U. S. Sheep Experiment Station Grazing and Associated Activities Project

Wildlife Specialist Report

Dubois, Idaho

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This wildlife report was originally prepared for a 2011 Draft Environmental Impact Statement for Grazing and Associated Activities on the U.S. Sheep Experiment Station. In 2016, this report was revised to provide current information for the 2016 Revised Draft Environmental Impact Statement. The affected environment for species analyzed has been updated, where relevant. In addition, the modifications to the alternatives being analyzed are as follows (and are listed more specifically in the 2016 DEIS).

1. Use of the BLM Bernice Allotment was removed from all Alternatives.
2. Alternative 3 was modified to allow grazing on the west side of Beaver Creek, which is a small portion of the Humphrey Ranch allotment. Grizzly bears are not know or expected to use that area, and use of some portion of the Humphrey Ranch allotment is necessary to have a viable alternative.
3. Livestock animal numbers grazed as well as the dates and movement patterns through allotments have been modified slightly to more accurately depict the annual variability necessary for the station manager to have flexibility regarding day to day operations.
4. Herbicides will be applied to approximately 60 acres per year along roads and disturbed areas to treat invasive plants. This would not occur along waterways and wetlands.
5. Prescribed fire and herbicides would be implemented on 160 acres per year in a designated area, for 5 years, to implement fire break research.

Revisions were also made to the Wildlife Report after publication of the Revised DEIS to update species status or listing information where it had changed for the following species: grizzly bear, wolverine and arctic grayling. In addition, updated data was acquired from the State of Idaho to update information regarding bighorn sheep and sage grouse populations.

The revisions have not resulted in changes to overall determinations and findings.

Grizzly Bear (*Ursus arctos horribilis*)

Consultation History

On May 6, 2008, and again on August 14, 2009 a list of threatened, endangered, and proposed species that may be present in the action area was discussed with the U.S. Fish and Wildlife Service (Arena 2008, personal communications; USDI Fish and Wildlife Service 2009). Results of these discussions concluded that only Canada lynx, Yellowstone Distinct Population of grizzly bear, and Northern Rocky Mountain gray wolf (currently delisted) have the potential to occur in or near the project area. Other species have no federal listing status, or do not occur in the area. No critical habitats occur in the project area.

A review of available information was conducted to assemble occurrence records, describe habitat needs and ecological requirements, and to determine whether additional field reconnaissance is needed to complete the analysis. Sources of information included interviews with Sheep Station staff, interviews with Forest Service biologists on the Caribou-Targhee National Forest, interviews with state wildlife agency employees, review of Idaho and Montana State Natural Heritage Program databases, and published research. An independent wildlife biologist (employed by the USDA Forest Service – TEAMS Enterprise Unit) visited the sites on four separate occasions including May 6th through 8th, 2008; July 6th through 14th, 2008; June 21st through 26th, 2009, and August 17th through 21st, 2009 in order to verify wildlife habitat types, observe resource conditions, review details of proposed activities, gather additional site information, and contact local biologists from state and federal agencies.

Other than Canada lynx and grizzly bear, no further analysis is needed for threatened, endangered or proposed species because they are not known or suspected to occur in the project area, and no suitable

habitat is present. Effects to non-listed species are reviewed in the “Analysis of Other Species” section in the Wildlife Report.

2008 - Interim U.S. Sheep Experiment Station and Associated Grazing Activities

The project biologist met informally several times with United States Fish and Wildlife Service staff in Chubbuck, Idaho (Arena 2008, personal communication). The initial meeting conducted on May 6, 2008 familiarized the Fish and Wildlife Service biologist with the project location and description of proposed activities. At that time, the project biologist and Fish and Wildlife Service biologist reviewed a list of species in or near the project area having federal status. A preliminary discussion of species occurrences in the area and potential project effects indicated that Canada lynx was the only federally-listed species and that effects are unlikely or minimal.

One federally-listed plant species, Ute ladies’-tresses (*Spiranthes diluvialis*), has been documented or has potential habitat near the geographic area of the Sheep Station. Upon review with the Fish and Wildlife Service, we agreed there is no habitat in the project area.

Additional phone calls and email exchanges occurred in September and October, 2008 to review potential effects to species, clarify procedural questions, and agree that the Sheep Station would work with the Chubbuck, ID Fish and Wildlife Service office as the lead contact. On December 9, 2008, the Fish and Wildlife Service concluded the consultation process for the interim grazing activities by providing written concurrence with the project biologist's determination of effects on listed species which included "Not Likely to Adversely Affect" Canada lynx (USDI Fish and Wildlife Service 2008). Similarly, the Fish and Wildlife Service acknowledged the biologist's determination that the project was "Not Likely to Jeopardize the Continued Existence of Gray Wolf".

2009 - U.S. Sheep Experiment Station and Associated Grazing Activities

On August 14, 2009, the biologist met with the Fish and Wildlife Service in Chubbuck, ID to again start the process of consultation. This phase of the project is the same as the interim phase, but activities and effects are considered over a longer time period, with more extensive scoping and public review. At the time of this meeting, (USDI Fish and Wildlife Service 2009) Canada lynx was the only listed species in the project area. The northern Rocky Mountain distinct population segment of gray wolf had been delisted on May 4, 2009.

In September, 2009, grizzly bears in the Yellowstone distinct population segment were restored as a threatened species. On October 1, 2009 the biologist contacted the Fish and Wildlife Service to discuss the recent court order relisting the Yellowstone distinct population segment of grizzly bear. Discussions included possible determinations and consultation process for control actions including hazing, trap and transport, lethal control, and personal safety if a herder is threatened by a bear. Similarly, the Sheep Station expressed their desire to participate in any upcoming Level 1 streamlined consultation meetings that occur between the Fish and Wildlife Service and the Caribou-Targhee National Forest, which also were likely to include discussions regarding previously analyzed projects in grizzly bear habitat. Based on the results of these discussions and a minimal history of Sheep Station encounters with grizzly bears (none with lethal control), the Sheep Station director concluded that the proposed action and alternatives do not include trap and transport or lethal control. These activities have not occurred in the past and are not expected to occur in the future.

Greater sage-grouse, pygmy rabbit, and northern Rocky Mountain gray wolf are all species that are not federally listed, but were at one time either federally-listed or petitioned. Therefore, there is some possibility that one or all the species could become federally listed. These species occur on Sheep Station properties and should they become listed, the Sheep Station would need to initiate (or reinitiate)

consultation on the potential effects the proposed activities may have on these species. In light of this, the wildlife analysis performed for this DEIS considers whether continued operation (proposed action) would cause any irreversible or irretrievable commitment of resources to these three species, vis-à-vis effects analysis. The wildlife analysis found that continued operations would not make such a commitment.

For the wolf, Sheep Station activities were analyzed in the 2008 wildlife report when the wolf was designated as a nonessential experimental population. The biologist's analysis and "No Jeopardy" determination was reviewed and recognized by the Fish and Wildlife Service. Wolves are no longer listed or proposed in Montana and Idaho, where the project occurs, so a biological determination is not required. The effects of the revised proposal are minimal and the same as those described in the 2008 biological analysis, so no further analysis will be completed. Should sage-grouse or pygmy rabbit become listed or critical habitat designated within the project area, prescribed burning activities would be deferred until consultation is completed. The current project proposal would not hinder or prevent the Sheep Station from implementing reasonable and prudent alternatives to protect those species (such as delaying prescribed fire treatments or modifying grazing strategies) until the consultation process is completed.

2011 – Biological Assessment Submitted for U.S. Sheep Experiment Station and Associated Grazing Activities

On August 19, 2011, the biologist submitted a Biological Assessment (BA) to the USFWS. This BA found that projects activities May Adversely Affect grizzly bears in the Yellowstone Distinct Population Segment, and were Not Likely to Adversely Affect Canada lynx. The purpose of the 2011 BA was to accommodate that grizzly bears were returned to the list as a threatened species, and to account for potential take to grizzly bears that could occur as a result of habituation to ARS domestic sheep as a food source resulting in lethal control measures on adjacent private lands.

2011 – Biological Opinion Issued by U.S. Fish and Wildlife Service

On November 8th, 2011, the USFWS issued a Biological Opinion regarding Sheep Station Activities effects on grizzly bears. The Opinion found effects from the project are not likely to jeopardize the grizzly bear. The Fish and Wildlife Service also concurred with the project biologist's finding that activities were "Not Likely to Adversely Affect" Canada lynx.

2013 – The Project Action Changed by Eliminating Sheep Grazing on BLM Bernice Allotment

The project change was to eliminate sheep and livestock grazing that occurs on the Bernice Allotment (BLM ownership), and maintain the animals with harvested feed in the Mud Lake Feedlot during that portion of the winter. Both areas are outside of grizzly bear or lynx habitat. On February 11th, 2013, the project biologist submitted a letter to the Fish and Wildlife Service Field Supervisor stating that "The existing Biological Opinion (page 19) indicates that specific project grazing areas that affect grizzly bears are Tom's Creek, Big Mountain, O'Dell, Henninger Ranch, and Meyer's Creek (USFS ownership). Livestock use and other activities on these grazing areas is unaffected by the proposed change to the project and thus will remain the same as was analyzed previously. The biologist concluded in a letter to the Fish and Wildlife Service (Kozlowski, 2013) that the existing consultation and resulting Biological Opinion would remain applicable and that there was no need to reinitiate consultation (unless contacted immediately and requested otherwise by the US Fish and Wildlife Service).

2014 – US Fish and Wildlife Service Issues a Revised Biological Opinion

On May 30th, 2014, the Service issued a new Biological Opinion that incorporated updated baseline information, and considered input received from ARS in a May 16th, 2014 letter and a subsequent

interagency Level 2 consultation meeting on May 20th, and another ARS letter issued May 28th, 2014. The Biological Opinion remains in effect today.

2015 - U.S. Fish and Wildlife Service Issues a Revised Biological Opinion

On February 25, 2015, the U.S. Fish and Wildlife Service again issued an amendment Biological Opinion on effects of the ARS's U.S. Sheep Experimental Station grazing program effects to the threatened grizzly bear. The Service reviewed and considered information presented in additional relevant documents, as well as other relevant scientific data, and found that the information did not change the no jeopardy conclusion. The Biological Opinion remains in effect today.

Affected Environment

On September 21st, 2009, grizzly bears in the Yellowstone distinct population segment returned to their previous status listed as a threatened species. The USDI Fish and Wildlife Service decision to remove the Yellowstone Distinct Population Segment of grizzly bear from the list of threatened species (USDI Fish and Wildlife Service 2007a) was vacated by order of the United States District Court (2009) in Missoula, Montana, based on two (of four) court findings:

> **The court found that the Conservation Strategy, Forest Plan Amendment, and State Plans are not adequate regulatory mechanisms because they are minimally enforceable, particularly outside of the primary conservation area, and rely on good faith and future promises of action. In addition, the final rule to delist didn't adequately analyze how various laws will protect the species.**
>
> **The court found that the USDI Fish and Wildlife Services did not articulate a good rationale regarding expected declines in whitebark pine and a lack of a threat grizzly bears.**

In contrast, the court found in favor of the plaintiffs (USDI Fish and Wildlife Service) regarding the other two points of the complaint.

> **The court found that the USDI Fish and Wildlife Service analysis adequately demonstrated that maintaining a population size of 500 animals is sufficient for genetic diversity. Similarly, that translocation from other populations is an adequate method to address genetic diversity shortfalls over the long term, and that there is not a short-term issue with genetics. The population does not need to be "self-sustaining" to be delisted.**
>
> **The court found that the USDI Fish and Wildlife Service analysis and the final rule to delist provided good rationale that the Distinct Population Segment /Primary Conservation Area (PCA) constitutes a significant portion of the Yellowstone grizzly bears' range. The USDI Fish and Wildlife Service did not need to identify migration corridors, because grizzlies, outside of the Distinct Population Segment boundary, are still protected under Endangered Species Act.**

The Yellowstone Distinct Population Segment of grizzly bear was de-listed in 2007 because of an increasing population in and around Yellowstone National Park in the bear's Primary Conservation Area, and because grizzly bears are expanding their range to inhabit suitable habitat throughout the boundaries of the Distinct Population Segment (which includes Sheep Experiment Station lands in the Centennial Mountain Range). Though the species has since been relisted, both of these factors are still applicable in evaluating the context of potential effects of the project. The US Fish and Wildlife Service Grizzly Bear Recovery website (http://www.fws.gov/mountain

percent2Dprairie/species/mammals/grizzly/yellowstone.htm) summarizes information from the Final Rule to Delist (USDI Fish and Wildlife Service 2007a) stating that,

> **The range of the Yellowstone grizzly bear population has increased dramatically as evidenced by the 48 percent increase in occupied habitat since the 1970s. Yellowstone grizzly bears continue to increase their range and distribution annually and grizzly bears in the Yellowstone area now occupy habitats they have been absent from for decades. Currently, roughly 84-90 percent of females with cubs occupy the primary conservation area and about 10 percent of females with cubs have expanded out beyond the primary conservation area within the distinct population segment boundaries. Grizzly bears now occupy 68 percent of suitable habitat within the distinct population segment boundaries and may soon occupy the remainder of the suitable habitat.**

ARS lands are within the Yellowstone Distinct Population Segment boundary for grizzly bear, but outside of the Primary Conservation Area. None of the ARS lands reside within the Primary Conservation Area. Suitable habitat for grizzly bear is managed differently within the Primary Conservation Area verses outside of it. As an example of this varying management strategy, The Forest Plan Amendment for the Grizzly Bear Habitat Conservation for the Greater Yellowstone Area National Forests (USDA Forest Service 2006b) states succinctly,

> **Manage grizzly bear habitat outside the Primary Conservation Area in areas identified in state grizzly bear management plans as biologically suitable and socially acceptable for grizzly bear occupancy, accommodate grizzly bear populations to the extent that accommodation is compatible with the goals and objectives of other uses.**

The Sheep Station has an Interagency Agreement with the Caribou-Targhee National Forest for grazing on the Meyers Creek allotment, which is inside the Primary Conservation Area. This grazing has been analyzed in a biological assessment (Fletcher 2012) prepared by the Forest Service Wildlife Biologist which found that,"trailing sheep through the Meyers Creek allotment and the interrelated action to the use of the East Summer range incurs a MAY AFFECT, LIKELY TO ADVERSELY AFFECT determination for the grizzly bear." This finding was based on the following rationale;

- No direct grizzly bear mortality is expected from the USSES grazing sheep in the Meyers Creek allotment and the East Summer range. Neither lethal control or trap and transport will be implemented or requested during the use of these areas. Should the need arise for these abatement techniques related to grizzly bear, consultation would be reinitiated.
- Potential effects are the limited probability over a 10-year period that a grizzly bear may become food conditioned to domestic sheep, change feeding behaviors, and confrontations develop on adjacent lands under other ownership. This change in patterns or habitat use on FS, USSES, or other lands (indirect effects) could be considered harm to grizzly bears.
- The grazing and associated activities would not limit grizzly bear genetic exchange, occupancy or movement through the Centennial Mountains since habitat would not be reduced and Sheep Station grazing practices include light utilization, short duration, over a large landscape with pasture rest one out of every three years. These grazing methods prevent frequent and recurring encounters with grizzly bears which might otherwise alter bear behavior or necessitate the need for lethal control.
- Conservation measures are in place to ensure that the Sheep Station activities will minimize the potential for encounters and effects to grizzly bears. These conservation measures include the use of dogs, multiple sheep herders, storage/removal of attractants, annual training, requirements to address encounters non-lethally (move sheep, haze only if necessary) and communication with other agencies.

