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A Comprehensive Analysis Of The Proposed Alternatives For Grizzly Bear Reintroduction Into The Bitterroot Ecosystem

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A COMPREHENSIVE ANALYSIS
OF THE PROPOSED ALTERNATIVES
FOR GRIZZLY BEAR REINTRODUCTION INTO THE
BITTERROOT ECOSYSTEM

Submitted in Partial Fulfillment of the Requirements for Graduation
with Honors to the Honors Scholars Program
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Abstract

In 1997, the United States Fish and Wildlife Service (USFWS) issued a Draft Environmental Impact Statement (DEIS) proposing possible modes of grizzly bear recovery in the Bitterroot Ecosystem (BE) of Central Idaho and Western Montana. Four alternatives were outlined in the DEIS. The first alternative suggests grizzly reintroduction into the BE managed by a Citizen Management Committee (CMC). This would require amending the Endangered Species Act (ESA) to allow the population to be labeled as experimental and nonessential. The second alternative proposes that the grizzlies naturally reinhabit the BE, through migrational movements. Experts have agreed that natural reinhabitation of the BE will not occur. The third alternative proposes that grizzlies be prevented from inhabiting the BE, which would allow the bears to be shot on sight, and would require millions of dollars in legislation to remove the bears from federal protection. The fourth alternative proposes that the grizzlies be reintroduced into the BE under full protection of the ESA and be managed by a Scientific Management Committee. This would cause road closures in several areas and possibly reduce timber harvesting and mining. Alternative 1 is proposed for action by the USFWS.

Alternatives 2 and 3 do not meet the need and purpose for action called for in the DEIS. Alternative 1 contains many weaknesses. The CMC may not be as capable of managing a grizzly bear population as well as the USFWS or a scientific team. The experimental nonessential designation inhibits any possibility of linkage zones between the BE and nearby grizzly populations. In all likelihood, since a population introduced by Alternative 1 would not have full protection of the ESA, the population would not be sustainable for long periods of time. Alternative 4 addresses each of these weaknesses, and has no large weaknesses of its own. Thus, Alternative 4 should be implemented, not Alternative 1.
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Introduction

In 1975 the grizzly bear (*Ursus arctos*) was listed as a threatened species in the lower 48 states of the United States under the Endangered Species Act (ESA). This listing was the first of many steps taken in an attempt to maintain grizzly bear diversity within these states. By 1982, the Grizzly Bear Recovery Plan (GBRP) called for the analysis of six possible habitats in which grizzly bear recovery could take place. One of these six areas was the Bitterroot Ecosystem (BE), which is located in Central Idaho and Western Montana. By 1997, a Draft Environmental Impact Statement (DEIS) had been created to propose alternatives through which this possible recovery might take place.

The DEIS includes the purpose and need for action within the BE, four possible alternatives (including the proposed action), possible consequences the alternatives would have on the environment, and various appendices describing economics, public comments, and other topics related to grizzly recovery within the BE. Of the four alternatives proposed, two do not fit the purpose and need for action. One suggests the reintroduction of an experimental, nonessential population. Another suggests the reintroduction of a population which would be fully protected under the ESA.

This paper provides the conservation history which led up to drafting the DEIS (including grizzly bear background, characteristics relevant to the proposal, and conservation efforts), summarizes and analyzes the four alternatives outlined in the DEIS, and proposes the most viable solution for grizzly bear recovery in the BE.
**Grizzly Bear Background**

Grizzlies originally inhabited large portions of the western United States and Canada. At one point prior to European settlement of North America, an estimated 50,000 grizzlies roamed these areas (USFWS 1-4). Since then, grizzly populations have rapidly dwindled. Wildlife populations have been forced out of their original habitat by growth of cities and roads in these areas. The grizzly populations have been hit especially hard because they need huge areas to survive. Grizzly habitats have become increasingly fragmented, and are becoming more isolated due to the insurgence of humans. An estimated 2% of the original grizzly bear habitat still exists today in the lower 48 states (ibid).

Although an estimated 22,000 grizzlies exist today in Canada, and over 30,000 in Alaska (MTFWP 1), there are currently only approximately 800 to 1,000 bears in the lower 48 states, dispersed among five subpopulations (MTFWP, threatened species 1). These include populations in and around Yellowstone National Park, the Selkirk Mountain range of northern Idaho and northeastern Washington, the Cabinet-Yaak Ecosystem of northern Idaho and western Montana, the Northern Cascades, and the northwest Montana Rockies (Figure 1). Most of these populations are isolated from one another, preventing gene flow between populations and thus limiting diversity within each population—a problem which could be partly alleviated by recovery within the Bitterroot Ecosystem.

Of the five subpopulations currently inhabiting the lower 48 states and Southern Canada, the only two which are genetically isolated are the Yellowstone population and
Northern Cascades population (Servheen, 1997, 10). The rest are connected by wildlife corridors, or linkage zones. The Craighead Environmental Research Institute is continuously involved in corridor analysis projects. They cite the Ninth U.S. Circuit Court of Appeals (1990), which defined corridors as: "...avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas..." (CERI corridors 1). These linkage zones are critical in maintaining the genetic diversity currently found in grizzly bear populations because they allow for interbreeding between populations. Maintaining the genetic diversity of the population is especially critical for small populations such as many of those in the Continental United States, because smaller populations are more susceptible to genetic drift and loss of genetic variability (Servheen, 1997, 2).
Grizzly bears are complex animals which portray display a variety of unique characteristics. There are, however, several characteristics which are extremely relevant to reintroduction efforts within the Bitterroot Ecosystem. These include their eating habits, average home range, and response to road density. While these are the most critical and immediately applicable to the proposed reintroduction into the Bitterroot Ecosystem, there are certainly many other characteristics of these dynamic bears which will affect the reintroduction decisions.

Some of the basic foods for grizzlies are fish, carrion, insects, berries, pine nuts, bulbs, and tubers (Craighead et al., 1982, 10). Preferred foods vary from population to population, based on the availability of certain food types. The population which once existed within the Bitterroot Ecosystem is thought to have depended a great deal on chinook salmon as an important food source, although the numbers of these fish in the area are now drastically lower than they were when grizzlies roamed the area (USFWS 3-18). Whitebark pine may have once been important to grizzlies in the BE, although an infestation by mountain pine beetles beginning in 1909 and subsequent white pine blister rust introduction in 1920 has eliminated most mature trees of this species from the area (USFWS 3-17). While these items were once very important to the grizzlies in the Bitterroot area, the remaining vegetation and animals used as sustenance by grizzlies must also be considered in any determination regarding food supplies for potential populations.

