DRAFT

ENVIRONMENTAL ASSESSMENT

FOR

THE POTENTIAL REINTRODUCTION OF BIGHORN SHEEP INTO THE BULL MOUNTAINS, LEWIS AND CLARK CAVERNS, AND DOHERTY MOUNTAIN

MONTANA FISH, WILDLIFE & PARKS

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CHAPTER I

PURPOSE AND NEED

A. THE PROPOSED ACTION

The Proposed Action is for Montana Fish, Wildlife & Parks (FWP) to reintroduce Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*) into three adjacent areas located in FWP Region 3 in south-central Montana: the Bull Mountains, Doherty Mountain, and Lewis and Clark Caverns area. These areas were, in part, selected because their proximity to one another would allow for interchange should sheep inhabit the area. In addition, each of these areas contain suitable year-round habitat for bighorn sheep. From population modeling efforts, it appears that the Lewis and Clark Caverns area and the Bull Mountains area would support an estimated population of 125-150 sheep at a density of 2.66 sheep/km, a density typical for bighorn sheep in similar habitats. Doherty Mountain is a relatively small area anticipated to support 50-75 sheep in addition to being used by sheep from the other two areas. Connectivity between the Caverns area and Doherty Mountain under Interstate 90 would be facilitated with two existing under-crossings consisting of a culvert and a bridge.

Reintroduction of bighorn sheep to these areas would depend on health analyses done at the time of capture, ability of each area to meet criteria for translocation as identified in the Montana Bighorn Sheep Conservation Strategy (MFWP 2010), and availability of sheep from other areas in Montana. If any or all of these three areas being investigated for reintroduction qualify for release of bighorns, it would likely take a few years before stocking would be completed. Translocations typically consist of 20 to 40 bighorns being released for two consecutive winters.

During capture, bighorn sheep would be handled in a manner which will minimize stress during transport (Aune 1994). While animals are immobilized, the following medications would be administered: antibiotic to reduce the possibility of infection, Ivermectine for parasite control, and a selenium supplement to reduce capture myopathy (Aune 1994). Tests for a variety of diseases and disease organisms using standard methodology would be performed.

Prior to release, some of the animals would be marked with radio transmitters to determine future movements and success of the reintroduction. Bighorns would continue to be surveyed annually by FWP to determine population parameters.

As bighorns become established in these areas, FWP biologists would determine when their numbers should be managed through sustainable harvest and/or translocation as approved by the FWP Commission. Establishing a sheep population numerically sufficient to support recreational hunting (i.e. limited special licenses) is a primary goal of this project.

B. PURPOSE AND NEED

Bighorn sheep were native throughout much of western Montana including these three areas (Buechner 1960). Wild sheep were extirpated throughout most of the west around the turn of the 19th century due to a variety of reasons including over hunting, disease, and competition for forage with other grazers. Bighorns are known to be poor pioneers of new areas (Geist 1971) and are unlikely to reoccupy these areas by natural means. One of the statewide objectives in the Bighorn Sheep Conservation Strategy is to "establish five new viable and huntable populations over the course of the next 10 years and augment existing populations where appropriate" (Montana Fish, Wildlife and Parks 2010). Additionally, the management plan for Lewis and Clark Caverns State Park identifies reintroduction of bighorn sheep to the park as a preferred option that was supported by the Citizen's Advisory Committee for the park (Montana Fish, Wildlife and Parks 2000).

The purpose of this proposed action is to reintroduce bighorn sheep to these three areas which will hopefully result in the establishment of two viable populations that would ultimately provide recreational opportunities including hunting and viewing.

Carrying out this reintroduction would provide the benefit of re-establishing a valuable and specialized native species in an area from which it has been absent for most of this century. Re-establishing native species has been an FWP objective since the 1940's and is supported by the public.

These reintroductions would provide a valuable new opportunity to view wild sheep in their native habitat, encouraging non-consumptive wildlife related recreation. This new opportunity would especially enhance recreation for visitors to Lewis and Clark Caverns State Park. Once these populations of sheep are established, it will further benefit recreationists in Montana by providing additional sheep hunting opportunity which is a highly sought after recreation that holds a great deal of public interest. Increased recreational opportunity, both consumptive and non-consumptive, would result in additional economic benefits to local merchants by hunters and wildlife watchers.

An established population of sheep in these areas will likely use private land and provide recreational opportunity; this project can illustrate cooperation and good relations between landowners, recreationists, and FWP.

The long-term survival potential for bighorns in Montana would be enhanced by providing a new population of sheep separate from others that might become threatened by disease or habitat related issues.

C. SCOPE OF THE PROPOSED ACTION

The three areas considered for bighorn sheep reintroduction comprise a total of approximately 139,373 acres. Of the total acres, approximately 44% is public land and 56% is privately owned with mixed ownership in all three areas (Table 1).

Table 1. Land ownership by acreage for the three potential areas for bighorn sheep translocation.

Area	Ownership					
	State	MFWP	Forest Service	BLM	Total Public	Private
Bull Mountains	640	-	28,160	10,880	39,680	19,615
Lewis and Clark	3,200	3,000	-	5,440	11,640	37,129
Doherty Mountain	960	-	-	8,320	9,280	22,029
Total Acres	4,800	3,000	28,160	24,640	60,600	78,773

Forest Service lands are administered by the Beaverhead-Deerlodge National Forest (USFS) and occur solely in the Bull Mountains; the Jefferson District office in Whitehall is responsible for managing lands in this area. The Bureau of Land Management (BLM) lands are administered by the Butte Field Office; BLM lands occur in all three areas. State lands occur in all three areas and
are managed by the Department of Natural Resources (DNRC) with offices in Helena.

The proposed action is to release sheep during winter at these three areas on potential winter ranges (Figure 1). Specific release sites have not been identified at this time. Release sites would be located on public lands or on private land where written permission to do so will be acquired prior to reintroduction.

Bighorn sheep may be released as early as the winter of 2011-12. Timing and location of releases may be dependent on sheep availability and winter access. Which area or areas, if any, would be selected for reintroduction first would depend on the results of this analysis.

Based on the information contained in this Environmental Assessment, the Regional Supervisor will decide:

- whether to recommend the Bighorn Sheep Reintroduction Project to the FWP Commission as proposed, implemented in modified fashion, or not implemented at all.
- whether the proposed action or alternatives considered have significant impacts requiring analysis in an Environmental Impact Statement (EIS).

