears would not have that training. It is not known how quickly bears may learn to catch fish. Bears without maternal training in fishing have been observed to take many years to begin fishing, even with concentrations of fish nearby (Wayne Kasworm, USFWS, April 17, 1997, personal communication). The bears' persistence at trying to catch fish might be increased if they have eaten carcasses nearby; however, availability of carcasses alone would not necessarily initiate fishing (Herb Pollard, NMFS, April 22, 1998, personal communication).

Along with the factors of fishing experience and stream dimensions, salmon abundance will influence bears' success in catching salmon. As noted in section III, above, numbers of Snake River spring/summer chinook salmon are currently very low and have been for several years. Annual adult spring/summer chinook salmon returns averaged approximately 125,000 fish in the 1950s, and 59,000 fish in the 1960s. In spite of increased production from hatcheries beginning in 1966, the abundance of natural⁹ fish continued to decline by about 50-70% per decade. Annual abundance estimates of spawners within the last few years have been approximately 1000-5000 fish, well below the average of approximately 30,000 fish which NMFS has identified as a recovery goal (see attachment 1 to this Opinion). Given the very low numbers of the species currently and considering the species' life cycle averages 5 years, the NMFS anticipates recovery will be slow and the recovery goal will not be met within the next 20 years. In this short term period, while numbers of spring/summer chinook salmon remain relatively low, reintroduced bears would not likely encounter concentrations of salmon which would trigger attempts at, and success with fishing.

In summary, it is not likely that bears will occur in areas with concentrations of listed salmon in the next 20 years, and even less likely that the bears will harm or kill listed salmon, given the low densities of salmon, the bears' focus on other foods, and the bears' lack of fishing experience. There is, however, a possibility that the proposed action could result in taking of salmon during this period. The USFWS will monitor movements of many bears, but will not know precise locations of all bears. The USFWS does propose to avoid conflicts (such as with some human activities, and with the survival and recovery of listed fish species) by fencing or hazing bears away from streams if bears are taking salmon and discussions with NMFS indicate management action is necessary. Relocation of bears could occur if other actions prove ineffective and relocation is logistically possible.

Listed steelhead are in the area where bears would be released, but the risk to steelhead is low primarily because of the timing of their spawning. Steelhead spawn in the spring, when bears are either still in, or just out of winter dens. Also, water levels are typically high and turbid at this time, reducing the bears' abilities to locate and capture steelhead. Further, steelhead will tend to move downstream into bigger rivers after spawning, so few carcasses would be available to attract bears. Still, fisheries biologists felt that at some sites (see Table 1) steelhead may be vulnerable to capture by bears. Capture of steelhead by reintroduced bears, while possible, does not appear to be probable in the short term, due to the timing of

⁹Natural fish are those produced in stream gravels; some of these fish have hatchery ancestors.

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steelhead spawning, lack of fishing experience among the bears, and the tendency for bears just out of the dens to feed in upland areas away from streams (Wayne Kasworm, USFWS, April 17, 1997, personal communication).

Long Term

In the long term (>20 years from the proposed reintroduction of grizzly bears), bears may become established in areas with listed salmon as well as steelhead. The NMFS' analysis of effects of the action must consider the longer term period because the introduction of bears itself will tend to foreclose some long term options, such as completely excluding bears from all areas where they may kill salmon.

It is difficult to estimate the degree of adverse effects reintroduced grizzly bears may have on listed anadromous fish in the long term. This will depend on future distributions and abundances of both bears and fish, as well as other factors. Table 2 contains a list of sites in the Salmon River basin where concentrations of listed fish may occur and dimensions of the sites could enable bears to catch fish. For reasons noted above, Snake River spring/summer chinook salmon are the listed fish most likely to be caught by bears. It is possible that grizzly bears could catch sockeye salmon in the Stanley Basin area. The sockeye salmon spawning grounds are also heavily used areas of tourism, however, so USFWS would likely haze bears away from this area anyway to avoid conflicts with humans.

Table 2. Areas more than 30 miles from the grizzly bear release sites (but within the grizzly bear recovery experimental area) where listed salmon or steelhead may be vulnerable to predation by bears (information from fishery biologists with USFS, IDFG, and Tribes).