The home range of grizzlies usually averages around 1000 to 1500 square miles.
(Craighead et al., 1982, 10), although some estimates can as low as a few hundred square miles (Craighead et al. 1995, 384). Female bears, or sows, usually have a smaller home range than the males, or boars, often by as much as half. In the words of John Craighead and his colleagues, “grizzlies have a sense of ‘personal’ space”, in which the bear feels comfortable and unthreatened (ibid 149). Due in part to their “personal space”, grizzlies generally live fairly solitary lives. Mothers keep their cubs for approximately two years, before leaving the cubs on their own (Schneider 4). Because of the large home range needed by each animal, a huge amount of land is required to sustain a sizeable population of grizzly bears.

In their discussion of habitat suitability for grizzly bears, the Craighead Environmental Research Institute discussed the effect of road densities on grizzly populations. They stated that for secure grizzly habitat, the area must have not more than “0.25 miles of road per each 1.0 square mile or less of habitat” (CERI wilderness 2). It is especially critical that road densities of 1.0 miles of road per square mile of habitat and higher be avoided. They cite several studies in which grizzlies underutilize the 500 square miles of habitat surrounding both roaded areas and campsites (ibid). It follows that habitat with low road density will be more efficiently utilized by bears. The Bitterroot Ecosystem is considered to be the largest roadless landmass in the lower 48 states, and is thus as close to ideal as possible for the grizzlies on the basis of road densities.
Conservation Efforts: The Road to Grizzly Recovery in the Bitterroot Ecosystem

Various laws have been enacted affecting today’s wildlife conservation efforts. Some laws simply outline how conservation efforts are to be carried out. Others describe and define environmental factors which must be considered when dealing with conservation issues. Still others define which species must be protected, and which might not need protection to survive in the wild. The following is a summary of those laws which most directly affect the currently debated grizzly bear reintroduction into the Bitterroot Ecosystem.

The Nez Perce Treaty of 1855, signed by the Oregon Territorial Governor, Isaac I. Stevens, ceded the title of lands occupied and claimed by the Nez Perce Tribe (USFWS 1-10). The rights reserved for the tribe in this treaty included fishing, berry and root gathering, and hunting rights on these lands. Because of this treaty, any action taken in the Bitterroot Ecosystem with regard to grizzly bears must include the consent of the Nez Perce Tribe.

In 1969, the first federal law was passed which would directly affect grizzly bear conservation. This act, the National Environmental Policy Act of 1969 (NEPA), declared it government policy to “encourage productive and enjoyable harmony between man and the environment and promote efforts to better understand and prevent damage to ecological systems and natural resources important to the nation” (USFWS-DOES 1999, NEPA screen 3). NEPA established requirements for preparing detailed Environmental Impact Statements (EIS) for “any major federal action significantly affecting the
environment," which includes any wildlife reintroductions (ibid). This EIS must contain: an examination of possible environmental impacts, unavoidable adverse effects, and the alternatives proposed (USFWS-DOES 1999, NEPA screen 4).

The federal government enacted the United States Endangered Species Act of 1973 for several purposes. These purposes include: providing a means for preserving the ecosystems on which endangered and threatened species depend, conserving endangered and threatened species, and working toward the achievement of the purposes outlined in certain treaties and conventions dealing with conservation of these species (USFWS-DOES 1973, screen 2-3). This act also defined terms dealing with the conservation of endangered species, such as "critical habitat," "species," and "conservation."

"Endangered species" were defined as "any species which is in danger of extinction throughout all or a significant portion of its range" other than certain insect species determined as pests by the Secretary of the Interior (USFWS-DOES 1973, screen 4-5).

"Threatened species" were defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (ibid). The ESA also discussed the determination of endangered and threatened species, exceptions, penalties to those not conforming with the law, and the cooperation required of the states and with foreign countries (USFWS-DOES, 1973, screen 1).

On July 28, 1975, grizzlies south of the Canadian border were listed as a threatened species under the Endangered Species Act (USFWS 1-5). At this point, three areas were identified as recovery zones: the Bitterroot Ecosystem, the Bob Marshall
Wilderness, and the Greater Yellowstone Area (USFWS 6-20).

In 1982, the ESA was amended, adding section 10 (j) (USFWS-DOES, 1999, screen 55-56). This amendment described the use of “experimental populations.” An experimental population was defined as any population authorized by the Secretary of Interior for release outside the current range of the population, if the Secretary determines the release will aid the conservation of the species (ibid). This population must be wholly separate geographically from nonexperimental populations of the same species (ibid). The population must not be essential to the continued survival of the species in the wild (ibid).

As a result of the ESA, many states passed laws protecting endangered and threatened species. Currently, Montana and Idaho state laws respectively list the grizzly bear as a rare and threatened species (USFWS 1-10). Both sets of laws protect the bears, stating that a grizzly may only be killed if a human life is in danger.

Also in 1982, the Grizzly Bear Recovery Plan (GBRP) was written as a guideline for grizzly bear conservation, with draft revisions submitted in 1990 and 1992, and finalized in 1993 (Craighead et al. 1995, 459). This plan described objectives for four threatened grizzly populations, which would ultimately lead to delisting each population. Specific time frames for these recoveries were not described. Also within the GBRP, the Bitterroot Ecosystem was identified as an area which should be evaluated to determine whether grizzlies were present and if habitat was viable for grizzly populations (USFWS 5-3). In response to this, multiple studies were performed, determining that there were most likely no bears existing in the BE and that the habitat was suitable for a grizzly
population of 200-400 bears (ibid).

A third major event in 1982 was the publication of a monograph by John Craighead, Jay Sumner, and Skip Skaggs. This monograph, which determined a system for analysis of grizzly habitat and other wilderness resources using LANDSAT technology, included a list of seven criteria for the maintenance of a grizzly population. These seven criteria have been used in subsequent studies and in determining the viability of the Bitterroot Ecosystem for grizzly bear reinhabitation. The first of these characteristics was defined as space to accommodate the large home range of the bears. The second characteristic was isolation, which included limiting conflict with humans due to roading, logging, and livestock use. The third characteristic was sanitation, as grizzlies tend to be attracted to “artificial” food sources such as edible refuse at recreation sites. These “artificial” food sources condition the bears to humans, causing the bears to lose their fear of humans, ultimately resulting in harm or death to individuals of both species. The fourth characteristic was food. A list was compiled of common foods eaten by bears. The fifth characteristic, denning, occurs in areas of heavy snowfall at relatively high altitudes (7000 to 9000 feet), and is also dependent on topography and isolation, as well as other factors. The sixth characteristic was vegetation types. The vegetation found in grizzly habitat is critical for feeding and other social activities such as bedding. The last characteristic was safety—protection against competition with humans for habitat and loss of prey due to human interference.