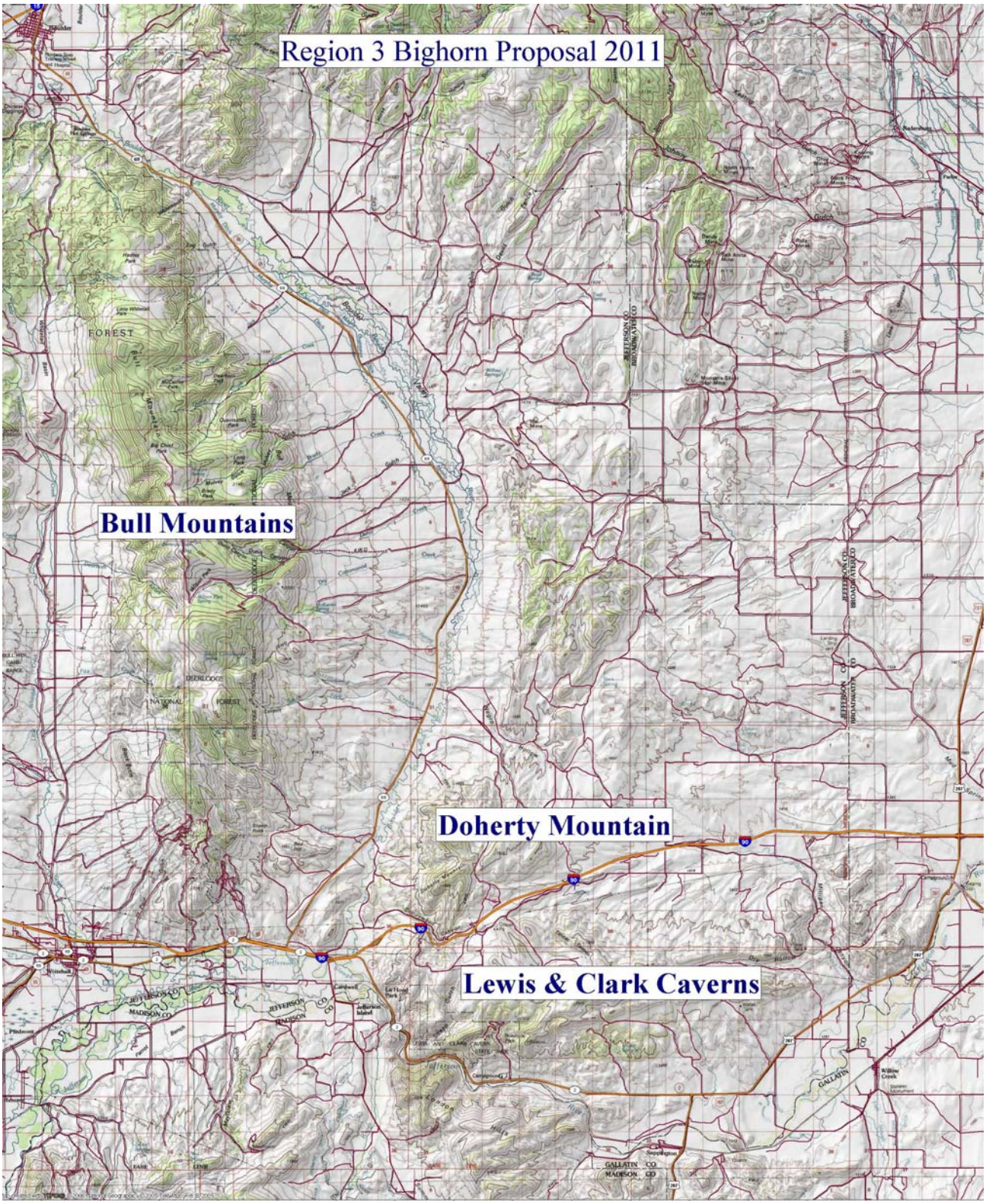

Figure 1. Location of potential bighorn sheep transplant areas in MFWP Region 3 in south-central Montana.

D. AGENCIES CONSULTED DURING EA PREPARATION

Potential bighorn sheep range occurs on lands administered by USFS, BLM, and DNRC. All agencies have been consulted and will be actively involved in habitat management should reintroduction occur. In addition, major landowners, including Golden Sunlight Mine, were contacted prior to releasing the EA and written agreement for supporting reintroduction of bighorn sheep pursued at that time.

CHAPTER II

THE ALTERNATIVES AND HOW THEY WERE DEVELOPED

A. GENERAL INTRODUCTION

Chapter II describes the alternatives that are being considered and provides a summary of their environmental consequences.

B. DEVELOPMENT OF ALTERNATIVES

1. Introduction

A two-step process was followed in developing alternatives. Step one was to define the issues and concerns raised by the proposal. Step two was to develop alternatives which addressed one or several of the identified issues.

A list of issues and concerns were arrived at through an internal and public scoping process.

2. Description of Internal and Public Scoping

A list of issues and concerns was developed internally by FWP personnel. Public scoping was done by a statewide news release that explained the proposal and requested comments from interested parties. The comment period ran from August 12, 2011, through September 12, 2011. Notices to the public appeared in newspapers of local and larger surrounding communities. The major private landowners in the vicinity of the proposed transplant areas were also contacted to inform them of the bighorn sheep reintroduction project and discuss possible concerns. A total of 11 comments were returned either in writing or on-line and are located in the project file at the FWP Townsend Field Office. Comments were reviewed and summarized by agency personnel and were used as a basis to identify issues.

3. Issues Prompting Alternative Development

Because of the unique character of a bighorn sheep reintroduction project, few options were available for extensive alternative development. Consequently, two action alternatives were

developed in response to the issues. This section describes the primary issues identified through internal and public scoping.

Issue 1. Activity Restrictions -- If bighorn sheep are reintroduced, is there the potential for new restrictions on motorized travel, mining, or other activities on federal lands?

There were comments suggesting that no further activity restrictions would be acceptable as well as comments suggesting that the land managing agencies should restrict some activities to ensure the success of bighorn sheep reintroduction. Some comments were against restricting motorized travel for bighorn sheep. Existing mineral operations were concerned that bighorn sheep would interfere with on-going or anticipated mining activities including reclamation. In other areas, bighorn sheep have foraged on newly vegetated reclamation sites.