Subbasin/Watershed	Location	Comments
Lochsa River/Crooked Fork	weir	Steelhead move through in April; human presence may deter bears from this area
Lochsa River/Crooked Fork	cataracts above mouth of Boulder Creek	Steelhead move through in April; not clear if densities would be sufficient to attract bears
Lochsa River/Colt-Killed Creek	cataracts in Storm Creek	Steelhead move through in April; not clear if densities would be sufficient to attract bears
South Fork Clearwater River/ Meadow Creek	lower 1/2 mile, steep area where steelhead jump	Steelhead move through in March and April; human activity nearby, and probably little overlap with bear presence (out of dens in April)
Clearwater River/Lolo Creek	weir	Steelhead move through in April, may be vulnerable to capture
Clearwater River/Lolo Creek	Eldorado Creek weir	Steelhead move through in April, may be vulnerable to capture
Little Salmon River/ Rapid River	hatchery weir	Chinook salmon and steelhead congregate below this and may be vulnerable to capture; however, human activity in the vicinity would tend to deter bears
South Fork Salmon River/Secesh River	In Lake Creek and below mouth of Lake Creek	Chinook salmon spawning, shallow, limited escape routes for fish, but redds may be scattered throughout

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Subbasin/Watershed	Location	Comments
South Fork Salmon River	Poverty Flats, Reed Ranch area	Chinook salmon spawning; black bears caught salmon here in the 1970s
South Fork Salmon River	Reaches where Roaring, Nickel, and Dime Creeks enter	Chinook salmon spawning, shallow, limited escape routes for fish
South Fork Salmon River/Cabin Creek	approximately 2 miles upstream	Chinook salmon spawning, small creek, shallow, limited escape routes for fish
South Fork Salmon River	IDFG fish trap	Migrating chinook salmon and steelhead confined at this site could be caught by bears
South Fork Salmon River	Stolle Meadows	Chinook salmon spawning, shallow, limited escape routes for fish
South Fork Salmon River/East Fork	Johnson Creek: Deadhorse Rapids, Ice Hole area	Chinook salmon migration and spawning, partial barrier or shallow, fish vulnerable to capture
Salmon River/ Chamberlain Creek	West Fork	Chinook salmon spawning, shallow, limited escape routes for fish
Middle Fork Salmon River/ Big Creek	primarily Coxey Hole; Monumental Bar; Lick Creek confluence; Taylor Ranch area	Chinook salmon spawning; black bears caught salmon in at least some of these areas in the 1970s
Middle Fork Salmon River/ Big Creek	Monumental Creek: Mud Creek to Roosevelt Lake; Roosevelt Lake to Annie Creek	Chinook salmon spawning, shallow, limited escape routes for fish
Middle Fork Salmon River/ Camas Creek	West Fork; above and below West Fork confluence	Chinook salmon spawning, shallow, limited escape routes for fish in some spawning areas
Middle Fork Salmon River/ Loon Creek	between Cold Springs and Mayfield Creeks	Chinook salmon spawning, shallow, limited escape routes for fish in some spawning areas
Middle Fork Salmon River/ Marsh Creek	weir	Chinook salmon and steelhead may mill at weir and be vulnerable to capture
Middle Fork Salmon River/ Cape Horn Creek		Chinook salmon spawning, shallow, limited escape routes for fish in some spawning areas
Middle Fork Salmon River/ Bear Valley Creek		Chinook salmon spawning, shallow, limited escape routes for fish in some spawning areas
Middle Fork Salmon River/ Elk Creek		Chinook salmon spawning, shallow, limited escape routes for fish in some spawning areas
Salmon River/Lemhi River	weir; section downstream from Leadore	Chinook salmon spawning, large concentrations of fish historically; current irrigation activities and concentration of human activity limit potential for fish and bears

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Subbasin/Watershed	Location	Comments
East Fork Salmon River	weir; upper mainstem (below Bowery Creek)	Chinook salmon migration and spawning, limited escape routes for fish at weir and in some spawning areas
upper Salmon River	Indian Riffles; Torrey's Hole	Chinook spawning, shallow, limited escape routes for fish in some spawning areas
upper Salmon River/ Valley Creek		Chinook salmon spawning, shallow, limited escape routes for fish in some spawning areas
upper Salmon River/Redfish Lake Creek	weir; low gradient reaches below weir	Shallow, sockeye salmon need to traverse to reach spawning areas; black bears present in the area; sockeye salmon numbers extremely low in recent years; concentrated human activity in this area

As noted in Table 2, there are several areas in the Salmon River basin where bears may be able to catch spring/summer chinook salmon, and a few areas where they may be able to catch sockeye salmon or steelhead, if the fish are available in sufficient numbers. Information from fishery biologists who assisted NMFS in compiling table 2 included observations of black bears catching fish at two of these sites in the 1970s, when spawning fish were approximately 5-10 fold more numerous than they are now. Salmon are currently absent from, or present in very low numbers in most of the areas listed in table 2. There are a few weir sites where spring/summer chinook salmon, at current population levels, could be available in great enough densities to attract bears; however, human activity around these sites combined with bear inexperience in fishing reduce the probability of bear predation on salmon.