In 1992, the Interagency Grizzly Bear Committee (IGBC) reviewed the studies performed within the BE and authorized the preparation of a Recovery Plan for grizzly
bears within the BE. Beginning in 1992, and continuing though 1997, the IGBC accepted public comments regarding possible grizzly bear recovery into this area. In July 1994, the IGBC authorized development of an Environmental Impact Statement for the Bitterroot Ecosystem to identify alternatives with which to carry out the recovery (USFWS 6-21). The most recent version of the Bitterroot Ecosystem DEIS was completed in July 1997. All references to the DEIS refer to the 1997 version.

The DEIS includes descriptions of a purpose of and need for action within the lower 48 states, specifically in the Bitterroot Ecosystem. Four alternatives for action are outlined within the DEIS, two of which were included to meet NEPA requirements and public concerns, and two that include reintroduction from existing grizzly bear populations. In addition, the DEIS addresses how each alternative could affect the environment, discusses the public comments and concerns regarding the reintroduction, and discusses various studies performed within the Bitterroot Ecosystem to determine habitat viability.

According to the 1997 DEIS, organization of the management committee and preliminary preparations were to begin in the spring of 1998, and the first bears were scheduled for reintroduction June through August of 1999 (USFWS 6-179). According to this plan, placement of the second group of bears would occur in June through August of 2000. This timeline has not been met, and a new schedule has yet to be announced.
Alternative Summaries

The content of the alternatives was determined by addressing public concerns and attempting to incorporate them into alternatives similar to those used in grizzly bear recovery plans in the past. Three preliminary alternatives were suggested by the USFWS, prior to public review, then two more were presented to the USFWS during the time period in which public comments were accepted. These five initial alternatives were edited to address public concerns as well as fulfill requirements of the NEPA. Ultimately, four alternatives were chosen to represent the broad range of possibilities for grizzly bear recovery within the BE. According to the DEIS, two of these alternatives do not meet the purpose and need for action, but were included specifically to meet these concerns set forth by the NEPA and to include a diverse selection of alternatives (USFWS 2-19 and 2-28).

Each proposed alternative includes the proposed action, estimated economic cost, and a section addressing the topics which most concerned the public during the scoping period. The following is a summary of each alternative, as well as a brief explanation as to why the alternative was proposed or included in the DEIS.

Alternative 1: Reintroduction of a Nonessential Experimental Population Alternative

(USFWS 2-4 to 2-18)

Alternative 1, informally referred to as the “ROOTS” alternative, was first drafted by two wildlife conservation groups, the National Wildlife Federation (NWF) and the Defenders of Wildlife (DOW) (Rembert 34). In an attempt to diffuse any possible hard
feelings between the conservationists and timber organizations, Tom France of NWF and Hank Fisher of DOW contacted Dan Johnson of Resource Organization on Timber Supply (ROOTS) ("Historic Plan..." 60). ROOTS represents many people associated with the timber industry in Idaho, including sawmill owners and workers, loggers, and approximately 1,700 paper-mill workers (ibid). According to Johnson, people involved with the organization were opposed to the idea of bringing grizzlies back into the Bitterroot, but "figured it was probably going to happen anyway, and we wanted to make sure we had a say in how it was done" (qtd. in "Historical Plan..." 60). In essence, the "ROOTS" alternative was written and proposed with two goals in mind: to reintroduce the grizzly bear into the Bitterroot wilderness, and to address the concerns of the parties involved, namely NWF, DOW, and ROOTS.

Alternative 1 proposes that grizzly bears be reintroduced into the Bitterroot Ecosystem as a nonessential experimental population, under section 10(j) of the Endangered Species Act (USFWS 2-4). Under this section of the ESA, the population would be less protected than they would be under full protection of the ESA. This allows for fewer changes in land-use and harsher punishment for "nuisance" bears, such as killing repeat offenders. The recovery area outlined by Alternative 1 (Figure 2), encompassing the Selway-Bitterroot Wilderness and the Frank Church-River of No Return Wilderness (approximately 5,785 square miles) would be the area most emphasized for recovery. The experimental population area includes a large portion of central Idaho and part of western Montana, extending for approximately 25,140 square miles (ibid). Appendix 18 of the DEIS sets a time line for implementation of this
alternative, stating that the first year would be a "phase-in" period to establish the management committee as well as to decrease the potential conflicts brought on by reintroduction of the bears. The first bears would be introduced approximately one year after initial implementation. Ideally, a minimum of 25 bears would be reintroduced into the recovery area over a period of 5 years. The bears would be obtained from sustainable populations within the U.S. and Canada (USFWS 2-17). At an estimated 2% growth rate, a low estimate for grizzly populations, the recovery goal of 280 grizzly bears would be reached in approximately 110 years (USFWS 2-12).

The reintroduced population of grizzly bears would be managed by a 15-member Citizen Management Committee (CMC), which would be comprised of local citizens, government agency representatives, and members of the Nez Perce Tribe. These individuals would be appointed by the Secretary of the Interior, in coordination with the governors of Idaho and Montana. The CMC would be responsible for making recommendations regarding conflicts or mortalities caused by the bears, land-use strategies, and guidelines for the general management of the bear population (USFWS 2-5). The existence of the CMC is dependent on the experimental, nonessential designation of the population, which allows for flexibility in management, such as addressing the concerns of people opposing reintroduction.

The risk to human safety posed by Alternative 1 is estimated to be minimal. The DEIS compares the Bitterroot Ecosystem with Yellowstone National Park, Glacier National Park, and the Northern Continental Divide Ecosystem (NCDE) which surrounds Glacier (USFWS 2-12). The NCDE has habitats and bear population densities similar to
those projected for the BE, as well as human activities such as hiking, fishing, and horseback riding (ibid). Within the NCDE, there has been only one grizzly-related human fatality and one injury occur since 1950 (ibid). Timbering, road density, trail closures, livestock grazing and mineral extraction would remain fairly unchanged under this alternative, due to the flexibility allowed by the experimental nonessential designation. Linkage zones, a concern of the Grizzly Bear Recovery Plan, would not be accommodated by this alternative, because Section 10(j) of the ESA requires that other grizzly populations not overlap with the recovery area of an experimental nonessential population (USFWS 2-15).