- There have only been a few encounters with grizzly bears in the past decade relative to Sheep Station activities. No grizzly bears have been killed, captured, or relocated from the Meyers Creek allotment or the ARS East Summer Range in response to Sheep Station activities. It is expected this trend would continue.
- The expected level of effects for the project is minimal and would not contribute to overall cumulative effects in a way which is detrimental to grizzly bear recovery.
- This project will be compliant with all management direction for the grizzly bear contained in the Final Conservation Strategy for the Grizzly Bear in the Greater Yellowstone Area.
- This project will be compliant with all standards and guidelines for the grizzly bear in the 1997 Revised Forest Plan for the Targhee National Forest (RFP).

On February 25, 2015 the Fish and Wildlife Service issued a Biological Opinion (BO) for U.S. Sheep Experiment Station Grazing (USDI Fish and Wildlife Service, 2015). The BO found that the U.S. Sheep Station and associated activities was not likely to jeopardize the continued existence of grizzly bears and included an incidental take statement. The following information summarizes important elements within the BO that pertain to grizzly bears[1].

- ARS continues a rotational grazing system of approximately 2,000 sheep. They would use Henninger Ranch in June/July. In early July, they would move sheep briefly across the USFS Meyers Allotment to the summer range which includes Tom's Creek Pasture (East Summer Range), Big Mountain Pasture (West Summer Range), and O'Dell Pasture (West Summer Range). In late August, sheep would be moved back to the Henninger Ranch. In Mid-September, sheep would be moved to lands outside of suitable grizzly bear habitat.
- All sightings that are confirmed grizzly bears or show positive evidence of grizzly bears in the vicinity of livestock will be reported by the Sheep Station to the Interagency Grizzly Bear Study Team.
- In 2012, a grizzly bear collar was found in the action area. The bear associated with the collar has not been found, and it is unknown if the bear was killed or not. No conclusions have been made that connect the bear collar to Sheep Station or its employees.
- No known grizzly bear mortalities or injuries have occurred in the action area in the recent past (i.e. since 2000).
- The period of ARS use of Meyers Creek Allotment is three day in early summer and three days in the fall, for trailing sheep.
- It is unlikely the Greater Yellowstone Area is serving as a grizzly bear source population for other ecosystems, nor are the Centennials.
- The GYA population of grizzly bear has experienced significant recovery and met its recovery zone goals.
- The Sheep Station is committed to implementing conservation measures that minimize potential impacts to grizzly bears.
- Individual grizzly bears may be adversely impacted as a result of the action, however the overall core population of grizzly bears in the GYA is expected to remain stable or increase.

[1] Numbers of sheep and dates of occupancy are approximate.

- Sheephearders may haze grizzly bears by shooting a rifle into the air (not at the bear) or use bear spray, to discourage their use of the area with sheep.
- The estimated loss of no more than three bears[2] within the 10-year term falls within the scope of recovery criteria mortality thresholds established under the Recovery Plan.
- The Sheep Station shall report annually to the Interagency Grizzly Bear Study Team and the USFWS Eastern Idaho Field Office in Chubbuck, Idaho information pertinent to bear/sheep conflicts, as described in detail on page 38 of the BO.

In summary, for 2014, grizzly bear monitoring results from the Annual Report of the Interagency Grizzly Bear Study Team (edited by van Menan et al. 2015) indicate the grizzly bear population is healthy and is meeting recovery criteria. The monitoring results summarized in the report display the following key information;

- Unduplicated females with cubs of year were modeled at 62, which meets the recovery criteria of 48;
- The total population estimate in the Greater Yellowstone Ecosystem was estimated at 757 grizzly bears.
- All 18 bear management units were occupied by females with young;
- Natural and human caused mortality (28 in 2014) was within sustainable limits for independent males, independent females, and dependant young.
- None of the human caused mortalities or livestock conflicts occurred on ARS lands or the Meyers Creek allotment.

On March 11, 2016, the Fish and Wildlife Service proposed to remove the Greater Yellowstone Ecosystem population of grizzly bears from the federal list of endangered and threatened species and to identify the Greater Yellowstone Ecosystem grizzly bear population as a distinct population segment. The best available scientific and commercial data indicate that the Greater Yellowstone Ecosystem population of grizzly bears has recovered and no longer meets the definition of an endangered or threatened species under the Endangered Species Act, as amended (U.S. Fish and Wildlife Service 2016a).

> **Although factors (motorized access management, developed sites, livestock allotments, mineral and energy development, recreation, snowmobiling, vegetation management, climate change, and habitat fragmentation) that may be responsible for present or threatened destruction, modification, or curtailment of Greater Yellowstone Ecosystem grizzly bear habitat, or range, continue to occur across the range of the Greater Yellowstone Ecosystem grizzly bear population, they have been sufficiently ameliorated so they only affect a small proportion of the population. Despite these factors related to habitat, the population has increased and stabilized while its range has expanded.**

Effects to migration corridors and genetic diversity regarding the Yellowstone Distinct Population Segment of grizzly bears were brought up as a concern during previous public scoping. In order to review the pertinence of this concern to Sheep Station activities, summarized below is the current science regarding genetic diversity from the Final Rule to delist grizzly bears (USDI Fish and Wildlife Service 2007a). Key points include:

- Current levels of genetic diversity are consistent with known historic levels and do not threaten the long-term viability of the species.

[2] One adult grizzy bear (male or female), or one adult female grizzly bear and her dependent cubs.

- The Final Conservation Strategy (USDI Fish and Wildlife Service, 2007b) includes the transplant of one to two effective migrants per generation if no movement or genetic exchange is documented by 2020.
- "the viability of the Yellowstone grizzly bear population is unlikely to be compromised by genetic factors in the near future…" and that "…one to two effective migrants per generation from the Northern Continental Divide Ecosystem (NCDE) to the Yellowstone ecosystem is an appropriate level of gene flow." Indicators of fitness in the Yellowstone population demonstrate that the current levels of genetic heterozygosity[3] are adequate, as evidenced by measures such as litter size, little evidence of disease, high survivorship, an equal sex ratio, normal body size and physical characteristics, and an increasing population.
- Yellowstone grizzly bear populations are not as low as previously feared, and the need for novel genetic material is not urgent.
- In addition to monitoring for gene flow and movements, interagency efforts will continue toward completing the linkage zone task in the Recovery Plan (USDI Fish and Wildlife Service 1993) to provide and maintain movement opportunities for grizzly bears, and reestablish natural connectivity and gene flow between the Yellowstone grizzly bear Distinct Population Segment and other grizzly bear populations.
- Linkage work not directly associated with the Yellowstone grizzly population is being completed in the northern Rockies, to address ways to improve cooperation and affect management on public lands, private lands, and highways in linkage areas across the northern Rockies.
- In court challenges to relist the grizzly bear, genetic diversity concerns were reviewed by the court (U.S. District Court 2009). The court found that in the Final Rule to delist the grizzly bear, the USDI Fish and Wildlife Service provided adequate evidence to support that maintaining a population size of 500 animals is sufficient for genetic diversity, there is not a short-term issue with genetics, and that translocation from other populations is an adequate method to address genetic diversity shortfalls over the long term.

The 2016 Proposed Rule to delist grizzly bears (U.S. Fish and Wildlife Service 2016a) builds on these findings:

- Recent work demonstrates that the effective population size (a metric used by geneticists to distinguish between total population size and the actual number of individuals available to reproduce at any given time) has increased from 102 in 1982, to 469 in 2010. The current effective population is more than four times the minimum effective population size suggested in the literature and is sufficiently large to avoid substantial accumulation of inbreeding depression, thereby reducing concerns regarding genetic factors affecting the viability of Greater Yellowstone Ecosystem grizzly bears.
- While this current effective population size of approximately 469 animals is adequate to maintain genetic health in this population, it is still believed that one to two effective migrants from other grizzly bear populations every 10 years would maintain or enhance this level of genetic diversity and therefore assure genetic health in the long term. However, the Service has removed the deadline of 2020 for translocation from the draft 2016 Conservation Strategy, as carried over from the 2007 Conservation Strategy.

[3] Heterozygosity: having dissimilar pairs of genes for a hereditary characteristic, used as a correlation to estimate the level of inbreeding within a population.

- The Service does not consider connectivity to the east, west, or south a relevant issue to the Greater Yellowstone Ecosystem grizzly bear population's long-term persistence because there are no extant populations in these directions to enhance the genetic diversity of the Greater Yellowstone Ecosystem population. However, it recognizes the Greater Yellowstone Ecosystem grizzly bear population could be a possible source population to recolonize the Bitterroot Ecosystem to the west.

Summary of Grizzly Bear Mortality Factors

Evidence that conflicts occur between grizzly bears and domestic sheep grazing is well supported. Knight et al. (1983) conducted a study to evaluate grizzly bears that killed livestock by radio-collaring 37 grizzly bears and tracking their movements and associated livestock conflicts between 1975 and 1979. Knight found that 7 of the 37 collared bears killed domestic sheep when they came into contact with them. It should be noted that the study occurred when sheep grazing was more prevalent within occupied grizzly bear habitat, many of the bears that were radio collared were already problem bears, and some sheep herders/private livestock operations were likely averse to protecting the newly listed grizzly bear. In the report, Knight makes assumptions about poaching by herders that plays an important role in projecting excessive grizzly bear mortality. This assumption does not apply to sheep herders employed by the Sheep Station given their status working for the federal government.

In 2004, Gunther et al. prepared *Grizzly bear - human conflicts in the Greater Yellowstone ecosystem, 1992-2000*. This report presents several pieces of information quantifying the likelihood of grizzly bear mortality and effects to population. Although 44 percent of grizzly bear conflicts were attributed to livestock depredation, 71 percent of them were related to cattle incidents and a total of 2 grizzly bears were killed because of sheep related incidents over the 8 year study period. Grizzly bears were killed at a rate of one dead bear per 39 sheep incidents. When grizzly bears did depredate on sheep, they killed an average of 4.3 sheep per incident. The 2004 report acknowledges that permanent removal of chronic depredators has been the most effective method of alleviating livestock losses while having minimal impact on long term survival of the grizzly bear populations.

In 2009 the Interagency Grizzly Bear Study Team (IGBST) prepared the *Yellowstone Grizzly Bear Mortality and Conflict Reduction Report* (Interagency Grizzly Bear Study Team 2009). This report summarized the sources of grizzly bear mortality from 1997 through 2008. In addition, they reviewed the effectiveness of recommendations made in 2004, and made additional recommendations to reduce grizzly mortality into the future. The table below provides a summary of the total number of known and probable grizzly bear mortalities in the Yellowstone Ecosystem between 1997 and 2009. Data was taken from the 2008 *Yellowstone Mortality Report* (Interagency Grizzly Bear Study Team 2009) and the 2009 and 2010 *Known and Probable Grizzly Bear Mortalities in the Greater Yellowstone Area*, which is published on the Northern Rocky Mountain Science Center website (Interagency Grizzly Bear Study Team 2011). 293 grizzly bears were killed in 1997 through 2009. Various forms of confrontation with humans (but unrelated to hunting) resulted in nearly 31 percent of mortality. These confrontations included defense of life in "Front Country" settings, "Backcountry" settings, management removal in populated areas, management removal because of human injury, road kill, and accidental bear death during management captures. Encounters related to hunting contributed another 26 percent of the mortality which includes mistaken identification during black bear season and hunter defense of life during big game seasons. A substantial amount of mortality between 1997 and 2008, nearly 20 percent, remained "undetermined" indicating that a dead bear was found, but investigations were unable to determine a specific human or natural cause of death. There is no indication that these undetermined mortalities were related to sheep grazing. The smallest amount of known and probable mortality, just over 1 percent, can be attributed to the sheep grazing activities, including three management removals and one illegal kill over the 12 year period. None of these mortalities are associated with Sheep Station activities.