Assuming that salmon would be substantially more abundant but not de-listed under ESA (abundances approximating those in the 1970s) in the long term, fishing areas for grizzly bears may still be few, as evidenced by the few areas where black bears¹⁰ were known to catch salmon in the 1970s. Further, the BA notes that grizzly bears may be relatively sparsely distributed south of the Salmon River, where the generally drier climate and associated vegetation provides less forage than in the Selway-Bitterroot Wilderness. The NMFS also considered that if grizzly bears do find a concentration of salmon and catch fish, they may displace black bears which would have fished the area, possibly merely maintaining a level of take which would occur without the proposed action.

As noted above, locations of bears would initially be determined with radio-collaring and other methods. Over the long term, as the bear population increases and expands its range, uncertainty about the location of individual bears will likely increase. Public concerns about locations of the bears will, however, tend to place continued emphasis on monitoring the bears through various means. Many sites where listed salmon are potentially vulnerable to capture by bears will also be monitored (typically for counting adult fish or redds), and thus it may be determined if a grizzly bear is using the area.

The USFWS has also stated that it will use hazing and relocations as necessary to minimize take of listed fish (Wayne Kasworm, USFWS, April 17, 1997, personal communication). Given the speculative nature

¹⁰Black bear fishing areas provide an indication of where grizzly bears would fish (Sterling Miller, ADFG, July 21, 1997, electronic mail to Wayne Kasworm, USFWS); however, information was not available to NMFS to determine if grizzly bears would fish in other areas not used by black bears.

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of envisioning the likelihood of, and allowable levels of take so many years in the future, this commitment by USFWS (along with mitigating factors mentioned above which reduce the scope of potential take) decreases NMFS' concern about conflicts between the recovery of grizzly bears and anadromous fish over the long term.

B. Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as “those effects of future state and private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.”

Information on specific activities planned or foreseeable on non-Federal land was not provided in the BA. The NMFS assumes, conservatively, that management impacts from non-Federal activities which have adversely affected listed anadromous fish or degraded or hindered recovery of elements of their habitat will continue in the short-term. This assumption may be conservative in the long-term, as the listed species may benefit from habitat improvements on non-Federal land, such as those gained through the Idaho bull trout plan and Habitat Conservation Plans (HCP) developed with non-Federal entities to fulfill the requirements of ESA section 10.

VI. Conclusion

The NMFS has determined that, based on the available information, the grizzly bear recovery project is not likely to jeopardize the continued existence of Snake River steelhead, sockeye salmon, and spring/summer chinook salmon species or result in the destruction or adverse modification of critical habitat. This conclusion was based on the following factors which create a very low risk of adverse effects in the short term:

- 1) Even with liberal estimates of bear population expansion, reintroduced bears will not likely encounter, and even less likely learn to catch spring/summer chinook salmon in the short term;
- 2) Bears will occupy areas with listed steelhead; however, the timing and other characteristics of steelhead spawning combined with bear denning and early season feeding habits make the likelihood of predation on steelhead very low; and
- 3) Sockeye salmon are essentially unavailable to bears in the short term.

Further, NMFS conclusion of “not likely to jeopardize or adversely modify” was based on the following considerations over the longer term:

- 1) The potential scope of grizzly bear impacts on spring/summer chinook salmon populations over the longer term is limited by a combination of low abundance of listed salmon (below de-listing levels), low densities of grizzly bears which can be sustained by vegetation south of the Salmon River, inexperience of bears with fishing, limited sites where fishing would be successful, and USFWS' commitment to haze/relocate bears if necessary to reduce conflicts between their project and the recovery of listed salmon;

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2) Grizzly bears could take at most a very small percentage of steelhead in the future, due to timing and other aspects of steelhead spawning, as well as early season feeding habits of bears which will minimize contact with listed steelhead; and

3) Sockeye salmon may be vulnerable to predation, particularly in Redfish Lake Creek; however, USFWS will relocate or haze bears away from this area of concentrated human activity if conflicts¹¹ occur.