Costs for the implementation of Alternative 1 are estimated at $1,968,160 for the first five years, which comprise the reintroduction period (USFWS 6-73). A breakdown of this figure shows that annually, an estimated $75,632 will be spent on capture and transport of the bears, $150,000 on monitoring and management by the USDA Forest Service, and $168,000 on monitoring and management by other parties (such as the CMC, Nez Perce Tribe, and Fish and Game Departments) (ibid). After the reintroduction period, the cost for CMC and monitoring the bears is estimated to be $168,000 annually (ibid).

Alternative 1 has been selected by the U.S. Fish and Wildlife Service as the proposed alternative for implementation.

**Alternative 2: The No Action Alternative—Natural Recovery** (USFWS 2-19 to 2-27)

Alternative 2 proposes that grizzly bears should naturally expand their range from
existing populations to recolonize the Bitterroot Ecosystem, even though, according to the Bitterroot Ecosystem Technical Committee, there is only a remote chance that this could occur, due to lack of dispersal by grizzlies in that region of the Rocky Mountains (USFWS 2-19). If natural recolonization were to occur, the bears in the Bitterroot Ecosystem would then be placed under full protection under the ESA. At this point, the USFWS would be responsible for managing grizzly bear recovery within the recovery zone (Figure 3). Alternative 2 was added to the DEIS so that public comments were addressed, as well as to provide a wide range of alternatives and to meet NEPA requirements, despite the fact that it does “not necessarily meet the purpose of and need for action” (USFWS 1-25).

Until bears would recolonize, there would be no risk to human safety posed by this alternative. Once recolonization occurred, the risk would be the same as in Alternative 1. If bears were to recolonize, land use might need to be altered to comply with Section 7(a)(2) of the ESA, such as reducing timber harvests and mining. Linkage zones are not currently accommodated by this alternative. However, the USFWS has the power to recommend a change in linkage zone policy if any analyses were to deem it necessary.

Incorporated in this alternative is an estimated $140,000 annual cost of implementation. Salaries and benefits for the USFWS ($25,000), operations costs, such as travel and supplies for the USFWS ($15,000), and miscellaneous costs for the United States Department of Agriculture Forest Service, such as sanitation and law enforcement ($100,000), comprise the implementation cost. This would be the least financially
demanding of the four alternatives.

*Alternative 3: No Grizzly Bear Alternative* (USFWS 2-28 to 2-30)

Alternative 3 proposes to prevent grizzly bears from inhabiting the Bitterroot Ecosystem. Under this alternative, any grizzlies attempting to naturally rehabit the area could be killed. In order to implement Alternative 3, the Endangered Species Act, which requires protection of endangered or threatened species, would need to be amended. The grizzly bear would also need to be removed from the protection of both Montana and Idaho laws. Alternative 3 was included in the DEIS to fulfill the necessary NEPA regulations, to provide a wide range of alternatives, and to address public comments. The actions outlined in this proposal will not be carried out by the USFWS in the foreseeable future.

Under this alternative there would be no threat to human safety or changes in land usage. Linkage zones would be discouraged.

The estimated cost for Alternative is $2,000,000. Incorporated into this estimate are salaries and benefits for the USFWS of approximately $400,000, legislative costs, such as lobbying and public relations of approximately $1,500,000, and miscellaneous operating costs for the USFWS estimated at $100,000 (USFWS 6-74). This Alternative has the potential to be the most financially demanding of the four proposed alternatives.

*Alternative 4: Reintroduction of a Threatened Population with Full Protection of the ESA Alternative* (USFWS 2-31 to 2-41)
Alternative 4 proposes that grizzly bears be reintroduced under full protection of the Endangered Species Act as a “threatened” species. All actions taken within the recovery area would therefore be controlled by the USFWS according to the ESA (USFWS 2-33). Alternative 4 was proposed by the Alliance for the Wild Rockies and the Salmon-Selway Grizzly Coalition, both of which are wildlife organizations active in grizzly bear protection efforts (Rembert 32). This less compromising alternative was proposed based on the idea that the grizzly population would not survive without full protection of the ESA, which restricts land activity within the recovery area as well as making it legal to kill the animals only if they directly endanger a human life.

Alternative 4 also involves land reclamation—over 30 miles of roads are specified in the DEIS to be reclaimed. In addition, over 1,500 square miles of the recovery area would be “designated for road density reduction through reclamation” (USFWS 2-33).

The 21,645 square mile recovery area (Figure 4) for this alternative would include the same recovery area proposed in Alternative 1, with the addition of the Sawtooth and Gospel Hump Wilderness areas and surrounding lands, which are largely designated National Forest lands (ibid). The process of reintroduction for the bears would be essentially the same as that outlined in Alternative 1, introducing a minimum of 25 bears into the recovery area over a period of 5 years. Using an estimated 2% growth rate, the recovery goal for Alternative 4, between 300 and 500 grizzly bears, is projected to be reached in approximately 125 years (USFWS 2-36).

The reintroduced population would be managed by the USFWS within the Bitterroot Ecosystem in coordination with federal land management agencies, the Nez
Perce Tribe, and the states of Idaho and Montana (USFWS 2-41). The need for additional research would be defined and performed by a Scientific Committee, whose duties would also include monitoring the program and developing strategies for reintroduction (USFWS 2-34).

The risk to human safety posed by this alternative would be similar to those in Alternatives 1 and 2, once the grizzly bear population was established. Humans acting in self-defense or in defense of others would be allowed to kill a grizzly. Due to the full protection of the ESA, road building and timber harvest would not be allowed within the recovery zone on lands which are currently not roaded. The grizzly bear management committee might foreseeably limit mineral extraction within the recovery area as well as timber harvesting on currently roaded areas. Livestock grazing would likely not be greatly affected, and the committee would attempt to prevent any problems with nuisance bears. This alternative addresses linkage zones, identifying a Corridor Special Management Area linking the northern end of the Bitterroot Recovery Zone to the southern end of the Cabinet-Yaak Ecosystem. Road densities would be reduced within this area.