Table 1. Known and probable grizzly bear mortalities, 1997-2009

Category of Mortality	Mortality, Number of Bears	Percentage of Total Mortality
Confrontation	90	30.72
Hunting	76	25.94
Undetermined	58	19.80
Natural	24	8.19
Poaching	16	5.46
Cattle Protection	13	4.44
Research	6	2.05
Under Investigation	6	2.05
Sheep Protection	4	1.37
Grand Total	**293**	**100**

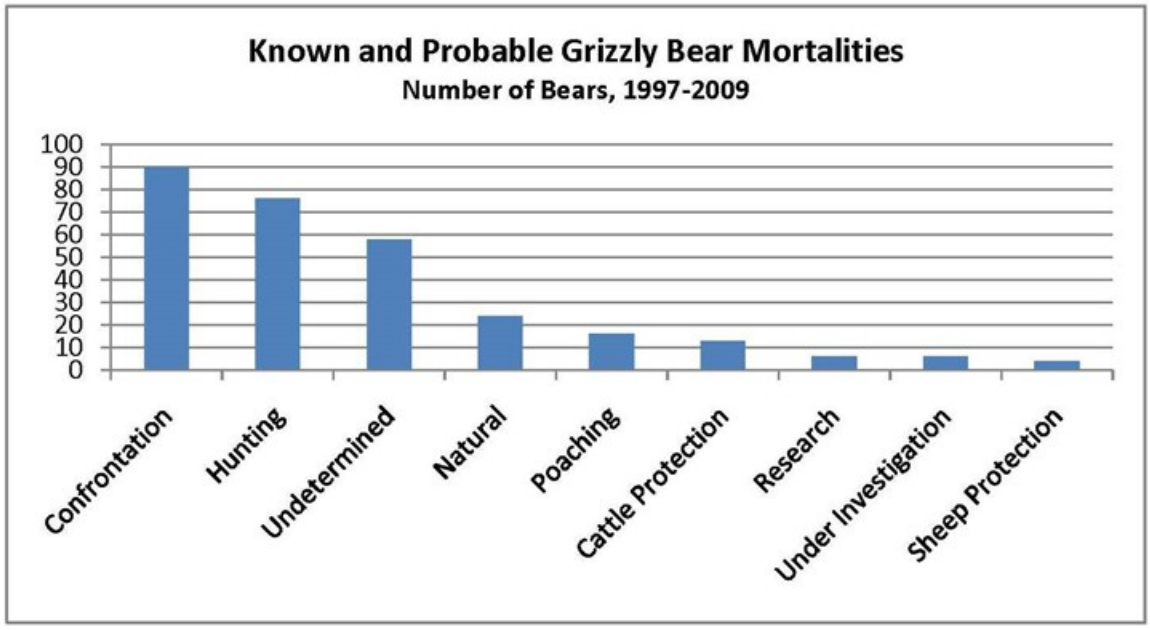

Figure 1. Number of known and probable grizzly bear mortalities, 1997-2009

In 2014 there were 28 known and probable grizzly bear mortalities in the Greater Yellowstone Ecosystem (Interagency Grizzly Bear Study Team 2015). Mortality related livestock conflicts was 9 animals (32%). None of these was related to sheep depredation.

Activities to Reduce Grizzly Bear Conflicts

The Sheep Station implements a number of conservation measures to reduce the likelihood of potential conflicts with grizzly bear (as well as other predators) and domestic sheep or other livestock. These measures include:

1. Grizzly bear trapping, transportation, or lethal removal is outside the scope of this project and thus, if needed, would require the Sheep Station to re-initiate consultation or conduct an emergency consultation, in order to consider the probability of incidental take.

2. When creating research plans that include a sheep grazing component, consider the history of livestock-bear conflicts within ARS properties, pastures, and sub-drainages. Where a history of conflicts suggests the likelihood of habituation developing, the Sheep Station would modify the grazing schedule and/or sheep movements to avoid recurring conflicts.
3. Use good husbandry practices so that sheep are as healthy as possible, are suitable for research, and the number sick/stray animals is kept to a minimum. An institutional animal care and use committee evaluates research protocols and livestock management practices to ensure they are consistent with good animal husbandry, and comply with Federal laws that govern the use of agricultural animals in research. Protocols and practices that do not comply are not approved.
4. Sheep herders, working dogs, and guard dogs are kept with the sheep full-time when on rangelands to reduce the likelihood of encounters, and to assist in efficient and prompt movement of animals when necessary. In the summer range, sheep are accompanied by a minimum of two guard dogs, two herd dogs, and a full time sheep herder. Very few stray animals occur over the course of the season because of the close contact the sheep herders have with sheep. In the evenings, sheep are bedded on an approximate one-acre area. On moonlit nights when sheep have the tendency to get up and graze, extra vigilance is necessary to watch over sheep. Lame animals that may occur on occasion are watched closely because of the impact they have on moving the herd, and because animals need to be accounted for to maintain research objectives. Therefore, when lame animals do not recover, they are subsequently removed from the herd within a short period of time, (approximately every 3 days when the camp tender brings supplies) and transported back to the headquarters property.
5. All unnatural attractants to bears are minimized. This includes treatment or removal of livestock carcasses, and proper storage of human foods, garbage, and dog food. Approved "bear-proof" containers are used, and damaged containers are repaired or replaced so that they work as designed. Camp tenders and managers make periodic visits (approximately every three days) to remove trash and/or dead animal carcasses in order to eliminate potential bear attractants. In some locations it is not feasible to remove carcass (due to degree of decomposition and/or access to get them out).
6. At least two formal training-orientation meetings are conducted annually with Sheep Station employees and herders to review identification of grizzly bear, black bear, bighorn sheep, Canada lynx, mountain lions, etc. In addition, they discuss Sheep Station sanitation and garbage removal practices, nonlethal procedures to address livestock-wildlife encounters, and who to contact should encounters occur. Training and education are ongoing and not limited to formal meetings.
7. Regarding grizzly bears, herders are instructed to avoid an encounter. Moving the sheep to other areas of the pasture may occur to avoid an immediate threat, and moving sheep to other pastures/locations would occur if encounters persist.
8. Sheepherders carry guns and bear spray for safety and to scare off inquisitive animals. If a grizzly bear is threatening sheep, herders may discharge their rifle into the air if they think it would help frighten the bear (hazing). A herder may shoot directly at a grizzly bear only if his personal safety is threatened, however this situation has not occurred with Sheep Station grazing, and is not expected to occur.
9. Herders are to report all bear sightings to their supervisor. When on Agricultural Research Service land, all existing and suspected bear activity and (or) conflicts are reported directly to APHIS Wildlife Services. APHIS Wildlife Services then contacts state and federal agencies as necessary to conduct damage investigations.
10. All sightings that are confirmed grizzly bears, or show positive evidence of grizzly bear in the vicinity of livestock would be reported by the Sheep Station to the Interagency Grizzly Bear Science Team (IGBST).

11. When on USDA, National Forest System land, all existing and suspected bear activity and(or) conflicts are reported directly to the Forest Service or Bureau of Land Management contacts as well as APHIS Wildlife Services.
12. In an interagency agreement with the USDA Forest Service (USDA Forest Service 2007a), the Sheep Station agrees they would comply with meeting grizzly bear management goals on the Meyers Creek and East Beaver Allotments including notifying appropriate personnel of encounters, and temporarily stopping or modifying grazing as necessary, should bear conflicts arise with humans or livestock. This agreement may be updated based on future consultation between USDA Forest Service and the USDI Fish and Wildlife Service regarding use of the Meyers Creek Allotment. Refer to the most up to date interagency agreement for details.
13. The sheep station shall report incidental take by December 31st of each year as described in Term and Condition 1 in the Biological Opinion.
14. The Sheep Station shall coordinate annually with the Interagency Grizzly Bear Study Team to gather data on the number of confirmed or suspected grizzly bear/sheep conflicts in the surrounding area (Term and Condition 2 in BO).
15. The Sheep Station shall cooperate with other selected agencies regarding grizzly bear identification protocols in the surrounding area (Term and Condition 3 in the BO).

Known accounts of past interactions between domestic sheep and grizzly bears

There have been very few grizzly bear/sheep encounters pertaining to Sheep Station grazing activities over the last 10 years despite the known presence of grizzly bears occupying the habitat. Encounters that did occur resulted in minimal loss of sheep, and ended after sheep were moved to a new location. APHIS Wildlife Services investigations of the incidents reported the possibility that the most recent encounters may have been black bears. No grizzly bears are known to have been killed, captured, or relocated from ARS lands or from Sheep Station activities on adjacent National Forest System Lands (Meyers Creek Allotment) and conflicts ended when sheep were moved.

In the past 10 years, there have been no reported grizzly bear/livestock conflicts on the Meyers Creek Sheep allotment of the Caribou-Targhee National Forest (Schwartz et al. 2009 in habitat monitoring report section), (Farr Personal Communication 2008 and 2010), (Personal communication with Sheep Station personnel 2008, 2009, 2015).

A review of APHIS monitoring reports between 2002 and 2008 as well as personal communications with APHIS Wildlife Service officer (Farr 2008, 2010) indicate a total of four known grizzly bear-livestock encounters[4] on ARS lands.

1. Two grizzly bear encounters were reported in 1985 and 1999 and ended without grizzly bear mortality or control actions (Farr, personal Communications 2008). To validate that these previous encounters did not result in direct or indirect grizzly bear mortality, the project biologist reviewed Gunther et al. 2004, which documents the location of all known grizzly bear mortality between 1992 and 2000. The biologist also contacted the Interagency Grizzly Bear Science Team for a map of grizzly bear conflicts and mortality from 1975 through 2009 (Haroldson, personal communications 2010). These references confirm that no sheep related grizzly bear mortality occurred in the area. Two mortalities did occur in 1981 and 1984 near the Meyers Creek Allotment on National Forest System Lands. According to Haroldson "There was no evidence that the 1981 and 1984 mortalities were associated

[4] For the purposed of this report, grizzly bear/sheep encounters are defined as any event or series of related events when a grizzly bear is observed or suspected in the vicinity of sheep.

with sheep. The 1981 event was claws only recovered. The 1984 event was a bear shot and left in the fall."

2. In 2007, in the Odell pasture of the West Summer Range, presence of a grizzly bear at a ewe sheep carcass was confirmed on August 2, but evidence was insufficient to verify loss attributable to grizzly bears; black bears were possibly involved (Farr 2010). When another ewe was killed on August 6th in the Odell Pasture, APHIS Wildlife Services (Idaho) consulted with APHIS Wildlife Services (Montana) to verify if they were eligible to conduct work on grizzly bears under Montana's documentation and establish protocol for involving Montana Fish, Wildlife and Parks personnel. Grizzly bears were not a listed species at the time. No follow up control action was taken. On August 20 in the Odell pasture, the Sheep Station had moved sheep to a different grazing unit for 'scoring' (weighing lambs) and returned briefly to the unit adjacent to where suspected bear predation had been occurring. The herder found remains of five ewes that had been depredated earlier in the season, but these were too far decomposed to establish cause (Farr 2010). A total of seven sheep had been killed. No further encounters occurred in 2007, nor were there any grizzly bear control actions taken on nearby adjacent lands.
3. On July 28, 2008 Sheep Station personnel reported encountering a grizzly bear in the Big Mountain pasture of the West Summer Range. Investigation by APHIS Wildlife Services found evidence of both grizzly bear and black bear in the vicinity. On August 1st, in the Big Mountain pasture, the herder encountered a bear again. One ewe was found killed, possibly by black bear (Farr 2010). No further encounters occurred in 2008, and no encounters occurred in 2009 or 2010.
4. In 2012, a grizzly bear collar was found in the action area. The bear associated with the collar has not been found, and it is unknown if the bear was killed or not. No conclusions have been made that connect the bear collar to the Sheep Station, its employees, or bear/sheep interactions.

Results of Telemetry Data for Grizzly Bear Use of ARS Lands

Grizzly bear telemetry data has been collected by the Interagency Grizzly Bear Study Team at various levels since 2001 (provided by Haroldson, 2010 unpublished data). A summary of those data collection points within ARS lands as well as on the National Forest System Meyers Creek Allotment showed the following:

- A total of five different collared bears used ARS properties and National Forest System Meyers Creek Allotment since 2001.
- Most use was of short duration (one or two days).
- One bear (#387) was located on the Sheep Station West Pasture during a 12 day period in 2001.
- Another bear, (#419) was located on multiple properties in 2005 covering a span of 61 days, then was located on ARS properties for only three days in 2006.

Based on radio-telemetry data of grizzly bear activity and habitat types on the ARS properties, the following can be inferred about grizzly bear habitat and occupancy on ARS properties.

- Two ARS parcels exist in Montana in high-elevation portions of the Centennial Range. These parcels contain suitable habitat that is occupied by grizzly bear. They include the East Summer Range (Toms Creek) and West Summer Range (Odell Creek and Big Mountain). All are outside of the grizzly bear Primary Conservation Area.
- The Henninger Ranch is a small ARS property in Idaho, at the base of the Centennial Range. Telemetry data indicates that, on occasion, grizzly bear have been in the vicinity of this parcel. However, the presence of county roads, open sagebrush habitat, and lack of white bark pine limit its

value to grizzly bears. On rare occasion, this parcel could be temporarily occupied by a traveling grizzly bear.

- All other parcels of ARS properties are in Idaho and are unlikely to be occupied by grizzly bear. These parcels are dominated by sagebrush with frequent motorized activity on county roads. 2007 telemetry data indicated no grizzly bear observations on or adjacent to these properties. They include Humphrey Ranch and the Headquarters.
- The Sheep Station grazes sheep on additional federal agency lands. With the exception of the Meyers Creek Allotment on National Forest System land, these areas do not support grizzly bear activity, are dominated by sagebrush, and recent telemetry data showed no observations on or adjacent to these areas. They include the Snakey/Kelly allotment, East Beaver allotment (both National Forest System), and the Mud Lake Feedlot (Department of Energy).

Grizzly Bear Direct/Indirect Effects

Alternatives 1 and 5 Direct/Indirect Effects for Grizzly Bear

- Alternative 1 represents current operations at the Sheep Station.
- Alternative 5 represents grazing operations without using National Forest System Snakey/Kelly allotment.
- The effects of these alternatives are nearly the same since grazing operations in or near occupied grizzly bear habitat are similar between the alternatives.