Issue 2. Domestic Sheep -- If bighorn sheep are reintroduced, what potential is there for disease transmission from domestic sheep near Lewis and Clark Caverns, and what are the possible consequences to sheep producers? A few comments from the public stated that diseases transmitted from domestic sheep to bighorn sheep could keep a reintroduction effort from succeeding.

Issue 3. Competition For Forage -- Will bighorns compete for forage, space, or other habitat components with livestock or other wildlife species?

Some comments questioned the logic of introducing additional "grazers" in an area already supporting large herds of livestock, deer, and elk. Livestock producers expressed concern that further restrictions on livestock grazing would result from reintroduction. Some comments suggested there were more elk in this area than the existing forage base could support, and until elk numbers were "controlled," bighorn sheep should not be reintroduced. A few comments suggested forage could be created to support bighorn sheep and other ungulates through the use of prescribed burning and/or timber harvest.

Issue 4. Range Condition -- What long-term effect will bighorn sheep have on soil, water, riparian areas, and vegetation? This issue was generated internally by agency biologists. This issue is a check to ensure that unacceptable effects are identified as part of the decision-making process.

Issue 5. Private Land -- Are bighorns likely to end up on private land where they are not wanted? Some comments suggested that like elk, sheep do not recognize federal land boundaries. Some sheep are bound to reside on private lands in the areas they are reintroduced. Some comments suggested the way to control sheep was through hunting and translocation programs.

Issue 6. Recreational Opportunities -- If bighorn sheep are reintroduced, will they be available for hunting and for non-consumptive uses such as wildlife viewing and photography?

Some public comments suggested that in the future positive benefits will be derived from the reintroduction of bighorn sheep through hunting and viewing activities. Other comments suggested that bighorn sheep may attract too many "viewers" (and possible poachers), and this activity may negatively affect traffic on existing roads or result in trespass on private lands.

C. ALTERNATIVES CONSIDERED IN DETAIL

1. Overview

The three alternatives being considered are described in this section. One action alternative in addition to the Proposed Action was developed to address the possibility that while not all three areas may be suitable for transplanting bighorns, one or potentially two of the areas would be. This alternative would allow the decision maker the latitude of selecting areas that are suitable for reintroducing bighorn based on the results of this analysis. A No Action alternative was also considered.

2. Features and Monitoring Common to All Action Alternatives

Each of the action alternatives calls for the release of bighorn sheep. Criteria addressed in the “Montana Bighorn Sheep Conservation Strategy” (FWP 2010) for reintroducing bighorn sheep have been and will continue to be followed if bighorn sheep are released.

All releases, regardless of the site, involve capturing bighorns from other Montana herds and transporting the animals by truck/horse trailer to the release site. Bighorns would be handled in a manner which will minimize stress during transport (Aune 1994). Medications will be administered including an antibiotic to reduce the possibility of infection, ivermectine for parasite control, and a selenium supplement to reduce capture myopathy (Aune 1994). Tests for disease and disease organisms will be conducted according to standard protocol and results documented. Post-release monitoring would include annual survey flights by FWP biologists to determine population size, distribution, and general herd status. Upon release, selected sheep would be marked with radio-transmitter collars for obtaining basic movement information. Relocation flights would be flown monthly or as often as logistically possible. Hunting would not be allowed until such time that criteria, as identified in the Montana Bighorn Sheep Conservation Strategy, are met for initiating hunting in newly established populations (FWP 2010).

3. Alternative Descriptions

<u>Alternative A (No Action)</u>

Under the No Action Alternative, bighorn sheep would not be reintroduced at this time. Alternative A represents the baseline condition against which the potential effects of the two action alternatives can be compared. Alternative A also responds to those who oppose the

bighorn reintroduction including respondents wishing to postpone any releases until elk numbers are reduced.

Alternative B (Proposed Action)

Alternative B represents the initial proposal for meeting the project objective specified in Chapter I. With this alternative, bighorn sheep would be released on selected winter ranges in each of the three areas with two releases planned for each site during consecutive winters. Habitats in the Bull Mountains and the Lewis and Clark Caverns area are expected to each support approximately 150 bighorns. Doherty Mountain, which has some excellent bighorn sheep habitat, is a smaller area and may be able to support 50 to 75 bighorns. The target population size will be based on what the winter ranges will support and when private lands are used by bighorns: specific numbers would be determined in consultation with the landowners. Scheduling of releases depends largely on availability of surplus sheep. It's likely that reintroductions will have to be prioritized by area, and it might take a few years to stock all three sites. The goal is to release 20-40 bighorn sheep into each area for two consecutive winters.

Alternative C

Alternative C is a modification of the Proposed Action. Depending on the conclusions of this Environmental Assessment, the decision maker (FWP Region Three Supervisor) may choose to implement portions of the Proposed Action. The Bull Mountains and Lewis and Clark Caverns area would both be able to support at least a minimum viable population of 125 animals which would be enough sheep to be self-sustaining over time (Geist 1971). If the conclusion of this analysis was that bighorn sheep should not be reintroduced in one of these two areas, it would still be feasible to transplant sheep into the other area. While the Doherty Mountain area is not large enough to support a minimum viable population, it's anticipated that bighorns would move between whichever other area sheep were transplanted. It's believed that maintaining less than a minimum viable population is feasible there because of the likely connection with other bighorns, and reintroducing bighorn sheep into the Doherty Mountain area could be part of Alternative C.

D. COMPARISON OF ALTERNATIVES WITH RESPECT TO EFFECTS

The alternatives differ primarily in the potential number of bighorn that may ultimately be re-established in historically occupied habitat and where that occupation will take place. Under the No Action Alternative, there would be no bighorn sheep re-established in former habitat while under Alternative B, where bighorns would be introduced into all three areas, there may be as many as 300-350 sheep. Implementing Alternative B would entail translocating as many as 200 bighorn sheep from other areas into the three described areas. Once transplants in an area are completed, bighorn sheep, assuming normal lamb recruitment of 30 to 35 lambs per 100 ewes, could reach population objectives within 5 to 10 years. Under Alternative C, where bighorns would be introduced into either the Lewis and Clark Caverns area or the Bull Mountains and possibly Doherty Mountain, there may be approximately 150-200 bighorns. These quantitative

differences would dictate the ability to establish new populations of bighorns in this vicinity and ultimately the ability to provide both consumptive (hunting) and non-consumptive (wildlife viewing) opportunities for the public. A more detailed issue-oriented comparison of the alternatives is found in Chapter IV Environmental Consequences.