Costs for the implementation of Alternative 4 are estimated at $1,968,160 for the first five years, during reintroduction and $168,000 per year after the initial reintroduction period (USFWS 6-75). These costs are identical to those estimated for Alternative 1, with the exception that salaries, benefits, and travel are estimated for the Scientific Committee and USFWS rather than the CMC of Alternative 1. It is also important to note that the conceivable reduction in timber harvest is estimated at 43-194...
million board feet per year for the next decade (USFWS 2-37). The decreased timber harvesting would likely result in a net loss of 138 to 1,136 decade-long jobs, although road reclamation would create approximately 1,501 year-long jobs in the area (USFWS 4-58). No estimates are given for possible reduction of mineral extraction, because the extent of impact is unforeseeable. According to the DEIS, “it is unclear what effect the offsetting factors of reduced timber harvest and increased road reclamation employment would have on federal finances”, although one expert estimates that the money saved by precluding below-cost timber sales in the area would more than offset the estimated cost of road reclamation (ibid). Another report claims that recovering the pristine wilderness area would stimulate future economic growth, as well as job growth in the area, thus adding jobs to the recovery area rather than harming employment by decreasing timber activities (ibid).
Analysis of the Alternatives

For the following analysis, I will reorder the four alternatives, ranging from the alternative least accommodating to the grizzly bear in the Bitterroot Ecosystem to the alternative most accommodating to the grizzly bear. Alternative 3, which proposes all existing or future grizzly bears present in the area should be removed, is by far the least favorable to the survival of the species in this ecosystem. Alternative 2 calls for natural recovery of grizzly bears. According to this alternative, minimal action would take place, allowing the grizzlies to migrate back into the area with no human assistance. Alternative 1, the next logical alternative, would implement the “experimental, nonessential population” status (USFWS 2-4 to 2-7). This would involve actual reintroduction of the grizzly bears, but not allow them full protection under the Endangered Species Act. The final alternative to be evaluated will be Alternative 4, because it also calls for the reintroduction of grizzly bears, but unlike Alternative 1, it would provide the bears with full protection under the Endangered Species Act. Each alternative raises specific questions which must be addressed regarding grizzly bear reintroduction. The answers to these questions might eliminate certain alternatives as viable possibilities as well as indicate which alternative(s) would be the most reasonable to implement. I will discuss and evaluate the economic impact of each alternative as well.

Alternative 3: No Grizzly Bear Alternative

Alternative 3 raises questions regarding the necessity of grizzly bear conservation,
such as whether conservation is necessary in the United States, and more specifically whether the Bitterroot Ecosystem plays a necessary role in that conservation.

The Endangered Species Act (ESA) was enacted to prevent the further extinction of species. One section of the ESA reads: “the United States has pledged itself as a sovereign state in the international community to conserve to the extent practicable the various species of fish or wildlife and plants facing extinction, pursuant to [various international treaties]...” (USFWS—DOES 1973, screen 3). This statement, coupled with the addition of grizzly bears to the list of threatened species on July 28, 1975 (USFWS—DOES 1999, screen 2), should provide ample evidence that grizzly bear populations must be conserved in the United States, if for no other reason than federal law mandates their conservation.

Furthermore, the 1999 report that sparked the recent movement in Congress to delist the species was not only misinterpreted by the Congressmen involved, it was also inaccurate on many counts. The report, written by Mark Boyce as Appendix 21C to a recent version of the DEIS, stated that “the probability of extinction for the entire assemblage of grizzly bear populations is very low, being smaller than 1/1,000,000.” (Boyce 3). This study showed major flaws in logic, possibly in part because it had not yet undergone peer review, constituting inappropriate scientific process. The model used in this study tends to favor the survival of small populations, ignores genetics and minimum viable populations (MVP), does not discuss migration, and makes several invalid assumptions dealing with time frame and carrying capacity (CIS 3). The Coalition of Independent Scientists determined that the majority of Boyce’s conclusions
were flawed, and that when accounting for management variables such as MVP and migration, even Boyce’s model, which was biased toward small populations, determined that the probability of 5 isolated populations (4 existing populations, plus the proposed Bitterroot population) surviving for 100 years would be approximately 54% (CIS 6).

Two separate proposals were brought forth by the Fund for Animals, Inc. and Mr. D. C. Carleton and presented to the Fish and Wildlife Service, Department of Interior in 1991 to reclassify the grizzly bears in certain areas of Washington, Montana, and Idaho, from threatened to endangered status (FWS—DOI screen 6). These areas encompass the Selkirk area in Idaho and Washington, as well as the Cabinet-Yaak area of Idaho and Montana, both of which nearly overlap with the Bitterroot Ecosystem. Although this request was denied on April 20, 1992, the Fish and Wildlife Service stated that the reclassification of these grizzly bear populations was “warranted but precluded by work on other higher priority species...” (FWS—DOI screen 3) supporting the claim that increase grizzly populations in the area of the Bitterroot Ecosystem is necessary. The judgement for the Cabinet-Yaak area was again issued in 1998, and further steps were taken toward reclassification in 1999 for the Selkirk area, stating that the reclassification is still warranted in both areas.

In 1998, a study was published by researchers from the University of Utah and the University of Alaska at Fairbanks, which studied the genetic interrelatedness of brown bears within North America, and determined guidelines for conservation with respect to the bears. The study determined that three “evolutionarily significant units for conservation” of bears exist in three geographic regions, which were identified as: “(1)
the Alaskan islands of Admiralty, Baranof, and Chicagof; (2) mainland Alaska, Kodiak Island, and northern Canada; and (3) southern British Columbia, southern Alberta, and the states of Idaho, Montana, and Wyoming” (Waits et al. 408). While discussing the implications their study should have on conservation efforts, Waits and her colleagues stated, “...the genetic distinctiveness of Alaskan brown bears and brown bears of the lower 48 states indicated by [mitochondrial DNA] sequence analysis highlights the importance of listing *U. arctos* populations in the lower 48 states as threatened in accordance with the U.S. Endangered Species Act, despite the fact that brown bears are thriving in Alaska...” (416). This statement alone, being a conclusion of a study on the genetic diversity of grizzly bears, should be ample evidence supporting the threatened status of the grizzly bears.

The Bitterroot Ecosystem plays a crucial role in grizzly bear conservation. Roadless habitat, ideally less than 0.26 miles of road per square mile, is an absolute necessity for grizzlies (CERI, wildlife screen 3). The Bitterroot Ecosystem, encompassing nearly 5 million acres when including the surrounding national forests, houses the largest roadless area in the lower 48 states (Van Putten 7). This establishes it as a possible candidate area for recovery habitat. The actual viability of the BE for grizzly recovery will be discussed later. In addition to the low road density, the Bitterroot Ecosystem comprises one of the largest blocks of federally held land in the lower 48 states and the two major wilderness areas within the ecosystem make up the largest block of wilderness in the U.S. portion of the Rocky Mountains (USFWS vi). By adding this ecosystem, the grizzly habitat in the lower 48 states could increase by almost
25%, providing a much greater chance of recovery for the species (USFWS 1-3).