To evaluate the potential and degree of effects to grizzly bears from the proposed activities, a variety of pertinent literature was reviewed. They included *Grizzly bear-human conflicts in the Greater Yellowstone ecosystem, 1992-2000* (Gunther et al. 2004), *Yellowstone Mortality and Conflicts Reduction Report* (Interagency Grizzly Bear Study Team 2009), Grizzly Bear – Human Conflicts in the Greater Yellowstone Ecosystem (Aber, Frey, Interagency Grizzly Bear Study Team, 2014) *Bear - Sheep Interactions on the Targhee National Forest* (Jorgensen 1983), *Sheep Losses on Grizzly Bear Range* (Johnson and Griffel 1982), *Does Aversive Conditioning Reduce Human-Black Bear Conflict* (Mazur 2010), *Feasibility of Using Portable Electric Fencing to Prevent Damage to Livestock and Apiaries by Bears and other Predators* (Debolt 2000), the *Biological Evaluation and Wildlife Specialist Reports for Meyers Creek Grazing Allotment* (Aber 2007b), the Biological Assesment for Meyers Creek Range Allotment Review (USDA Forest Service, 2012), and the Biological Opinion for U.S. Sheep Experiment Station Grazing (USDI Fish and Wildlife Service, 2014). A synthesis of the information in these documents and known encounters related to Sheep Station activities indicates that there is a likelihood that grizzly bear/sheep conflicts would occur during the 10 year period being considered for the project proposal. However, the number of conflicts that might occur in any given year is few. A projection of zero conflicts in most years, and up to three conflicts in occasional years will be used as an estimate for further analysis and is based on the previous number of encounters on ARS lands and an expanding population. The potential for those conflicts leading to injury, harm, or direct or indirect mortality to grizzly bears is minimal with reasoning described below.

The documents mentioned above describe fundamental biology of the grizzly bear and the importance of high calorie food sources, particularly important during August and September when bears are building fat reserves in preparation for winter denning. Since grizzly bears are opportunistic, they are known to scavenge or pray on easily available foods, including livestock, which places them in direct conflict with man and possibly leading to eventual mortality in defense of property, livestock, or human safety. Similarly, a concern has also been brought up during conferencing with the USDI Fish and Wildlife Service that bears to some extent may alter their feeding behavior in search of readily available livestock.

For the purposes of this analysis, injury or harm would be considered a grizzly bear becoming food conditioned. Food-conditioned bears may become habituated, leading to a loss of avoidance behaviors (Mazur 2010). A food conditioned bear is more likely to periodically recheck areas where it successfully found food, and also has the potential to associate the presence of man/sheep as a food reward. Once a bear is food conditioned, there is an increased risk of human/bear conflicts, and associated mortality from control actions that may result. Also, there could be some movement of bears away from active grazing areas if repeated hazing occurs.

Over the 10-year period for which the project decision would be valid and assuming continued expansion of bear populations and habitat use, there is some likelihood that an individual bear may become habituated/food conditioned. Although the number of repeat visits to a food source cannot be precisely determined before food conditioning has occurred, this analysis will assume that three or more visits to the same food source (similar to Mazur 2010) indicates that food conditioning/habituation is potentially occurring. If this happens, negative effects to grizzly bears could occur through three primary avenues:

1. A food conditioned bear could become a sheep killer, first attacking sheep associated with the Sheep Station, then progressing to other sheep on adjacent lands and not associated with Sheep Station activities. Although the Sheep Station proposed action indicates they would move sheep from the area and not request control actions, indirect effects could occur if adjacent private ranchers or other agencies experiencing problems from the food conditioned bear seek control measures eventually resulting in bear removal. This condition is not yet known or suspected to occur in association with Sheep Station activities.
2. Another scenario of possible negative effects is if a grizzly bear becomes food conditioned, and continues to repeatedly follow Sheep Station sheep around the properties rather than pursuing natural food sources. The resulting change in habitat use could be considered harm (USDI Fish and Wildlife Service communications). This condition is not yet known or suspected to occur in association with Sheep Station activities.
3. A third scenario of possible negative effects would be if Sheep Station personnel (sheep herder) shoots a grizzly bear in defense of his life and causes direct harm or injury to the bear and its young. This condition has not occurred, nor is it expected to occur in association with Sheep Station activities. Killing of a grizzly bear in defense of life is not considered part of the proposed action.

Although the literature suggests there is a possibility of the negative effects as described above, there are number of items indicating the likelihood of these effects occurring is low, and if they were to occur, the degree to which individual bears or the population would be affected is minimal.

Bear Encounters and Resulting Bear Mortality

There have been very few grizzly bear/sheep conflicts as a result of Sheep Station grazing activities over the last 10 years despite the known presence of grizzly bears occupying the habitat. Encounters that did occur resulted in minimal loss of sheep, and ended after sheep were moved to a new location. APHIS Wildlife Services investigations of the incidents reported some probability that the most encounters may also have been black bears. No grizzly bears are known to have been killed, captured, or relocated from ARS lands or from Sheep Station activities on adjacent National Forest System lands (Meyers Creek Allotment) and conflicts ended when sheep were moved. This indicates that food conditioning/habituation has not been occurring from Sheep Station activities, grizzly bears have not been removed or killed as a result of Sheep Station activities, and this trend is likely to continue.

Sheep Herding Practices

Sheep herding practices on ARS lands are implemented at a high quality standard and have been effective to date at minimizing the number of encounters and avoiding harm to grizzly bears. Herders are required to be on site with the sheep band full time, including camping adjacent to the sheep bed grounds and keeping 4 dogs (2 guard dogs/2 herd dogs) with the band. Lame sheep, carcasses and trash are removed during camp tender visits which occur every three days. Sheep are moved to new bed-grounds every three to five days. Sheep are kept in fairly tight bands so the herder has close watch over their health. The Sheep Station would move sheep within and outside of properties to avoid repeated encounters (avoid food conditioning), and herders carry bear spray as a first measure of protection against bears. They are trained annually and advised to avoid grizzly bear encounters if at all possible. Good herding practices and temporal movements are recommended as effective ways to reduce bear-sheep conflicts and ultimately bear mortality in Jorgensen (1983), and Gunther et al. (2004). Similarly, Johnson and Griffel (1982) indicated the importance of livestock permittees willing to deal with problems cooperatively and positively. This willingness is demonstrated by the Sheep Station commitment to the conservation measures in the proposed action. Johnson and Griffel also noted that allotments with grizzly bear depredation typically had a high amount of stray sheep and frequent small scattered groups of sheep which is contrary to the methodology used by the Sheep Station. In further support of Sheep Station practices, the Biological Evaluation for Meyers Creek grazing allotment (Aber 2007b) concluded that the Sheep Station has had an excellent record of avoiding conflicts with bears for many years and that there is no reason to assume this record would change in the future. Similarly, the Biological Assessment prepared by Fletcher (2012) documents that "There have only been a few encounters with grizzly bears in the past decade relative to Sheep Station activities. No grizzly bears have been killed, captured, or relocated from the Meyers Creek allotment or the ARS East Summer Range in response to Sheep Station activities. It is expected this trend would continue." Also, she documented that "This project will be compliant with all standards and guidelines for the grizzly bear in the 1997 Revised Forest Plan for the Targhee National Forest (RFP)."

Movement of Sheep

The proposed project employs a conservation measure of moving sheep frequently to new bedgrounds, and the ability to move sheep to entirely different pastures or properties if repeated bear -sheep conflicts develop. Jorgensen, 1983 studied bear and sheep interactions on the Targhee National Forest and showed that such movements reduced contact potential between bears and sheep, decreased resulting depredations, bears did not follow sheep, nor did the presence of sheep influence a bears homerange. Similarly, Knight (1983) found that grizzly bears that killed sheep were not exclusive to killing sheep, and had normal feeding habitats and behaviors similar to those of other bears monitored. Considering that the Sheep Station is willing to move sheep regularly in order to minimize potential contact, and to move sheep to a different pasture or property before repeated grizzly bear conflicts develop, the overall risk of food conditioning and resultant harm to grizzly bears is low.

Poaching by Herders

Knight (1983) estimated that a substantial amount of grizzly bear mortality might occur from unreported sheep-grizzly bear conflicts and subsequent poaching of grizzly bears (by sheep herders) in order to reduce economic losses. To some extent, the belief that this still occurs and is applicable to the Sheep Station activities persists in the small towns and restaurants that surround the Centennial Mountains. While poaching by private sector sheep herders may have been a substantial mortality factor during the time of the original study (1970s) it is unlikely to occur today regarding Sheep Station activities. Sheep Herders for the Sheep Station are documented workers employed by the US government, are trained in grizzly bear/black bear identification, are issued instructions to avoid all contact with grizzly bears if possible, carry pepper spray as a first line deterrent against bears, and gun ammunition is kept as

inventory. They are made aware that strict penalties may be incurred if grizzly bears are harmed without an immediate threat to life, and that any grizzly bear encounters are to be reported to their supervisor. Although private ranches and sheep herders may have had an economic incentive to poach grizzly bears when the species was newly listed, the Sheep Station and its employees have no such incentive and have much to lose. As such, the likelihood of a sheep herder engaging in poaching of grizzly bears is negligible and is not expected to occur.

Effects over a 10 year period

The likelihood of negative effects to grizzly bear in any given year is low. Injury or harm to grizzly bears would not occur due to mere presence of a grizzly bear on the property; or even if there is a limited number of conflicts between grizzlies and the sheep. Harm would occur if grizzly encounters progress into repeated conflicts, which is unlikely unless the Sheep Station is unresponsive in moving sheep when conflicts occur. It is unlikely in the short term based on the limited number of previous encounters and because conservation measures including willingness to move sheep to avoid repeated conflicts. However, it is reasonable to expect that a small negative effect described previously may eventually occur because of continued grizzly bear expansion into suitable habitat, the continued presence of sheep within that occupied grizzly bear habitat, the opportunistic nature of grizzly bear feeding, and the total number of years which the activity is being analyzed. Gunther et al. (2004) found that one grizzly bear was killed for every 39 sheep incidents. The Sheep Station had a total of 5 grizzly bear/sheep interactions over a two year period (2007 and 2008) which represents a period where they had more grizzly bear interactions than typical. Therefore, a projection of three encounters per year, over a ten year period, will be used to account for an expanding grizzly bear population while considering the low number of historical encounters on the Sheep Station which peaked in 2007 and 2008. Using this assumption, there would be approximately 30 sheep incidents over the 10 year period of the project, which is less than the reported rate of 39 bear/sheep incidents for each bear mortality reported in Gunther et al. (2004). Considering that harm, if it occurs, could include a female with dependent young, it can be concluded that Sheep Station activities could result in negative effects to between zero and five grizzly bears over the next 10 year period[5]. These effects, which may or may not occur, are small in comparison to estimated population size of the Yellowstone distinct population segment of grizzly bears of over 700 animals, population increases between 4 and 7 percent annually, known and probable grizzly human caused grizzly bear mortality, predominately associated with big game and black bear hunting seasons (estimated near 50 percent in 2008 and 2009 annual reports). Gunther, 2004 acknowledges that control actions between 1992 and 2000 did not affect the population to a degree that affects recovery.

Effects to grizzly bears from predator control activities are non-lethal and limited to occasional hazing of bears before they habituate to domestic sheep. As mentioned previously, herders are instructed to avoid all encounters if possible, move sheep within the pasture, and move sheep to other pastures if problems persist within a given area. On rare occasion, if sheep are being directly threatened, herders may fire rounds into the air in order to scare a grizzly bear away from the herd. There is no evidence to suggest that rare occurrence of this hazing would affect the grizzly bears ability to inhabit the landscape or raise cubs. If encounters continue, sheep would be moved out of the pasture or grazing unit to prevent continued losses to livestock and to prevent the need for lethal control measures. Herder's ammunition is accounted for, indicating that they have an incentive to address problem carnivores in a manner consistent with Sheep Station policy. All grizzly encounters are reported immediately to the herder's supervisor who contacts USDA Wildlife Services for additional investigation if needed. Through established Memoranda of Understanding, Wildlife Services contacts Idaho/Montana state wildlife agencies and/or USDI Fish and Wildlife Service.

[5] Three types of negative effects were described previously.

There would be no effects to grizzly bear genetic diversity as demonstrated by several key points.

- First, as stated in the Final Rule to delist, current levels of genetic diversity are consistent with known historic levels and do not threaten the long-term viability of the species.
- Second, The Final Conservation Strategy (USDI Fish and Wildlife Service 2007b) includes the transplant of one to two effective migrants per generation if no movement or genetic exchange is documented by 2020.
- Third, grizzly bear mortality or change in habitat use would not occur from Sheep Station activities based on the history of only a few encounters that ended without incident, and conservation measures in place to reduce the potential of conflicts.

Considering these factors, it is expected that grizzly bear movement through the Centennial Mountains would not be limited by Sheep Station activities, and thus would not limit genetic exchange with other grizzly bear populations.

Alternatives 2 and 3 Direct/Indirect Effects for Grizzly Bear

- Alternatives 2 and 3 affect grizzly bears similarly because grazing would not occur near currently occupied habitat[6].
- In alternative 2, no Sheep Station grazing would occur.
- In alternative 3, no Sheep Station grazing would occur on ARS lands or Meyers Creek allotment in the Centennial Mountains which is identified as biologically suitable and socially acceptable to grizzly bear occupancy (Schwartz et al. 2009 in the Habitat Monitoring Report section).

The intent of livestock allotment standard in the Final Conservation Strategy (USDI Fish and Wildlife Service 2007b) would be fully implemented by eliminating sheep grazing on the last occupied sheep allotment (Meyers Creek) within the Primary Conservation Area. In these alternatives, presumably, the Meyers Creek allotment would become vacant and permanently close. Similarly, sheep grazing would be eliminated on the East Summer Pasture (Toms Creek), which is immediately adjacent to the Primary Conservation Area. The area is likely biologically suitable and socially acceptable to grizzly bear occupancy according to the Grizzly Bear Management Plan for Southwestern Montana (Montana Fish Wildlife and Parks 2002), though boundaries for such designation have not been formally identified in Montana. The potential for livestock/grizzly bear conflicts from the Sheep Station would be nearly eliminated in these alternatives since the predominant grizzly bear population is located within the Primary Conservation Area, and Sheep Station grazing would not occur within five miles of the Primary Conservation Area. Grizzly bear mortality from Sheep Station activities would not occur.

Alternative 4 Direct/Indirect Effects for Grizzly Bear

Alternative 4 was developed specifically to address public scoping comments related to sheep grazing within and adjacent to the grizzly bear Primary Conservation Area. In this alternative, Sheep Station grazing and associated activities would not occur on the East Summer Range (Toms Creek) or on the National Forest System Meyers Creek allotment.