CHAPTER III

THE AFFECTED ENVIRONMENT

A. INTRODUCTION

The purpose of Chapter III is to describe those components of the environment that could be affected by implementation of the proposed action or one of the other alternatives. The chapter begins with a general description of the analysis area. Resources related to project issues identified during the scoping process are described next.

B. AFFECTED ENVIRONMENT

The three areas being considered for reintroduction of bighorn sheep are Lewis and Clark Caverns area, Doherty Mountain, and the Bull Mountains (Figure 1). Estimated acres of potential habitat is 98,975 (Bull Mountains), 60,409 (Lewis and Clark Caverns area), and 40,589 (Doherty Mountain). These areas were selected, in part, because there would likely be interchange between them should sheep inhabit this area. From population modeling efforts, it appears the Lewis and Clark Caverns area and the Bull Mountains area would support at least a minimum viable population of 125 sheep (minimum number of sheep to provide a self-sustaining population over time) at a density characteristic of this type of habitat of 2.66 sheep/km^2. Doherty Mountain is a relatively small area and is not anticipated to support a minimum viable population but contains some high quality habitat and would likely support 50-75 sheep as well as be used by sheep from the other two areas. Connectivity between the Caverns area and Doherty Mountain under Interstate 90 would be facilitated with two existing under crossings consisting of a culvert and a bridge. In addition, if bighorns are either released in or occupy the Lewis and Clark Caverns area, it is likely that they will occupy the London Hills just across the Jefferson River to the south from Lewis and Clark Caverns area. These two locations are directly adjacent to each other forming a steep canyon on opposite sides of the river.

Assuming this proposal moves forward, releases could occur in all three areas in the same year or as sheep become available. The priority area would be the Lewis and Clark Caverns area followed by the Bull Mountains. It may not be necessary to transplant sheep on Doherty Mountain depending on movement of sheep from the other areas.

A description of the physical and human environment potentially affected by this proposal follows and is organized under six headings: Soil, Water, Vegetation, Other Wildlife, Social Issues, and Cultural Resources.

1. Soil

A detailed description of soils for the Deerlodge portion of Beaverhead-Deerlodge National Forest is contained in the Draft Environmental Impact Statement-Forest Plan Deerlodge National Forest (USDA 1985). These descriptions are pertinent to all three areas as they are in close proximity to each other.

Most of the area that bighorn sheep are expected to occupy during the winter months are dominated by shallow to moderately deep Mollisols. Mollisols are characterized by having a dark colored surface horizon which is high in organic matter. The expansion of woody vegetation, primarily Douglas fir and juniper, into sage and grass community types has resulted in a disruption of nutrient cycling and soil moisture cycles in these areas. Surface soil erosion can be a problem in these areas. However, accelerated erosion can be prevented or limited by maintaining healthy plant communities for sufficient ground cover.

Most of the area that bighorn sheep are predicted to occupy during the summer months are dominated by rock, rubble, and scree with some soil development occurring in volcanic ash-influenced deposits. Much of this area was influenced by glaciers. In this cold rocky zone, soil nutrient recycling and decomposition rates are very slow.

2. Water

The major drainages in the area influenced by this proposal include the Boulder and Jefferson rivers. Most water bodies within the analysis area are characterized as small perennial and ephemeral creeks. While free water is not overly abundant in these areas, it is not believed to be a limiting factor in the potential reintroduction of bighorn sheep into these areas. Bighorn sheep are well adapted to arid conditions and can subsist for long periods without free-standing water. Water requirements are met from succulent vegetation in the summer and snow and ice in the winter (Shackleton et al. 1999). In addition, several springs occur throughout the analysis area, particularly in the Bull Mountains.

3. Vegetation

<u>Habitat Types and Range Condition</u>
The predicted bighorn winter range sites are characterized by grassland habitat types including bluebunch wheatgrass/blue grama, rough fescue/bluebunch wheatgrass, rough fescue/Idaho fescue, Idaho fescue/western wheatgrass, and Idaho fescue/bluebunch wheatgrass. Several shrub habitat types are also represented and include: Wyoming big sagebrush/rough fescue, mountain big sagebrush/Idaho fescue, curl-leaf mountain mahogany/Idaho fescue, and bitterbrush/Idaho fescue. Many of these grassland/shrublands have been affected to some degree by conifer colonization.

The condition of most of the potential winter range is excellent based on field observations. It appears that better growing sites along ridgetops and far from water have vigorous vegetation in the high to very high seral stages. Conditions on BLM lands on potential winter range are characterized as having vigorous vegetation on the areas of preferred bighorn habitat. Some winter range areas have areas of conifer colonization which reduces the productivity of some sites. This could be addressed through prescribed burning in appropriate sites to reduce colonization.

A major change occurring in forested habitats, particularly in the lodgepole pine zone, is the impact of the pine bark beetle resulting in major tree mortality. In the long term, these areas may become more open because of this which could benefit bighorn sheep as they prefer more open habitats that offer good visibility.

Much of the area predicted as bighorn sheep summer range is forested and only lightly used by livestock and other wild ungulates. There are numerous small meadows and grassy parks in this area. Most of these are in good condition.

Threatened, Endangered and Sensitive Species

No plants listed as threatened or endangered by the U.S. Fish and Wildlife Service are known to exist in the analysis area, and no further consideration will be given to them in Chapter 4. Table 2 is a list of sensitive species (S1 and S2 rankings) with a brief description of habitats. These species are known to occur in one or more of the following counties, Gallatin, Jefferson or Madison, which collectively comprise the analysis area or they are in close proximity.

Table 2. Occurrence of sensitive plant species within the analysis area and affiliated habitat. Occurrence and habitat information is from http://mtnhp.org/SpeciesOfConcern/.