Not only are the size and low road density great benefits to be considered in recovery efforts, location should also be considered. Grizzly bear reintroduction into the Bitterroot Ecosystem would provide an island of bears between the three populations to the north (Selkirk, Cabinet-Yaak, and Northern Continental Divide) and the extremely isolated Yellowstone Ecosystem to the southeast. Insertion of a new grizzly bear population between those already existing would provide a greater likelihood of migration, therefore not only decreasing the isolation of the Yellowstone Ecosystem, but also allowing for the possibility of greater genetic mixture between populations. This increased genetic flow between populations is critical, since it alleviates any possible genetic problems that may arise due to small populations, such as inbreeding effects or bottlenecks. Demographic problems stemming from isolated populations, such as the increased risk of drastic decreases in population size by habitat devastation (such as a forest fire or human alteration of habitat) might also be alleviated by this.

Alternative 3 could have a tremendous negative impact on the economy. First, congress would need to pass legislation removing the grizzly bear from the list of threatened species in Idaho and Montana. The recent movement in Congress to do this has met with great opposition from wildlife biologists and conservationists, and will likely be tabled or voted down due to the faulty study it was initially based upon. Not only would the bears need to be removed from federal protection, both Montana and Idaho would also need to remove the bears from protection of their state laws. Appendix 7 of the DEIS conservatively estimates the total costs of this alternative to be a minimum
of 2 million dollars (6-74).

Alternative 3 not only runs counter to federal mandates on the Fish and Wildlife Service, it eliminates one of the best areas for grizzly habitat in the lower 48 states as a possible recovery habitat. The elimination of this ecosystem as a possible recovery area would harm the potential for grizzly bear survival south of Canada and increase the isolation of the Yellowstone Ecosystem, increasing the possibility for genetic and demographic problems brought on by isolation. The costs of removing grizzlies from federal and state protection represents yet another negative aspect to this alternative.

**Alternative 2: Natural Recovery**

Alternative 2, which calls for the natural recovery of grizzly bears, brings up questions regarding the ability of the Bitterroot Ecosystem to sustain a grizzly population, especially with the decreased levels of salmon and white bark pine in the region. It also brings up questions regarding the possibility of natural recovery, and whether human intervention is necessary to facilitate grizzly bear recovery in the ecosystem.

Bart Butterfield and Jon Almack performed a study in 1985 to determine the space and habitat necessary to support a viable population of grizzly bears in the ecosystem, thus fulfilling one of the steps in the Grizzly Bear Recovery Plan. Their study included two objectives: to survey for potential habitat and to classify and describe the vegetation types as a precursor to further classification via satellite (Butterfield et al. 2). This study revealed that the Selway-Bitterroot Wilderness Area fully satisfies the seven
habitat characteristics essential for grizzly bear survival (Butterfield et al. 32, Craighead et al. 1982, 10) and that adding the surrounding wilderness and undeveloped lands to the Selway-Bitterroot Wilderness Area would further enhance the Ecosystem as a recovery area. According to this study, the Bitterroot Ecosystem would provide “an ecologically superior area for augmentation of grizzly bears” (Butterfield et al. 43). Populations of both white bark pine and chinook salmon in the ecosystem were also addressed in this study. Evidence was found that although a beetle infestation in the early 1900s destroyed large amounts of white bark pine, black bears currently feed on the nuts of these trees within the Bitterroot Ecosystem, suggesting that the white bark pine population is not too depleted to serve as a food source for grizzly bears. Although they found that chinook salmon populations in the study area were lower than they once were, the researchers determined that since grizzly populations survive in other ecosystems without these fish, the bears would likely be able to adapt and take advantage of other fish species in the area.

Over the past 50 years, there has been no verifiable evidence brought forth that grizzlies still exist in the Bitterroot Ecosystem. Various studies have been performed in the region for the past several decades, and although there are occasional reports of grizzly presence, they have not been verified. One of the most recent studies, performed by Chris Servheen and colleagues, attempted to detect grizzly bear presence with remote-sensitive cameras, with no success (Servheen 2). Based on the lack of evidence and the findings in these and other studies, it is assumed that there are currently no grizzly bears in the Bitterroot Ecosystem (ibid). According to the Grizzly Bear Recovery Plan
Supplement amended in 1993, it is understood that natural recolonization is considered to be a remote possibility (Servheen 3). This is mainly due to the lack of existing corridors linking the BE to other systems. Because of this, recovery will require reintroduction of grizzly bears from existing populations.

This alternative has smaller immediate economic impact than the Alternative 3. In Appendix 7 of the DEIS, the annual cost of Alternative 2 is approximately $140,000, which would be paid out as salaries, various expenses, and legal fees. Implementing this alternatives would place no jobs in danger, as there would be no timber, mining, or agricultural changes (USFWS 6-74).

Since it has been established that grizzly bears will not naturally recolonize the Bitterroot Ecosystem, Alternative 2 would prevent grizzly bear recovery within the area. Choosing this alternative would run counter to the federal mandates on the Fish and Wildlife Service while also eliminating the best recovery habitat from consideration for reinhabitation by the bears. From a conservation viewpoint, the Bitterroot Ecosystem is considered one of the best habitats for grizzly bear reintroduction, and implementing either of the alternatives I have already discussed would waste habitat, rendering it incapable of sustaining a population. Although this alternative would include very little economic cost, any money spent implementing it would be wasted, as there is only a minute possibility that grizzlies will migrate into and rehabit the Bitterroot Ecosystem.

Alternative 1: Citizen Management Plan

Alternative 1 introduces the possibility of a Citizen Management Committee

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(CMC), as well as labeling a reintroduced Bitterroot population as “experimental and nonessential” under section 10(j) of the ESA. Questions arise regarding the objectivity of the CMC, as well as the advantages and disadvantages that might be associated with it. It is also imperative to discuss the advantages and disadvantages to the “experimental and nonessential” designation for the grizzly bears. The necessity of linkage zones and continuing resource extraction are also introduced by this alternative.