In regards to alternative 4, the intent of livestock allotment standard in the Final Conservation Strategy (USDI Fish and Wildlife Service 2007b) would be fully implemented by eliminating sheep grazing on the last occupied sheep allotment (Meyers Creek) within the Primary Conservation Area. In this alternative, presumably, the Meyers Creek allotment would become vacant and permanently close. Similarly, sheep grazing would be eliminated on the East Summer Pasture (Toms Creek), which is immediately adjacent to

[6] Humphrey ranch is considered outside of the current occupied range of grizzly bears (BO page 21).

the Primary Conservation Area. The area is biologically suitable and socially acceptable to grizzly bear occupancy according to the Grizzly Bear Management Plan for Southwestern Montana (Montana Fish Wildlife and Parks 2002), though boundaries for such designation have not been formally identified in Montana.

Alternatives 1-5 Grizzly Bear Cumulative Effects

The spatial boundary for the discussion of cumulative effects for grizzly bears is the Greater Yellowstone Ecosystem, because it is the boundary for the Yellowstone Distinct Population Segment of grizzly bears, and, therefore, puts the potential effects in the context of grizzly bear recovery for the designated population. The temporal boundary is 10 years because projections beyond this time period are less likely to be accurate.

The expected level of the effects for the project would not contribute detrimental cumulative effects to grizzly bear recovery considering the following points:

- The Yellowstone Distinct Population Segment of grizzly bears continues to expand in both population size and distribution.
- No direct grizzly bear mortality is expected from Sheep Station activities, and the probability of food conditioning resulting in indirect grizzly bear mortality or removal is low. There is no expected loss of habitat or loss of use in existing suitable habitat. Effects would be limited to rare occasions when a lone bear or sow with cubs is temporarily hazed to stop an immediate threat to sheep or human safety.
- Occasional hazing of a bear and implementation of other conservation measures described previously would not measurably increase annual mortality or cause exceedance of mortality threshold described in the Final Conservation Strategy. Although mortality thresholds were exceeded in 2008 for the Distinct Population Segment, none of these mortalities were attributed to Sheep Station activities, and most were attributed to hunting related incidents (many related to black bear hunting). It is reasonable to conclude that management actions that reduce mortalities related to hunting incidents are a likely tool to minimize grizzly bear mortality and keep it below established thresholds.

Sheep Station activities are not expected to limit grizzly bear movement or occupancy in the Centennial Mountains, and similarly would not limit genetic exchange with other grizzly bear populations. This finding is based on a limited number of documented encounters, no previous control actions on ARS lands or Meyers Creek, no direct mortality as a result of Sheep Station activities, low probability of food conditioning resulting indirect mortality on adjacent lands, and large expanses of suitable habitat in the Centennial Mountains.

Climate change (warming) is expected to continue over the next decade and beyond, and, therefore, could be considered as a cumulative effect condition that might affect grizzly bears. Primary effects to grizzly bear regarding climate change trends are indirect, and related to losses of larger diameter white bark pine and its cone crop, an important food source for grizzly bears in the Greater Yellowstone Ecosystem.

Jean et al. (2011) demonstrated there appears to be a trend of dying whitebark pine in the Greater Yellowstone Ecosystem between 2007and 2010 from blister rust and mountain pine beetle. Similarly, Haroldson and Podruzny (2010) found that 2010 was a low cone production year and emphasize that grizzly bears eat more meat when production is low, there is an increase in hunter/grizzly bear conflicts, and that extensive areas of beetle-killed whitebark pine in the Greater Yellowstone Ecosystem may exacerbate this concern. Considering this trend, it can be expected that grizzly bears occupying the Sheep Station and adjacent lands may increase their food search area, and the Greater Yellowstone Ecosystem would experience an increase in grizzly bear confrontation and hunter related bear mortality. However, Sheep Station domestic sheep grazing would not accelerate these rates of conflicts (or mortality), because

strong measures are in place to reduce potential conflicts including tightly herded bands, full time herders, guard dogs, and the Sheep Station is willing to move sheep before habituation occurs. Also, the Sheep Station is not seeking removal of problem grizzly bears in any of the proposed alternatives, so no direct increase in mortality is expected.

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. The removal and closure of sheep grazing permits on Forest Lands inside the primary conservation area, is an interrelated action. Under this interrelated action, all domestic sheep grazing on National Forests inside the primary conservation area has been subsequently vacated and/or closed except for that occurring on the Meyers Creek allotment by the Sheep Station.

- Under the proposed action and alternative 5 the Meyers Creek allotment would continue to be grazed for a short duration (3 days) during trailing activities. However, continued grazing remains consistent with the Final Conservation Strategy (USDI Fish and Wildlife Service 2007b), because the standard applies to permittees voluntarily withdrawing their grazing. Since grazing on Meyers Creek allotment is critical to the research mission of the agency as well as the grazing rotation schedule and movement of sheep, the US Sheep Experiment Station would not currently be considered a "willing" permittee.
- Under alternatives 2, 3, and 4, domestic sheep grazing in the Centennial Range would not occur so the interrelated action of removing all sheep grazing within the primary conservation area would be implemented.

The project would have "No Effect" on critical habitat as none is present or proposed within the project area.

Grizzly Bear Biological Determination

The project biologist has determined that U. S. Sheep Experiment Station Grazing and Associated Activities Project - May affect, and are likely to adversely affect the Yellowstone Distinct Population of grizzly bear. This determination is applicable to the proposed action (alternative 1) as well as alternatives 4, and 5. Effects are similar in these alternatives. However, the potential encounters are further reduced in alternative 4. This determination is supported by rationale summarized below.

- This determination was previously consulted on in 2014, and the USFWS issued a Biological Opinion (USFWS Tracking Number 2014-F-0074). The changes in the project proposal are minor adjustments that are not expected to change the way grizzly bears are affected from what was previously analyzed and determined.
- No direct grizzly bear mortality is expected from Sheep Station activities. Neither lethal control or trap and transport will be implemented or requested under this proposal. Should the need arise for these abatement techniques related to grizzly bear, consultation would be reinitiated.
- Potential effects are the limited probability over a 10-year period that a grizzly bear (and/or cubs) become food conditioned to domestic sheep, change feeding behaviors, and confrontations develop on adjacent lands under other ownership. The resulting change in habitat use could be considered harm (Arena, personal communications, 2010). Also, indirect effects could occur if adjacent private ranchers or other agencies experiencing problems from the food conditioned bear seek control measures eventually resulting in bear removal.
- The project would not limit grizzly bear occupancy or movement through the Centennial Mountains because grizzly bear habitat would not be reduced, and Sheep Station grazing practices include light utilization, for short duration, over a large landscape, with Summer Pastures rested one out of every three years. This grazing method prevents frequent and recurring encounters with grizzly bears which might otherwise alter bear behavior or necessitate the need for lethal control.

- Potential opportunities for genetic exchange with other grizzly bear populations would not be affected since occupancy or movement through the Centennial range would not be limited. In addition, recent evidence demonstrates that genetic diversity is not limiting Yellowstone distinct population segment grizzly bear populations in the short term, and that translocation from other populations is an adequate method to address genetic diversity shortfalls over the long term.
- Fifteen conservation measures (described previously) are in place to ensure that Sheep Station activities continue to operate in a manner that minimizes the potential for encounters and effects to grizzly bears. These conservation measures include proactive measures to avoid conflicts (research design criteria, guard dogs, sheep herders, and storage/removal of attractants), annual training, policy to address encounters non-lethally (move sheep, haze only if necessary), and established communication processes with other agencies.
- There have been only a few encounters with grizzly bears in the past decade relative to Sheep Station activities. No grizzly bears have been killed, captured, or relocated from ARS lands or on National Forest System/BLM allotments in response to Sheep Station activities. It is expected this trend would continue.
- Sheep Station sheep grazing in the Meyers Creek Allotment was analyzed previously by the USDA Forest Service who found that the grazing has occurred there for decades with minimal conflicts, meets the standards and guidelines from the Grizzly Bear Forest Plan Amendment, and noted that "The permittees (Sheep Station) have had an excellent record of avoiding conflicts with bears for many years."
- The potential for livestock/grizzly bear encounters would be further reduced in alternative 4, since the predominant grizzly bear population is located within the primary conservation area, and Sheep Station grazing would not occur within 5 miles of the primary conservation area.
- The expected level of effects for the project are minimal, and would not contribute to overall cumulative effects in a way which is detrimental to grizzly bear recovery.
- The biologist has also determined that alternatives 2 and 3 would have "No Effect" on the Yellowstone distinct population segment of grizzly bears since Sheep Station sheep grazing activities would not occur in occupied grizzly bear habitat or alter habitat conditions.

Canada Lynx (*Lynx canadensis*)

Canada Lynx Affected Environment

A comprehensive review of Canada lynx life history can be found in Lynx Conservation Assessment and Strategy (LCAS) (Interagency Lynx Biology Team, 2013). A condensed version of life history from the Lynx Recovery Outline (USDI Fish and Wildlife Service 2005a) is summarized below.

Lynx are highly adapted for hunting snowshoe hare, the primary prey, in the snows of the boreal forest. Lynx in the contiguous United States are at the southern margins of a widely-distributed range across Canada and Alaska. The center of the North American range is in north-central Canada. Lynx occur in mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare. Lynx survivorship, productivity, and population dynamics are closely related to snowshoe hare density in all parts of its range. Both timber harvesting and natural disturbance processes, including fire, insect infestations, catastrophic wind events, and disease outbreaks, can provide foraging habitat for lynx when resulting understory stem densities and structure provide the forage and cover needs of snowshoe hare. These characteristics include a dense, multi-layered understory that maximizes cover and browse at both ground level and at varying snow depths throughout the winter. Despite the variety of habitats and settings, good snowshoe hare habitat has a common denominator - dense, horizontal vegetative cover 1-3 meters (3-10 feet) above the ground or snow level. In northern Canada, lynx populations fluctuate in response to the cycling of snowshoe hare. Although snowshoe hare populations in the southern portion of the range in the contiguous United States may fluctuate, they do not show strong, regular population cycles as in the north. The southernmost extent of the boreal forest that supports lynx occurs in the contiguous United States in the Northeast, western Great Lakes, northern and southern Rockies, and northern Cascades. Here the boreal forest transitions into other vegetation communities and becomes more patchily distributed. As a result, the southern boreal forests generally support lower snowshoe hare densities, hare populations do not appear to be as highly cyclic as snowshoe hares further north, and lynx densities are lower compared to the northern boreal forest.

Canada lynx is a federally-listed threatened species and historically resided within the Centennial Mountain Range portions of the Sheep Station, which includes the West Summer Range (Odell Creek and Big Mountain) and the East Summer Range (Toms Creek). These areas are outside of, but adjacent to Lynx Analysis Units established on the Targhee National Forest in 2005. There is no Canada lynx critical habitat in the project vicinity. The Idaho statewide wildlife observation database indicates that historically, a number of Canada lynx have been observed in the Centennial Mountain Range. The TEAMS wildlife biologist has discussed occurrences of Canada lynx with US Fish and Wildlife Service in Chubbuck, ID (Arena 2008, 2009), Idaho Department of Fish and Game Biologists (Schmidt 2008, personal communications), and USDA Forest Service Biologists on the Caribou-Targhee National Forest (Aber, Keetch, Orme 2008, personal communications). Biologists with these agencies indicated that Canada lynx are unlikely to be currently residing year-round in the Centennial Range based on:

- A limited number of occurrences, 1874-1998
- Negative findings during hair snare surveys in 1999 - 2001, and
- Limited observations from winter track surveys conducted from 1996 - 2004.
- Biological Assessment for Meyers Creek Sheep and Goat Rang Allotment (Fletcher, 2012)

A summary of lynx habitat and observation data compiled for the Caribou-Targhee National Forest (adjacent to ARS properties) is presented in a Forest report prepared by Orme (2005). In the biological assessment (Fletcher, 2012) completed for sheep grazing on the USDA Forest Service Meyers Creek Allotment, which is adjacent to Toms Creek on ARS properties, the biologist determined that grazing

activities are not likely to adversely affect Canada lynx and are consistent with the Lynx Conservation Assessment and Strategy. According to maps prepared for the Lynx Conservation Agreement between the USDA Forest Service and the US Fish and Wildlife Service (USDA Forest Service 2006), areas in the Centennial Range are Secondary Habitat, which the Lynx Recovery Outline defines as "those with historical records of lynx presence with no record of reproduction; or areas with historical records and no recent surveys to document the presence of lynx and/or reproduction." A majority of habitat on ARS properties is unsuitable for lynx, because it is in lower elevation shrublands (Headquarters, Henninger Ranch). Higher elevation properties (West Summer Range, East Summer Range, and Humphrey Ranch) are potential lynx habitat but are of lower quality, because the properties do not contain large, connected expanses of boreal forest. ARS properties are outside of established Lynx Analysis Units.

Based on a review of the above information, there is potential for an occasional lynx to use the area traveling through high-elevation ARS properties in the Centennial Mountain Range, while temporarily foraging or moving between larger expanses of quality habitat in northwest Wyoming and Central Idaho. However, the area is unlikely to be currently occupied by a resident lynx population considering the lack recent observations in the Centennial Range and the status of adjacent habitat on USDA Forest Service lands as unoccupied according to the Lynx Conservation Agreement (Fletcher, 2012).