Species	**Habitat Characteristic**
Wedge-leaved Saltbrush *(Atriplex truncate)*	Wetland/Riparian
Ute Ladies Tresses *(Spiranthes diluvialis)*	Wetland/Riparian
Peculiar Moonwort *(Botrychium paradoxum)*	Meadow(mesic)
Annual Indian Paintbrush *(Castilleja exilis)*	Wetland/Riparian
Dense-leaf Draba *(Draba densifolia)*	Alpine
Parry's Fleabane *(Erigeron parryi)*	Slopes and Ridges (Open Meadows)
Mealy Primrose *(Primula incana)*	Wetland Riparian

Missoula Phlox (*Phlox kelseyi* var. *missoulensis*)	Slopes and ridges (Open foothills to subalpine)

4. Other Wildlife

Big Game Resources

The proposed bighorn summer and winter ranges overlap with existing elk and mule deer habitats. Potential bighorn winter ranges are inhabited by elk, particularly in the Bull Mountains. Elk use these areas lightly during winter as well as limited use during the rest of the year. Elk summer on and around potential bighorn summer ranges. Mule deer are also distributed throughout much of the potential bighorn summer range. While elk occur at least seasonally in all three areas, they are less abundant in the Doherty Mountain and Lewis and Clark Caverns areas.

During the scoping process, concern was expressed by several landowners adjacent to the Bull Mountains regarding elk numbers. The Bull Mountains (Hunting District 370) are part of the Highland Elk Management Unit along with Hunting District 340 and 350. The population objective for the entire Elk Management Unit is 1,600 elk +/- 20% observed elk (1,280-1,920) (FWP 2004). During 2011 winter surveys, a total of 1,763 elk were observed in the entire EMU. Elk numbers in the Bull Mountains have been relatively stable and have averaged around 300 with 271 elk observed during winter 2011.

Several years ago, FWP proposed introducing bighorn sheep into the Lewis and Clark Caverns area. Some public interests in that vicinity expressed concern that since hunting wasn't allowed on the Lewis and Clark Caverns State Park the bighorn sheep population might not be accessible to the hunting public, the park might become a "sanctuary" for the bighorn sheep, and adequate population management would not occur. The proposal was tabled largely because of these concerns. A management plan for the park subsequent to that proposal was developed and included opening up approximately half of the park (1,500 acres) to hunting (FWP 2000). This management decision has addressed need for public hunting opportunity, population management, and the park becoming a "sanctuary" for bighorn sheep as well as other wildlife species.

Many of the landowners currently expressing concerns about an overabundance of elk are not in the vicinity of potential bighorn habitat. Based on our assessment, there is suitable habitat on public and private lands to support approximately 300-350 bighorns if sheep were reintroduced into all three areas. Selected release sites would tend to be on public lands as would most predicted wintering areas. FWP is committed to managing for Elk Plan objectives and will continue to work with cooperative landowners to ensure wildlife numbers on their private lands are within tolerable levels.

Because there is limited free water in the Lewis and Clark Caverns and London Hills areas and the two are so close in proximity separated only by a narrow canyon in the Jefferson River and small secondary highway MT-2, it is likely that bighorns will regularly cross between the two

areas and possibly be drawn to the river for water. It is possible that there may be vehicle collisions and ensuing bighorn sheep mortalities. Signing along the highway may help reduce that potential, but the potential may be greater than in other areas where highway crossings occur across a wider valley.

Threatened, Endangered, and Sensitive Species

Federally Listed Species: No endangered animals are known to occur in the analysis area. The threatened grizzly bear is not known to be present within the analysis area nor is there any known denning or summer use sites. Seasonal habitat for grizzlies may exist, but the analysis area is outside the Northern Continental Divide Grizzly Bear Recovery Area as well as the Greater Yellowstone Recovery Area. Lynx may occur as a transient species although the habitat is not typical of the species.

Sensitive Species: Table 3 is a listing of sensitive species (S1 and S2 rankings) known to occur in one or more of the counties that collectively comprise the analysis area: Gallatin, Jefferson, and Madison.

Table 3. Occurrence of sensitive wildlife species within the analysis area. Occurrence and habitat information is from http://mtnhp.org/SpeciesOfConcern/.

Species	Habitat Characteristics
Western Spotted Skunk *(Spilogale gracilis)*	Riparian Shrub
Sharp-tailed Grouse *(Tympanuchus phasianellus)*	Shrub Grassland
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	Caves in Forested Habitat
Black-tailed Jack Rabbit *(Lepus californicus)*	Sagebrush/Grassland
Great Basin Pocket Mouse *(Perognathus parvus)*	Sagebrush/ Grassland
Canada Lynx *(Lynx canadensis)*	Subalpine Conifer Forest
Grizzly Bear *(Ursus arctos)*	Conifer Forest
Mountain Plover *(Charadrius montanus)*	Grasslands
Black Rosy-Finch *(Leucosticte atrata)*	Alpine
Lewis's Woodpecker	Riparian Forest

(Melanerpes lewis)	

5. Social Issues

Motorized Travel

Motorized travel on public lands in the analysis area is managed through travel planning efforts in the Beaverhead-Deerlodge National Forest (USDA 2009) and the Bureau of Land Management-Butte Field Office (USDI 2008). Much of the analysis area is either mixed ownership (combination of public and private lands) or predominantly private lands, and motorized access is controlled by the private landowner. Some private lands in the Bull Mountains are in FWP's Block Management Program, and access is managed during hunting season by FWP in conjunction with the landowners. Additionally, the Lewis and Clark Caverns State Park doesn't allow off road travel by motorized vehicles, and the trail system in the park is limited to foot traffic only. Approximately half the park (1,500 acres) is unroaded.

Mining and Recreational Activities

Mining and exploration activities presently occur in the Bull Mountains area. The Golden Sunlight Mine, sitting at approximately 6,000 feet elevation, has been in operation at the south end of the mountain range since 1982. The gold mine employs approximately 205 people and does business with approximately 60 contractors.

Recreation in the project area includes hunting, fishing, camping, hiking, horseback riding, mountain biking, driving for pleasure, wildlife viewing, and off-road vehicle use. Winter activities are restricted because of seasonal road closures designed to protect big game winter range. Some cross-country skiing occurs when snow conditions permit.

Livestock Grazing

There are no domestic sheep allotments on any predicted bighorn seasonal ranges in this proposal. There are a few small "hobby" farm situations with small numbers of domestic sheep or goats located on the periphery of the Bull Mountains and Lewis and Clark Caverns areas. There is one domestic sheep operation based near Harrison and the London Hills. This operation leases sheep from Harlowton in the summer, then transfers them to locations further up the Jefferson River near Waterloo as well as near Bozeman to manage noxious weeds. Before and after transfer to these locations and before transfer back to Harlowton for the winter, large numbers of sheep are on the base property. The potential bighorn winter and summer ranges overlap with some existing cattle grazing allotments. Potential bighorn summer range is generally at higher elevations, outside of grazing allotments, or in more rugged topography than that normally used by livestock.