Since the CMC is a fairly new idea that has not been implemented in the past, it is difficult to gauge what types of advantages and/or disadvantages it may provide. One large disadvantage it may present is a lack of complete objectivity. Although the committee would be appointed by the Secretary of Interior in consultation with the governors of Idaho and Montana, most appointees would still be ordinary citizens with a limited view of the situation. The presence of representatives from state and federal agencies would assist the rest of the CMC to understand ecological implications of their decisions, but there is a great chance that the CMC would not always make decisions in the best interest of maintaining the bears’ survival, because they are not knowledgeable enough regarding the full complexity of the decisions they must make. In the words of Jay S. Sumner, who has worked in various capacities in grizzly studies since 1964, and has been a biologist of the Craighead Wildlife-Wildlands Institute since 1984, “Citizens are not knowledgeable enough in wildlife and scientific problems and alternatives to make intelligent decisions. They can in no way understand the complexities of the management alternatives even when versed in the various disciplines.” (Sumner 4).

There is also a chance that with such a diverse group of people, each could
maintain personal biases more intensely than wildlife management professionals, which could result in poor decisions or the inability to make decisions as a group. Citizens might also be more susceptible to outside influence. According to Mr. Sumner, “Citizens are even more likely to be influenced by the various special interest groups. These groups not only lack objectivity, but usually have one or more causes that they are supporting.” (4). At the very best the CMC would be inefficient.

In general, the CMC alternative is not widely embraced by wildlife biologists. For example, in a letter to Dr. Christopher Servheen, the Team Leader of the Bitterroot Grizzly Bear EIS, the biologists from CWWI stated that “we object to delegating management authority to a local citizen committee as specified in Alternative 1...”, listing two main reasons: (1) the lands are public, not private lands, thus the government should manage the land and the bears on it, and (2) the recovery in this area is not a routine procedure which a lay committee should be entrusted with (Craighead et al. 1997, 1).

While the diversity of the CMC might provide disadvantages, it also has the ability to provide advantages in decision making. Many different points of view would be taken into consideration, which might happen to a lesser degree in the absence of such a committee.

Overall, this committee has the capability of being more harmful to the reintroduction than helpful, and may have been proposed more as a political “pawn” to placate the public and make them feel as if they have some control over the management of the grizzly bears. In appeasing the fears of the public, the people involved in
implementing the plan will likely encounter less resistance from people opposed to
reintroduction. The Citizen Management Committee would not be necessary as long as
the public concerns are considered by the group overseeing the reintroduction efforts.

According to section 10(j) of the ESA, an “experimental” and “nonessential”
population refers to an experimental population whose loss would not likely reduce the
survival of the species in the wild, and when the population is completely geographically
separated from any non-experimental populations in the wild (USFWS—DOES screen
55-56). Since it has been determined that grizzlies from other populations will not likely
migrate in and rehabit the Bitterroot Ecosystem, it is safe to assume that the Bitterroot
population would be geographically isolated. This classification can only be used for
species proposed to be listed or threatened species. The advantage to an experimental,
nonessential population is the increased flexibility allowed in the management of the
population. This allows for continued resource extraction while the bears are being
reintroduced, as well as for the presence of the CMC, and limits the measures that can be
taken to ensure the survival of this population. While the reintroduction of grizzly bears
into the Bitterroot Ecosystem would increase habitat of the species in the United States
by approximately 25%, under this alternative the Bitterroot Ecosystem would likely
house an isolated grizzly population, which would thus not be able to breed with other
populations and maintain genetic diversity (USFWS 1-2,2-9).

This proposal discusses linkage zones, although does not favor them, since the
nonessential experimental designation requires that the recovery area be isolated from
other grizzly bear populations. Linkage zones are critical in this area. According to
CERI, "the location, size, and habitat components of the currently protected National Parks and wilderness areas indicate that the best conservation strategy is to design a network of core reserves, connected by functional wildlife linkage corridors" (CERI, 1999). According to Jay Sumner, "Corridors are essential to the long-term survival of the grizzly...Without corridors, the entire transplant reintroduction program would eventually fail (even though the original transplants would be from a genetically diverse population)" (4). In the letter written to Dr. Servheen by the CWWI biologists, they cite the Grizzly Bear Recovery Plan, which states, "It is essential that existing options for carnivore movement between existing ecosystems be maintained while the (five-year) evaluation of linkage zones is underway." (3). The biologists use this statement to assert that Alternative 1 does not fulfill the recommendations set forth by the GBRP.

While there is no guarantee that the grizzly bears would use any corridors set forth, their existence would increase the possibility of interbreeding between subpopulations. Also, if the population in the Bitterroot Ecosystem were to grow, the population would begin to spread out, expanding the total area of habitat being utilized. This expansion would ultimately lead to the bears' movement through the corridors into other grizzly bear supporting ecosystems.

Resource extraction has the capability of driving grizzlies out of their habitat. Just as grizzlies avoid roaded areas, they avoid any areas with human activity, which include camping sites, logging sites, developed areas, and roads, even if the human activity is sporadic (CERI, 1999). Despite this, there is still a possibility that there would be an increased chance of bear-man encounters. Alternative 1 calls for minimal change
in timber harvest, livestock grazing, permanent trail closures, or mineral extraction. While the livestock grazing may not have a large effect on the bears, the other three items would likely drive grizzlies away from those areas.

Appendix 7 of the DEIS estimates the annual cost for the first five years (reintroduction period) to be approximately $393,000, with an annual cost of $168,000 after the reintroduction period. A minimum number of jobs would be lost due to the possible reduction of timbering and mining industries within the ecosystem.

Alternative 1, while the most reasonable reintroduction plan discussed thus far, still leaves much to be desired. The grizzlies would be constantly avoiding people, since no further roads or human operations would be shut down within the wilderness. The Citizen Management Committee would provide alternative viewpoints, but may not have the ability to make consistent decisions in the best interest of the bears. Crucial linkage zones are discouraged by this alternative. The experimental, nonessential population, which is essentially being proposed to allow for the CMC and future mining and timbering, is not necessary when taking into account that the new designation will be more harmful to the bears than helpful.

**Alternative 4: Full Protection Under ESA**

Alternative 4, which allows for full protection of grizzlies under the ESA, brings up many of the same questions as Alternative 1. These questions concern the necessity of full protection under the ESA, whether the alternative addresses linkage zones, the abilities and advantages/disadvantages of the management committee, and the necessity
of land reclamation.