VIII. Conservation Recommendations

Section 7 (a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. NMFS believes the following conservation recommendation is consistent with these obligations, and therefore should be implemented by the USFWS:

The USFWS should maintain and regularly update lists of bear locations and salmon concentrations within 10 miles of the bears, so that USFWS will be prepared to determine, and apprise NMFS of situations where take of listed anadromous fish could occur.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or their habitat, NMFS requests notification of the implementation of any conservation recommendations.

IX. Reinitiation of Consultation

Consultation must be reinitiated if: the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals that the action may affect listed species in a manner or to an extent not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

Consultation must also be reinitiated within 20 years after the USFWS begins implementing the proposed action. This will enable USFWS and NMFS to re-assess the effects of the action with up-to- date information on the populations of bears and their potential to affect anadromous fish. If, in the meantime, circumstances occur which limit USFWS' ability to meet the terms and conditions in this Opinion (section XI.c.), the USFWS must reinitiate consultation to identify where measures to minimize take should be focused.

X. References

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this opinion.

¹¹There would be a high probability of conflicts with humans if grizzly bears were in this area.

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XI. Incidental Take Statement

Sections 4 (d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary; they must be implemented by the USFWS so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The USFWS has a continuing duty to regulate the activity covered in this incidental take statement. If the USFWS (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

A. Amount or Extent of the Take

The NMFS finds that the proposed action has a very low risk of causing take of listed salmon or steelhead over approximately the next 20 years. The action has a greater likelihood of resulting in take of listed salmon beyond the 20-year period, if the action is successful in re-establishing grizzly bears throughout the experimental population area and if salmon become substantially more abundant than they are currently but are still listed under ESA. The potential for take in the long term will be addressed in the reinitiation of consultation which is required 20 years into the project (see section IX., above). In the interim, it is possible that the grizzly bears may take listed salmon if the bears range substantially beyond the area predicted, and prey on salmon in areas such as those identified in tables 1 and 2, above. The risk of take of listed steelhead is also low, but for different reasons. The reintroduced bears will immediately occupy watersheds containing listed steelhead; however, the timing and other circumstances of steelhead spawning tend to minimize their availability to bears.

The NMFS cannot quantify the take which may occur from the proposed action. The NMFS does, however, with this Opinion authorize a very low level of take which may occur from the proposed action. To ensure that take, if it does occur, is kept to a very low level, NMFS (with input from USFWS) developed the reasonable and prudent measures and terms and conditions described below.

B. Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimizing take of listed salmon and steelhead:

1. USFWS will monitor locations of radio-collared grizzly bears and, when possible, non-collared progeny of released bears.
2. Increase interagency coordination and intensify monitoring if bears move into areas where salmon are located.
3. Guided by interagency coordination per item 2, above, implement measures to minimize take of listed anadromous fish at sites of concern.

C. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the USFWS must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. USFWS will monitor locations of radio-collared grizzly bears and, when possible, non-collared progeny of released bears. This information would be used to validate that the growth and distribution of the grizzly bear population is within USFWS projections in the BA.
2. If monitoring indicates a grizzly bear has moved into an area where listed salmon occur and are vulnerable to capture (as indicated by the best available information¹²), then the bear would be monitored more frequently during the period salmon are expected to be vulnerable. During this period USFWS would notify NMFS of the bear's location, and NMFS and USFWS would coordinate¹³ to obtain current information on timing and location of the vulnerable salmon run. Information sources would likely include redd surveys conducted by IDFG, Tribes, USFWS, BLM, and USFS, and monitoring of weirs and traps conducted by IDFG and Tribes.
3. If monitoring indicates a bear is taking listed anadromous fish, USFWS will contact NMFS as soon as possible and then implement measures the agencies deem necessary to ensure, to the best of USFWS' ability, that further taking is avoided. These measures may include electric fencing of these areas to limit grizzly bear access, hazing of bears with the aid of noise and other devices, or capture and relocation. Relocation would occur, where possible, for a bear not deterred by fencing or hazing. Relocated bears will be radio-collared and monitored to determine if they return to the site.

¹²Best available information should include salmon distribution information USFWS submitted with the BA and NMFS summarized in this Opinion (Tables 1 and 2) updated with any new information on salmon distribution and actual or predicted fishing success of bears.

¹³As part of this coordination, the agencies should consider the immediate risk of take and the risk of not being able to minimize the take effectively. Factors to consider should include the bear's location and the vulnerability of the salmon at the site(s) of concern. If the bear's location is not closely monitored via a radio-collar, the agencies should discuss if it is necessary to collar the bear or if alternative locating or exclusion techniques should enable high likelihood of minimizing take at the site(s) of concern.