Most of the area that is predicted to be occupied by bighorn sheep during winter is generally classified as secondary range for livestock. This classification is primarily a factor of steepness or lacking sufficient water (FS Range Handbook FSH 8/81 AMEND 20). Domestic livestock prefer gentle slopes and easy access to freestanding water.

Private Land
Much of the three potential transplant sites are in private ownership. Range conditions on these private lands are similar to those on public lands as discussed in the preceding section. Lower elevations and benchlands near water sources are in mid to low seral condition while slopes and higher elevations are in mid to late seral condition. Private lands and the ability of bighorn to use these lands, especially those at higher elevation and containing suitable wild sheep habitat, are very important in the potential success of reintroducing bighorn sheep into these three areas. The most bighorn sheep that would be managed for in all three areas combined would be approximately 300-350 sheep, and these animals would be well dispersed over a large geographic area. Even at the highest population, it's not anticipated that bighorns would have an impact on private lands from an agricultural operation basis or otherwise.

6. Cultural Resources

Both action alternatives do not involve any ground disturbing activities. Therefore, no further discussion of Cultural Resources will be given in Chapter 4.

CHAPTER IV

ENVIRONMENTAL CONSEQUENCES

The purpose of Chapter IV is to describe the potential consequences of implementing each of the alternatives under consideration. This chapter forms the scientific and analytic basis for comparison of the alternatives including the proposed action.

The primary emphasis is on resources connected with issues identified during the scoping process described in Chapter II. Resource discussions are presented in the same order as they appeared in Chapter III.

With any wildlife reintroduction project, there are many unknowns. Until bighorn sheep become established and use seasonal habitats in a traditional manner, some of the effects can only be anticipated based on predicted bighorn sheep behavior and habitat preferences.

A. SOIL

Effects of implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, soils would remain unaffected.

Effects of implementing the action alternatives:

Bighorn sheep are expected to have little impact on soils. Isolated erosion may occur where soils have been disturbed by hooved traffic, especially where vegetation is sparse. Soils can best be conserved by maintaining healthy vegetative cover.

B. WATER

Effects of implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, water resources would remain unaffected.

Effects of implementing the action alternatives:
Water quality is not expected to be impacted by reintroduced bighorn sheep. Bighorns spend little time in riparian areas. If isolated soil erosion is caused by bighorn sheep, it would be at too small of a magnitude to impact water quality.

C. VEGETATION

1. Range Condition

Effects of implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, range condition would remain unaffected.

Effects of implementing the action alternatives:
At the desired population levels (300-350 bighorns under Alternative B and 150-200 bighorns under Alternative C), no impacts on range condition are anticipated. Bighorns are expected to be the primary grazer on their predicted winter ranges. Present use of these areas by big game and livestock is light, probably because of the rough terrain and a lack of water sources. Long-term detriment to the range is improbable since native grasses in the analysis area have co-existed with grazing by large herbivores including bighorns.

Bighorn sheep would also have little impact on riparian areas. In northern climates, bighorns obtain most of their water from feeding on succulent vegetation and from snow (Lawson and Johnson 1982). Bighorns do not key in on riparian vegetation as a food source but feed primarily on upland grasses and forbs. Shrubs can be important foods during periods of deep snow and are typically upland species (i.e. sagebrush, curl-leaf mountain mahogany, rabbitbrush, winterfat, etc.) (Lawson and Johnson 1982).

2. Sensitive Plant Species

Effects of implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, sensitive plants would remain unaffected.

Effects of implementing the action alternatives:
This section summarizes the effects of the alternatives on the sensitive plants that are "likely" or "possible" to occur in the analysis area (see Chapter III).

The highest potential for negative effects on sensitive species by bighorn sheep occurs with plants. After reviewing food items eaten by bighorn sheep (Oldemeyer et al. 1971, Todd 1975, Keating et al. 1985), it was determined the Missoula phlox could possibly be affected by bighorn sheep if it exists in the analysis area (Table 4).

Table 4. Predicted effects of the alternatives on sensitive plants which have the potential of occurring in the analysis area.

Species	Effects
Wedge-leaved Saltbrush *(Atriplex truncate)*	No expected impact; outside the realm of bighorn food habits, little habitat overlap
Ute Ladies Tresses *(Spiranthes diluvialis)*	No expected impact; outside the realm of bighorn food habits, little habitat overlap
Peculiar Moonwort *(Botrychium paradoxum)*	No expected impact; outside the realm of bighorn food habits, little habitat overlap
Annual Indian Paintbrush *(Castilleja exilis)*	Low possibility of impact; within normal bighorn summer habitat, but outside documented bighorn food habits
Dense-leaf Draba *(Draba densifolia)*	No expected impact; outside the realm of bighorn food habits, little habitat overlap
Parry's Fleabane *(Erigeron parryi)*	Low possibility of impact; within normal bighorn summer habitat, but outside documented bighorn food habits
Mealy Primrose *(Primula incana)*	Low possibility of impact; within normal bighorn summer habitat, but outside documented bighorn food habits
Missoula Phlox (*Phlox kelseyi* var. *Missoulensis*)	Possible impact on individual plants but no anticipated long-term effect

Bighorns are known to eat members of the *Phlox* genus of which there are several species. The likelihood of bighorns focusing grazing on the Missoula phlox is very small. Moreover, both phlox and bighorns are native species which have co-existed. If bighorns are reintroduced into the analysis area, the long term impact on Missoula phlox, if it occurs, is predicted to be slight if at all.

D. OTHER WILDLIFE

1. Big Game Resources

Effects of implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, big game resources would remain unaffected.

Effects of implementing the action alternatives:
Reintroducing bighorns onto historic range in the analysis area is not expected to have a significant negative impact on existing wildlife species. The proposed transplant areas were selected in part to avoid possible conflicts with deer and elk. Elk have been known to compete with bighorns for winter forage. However, a preliminary examination of the proposed winter ranges and observations of other bighorn populations in Montana suggest bighorns would be occupying an area used lightly by elk during the winter and lambing seasons. Also when elk numbers are maintained at moderate levels, partial niche separation between elk and bighorn sheep may occur (Constan 1972). There is no overlap of the predicted bighorn winter ranges with known core mule deer winter ranges.