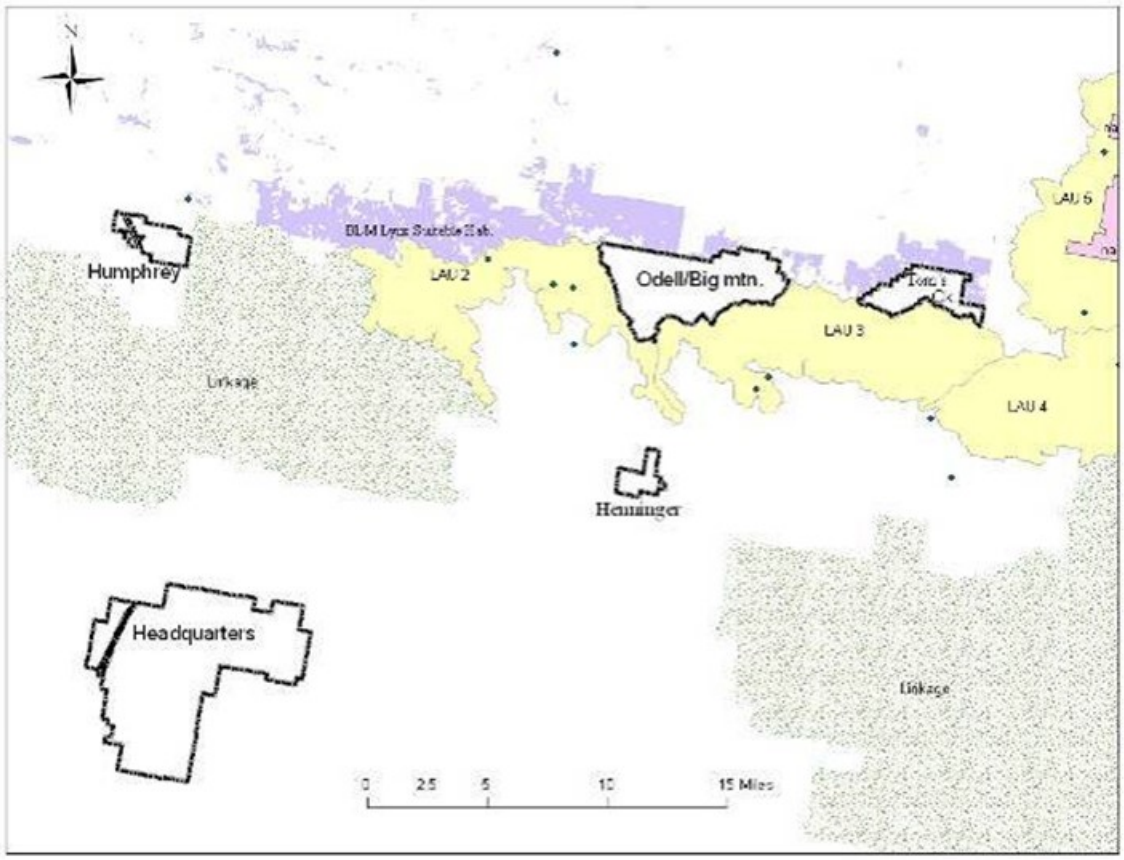

Figure 2. Sheep Station grazing lands adjacent to LAUs on the Caribou-Targhee NF, 2005

Canada Lynx Direct/Indirect Effects

Alternatives 1, 4, and 5 Direct and Indirect Effects Canada Lynx

- Modified alternative 1 represents current operations at the Sheep Station.
- Modified Alternative 4 - No grazing would occur on the East Summer Range as well as Meyers Creek allotment.
- Modified Alternative 5 - No grazing would occur on the Snakey/Kelly Allotment.

The effects of these three alternatives are the same since grazing operations take place in suitable lynx habitat in the Centennial Mountains which is thought to be unoccupied.

A review of the activities for each of these alternatives indicates that minimal, if any, effects would occur with regard to Canada lynx, both to individuals as well as to habitat. No effects would occur to designated critical habitat as none is present, and none is being proposed or considered in the area.

Most of the activities would have no effect on Canada lynx or their habitat. Those activities that occur in sagebrush shrublands at lower elevation are outside of lynx analysis units; and are in areas that do not have continuous forested cover, and do not provide adequate habitat features for denning or routine lynx foraging activities. The activities that are outside of suitable habitat and thus would have no effect include:

- All livestock grazing and camp tending activities during winter months,
- Livestock trucking activities,
- Cattle and horse research grazing,
- Activities on the Mud Lake Feedlot facility,
- Prescribed fire, Integrated pest management,
- Temporary watering sites,
- Road maintenance,
- Water diversions, and
- Permanent fencing and its maintenance.
- Herbicide use.

Within the Centennial Range, there are five permanent watering features. However, their presence and associated maintenance activities would not alter available lynx habitat, do not affect lynx prey, nor would they be expected to affect individual lynx.

Activities that could have minimal effects to Canada lynx occur during the summer grazing season and are within or adjacent to suitable habitat. These activities include sheep grazing and trailing and camp tending activities in the West Summer Range (Odell Creek and Big Mountain) and the East Summer Range (Toms Creek). Although Canada lynx have not been recently documented within the Centennial Mountains through hair snare surveys, suitable habitat is present in these high elevation forests. They support a low density population of snowshoe hare, lynx primary prey, as well as patches of large diameter downed wood suitable as denning habitat. The delineation of Lynx Analysis Units (2005) in habitat nearby on the Targhee National Forest indicates the presence of suitable habitat.

Though habitat may be suitable, expected effects from the above activities are minimal. Domestic sheep are only present in the East and West Summer Range area for a short duration during the summer, generally from start of July through the first week of September. This period is not critical to denning, and any Canada lynx that might be in the area could continue to forage across the landscape. Human disturbances may result in an occasional incident where lynx temporarily avoid the immediate area coincident with a band of domestic sheep, guard dogs, and herd dogs. Where there exists small patches of suitable foraging and denning habitat in sufficient quantities, Canada lynx would remain in the area, but temporarily adjust their travel and foraging locations to avoid direct encounters.

Another possible indirect effect to lynx is that associated with competition for browse between livestock and snowshoe hare (Ruediger et al. 2000). On-the-ground conditions quantified in the Range Report indicate that sheep grazing in the Centennial properties is of low intensity with a high amount of available forage. Light stocking and a rotation schedule that rests areas one year in three have allowed for highly productive range conditions with a stable or upward trend. Appropriate diversity of forbs, shrubs, and grasses is present, and in 2009, forb production was double or triple that expected. Utilization was light. Visual comparison of plants inside exclosures that have not been grazed in over 30 years to those outside the enclosures showed no difference in vegetative composition. Forested understory that provides winter cover and browse for snowshoe hares is present, and remains unaltered by the sheep grazing activities except where down logs are occasionally bucked into pieces to allow sheep passage along established trails. Near pristine on-the-ground conditions in the Summer Range are a result of many previous years in which the proposed activities have been occurring, and indicate that long-term habitat changes that might be of concern (described in the Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team, 2013) would not occur from the proposed activities.

No effect to Canada lynx from predator control activities is expected. Sheep herders are trained annually on predator control procedures. In order to protect the sheep herd and for the herder's safety, they are outfitted with rifles and all ammunition is inventoried. Fired ammunition is accounted for through an explanation to their supervisor. Herders are instructed how to address problems with wolves (*Canis lupus*), coyotes (*Canis latrans*), mountain lions (*Felis concolor*), and black bears (*Ursus Americanus*). Instructions are issued in semi-annual trainings that herders should not fire weapons at bobcat or lynx since they are difficult to identify, and the Canada lynx is a federally protected species. Ruediger et al. (2000) describes the risk of lynx mortality from predator control activities targeted for other carnivores as low because trapping efforts are reduced from historical levels, trapping efforts target individual offending animals, and trapping usually occurs in lower elevations (outside of lynx habitats). An interview with Wildlife Services (Farr 2008, personal communication) who conducts control actions on ARS properties indicated that:

- They have not caught any lynx in leghold traps.
- The lower elevation ARS properties are not suitable lynx habitat.
- There have been no depredations by felines in the Summer Range properties, so trapping for felines has not been necessary.
- Mr. Farr is not aware of lynx being captured in the area related to fur trapping.
- Canada lynx are unlikely, or unexpected to occupy the area.
- When trapping, Wildlife Services uses lures specifically targeted for canines and thus, greatly reduces potential of inadvertently capturing felines such as Canada lynx.

In addition to the information above that indicates a minimal potential for negative effects, it should also be noted that there is a very low probability of Canada lynx occurrences on ARS properties as discussed previously.

Alternatives 2 and 3 Direct and Indirect Effects for Canada Lynx

- Alternative 2 - No grazing would occur.
- Modified Alternative 3 - No grazing would occur on ARS properties in the Centennial Range except west of Beaver Creek on Humphrey Ranch.
- These alternatives have the same effects on Canada lynx because grazing is eliminated in/or near suitable habitat that could provide for a resident population of lynx.

Elimination of all grazing and associated activities (alternative 2), or all grazing activities in the Centennial Range except west of Beaver Creek on Humphrey Ranch (alternative 3) would eliminate the potential effects discussed in other alternatives. Human disturbances from Sheep Station activities would not occur which otherwise may result in uncommon occasions where lynx avoid the immediate area coincident with a band of domestic sheep, guard dogs, and herd dogs. Where there exists small patches of suitable foraging and denning habitat in sufficient quantities, Canada lynx would not have to temporarily adjust their travel and foraging locations to avoid direct encounters. There would be no competition for browse between livestock and snowshoe hare.

Canada Lynx Cumulative Effects

The spatial boundary for the discussion of cumulative effects for Canada lynx is the Centennial Mountain Range, because this landscape incorporates multiple Lynx Analysis Units established by the USDA Forest Service (2005) in cooperation with the USDI Fish and Wildlife Service, and is large enough in size to support a resident population of several lynx. The temporal boundary is from present day through the next 10 years because projections beyond that timeframe are similar to that being described, but with reduced accuracy.

The status of adjacent habitat on USDA Forest Service lands is secondary habitat, with historical records of lynx present with no records of reproduction (Fletcher, 2012). There is potential for occasional lynx to use the Centennial Mountains while temporarily foraging or moving between larger expanses of quality habitat in northwest Wyoming and Central Idaho. The proposed project and alternatives do not reduce available habitat, would not add additional effects which would render potentially occupiable habitat as unsuitable, nor would it deter from the Centennial mountains ability to provide temporary Canada lynx travel and foraging between higher quality habitat in Yellowstone or Central Idaho. As such, the project and alternatives do not contribute to additional cumulative effects.

There are no interrelated actions associated with this project. Interdependent actions include livestock grazing permits issued in Targhee National Forest lands, as well as past and proposed timber sales there. Existing habitat on National Forest System lands is managed in compliance with the Lynx Conservation Assessment and Strategy, the Lynx Conservation Agreement, as well as Northern Rockies Lynx Management Direction (2007) and thus, would maintain conditions that provide for continued protection and recovery of Canada lynx. Considering that effects from the proposed project are negligible, and effects from past or planned projects provide for lynx conservation, then there are no additional cumulative effects to Canada lynx from the project proposal or its alternatives.

Canada Lynx Biological Determination

The project biologist has determined that alternatives 1, 4, and 5 "USSES (Sheep Station) Grazing and Associated Activities - May affect, but are not likely to adversely affect Canada lynx." This determination

is supported by rationale presented in the Biological Assessment and summarized below. Alternatives 2 and 3 would have no effect to Canada lynx.

- This determination was informally consulted on in 2011. The USFWS provided a letter (USFWS reference Number 14420-2011-F-0326) that concurred with this determination. The changes in the project proposal are minor adjustments that are not expected to change the way Canada lynx are affected from what was previously analyzed and determined.
- Suitable lynx habitat is present, however that habitat has been identified as secondary habitat having a low potential for year-round occupancy, and no records of Canada lynx reproduction.
- Canada lynx have not been targeted for abatement on ARS properties, nor are there records of personal accounts indicating that abatement actions have been taken to control Canada lynx on ARS properties. No take would occur from predator control activities.
- Grazing practices and associated activities implemented by the Sheep Station do not affect denning habitat, do not remove cover important to lynx travel, and retain adequate cover and forage available to snowshoe hares, lynx primary prey. Activities are consistent with standards in the Lynx Conservation Assessment and Strategy.
- Cumulative effects of the project are negligible.
- Negative effects are unlikely. If they occur at all, they would be limited to small temporary changes in daily movements. In the Centennial Mountains, individual lynx moving through the area may make small temporary adjustments in habitat use/travel routes to avoiding conflicts with guard dogs and/or humans associated with grazing a band of sheep.

North American Wolverine (*Gulo gulo luscus*)

Wolverines are uncommon and wide ranging, but may use ARS properties in the Centennial Mountain Range for occasional foraging. On February 4, 2013 the U.S. Fish and Wildlife Service proposed to list the distinct population segment of the North American wolverine occurring in the contiguous United States, as a threatened species under the Endangered Species Act (ESA)(U.S. Fish and Wildlife Service 2013). On August 13, 2014, the Service withdrew the proposal. Since that time, the courts vacated the action, reverting status back to proposed as threatened (U.S. Fish and Wildlife Service 2016b). Critical habitat has not been proposed for this species.

The wolverine, a large but elusive member of the weasel family found in the Mountain West, has made a steady recovery in the past half century after hunting, trapping and poisoning nearly extirpated the species from the lower 48 states in the early 1900s (http://www.fws.gov/mountain-prairie/species/mammals/wolverine/).

Wolverine Affected Environment

A summary of regional wolverine distribution, habitat, ecology, and issues can be found in Idaho Comprehensive Wildlife Conservation Strategy (CWCS), species accounts in appendix F (Idaho Department of Fish and Game 2005). Wolverines use large tracts of land ranging from 150 square miles to over 500 square miles, and talus slopes are important for denning. ARS properties contain good summer wolverine habitat made up of sub-alpine forests and meadows, minimal roads, and minimal human disturbance on Odell Creek, Big Mountain, and Toms Creek allotments. Winter habitat may occur in the foothills including Humphrey Ranch and Henninger Ranch properties, in particular as it relates to ungulate use as a food source for wolverine. The Headquarters property is non-forested and outside of wolverine habitat. ARS properties are small in comparison to overall habitat needs, so occurrences of wolverines are expected to be uncommon.

Potential threats to this species include habitat loss and fragmentation, loss and alteration of alpine (snow) habitat from climate change, and increasing human presence (disturbance). The USFWS (2013) noted climate change as the threat with the greatest potential to impact wolverine. A warming climate will likely result in a loss of suitable habitat due to increased summer temperatures and a reduced incidence of persistent spring snowpack. The USFWS (2013) noted recreation as an additional threat to wolverines because mother wolverines tend to move their kits to alternate denning areas once humans have been detected nearby. State heritage databases indicate a number of wolverine observations in the Centennial Mountain Range.