Since grizzly bears are currently classified as a "threatened" species under the ESA, the USFWS is within the ESA parameters to implement bears into the Bitterroot Ecosystem as a nonessential experimental population. The petitions which have recently been considered by the USFWS regarding the reclassification of grizzlies to "endangered" status must also be considered. Since the reclassification of bears in two of the three closest ecosystems to the Bitterroot Ecosystem from "threatened" to "endangered" has recently been described as "warranted but precluded by work on other higher priority species" (FWS—DOI screen 3), it sets the bear populations in this area in a "limbo" of sorts, somewhere between "threatened" and "endangered". So although the bears are currently listed as "threatened", they should be treated as an "endangered" species, in the interest of erring toward the side of caution, until some judgment is made regarding their status. Considering this, the bears should be reintroduced into the Bitterroot Ecosystem under the full protection of the ESA rather than as an experimental, nonessential population.

Furthermore, this alternative addresses linkage zones in a positive manner for grizzly bear conservation. A Corridor Special Management Area would be designated that links the proposed Bitterroot Recovery Zone to the Cabinet-Yaak Ecosystem. This would allow for increased genetic variability in these populations, as well as increasing the probability of grizzly bear survival in the wilderness.

Under this alternative, grizzly bear management in the Bitterroot Ecosystem would lay primarily in the hands of the USFWS, who would be assisted by federal and
state agencies as well as the Nez Perce Tribe. An interagency committee would manage the population, an action common to other grizzly bear recovery areas that is known to work efficiently. A Scientific Committee would be appointed by the Secretary of Interior to monitor the program and provide recommendations regarding the population. The combination of the interagency committee and the scientific committee would allow the capability of making more educated decisions in the best interest of both the grizzly bears and the citizens of the area. The state agencies and Nez Perce representatives should be able to provide local viewpoints to consider when making decisions. The Scientific Committee could provide the expertise to make sound ecological decisions, which might not be true of the CMC in all instances.

This alternative calls for land reclamation (reducing road densities) within the Lolo Restoration Area and Special Corridor Management Areas. An estimated 3500 miles of roads would be reclaimed. As previously stated, grizzlies tend to under-utilize all roaded areas, since even periodic use by humans causes their aversion to the areas. Although land reclamation may seem unnecessary, when comparing the current road density in the area (0.60 mi/mi² in developed and 0.20 mi/mi² in undeveloped portions of the Clearwater and Nez Perce portions of the BE) and the standard recommended road density for suitable grizzly habitat (0.26 miles of road/square mile of habitat) it is obvious that the current density of 0.60 mi/mi² in developed areas is not ideal for grizzly bear habitat (CERI, wildlife screen 3). Although it will likely take several generations for the bears to respond to these road closures, land reclamation is necessary in each roaded area.
The cost of implementing Alternative 4 is estimated to be exactly the same as the previous alternative: $393,000 for each of the first 5 years, then $168,000 per year after the 5-year reintroduction period. The cost of road reclamation is not discussed in the DEIS. Since no logging or road building would be allowed on the roadless lands within the recovery zones, some jobs will potentially be lost, and the reduction in timber harvest is estimated to be between 43 and 194 million board feet per year over the next decade (USFWS 6-75). Due to fluctuating timber prices and the large estimated range for timber loss, this cannot be translated into monetary value. Mineral extraction would also be altered, but there is no estimate provided in the DEIS for the economic impact this would have.

This alternative allows for the critical corridor linkages. The groups involved in management of the introduced population would be more capable and efficient than the Citizen Management Committee, while still considering the public concerns. This alternative also allows for land reclamation, which, while tedious, is extremely necessary. The economic impact is slightly larger than that for Alternative 1 when jobs are considered, but still feasible when considering that road reclamation will likely offset many jobs lost to timber reduction.

Analysis Conclusions: Determination of the Most Viable Alternative

It has been established that within the Bitterroot Ecosystem, the re-inhabitation of grizzly bears is necessary, thus eliminating Alternative 3 as a viable option. It has also been established that grizzly bears will not naturally re-inhabit the BE, thus Alternative 2
is not feasible and reintroduction is necessary to establish a grizzly bear population.

Both Alternative 2 and Alternative 3 would waste an opportunity that only the Bitterroot Ecosystem can provide.

When comparing Alternatives 1 and 4, Alternative 4 nearly always comes out the superior choice. Alternative 4 addresses linkage zones, which have been established as an essential component for long term survival of the bears. The Citizen Management Committee would likely manage the population in an inferior manner to that of a scientific committee, thus Alternative 4 provides for a better management system. I have established that the reclassification of grizzlies to “endangered” status is warranted (thus the population in the BE would be necessary to survival of the species as a whole), and thus the bears should not be reintroduced as an experimental, nonessential population.

This alternative is also more favorable for the bears regarding road density and timbering. Alternative 1 provides for none of these. Alternative 4 is less favorable than Alternative 1 only when considering economics, because Alternative 4 would cause reduction in timbering, which would cause both financial losses and job losses to the timber industry.

As discussed, Alternative 4 is also considered the best possible choice by many wildlife biologists, including those of CWWI. Among the reasons for their support of Alternative 4 are problems associated with Alternative 1, such as weaknesses brought on by the CMC, the smaller recovery area of Alternative 1 (when compared to Alternative 4), and the lack of linkage zones established by Alternative 1 (Craighead et al. 1997, 3). Many biologists also feel that management plans should be based on “sound scientific
data gathered by independent researchers” (Sumner 5). They feel that the Scientific Committee outlined in Alternative 4 would accomplish this more efficiently than would the CMC. The Alliance for the Wild Rockies (AWR), the wildlife conservation organization which proposed Alternative 4, even went so far as to call Alternative 1 “illegal and deficient under both NEPA and the ESA.” (AWR 3).

Alternative 1 is currently the “proposed alternative”. For the reasons I have just described, implementing Alternative 1 would be a mistake. Alternative 4 should be implemented by the USFWS, because it is the only alternative which can protect the grizzly bears to the extent they require in order to increase the species’ likelihood of surviving in the wild. The survival of grizzly bears should be the primary concern.
Figure 1. Current Grizzly Bear Populations in the Lower 48 States and Southern Canada, shown with the Bitterroot Ecosystem. (Adapted from Servheen 1997).
Figure 2. Alternative 1—Experimental Population Area and Recovery Area. 
(Adapted from USFWS 1997).
Figure 3. Alternative 2—Recovery Zone (Adapted from USFWS 1997).
Figure 4. Alternative 4 — Recovery Zone, Habitat Linkage Corridor, and Habitat Restoration Area. (Adapted from USFWS 1997).
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