2. Sensitive Wildlife and Fish Species

Effects of implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, sensitive wildlife would be unaffected.

Effects of the action alternatives:
This section summarizes the effects of the alternatives on sensitive wildlife which are either known to occur in the analysis area or are possible inhabitants (see Chapter 3). For many of these species, their habitats do not typically overlap with bighorn sheep. Bighorns are not predicted to spend much time in forested habitats (Lawson and Johnson 1982) which is where three of the sensitive species normally occur (Table 5).

There is a possibility of Townsend's big-eared bat habitat overlapping with predicted bighorn habitats. Bighorns are known to occasionally use cave entrances for bedding (Lawson and Johnson 1982). However, bighorns are not otherwise anticipated to impact big-eared bat habitats or their associated forage base. The long term impact on big-eared bats, if overlap should occur, is predicted to be minimal.

E. SOCIAL ISSUES

If bighorn sheep are released into the analysis area, the project would be subject to the "New Site Selection Criteria" presented in the Translocation section of the "Montana Bighorn Sheep Conservation Strategy" (FWP 2010) as adopted by the FWP Commission January 2010. The criteria include how FWP would respond if the bighorns fail to thrive, end up on private land outside predicted ranges, or conflict with livestock operations on private and public lands. The criteria provide additional protection for private property and some existing land uses discussed in this section.

Table 5. Predicted impacts on sensitive wildlife species which are either known to occur in the analysis area or are possible inhabitants.

Species	Effects
Western Spotted Skunk *(Spilogale gracilis)*	no impact; riparian/shrub habitat does not overlap with predicted bighorn habitat
Sharp-tailed Grouse *(Tympanuchus phasianellus)*	low possibility of impact; low elevation grassland/shrubland habitat may overlap with predicted bighorn habitat
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	low possibility of impact; possible habitat overlap but habitat and food source will be unaffected
Black-tailed Jack Rabbit *(Lepus californicus*)	low possibility of impact; low elevation grassland/shrubland habitat may overlap with predicted bighorn habitat
Great Basin Pocket Mouse *(Perognathus parvus)*	low possibility of impact; low elevation grassland/shrubland habitat may overlap with predicted bighorn habitat
Canada Lynx *(Lynx canadensis)*	no impact; dense conifer forest habitat does not overlap with predicted bighorn habitat
Grizzly Bear *(Ursus arctos)*	no impact; coniferous forest habitat does not overlap with predicted bighorn habitat
Mountain Plover *(Charadrius montanus)*	low possibility of impact; low elevation grassland habitat may overlap with predicted bighorn habitat
Black Rosy-Finch *(Leucosticte atrata)*	no impact; alpine does not occur in the analysis area
Lewis's Woodpecker *(Melanerpes lewis)*	no impact; riparian/forest habitat does not overlap with predicted bighorn habitat

1. Activity Restrictions

Effects of Implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, no additional road closures would occur and potential conflicts with mining or other activities would not exist.

Effects of Implementing the Action Alternatives:
FWP isn't considering recommending any new travel plan restrictions to land managing agencies (Forest Service and BLM) in relation to these potential transplants

No additional activity restrictions are anticipated as a result of either action alternative. The presence of bighorns in the analysis area is not predicted to solely limit activities presently occurring in the area, i.e. recreation, mining, grazing, etc. Bighorn sheep, along with other wildlife species and resources, may collectively play a role in planning future activities. To minimize any potential conflicts with existing mining operations in the vicinity of the Golden Sunlight Mine, a Memorandum of Understanding is being developed between FWP and the mine to address potential concerns of the mine. Concerns of mining companies, as to the possibility of bighorns using reclaimed areas and potentially interfering with operations, are valid and joint mitigation will be developed as needed.

2. Competition with Livestock for Forage

Effects of implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, there would be no possible competition with livestock.

Effects of implementing the Action Alternatives:
With the bighorn population objectives, there are no substantial conflicts expected with livestock. Bighorns are generally considered to be poor competitors with other wild or domestic ungulates (Lawson and Johnson 1982). The bighorn's preference for rugged habitats and their ability to feed in areas far from standing water separates them from areas normally grazed by livestock. The anticipated bighorn winter ranges in both action alternatives are not considered primary range for domestic livestock.

One way to look at the amount of forage bighorn sheep might use is to calculate the number of Animal Unit Months for the anticipated number of bighorn sheep in a particular area. An Animal Unit Month (AUM) is defined as the amount of forage a 1,000 pound cow and calf would consume in one month. One mature sheep (domestic or bighorn) has an Animal Unit Equivalent of a cow of 0.2, meaning a mature sheep would consume 20% of the forage of a cow (Pratt and Rasmussen 2001). Lambs and yearling sheep are actually somewhat less than the 0.2 value, but for the sake of simplicity in the following example we would assume all sheep to be mature sheep and have the equivalent value of 0.2 AUM. For a population of 150 bighorn sheep, as is being predicted for the Bull Mountains and the Lewis and Clark area, this would translate into (150 X 0.2 = 30 AUM's). So, the 150 bighorn sheep would be comparable to 30 cow/calf pairs. During most times of the year, bighorns would be spread out over a large area and are not anticipated to have a noticeable impact on the range, especially at this light stocking rate.

3. Domestic Sheep

Effects of implementing Alternative A:
Under Alternative A, domestic sheep operations in the area will remain unaffected as no bighorn sheep will be released.

Effects of implementing the action alternatives:

There is no indication in the literature of disease transmission from bighorn sheep to domestic sheep. There is much scientific evidence of transmission of pathogens to wild sheep from domestic sheep and less so from domestic goats that proves fatal to bighorn sheep (Wehausen et al. 2011). Domestic sheep can carry a strain of *Pasteurella* and other bacteria which domestic sheep are immune to but is potentially toxic to bighorns. There are some small "hobby" farm situations on the periphery of the three potential reintroduction areas. Maintaining effective separation between the species and preventing contact is essential. FWP biologists are in the process of meeting with owners of these livestock in an effort to inform them of the issues should bighorns come in contact with their domestic animals and to provide them with the course of action should that occur. This would include contact with FWP personnel that can respond to such a situation quickly. No effects on existing domestic sheep operations are predicted under either action alternative.