Wolverine Direct and Indirect Effects

Wolverines have not been known to depredate domestic sheep on ARS properties. No control actions have occurred, and none are expected to occur for the species. Conservation measures are in place to reduce the likelihood of potential conflicts with grizzly bear, as well as other predators, and domestic sheep. The described activities for all alternatives do not create barriers to wolverine travel, do not alter forest vegetation or ungulate populations that might affect wolverine use, and do not concentrate activity on talus slopes that might be used for denning. Potential habitat connections provided by the Centennial Range between the Greater Yellowstone Ecosystem and Central Idaho would not be altered.

Wolverine Cumulative Effects

Activities would not have effects to wolverine and, thus, would not contribute cumulative effects to wolverine populations or habitat that might be present.

Wolverine Biological Determination

USSES (Sheep Station) Grazing and Associated Activities, under modified alternatives 1, 3, 4, or 5, are not likely to jeopardize North American wolverine. This determination is supported by rationale summarized below. Alternative 2 is not likely to jeopardize North American wolverine because all grazing operations and associated activities would be eliminated.

- Wolverines have not been known to depredate domestic sheep on ARS properties.
- No control actions have occurred, and none are expected to occur for the species.
- Conservation measures are in place to reduce the likelihood of potential conflicts with predators and domestic sheep.
- Activities do not create barriers to wolverine travel, alter forest vegetation or ungulate populations that might affect wolverine use, and do not concentrate activity on talus slopes that might be used for denning.
- Potential habitat connections provided by the Centennial Range between the Greater Yellowstone Ecosystem and Central Idaho would not be altered.

Gray Wolf (*Canis lupus*)

Gray Wolf Affected Environment

Effective May 5, 2011 the US Fish and Wildlife Service removed gray wolves in a portion of the Northern Rocky Mountain Distinct Population Segment (DPS) encompassing Idaho, Montana and parts of Oregon, Washington and Utah from the Federal List of Endangered and Threatened Wildlife. This wolf population was de-listed due to recovery. The wolf population in Northern Rocky Mountains continue to hold steady. As of December 31, 2014, there were at least 1,657 wolves in 282 packs (including 85 breeding pairs) in Montana, Idaho and Wyoming. An additional 145 wolves in 31 packs (including 13 breeding pairs) were estimated in Oregon and Washington. Wolf numbers continue to be robust, stable and self-sustaining in the Northern Rocky Mountains. http://www.fws.gov/mountain-prairie/species/mammals/wolf/

As summarized in the Montana Fish, Wildlife, and Parks Fact Sheet on Wolves (2011), "The northern Rocky Mountain gray wolf population first met biological recovery goals in 2002. The Northern Rockies "metapopulation" is comprised of wolf populations in Montana, Idaho, and Wyoming. About 1,650 wolves live in the region, where wolves can travel about freely to join existing packs or form new packs. This, combined with wolf populations in Canada and Alaska, assures genetic diversity. Federal rules require Montana and Idaho to maintain at least 150 wolves and 15 breeding pairs in each state (as well as Wyoming). About 566 wolves inhabited Montana in 2010 in about 108 packs, 35 of which were breeding pairs." Similarly, about 835 wolves inhabited Idaho in 2009 in about 94 packs, 49 of which were documented breeding pairs (Mack et al. 2010).

The wolf is reclassified under Montana law as a "species in need of management" statewide. Montana laws and administrative rules protect wolves. Wolves can only be legally killed: during an official hunting season authorized by the FWP Commission; if the wolf is seen attacking or killing or threatening to kill dogs or livestock; to protect human life; or as authorized by FWP to resolve wolf-livestock conflicts.

In Idaho wolves are being managed as a big game animal. They are protected by state laws. The Idaho Fish and Game Commission approved 2011 wolf hunting season.

Wolf Control Procedure

Radio collars, leghold traps, and/or aerial control are methods used on private and federal lands to track problem wolves/wolf packs and, if conflicts persist, implement lethal removal, which is usually targeted at offending animals (Farr 2008, Meintz 2009, personal communications). APHIS Wildlife Services acts on the behalf of the Sheep Station to verify livestock damage before any control actions are taken. If wolf damage is verified, APHIS Wildlife Services contacts his supervisor as well as the state wildlife agency to request authorization if it is necessary to pursue direct control. Authority for control actions are granted through state wildlife agencies (Arena 2008, Farr 2009, personal communications).

The following text describes the typical methodology of "Incremental Control Measures" referred to in other portions of this document. Effects to wolves involved in depredation scenarios generally occur in three categories. First, if an individual wolf is involved in limited depredation such as while traveling through habitat to a new or different territory and no further incidents occur, non-lethal control measures (such as the presence of herders and guard dogs) are deemed adequate. Second, if offending wolves are part of a group, breeding pair, or pack and remain active in the vicinity, individual wolves may be radio-collared so activities can be monitored and tracked. If depredations continue, one to three animals are lethally removed, with the intention to target specific offending animals. If possible, the pack is left intact with a breeding pair. Third, if depredation is a recurrent problem and there are substantial livestock losses from a specific pack or group of wolves (including losses on private producers as well as Sheep Station livestock), authorization may be given to remove all or most pack members. This may involve individual trapping and/or aerial targeting (at the discretion of APHIS Wildlife Services and state agencies) to achieve removal of the breeding pair, pups, and other associated wolves.

Gray Wolf Direct/Indirect Effects

Modified Alternative 1, 4, and 5 Direct and Indirect Effects for Gray Wolf

Effects from activities in these three alternatives are essentially the same since each proposes similar livestock grazing in the Centennial Mountains where wolves are known and expected to occur. Modified alternative 1 proposes grazing in both the East and West Summer Ranges. Modified alternative 4 proposes grazing in the West Summer Range while discontinuing grazing in the East Summer Range and USDA Forest Service Meyers Allotment. Modified alternative 5 continues grazing in both the East and West Summer Ranges while discontinuing grazing from Snakey/Kelly allotment. Potential effects to wolves remain the same throughout each alternative, because each alternative continues grazing in occupied wolf habitat.

A review of the activities described in these alternatives indicates that activities would have effects on gray wolves and their habitat. Specifically, the activities that would have some effects can be categorized and described as follows:

1. Trailing, grazing, and camp tending activities in the Centennial Mountains have previously, and would continue to result in occasional encounters with wolves. The habitat is occupied by deer and elk (a natural food source for wolves), and the addition of sheep bands would, on occasion, attract wolves opportunistically searching for food, or wolves habituated to sheep as an easy food source. Mitigations including the presence of full-time sheep herders, guard dogs, and herd dogs provide consistent and effective methods of non-lethal control, which in-turn discourages most individual wolves and wolf packs from habituating to Sheep Station sheep herds as a food source. In addition, on a daily basis, herders keep a daily count on sheep, and ride trails to gather strays. Dead or injured sheep are removed from the field when possible. As a result, the effect of attracting wolves to domestic sheep as a potential food source is substantially reduced because of continual human presence, guard dog presence, and by reducing the number of stray sheep, or dead sheep available as

a food source. The overall direct and indirect effect to wolves from these activities is minimal. Effects of harassment and predator control activities (such as firing gun shots in the air and other abatement tools) are discussed separately in letter c below.

2. Activities that could affect daily or annual movements of wolf prey (deer, elk, and moose) also have the potential to indirectly effect gray wolf movements. Prescribed fire may improve range conditions such as increased vigor on the annual growth of shrubs and grasses, which correspondingly attracts more ungulates. Thus, wolves could be indirectly attracted to areas with prescribed fire, in search of big game food sources concentrated near productive foraging habitats. Prescribed fire is occurring on the Headquarters property, which is big game transitional range. Since this area is covered in snow much of the winter season, its capacity to support deer and elk in large concentrations is minimal, and its corresponding potential to affect gray wolf is even smaller and limited to a short duration as ungulates migrate through the area to different elevations. Maintenance of fire breaks and roads on the ARS properties could temporarily have small effects on deer and elk herd movements, where the ungulates avoid mechanized operating equipment. However, these effects are limited to times when heavy equipment is operating in the area. With a lack of public motorized access to roads on the Sheep Station, big game persists with minimal disruption across the landscape, which translates to few or no corresponding impacts to wolves. Water developments that occur in the Big Mountain grazing unit may occasionally attract deer, elk or moose, but these occasions are rare since ungulates more likely use natural water sources. Fencing on ARS properties at lower elevations is constructed to specifications that do not limit travel for ungulates, and upper elevation fencing (horse corral) is temporary, small in size, and is not big enough to substantially affect big game movements. The one large fence present on ARS properties near the Headquarters (coyote fence) does eliminate big game access to forage on approximately 640 acres. Since the fence is in low elevation sagebrush that does not include any mapped wetlands or unique wildlife habitat features, and is surrounded by thousands of acres of similar habitat, the fence does not limit ungulate use across the landscape or their access to limited habitats. As a result, effects would be limited to the loss of a small amount of available forage for deer and elk, a local change in daily movements of deer and elk around the one square mile exclosure, and ultimately, little or no corresponding effect to wolves.

3. Effects to wolves are expected from predator control activities on ARS properties including non-lethal measures such as hazing, lethal removal of individual animals, and in some cases, particularly when depredation to private livestock is also occurring, removal of entire packs and/or breeding pairs. The history of minimal conflicts with wolves on the Sheep Station before 2008, and the incremental control measures that resulted in the removal of two packs in 2009 near Humphrey Ranch, indicate that control measures are likely to vary from year to year. In most years, such as occurred in 2005 through 2008, non-lethal activities including having sheep herders and guard dogs with sheep, hazing individual wolves during encounters, and trapping/radio collaring individual wolves would be adequate to address depredation on Sheep Station herds. Despite proactive conservation measures to reduce conflicts, in some years packs would establish and/or expand in or near the Centennial Mountains, and depredate more heavily on livestock from the Sheep Station as well as adjacent private producers. In these cases, lethal control measures would be necessary to curtail depredation on Sheep Station sheep and/or prevent a pack from habituating to domestic sheep. Lethal removal would be implemented typically on one to three wolves. In uncommon circumstances such as occurred in 2009, when numerous depredations continue on private and Sheep Station livestock, control actions could continue in an incremental fashion until an entire offending pack is removed, varying between three and ten animals. At the legal discretion of Idaho/Montana Wildlife Agencies, and APHIS Wildlife Services, incremental control measures would continue to be authorized, to a varying degree, resulting in the removal of individual wolves, breeding pairs, and on occasion, established packs.

Overall, the effects described above are not expected to affect the delisted status of gray wolves nor reduce the population or number of breeding pairs to a level approaching the low-end threshold of 150 animals and 15 breeding pairs in each state.

Alternative 2 and Modified Alternative 3 Direct and Indirect Effects

- Alternative 2 and modified alternative 3 affect gray wolves similarly because all Sheep Station grazing activities in suitable wolf habitat would be eliminated in the Centennial Range.
- In alternative 2, no Sheep Station grazing would occur.
- In modified alternative 3, no Sheep Station grazing would occur in the Centennial Mountains

Elimination of all Sheep Station grazing and associated activities (alternative 2), or all Sheep Station grazing activities in the Centennial Range (modified alternative 3) (except west of Beaver Creek) would nearly eliminate the Sheep Station role in potential effects on wolves discussed in the earlier alternatives. Livestock grazing on ARS properties which otherwise may have resulted in lethal control actions to remove a few individual wolves annually, or in some years, up to two wolf packs or groups that are establishing, would likely not occur. However, control actions related to private livestock owners and USDA Forest Service/Bureau of Land Management Permittees in and adjacent to the Centennial Range would continue in its current fashion. It is unknown if new resident wolf packs would naturally reestablish, or if other control actions related to private/permitted producers would limit pack establishment on the Centennial Range.

Gray Wolf Cumulative Effects

The spatial boundary for the discussion of cumulative effects for wolves is the Centennial Mountain Range to the I-15 corridor because this area is:

- Large enough to sustain one or more wolf packs,
- Is influenced by (or influences) wolf management on adjacent lands under other ownership, and
- Is an important piece of undeveloped habitat between the Greater Yellowstone Ecosystem and Central Idaho.

The temporal boundary is 10 years because projections beyond that point are similar to those being discussed, but become less accurate over time.

The project is not expected to add cumulative effects detrimental to wolf recovery based on the following information:

- Hunting seasons are managed on an annual quota basis by state wildlife agencies, who point to evidence that such management would not detract from sustaining the current population, and that genetic connectivity would not be impacted, even if the maximum quota animals is reached.
- The Northern Rocky Mountain Wolf population is expanding in both size and distribution, and a limited number of wolves or packs have been or would be impacted by continued operations on the Sheep Station.
- State wildlife agencies have the authority to authorize or deny lethal control actions on private or agency lands, thus procedures are in place to balance lethal control actions with larger population/pack management goals in the Centennial Mountain Range.

Bighorn Sheep (*Ovis canadensis*)

Bighorn sheep are not known or expected to be present on ARS properties. Bighorn sheep in Idaho and Montana portions of the project area have no federal listing status, and are managed as game species with controlled hunting allowed in certain areas. Bighorn sheep herds nearest to ARS properties are approximately 20 miles removed from all Sheep Station activities and separated by non-habitat such that interactions are not expected to be a concern with these herds. Two small herds from prior bighorn sheep reintroductions are present in the Upper Snake region of Idaho near the Snakey/Kelly allotment (National Forest System).

Bighorn Sheep Affected Environment

In the Rocky Mountain west, a primary issue regarding bighorn sheep and domestic sheep interaction revolves around die-offs within native or transplant bighorn sheep herds, after coming in contact with domestic sheep. The issue has been largely polarized by evidence that domestic sheep diseases threaten the persistence of bighorn sheep populations, economic and social consequences of restricting domestic sheep grazing are substantial, and the effectiveness of maintaining separation between domestic sheep and bighorn sheep is debated. In examples such as occurred near Hell's canyon in Western Idaho, where one or more bighorn sheep became infected with pneumonia (*Pasteurella* or *Manhiemmia*), the pneumonia spread to other members within a bighorn sheep herd, and a portion of the bighorn sheep herd died. The majority of documented bighorn sheep die-offs follow contact with domestic sheep. Clifford et al. (2009) and Lawrence et al. (2010) demonstrated the transmission of *Mannheimia haemolytica* bacteria from domestic sheep resulted in the pneumonia and death of bighorn sheep under certain controlled conditions.