APPENDIX 10. MEMORANDUM REGARDING CONCEPT OF “HABITAT SECURITY” FOR GRIZZLY BEARS

Interim direction for the management of suitable but unoccupied grizzly bear habitat in the Bitterroot Ecosystem (BE) was issued by the Fish and Wildlife Service in a 6 November 1995 Memorandum. The memorandum was issued to the Clearwater, Nez Perce, and Bitterroot National Forests (Nez Perce letter is included as an example, see attached documents). Until an EIS for implementing recovery actions is completed, the following management direction is to be followed: “In the interim, the Forest Supervisors responsible for managing the Selway-Bitterroot evaluation area have agreed to protect suitable grizzly bear habitats by assuring that big game standards are in compliance with Forest Plans.”

Standards and guidelines for the management of big game habitat that lies within the Bitterroot Evaluation Area (BEA) (see Figure 3-6) were taken from the Clearwater, Nez Perce, and Idaho Panhandle National Forests. The standards and guidelines for big game habitat management on the Clearwater Forest were reviewed by an interagency group of biologists on 4 May 1995. The group agreed that current standards and guidelines for wildlife and fisheries habitat management appeared adequate to protect bear habitat in the interim. This consensus was reached by reviewing current and projected road densities and limitations due to elk guidelines, bull trout, and other fisheries guidelines for the Clearwater Forest; the juxtaposition of management allocations per the Forest Plan; and known road density requirements for grizzly bear management. The same technique was also used to review the Nez Perce, Lolo, Bitterroot, and Panhandle National Forest lands within the BEA with the added road restrictions implemented for PACFISH direction for anadromous fisheries management. Management areas and road densities for the BEA are grouped and identified below (USFS unpubl. data; S. Blair and D. Davis, Pers. Comm. 1996) (Tables 6-13, 6-14, 6-15).

Table 6-13. Current estimates of road miles within the Nez Perce and Clearwater Forests portion of the BEA.

Management Area Type	Percent of Area (%)	Open Road (mi)	Restricted Road (mi)	Total Road (mi)
Roaded / developed lands (154,500 acres approx.)	8 (2/6) ^a	103 (38 / 65)	41 (21 / 20)	144 (59 / 85)
Unroaded / essentially undeveloped (629,456 acres approx.)	33 (10 / 23)	141 (25 / 116)	60 (50 / 10)	201 (75 / 126)
Wilderness & proposed lands (Selway-Bitterroot & Frank Church-RNRW) (1,118,024 acres approx.)	59 (49 / 10)	0	0	0

^a Table data presented in format: Total for both Forests (Nez Perce Data / Clearwater Data).

6-14. Current estimates of road densities within the Nez Perce and Clearwater Forests portion of the BEA.

Management Area Type	Open Road (Mi/mi sq.)	Restricted Road (Mi/mi sq.)	Total Road (Mi/mi sq.)
Roaded / developed lands	0.43 (0.7 / 0.35) ^a	0.17 (0.38 / 0.10)	0.60 (1.08 / 0.45) ^b
Unroaded / essentially undeveloped	0.14 (0.08 / 0.17)	0.06 (0.16 / 0.01)	0.20 (0.24 / 0.18)
Wilderness & proposed lands (Selway-Bitterroot & FCRNRW)	0	0	0

^a Table data presented in format: Total for both Forests (Nez Perce Data / Clearwater Data).

^b A separate analysis determined the area of roaded / developed lands having greater than 2 miles / square mile total road density for each Forest. Nez Perce Forest = approximately 60 sections (38,400 acres); Clearwater Forest = approximately 12 sections (7,500 acres).

Table 6-15. Predicted maximum estimates of road densities assuming current Forest Plan standards and guidelines for the Nez Perce and Clearwater Forests portion of the BEA.

Management Area Type	Open Road (mi/mi sq.)	Restricted Road (mi/mi sq.)	Total Road (mi/mi sq.)
Roaded / developed lands (241.5 sq. mi. approx.)	0.28 (0.7 / 0.16) ^a	0.17 (0.38 / 0.10)	0.45 (1.08 / 0.26)
Unroaded / essentially undeveloped (983 sq. mi. approx.)	(UK / 0.04)	(UK / 0.05)	0.21 (0.48 / 0.09)
Wilderness & proposed lands (Selway-Bitterroot & FCRNRW)	0	0	0

^a Table data presented in format: Total for both Forests (Nez Perce Data / Clearwater Data).