4. Private Land

Effects of implementing Alternative A:
Because no bighorn sheep would be released under the No Action Alternative, there is no possibility of bighorns conflicting with private lands.

Effects of implementing the action alternatives:
The proposed transplant areas were selected to reduce the potential for bighorn sheep occupation of private lands. Much of the land which bighorns are expected to use is publicly-owned. Adjacent private lands may provide important winter range to bighorns but other than in the London Hills are not expected to be used throughout the rest of the year.

To recognize the importance of landowner tolerance in establishing new populations of bighorn sheep, FWP is required to obtain written permission from the major landowners in an area where newly released bighorns might establish (FWP 2010). A written agreement has been developed that assures landowners their rights under state statute as well as depicting what FWP will do to work with them if any issues in relation to bighorn sheep arise. Once bighorn sheep become established in an area, FWP biologists will write a management plan for the sheep that will include a population objective for the sheep in a particular area. This plan would be an amendment to the Montana Bighorn Sheep Conservation Strategy through the process described in the strategy which would include a public comment period and approval by the FWP Commission (FWP 2010). The major landowners in that area will be consulted in the development of that plan and will be instrumental in helping to develop the objective for sheep in the area they own.

If bighorn sheep depredation problems occur on private property, a number of possible actions may be taken by FWP in cooperation with the landowner to resolve the problem. Hunting and/or translocation to other reintroduction sites may be used where appropriate. Hazing, herding, or scare guns may also be employed as the situation merits.

At the suggestion of some landowners adjacent to the release sites, there is a possibility of prescribed burning by USFS and/or BLM on public land and potentially on adjacent private land to improve range conditions for domestic livestock and bighorn sheep. Such action may be taken to mitigate for persistent use of private land by bighorn sheep.

5. Recreational Opportunities

Effects of implementing Alternative A:
Because bighorn sheep would not be released under the No Action Alternative, there would be no opportunity for hunting or viewing bighorn sheep in the analysis area. Also, no potential conflicts related to these activities would arise.

Effects of implementing the action alternatives:
Both action alternatives would create additional recreational opportunities for viewing wildlife in the analysis area. Alternative B involves one more release site than Alternative C. Therefore, it is likely Alternative B would enhance hunting and bighorn viewing opportunity more than C. During the scoping process and internal development of potential issues, there was some concern expressed about wildlife viewing. These were: (1) trespass problems on private land; (2) interference with mining operations; and (3) human disturbance of bighorn sheep. Under both action alternatives, there is some potential for each of these scenarios to occur. It is difficult however, to estimate the probability of such occurrences at this time. Because bighorn sheep hunting would be limited to a few licenses, the potential for similar conflicts is considerably less.

Strategic pull-offs along roadways for viewing bighorns in conjunction with interpretive signs educating the public on responsible viewing may be used to curb potential conflicts with sheep, private land, and other activities.

F. CUMULATIVE EFFECTS

Chapter 3 described the existing conditions within the analysis area. Activities expected to occur within the affected environment for the reasonable foreseeable future include: (1) potential vegetation treatments on Forest Service and Bureau of Land Management lands (conifer colonization projects) which could include adjacent private lands if landowners exhibit interest and there is benefit to bighorn sheep; (2) expansion of mining by Golden Sunlight mine depending on a number of factors.

The cumulative effects of bighorn sheep reintroduction along with the above reasonably foreseeable activities were considered. No measurable cumulative effects are anticipated. Because bighorn sheep are grazers, the highest probability of a cumulative effect would be associated with the forage base. As this environmental assessment has shown, the probability of competition for forage with other ungulates is slight because: (1) past forage utilization by livestock on predicted bighorn ranges has been low due to the rough terrain and/or the absence of free standing water; (2) predicted bighorn winter ranges are outside of known core deer winter ranges; (3) past use of predicted bighorn winter ranges by elk has been light; and (4) bighorn

numbers will be managed at a level which will maintain winter range desired vegetation conditions (see Chapter 2, Features and Monitoring Common to All Action Alternatives).

G. PUBLIC PARTICIPATION

1. Public involvement:

The public will be notified in the following manners to comment on this current EA, the proposed action and alternatives:

- Two public notices in each of these papers: Bozeman Daily Chronicle, Whitehall Ledger, and Helena Independent Record.
- Public notice on the Fish, Wildlife & Parks web page: *http://fwp.mt.gov*.

Copies of this environmental assessment will be distributed to the neighboring landowners and interested parties to ensure their knowledge of the proposed project and copies will be available at the Bozeman FWP Office, 1400 South 19th Avenue, Bozeman MT 59718.

A public meeting to discuss this proposal will be conducted on December 7 at 7:00 p.m. at Whitehall High School Cafeteria in Whitehall, MT.

2. Duration of comment period:

The public comment period will extend for (30) thirty days. Written comments will be accepted until 5:00 p.m., December 16, 2011 and can be mailed or emailed to the addresses below:

Tom Carlsen
Montana Fish Wildlife and Parks
Bighorn Sheep EA
68 Lost Trail
Clancy, MT 59634
tcarlsen@mt.gov

H. EA PREPARATION

1. Based on the significance criteria evaluated in this EA, is an EIS required? (YES/NO)?
No
If an EIS is not required, explain why the EA is the appropriate level of analysis for this proposed action. It has been determined that no significant impacts to the physical and human environment will result due to the proposed action alternative, nor will there be significant public controversy over the proposed action; therefore, an Environmental Impact Statement is not required.

2. Persons responsible for preparing the EA:

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Vanna Boccadori
Wildlife Biologist
Montana Fish, Wildlife & Parks

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Joe Sampson, fire management officer, Beaverhead-Deerlodge National Forest
Tanya Thrift, Renewable Resources Officer, Bureau of Land Management
D. J. Bakken, Helena Unit Manager, DNRC
Vince Carey, private landowner
Tom Carey Jr, private landowner
Chris Carey, private landowner
Jack Dawson, private landowner
Doug Salsbury, private landowner
Cory and Diane Fitzgerald, private landowner
Randy Kirk, manager, Mulvey Gulch Ranch
Citizen Technical Advisory Committee (CTAC)
Jefferson Valley Sportsmen
Mark Thompson and Tim Dimock, Golden Sunlight Mine
Pleasant View Ranch – William Jackson, Dean Jackson
James Griffin
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KG Ranch
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