Predictions of maximum future road densities are based on the distribution of 25, 50, 75, and 100% elk objectives within each management allocation along with a reasoned estimate of probable road density thresholds and other likely influences of current Forest Plan standards and guidelines. Though no plans are in place to harvest timber from the “unroaded/essentially

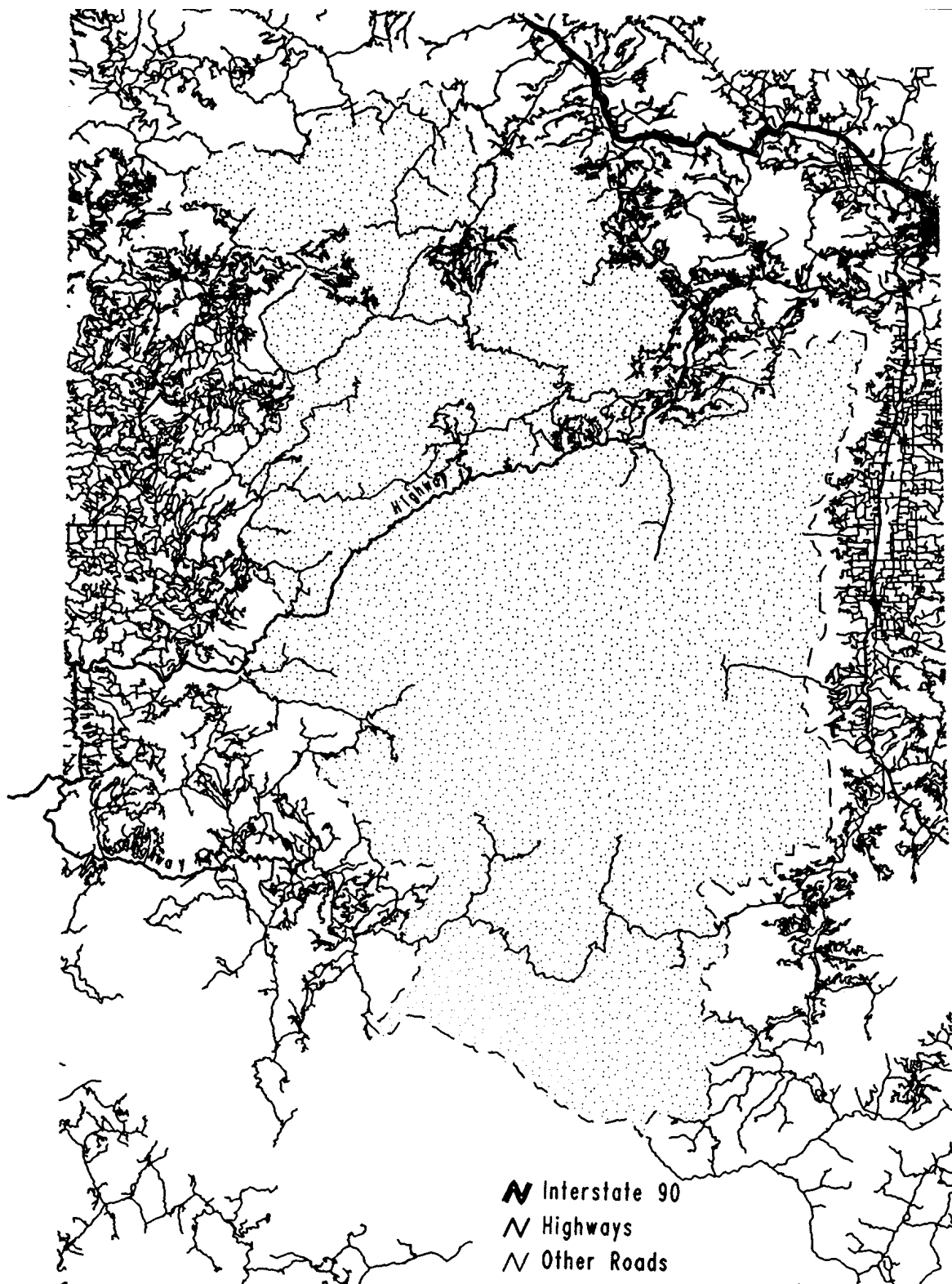
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undeveloped” lands on the Nez Perce Forest at the present time, the estimate above provides a worst-case analysis for the purpose of this estimation only. However, the Clearwater Forest has plans to develop “unroaded/ essentially undeveloped” areas, and the above road densities are calculated to reflect those plans.

Other Forests within the BEA include the Lolo, Bitterroot, Panhandle, and Challis. Of these, the Bitterroot and Challis portions within the BEA are totally wilderness. The Lolo portion is the Great Burn proposed wilderness, which has 2.5 miles of seasonal road, and 1 mile of closed road.

The Idaho Panhandle Forest portion of the BEA is contained within the St. Joe Ranger District, and is approximately 50% proposed wilderness (Mallard Larkins Pioneer Area, 78,500 acres) and semi-primitive recreation, and has few or no proposed roads. The remaining approximately 50% is designated as timber production land within important elk summer range, and thus has restricted road densities with long-term road closures. Road density estimates for this small area were not available.

Although much of the Primary Analysis Area for the DEIS lies outside the boundaries of the BEA, most concerns by grizzly bear biologists regarding road densities lie within the BEA. The area within the BEA, and the wilderness and immediately adjacent lands to the south, will probably be the predominant areas of use by grizzly bears within the first few decades following reintroduction. Therefore, the security for bears within the BEA will be paramount in assuring grizzly bear survival and reproduction during the critical initial stages of recovery. It is for these reasons that analyses were conducted for road densities within the BEA (Figure 6-4). And as a result, the USFWS and other agency biologists reached consensus that current Forest Plan standards meet or exceed present grizzly bear road density guidelines over much of the BEA, and therefore are adequate to assure security for grizzly bears within this landscape.



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United States
Department of
Agriculture

Forest
Service

Nez Perce
National
Forest

Rt. 2, Box 475
Grangeville, ID 83530

File Code: 2670-3
Route To: *

Date: March 4, 1996

Subject: Interim Direction for Grizzly Section 7 Consults
on Nez Perce NF portion of Bitterroot Ecosystem

To: District Rangers

Enclosed please find a copy of a November 6, 1995 letter from Fish and Wildlife Service (FWS) concerning an interim approach for considering grizzly bear habitat management in or adjacent to the Selway-Bitterroot Ecosystem.

Until the EIS for implementing recovery actions for grizzly bears is completed and approved for the Bitterroot Ecosystem, I am issuing the following interim direction:

1. Continue to collect information on reported sightings of grizzly bears on the forest. Until occupancy can be confirmed and documented as permanent, consider suitable habitat within the Bitterroot Ecosystem boundaries to be "unoccupied".
2. Projects outside of the currently delineated boundary for the Bitterroot Ecosystem do not need to consider grizzly bear habitat as an issue in the NEPA process or in the Biological Assessment (BA).
3. Proposed projects within the Bitterroot Ecosystem should consider the effects to grizzly bear habitat as being incorporated into the analysis for big game habitat. As long as Forest Plan standards for big game are being met, and/or big game issues are sufficiently covered within the NEPA document, the project will be considered to be within compliance with Section 7(a)(1). For consistency purposes and to avoid confusion in the Section 7 informal consultation process, do not include a discussion on grizzly bear effects in the BA. In the interim, grizzly bear habitat will be incorporated into the effects analysis and management direction for big game habitat. If big game issues are properly dealt with in the NEPA process, then it will be assumed that grizzly bear habitat issues are also adequately addressed. This is consistent with the November 6, 1995 letter from FWS and 2670 FS Manual Direction.

If there are any questions concerning the implementation of this interim directive into on-going or future NEPA projects, please contact Steve Blair in the Supervisor's Office.


COY E. JEMMETT
Forest Supervisor

Enclosure

cc: District Wildlife Biologists



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Snake River Basin Office, Columbia Ecoregion
4696 Overland Road, Room 576
Boise, Idaho 83705

November 6, 1995

Michael King
Forest Supervisor
Nez Perce National Forest
(Attention: Steve Blair)
Route 2, Box 475
Grangeville, Idaho 83530

Subject: Level I Team Clarification Of Interim Approach For Considering Grizzly Bear
Habitats In Or Adjacent To The Selway-Bitterroot Ecosystem. (File #106.0000)

Dear Mr. King:

The Nez Perce National Forest held their first Level I Section 7 Streamlining Team meeting in Grangeville, Idaho, on September 19, 1995. During that meeting, team members requested clarification from the U.S. Fish and Wildlife Service (Service) as to what level of consideration the team should give to projects within or adjacent to the grizzly bear habitat provided by the Selway-Bitterroot Ecosystem. This question was triggered as a result of the Service's July 18, 1975, listing of the grizzly bear as threatened species in accordance with the Endangered Species Act of 1973 (Act), as amended; and subsequent discussions of the Selway-Bitterroot Ecosystem by the September 10, 1993, Grizzly Bear Recovery Plan (USFWS, 1993). The purpose of this letter is to respond to the Level I team inquiry.

Section 7(a)(2) Compliance

Pursuant to the requirements of Section 7(a)(2) of the Act, Federal agencies such as the U.S. Forest Service, are to prepare a biological assessment (BA) for their decisions involving major construction if a listed species or critical habitat may be present in the action area. The Service has not designated critical habitat for the grizzly bear within the Selway-Bitterroot Ecosystem. Thus, for purposes of determining whether a BA is required, the U.S. Forest Service need only answer the question of whether grizzly bears may occupy the Selway-Bitterroot Ecosystem. A 5-year habitat and population evaluation was completed for the Selway-Bitterroot area in 1991 (Davis and Butterfield). Although there were a number of unconfirmed grizzly bear sightings noted, there was no information indicating that grizzly bears permanently occupy the Selway-Bitterroot area. The report did confirm that the area contained sufficient amounts of quality habitat to warrant grizzly bear recovery (Servheen et al., 1991). Thus, if the U.S. Forest Service determines that grizzly bears may occupy habitat within a project area, a BA should be prepared.

Otherwise, preparation of a BA for grizzly bears is not mandatory, although you may document your findings and request our review at your discretion.

Section 7(a)(1) Consistency

Section 7(a)(1) of the Act states that Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered and threatened species. Thus, in the event that the Forest Service determines that a project will occur in suitable yet unoccupied grizzly bear habitat, it is not mandatory that a BA be prepared. However, the Service encourages the Forest Service to discuss the project impacts to this habitat, either in a BA or National Environmental Policy Act (NEPA) document. Such documentation will help you make decisions that are consistent with Section 7(a)(1) of the Act, gives the Service information about how decisions might influence recovery, and allows us the opportunity to provide technical assistance to the Forest Service concerning conservation actions associated with such projects.

Although the Grizzly Bear Recovery Plan discusses the Selway-Bitterroot Ecosystem, the section dealing with implementation of recovery actions has not been finalized. The Service is currently gathering public input and preparing an Environmental Impact Statement in regard to implementing recovery actions in the Selway-Bitterroot Ecosystem. In the interim, the Forest Supervisors responsible for managing the Selway-Bitterroot evaluation area have agreed to protect suitable grizzly bear habitats by assuring that big game standards are in compliance with the Forest Plans (Servheen, 1995). In the event that a big game unit currently falls below Forest Plan standards within the Selway-Bitterroot Ecosystem, we encourage the development of projects that will improve the habitat conditions in these units. Supplemental information may be required by the Level I Team concerning the status of potential grizzly bear habitats provided by these units if big game standards are not met after implementation of projects involving habitat enhancements. We encourage you to document compliance in the project area, either in BAs or NEPA analysis.

Thank you for your inquiry into this matter. If you need further assistance please feel free to contact Bob Kibler or Alison Beck Haas of my staff at (208) 334-1931.

Sincerely,


Acting Supervisor, Snake River Basin Office

Enclosure

cc: USFWS-ES, Missoula (Servheen)
USFWS-ES, Denver (Stevens)
USFWS-FFA, Portland (Diggs)
USFWS-ES, Portland (Finn)
USFS-Clearwater NF, Orofino (Davis)
USFS-Bitterroot NF, Hamilton (Torquemada)

Appendix 10 - Memorandum on Habitat Security for Grizzly Bears

Literature Cited

Davis, D. and B. Butterfield. 1991. The Bitterroot grizzly bear evaluation area: a report to the Bitterroot Technical Review Team. Interagency Grizzly Bear Committee, Denver, CO. 56 pp.

Servheen, C., A.N. Hamilton, R. Knight, B.N. McLellan. 1991. Evaluation of the Bitterroot and North Cascades to sustain viable grizzly bear populations. Report to the Interagency Grizzly Bear Committee. Boise, ID. 9 pp.

Servheen, C. 1995. October 13, 1995, electronic mail reply to Mr. Dan Davis in regard to forwarded Section 7 grizzly bear update and telephone conversation. U.S. Fish and Wildlife Ecological Services Office. Missoula, MT. 1 pp.

U.S. Fish and Wildlife Service. 1993. Grizzly bear recovery plan. Missoula, MT. 181 pp.