While Besser et al. (2013) found some degree of biological explanation for all suspected agents and strong experimental evidence for *M. haemolytica* as the cause of pneumonia in bighorn sheep, they demonstrated that of the alternatives considered, *Mycoplasma ovipneumonia*e is the best supported. The strong but somewhat controversial experimental evidence implicating disease transmission from domestic sheep is consistent with this finding. Based on epidemiologic and microbiologic data, the authors hypothesize temporarily prevalent and widespread pneumonia occurs in bighorn sheep populations when *M. ovipneumoniae*, native to domestic sheep and goats, is transmitted into a bighorn sheep population. Animals surviving the initial epizootic can become chronic carriers, shedding *M. ovipneumoniae* in the nasal secretions. Chronic carrier ewes may transmit the infection to subsequent years' lambs resulting in epizootic lamb pneumonia while chronic carrier rams may potentially spread the agent to adjacent populations in the course of their natural movements.

Once introduced into a bighorn sheep population, *M. ovipneumoniae* may be cleared after a year or two, or persist for decades. Although research is needed to better describe the range of potential ultimate outcomes of infection, they may include selection for reduction of the agent due to the high death loss of hosts infected with fully virulent strains, selection of bighorn sheep with increased genetic resistance to the infection, stochastic loss of carrier animals resulting in elimination of the agent and cessation of the infectious cycle, or local extirpation of bighorn sheep populations due to lack of lamb survival. (Besser et al. 2013).

If this hypothesized model is correct, efforts to ensure segregation of healthy bighorn sheep populations from *M. ovipneumoniae*-infected reservoir hosts are crucial to prevention of widespread new disease. It may also be possible to develop *M. ovipneumoniae* vaccines or other management strategies that could reduce the impact of pneumonia in bighorn sheep. (Besser et al. 2013)

In two experiments (Besser et al. 2014), bighorn sheep housed in multiple pens 7.6 to 12 m apart were exposed to *M. ovipneumoniae* by introduction of a single infected or challenged animal to a single pen. In

both experiments the challenge strain of *M. ovipneumoniae* was transmitted to all animals both within and between pens and all infected bighorn sheep developed bronchopneumonia. In six bighorn sheep in which the disease was allowed to run its course, three died with bronchopneumonia 34, 65, and 109 days after *M. ovipneumoniae* introduction. The epidemiologic, pathologic and microbiologic findings in these experimental animals resembled those seen in naturally occurring pneumonia outbreaks in free ranging bighorn sheep.

Payette National Forest Decision

State and Federal Agencies across the Western United States model bighorn sheep habitat and updated herd distribution based on models used for the Payette National Forest. In 2010 the Payette National Forest made a decision to discontinue sheep grazing in a number of areas where bighorn sheep use and domestic sheep use overlap based on a bighorn sheep viability analysis. This analysis used outputs from source habitat, risk of contact, and disease models. Rate of contact between bighorn sheep and domestic sheep, probability of contact resulting in transmission of disease, and effect of disease on the bighorn sheep population were the three factors considered in assessing the potential impacts of disease on populations of bighorn sheep. Rate of contact was estimated using a large telemetry data set to model core herd home ranges and bighorn sheep forays outside of home ranges relative to the availability of summer source habitat. Outputs of the core herd home range and foray analyses were used to determine the likely rate of bighorn sheep contact with domestic sheep. Telemetry data used in the analysis indicated one ram had traveled up to 35 kilometers (22 miles), with the majority of forays ending at 26 kilometers (16 miles). Forays were documented occurring mostly within source habitat and the analysis showed that bighorn sheep were 97 percent less likely to occur in non-habitat. (USDA Forest Service 2010) The analysis and decision was completed to ensure compliance with regulations including National Forest Management Act, Hells Canyon National Recreation Area Act, and USDA Forest Service Sensitive Species Policy.

Since the Sheep Station is approximately 200 miles east of the Payette NF, the modeling process and effects analysis used on the Payette National Forest was reviewed. The boundary of bighorn sheep "Population Management Units" (PMUs) nearest ARS properties are roughly 20 miles away (see below). Although the Forest Service and Idaho Department of Fish and Game (IDFG) are currently working to refine foray distances, and core herd home ranges, in lieu of complete information, a number of other sources were considered in order to accurately portray the existing condition and potential effects.

Bighorn Sheep Herd Information

Available information from Montana Fish, Wildlife and Parks and IDFG, including the Bighorn Sheep Management Plan (IDFG 2010), Idaho 2009 Progress Report (IDFG 2009), and 2013 Statewide Report (IDFG 2013) are used to describe the following bighorn sheep existing condition information for all locations used for domestic sheep grazing by ARS.

ARS Properties

ARS properties in Idaho are within Idaho Game Management Unit 61 of the Upper Snake Region. A small population of California bighorn sheep, the Lionhead PMU, occurs on the Idaho-Montana border in the Lionhead area of Idaho Game Management Unit 61 (figure 3). In Montana, this bighorn herd is known as The Hilgard herd, Montana Hunting District 302. The population objective for this herd is 80 to 120 sheep observed during annual population counts.

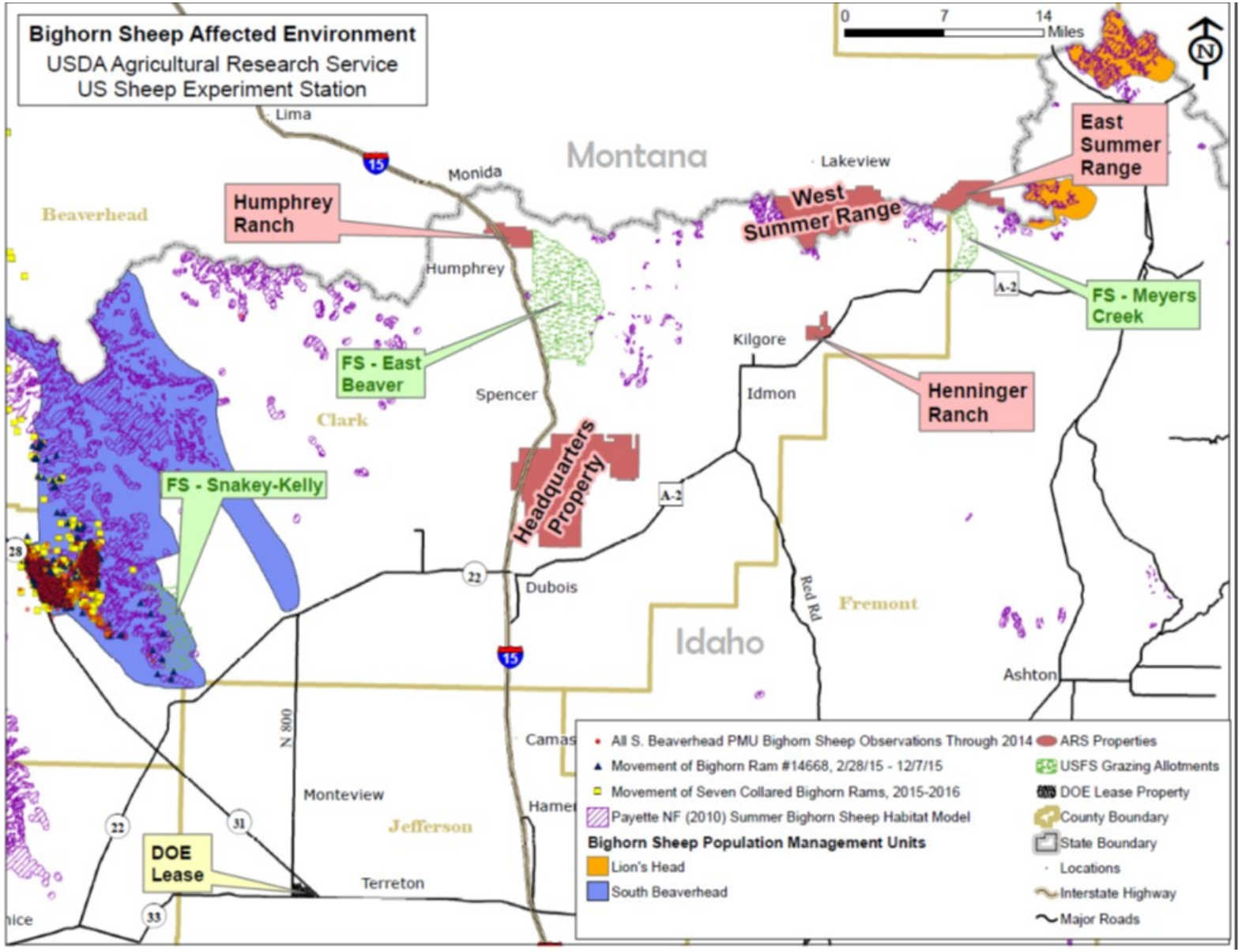

Figure 3. Bighorn sheep affected environment

Most recent population counts are as follows: 2016 – 184; 2015 – 132 (poor count); 2014 – 266; 2013 – 185; 2012; 131 (J. Cunningham, pers. comm.). The herd has limited available winter range, thus the Montana Fish, Wildlife and Parks goal is to manage the herd at current levels. The herd is separated from the East and West Summer Ranges which include Odell Creek, Big Mountain, and Toms Creek grazing units by a distance of approximately 20 miles, Henry's Lake basin, and substantial geographic topography along the continental divide. Although the Idaho Bighorn Sheep Management Plan delineates the Lionhead population management unit closer to ARS property, there is no indication that a herd occupies the area adjacent to Toms Creek and-or Odell Creek grazing units. Neither the Idaho Fish and Game Bighorn Sheep Progress Report (2009) nor the Montana Bighorn Sheep Conservation Strategy (2010), or the Idaho Bighorn Sheep Management Plan (2010) suggests any known interaction between the Hilgard/Lionhead herd and Sheep Station grazing activities. According to the Idaho Fish and Game Bighorn Sheep Progress Report, 12-15 sheep are seen in Idaho during the summer months.

Bighorn sheep populations in other adjacent areas of Montana, which are also outside of ARS properties, include the Tendoy Mountain herd, over 20 miles to the northwest of the Humphrey Ranch. The herd is in Montana Hunting District 315, with an estimated population of 59, and a population goal of 200. It is currently closed to hunting until objectives are achieved.

The closest boundary of the Idaho South Beaverhead Rocky Mountain bighorn sheep PMU (part of GMUs 58 east, 59A, and 59) to ARS headquarters and Humphrey Ranch properties is roughly 20 miles away based upon the most current Idaho Department of Fish and Game (IDFG) telemetry data for collared rams and observational bighorn sheep data through 2014. The closest data points from that herd are for two observations of rams roughly 20 miles away from the headquarters and Humphrey Ranch properties. Risk of contact with domestic sheep on ARS properties has not been identified in the Idaho Department of Fish and Game 2013 Statewide Report for Bighorn Sheep as an issue for this PMU (Idaho Department of Fish and Game 2013).

U.S. Forest Service Grazing Allotments (Snakey-Kelly Allotment)

The Sheep Station also grazes sheep on National Forest System allotments (Snakey/Kelly). The Sheep Station grazes the Forest Service allotments following an existing agreement and annual operating instructions that are developed cooperatively with the Forest Service. In April 22, 2015, the Dubois Ranger District of the Caribou-Targhee National Forest sought initial public comments on its proposal to reauthorize livestock grazing on six allotments, including the Snakey Canyon and Kelly Canyon (Snakey-Kelly) Sheep and Goat Allotments. Based on that scoping letter, their proposed action includes conducting a Qualitative Assessment of the “likelihood of contact” between bighorn sheep and domestic sheep as outlined in Attachment 1 of the Intermountain Region Briefing Paper dated September 9, 2011 (USDA Forest Service 2015a). The qualitative assessment has not been completed at this time.

According to the Idaho 2009 Progress Report (IDFG 2009) and 2013 Statewide Report (IDFG 2013):

- In the Beaverhead Range, the Snakey Canyon domestic sheep allotment (USDA Forest Service) overlaps with bighorn sheep range in Idaho Game Management Unit 59a.
- Observations of 30 bighorn sheep in the Beaverhead range occurred in 2007.
- There is no current population estimate for this PMU, but incidental observations appear to show a decline in bighorn sheep numbers since the mid-1990s. Four bighorn sheep (1 ram and 3 ewes) were radio-collared in the south Beaverhead PMU during 3 capture efforts in December 2011 and January and February 2012. Management direction is to maintain populations and increase them in areas of the PMU where separation can be maintained.

- There have been no bighorn hunts in the South Beaverhead PMU and none are planned until the population increases enough to allow hunting.
- More information is needed to manage this population; including use areas, seasonal movements, a population estimate, survival rates, and production. IDFG will use the information gathered from the satellite GPS collars to look at spatial and temporal use of the area and to evaluate the Payette Summer Habitat Model that was used to predict habitat in the Statewide Bighorn Sheep Management Plan.
- Bighorn sheep are known to occupy the west side of the Beaverhead Mountains in the winter months, while the Sheep Station grazes domestic sheep on the east side of Beaverheads (Snakey/Kelly allotments) November through January. Based upon the most current Idaho Department of Fish and Game (IDFG) telemetry data for collared rams and observational bighorn sheep data through 2014, there are 10 data points within approximately one mile of western and southern boundaries of the Snakey-Kelly Allotment and one within the western allotment boundary, roughly two linear miles from the east side allotment boundary. Eight of the observations, including the one within the allotment boundary, are attributed to a single ram between November 18 and November 20, 2015. This period of time overlaps the Snakey-Kelly Allotment season of use. Although this suggests potential for contact between wild and domestic sheep on the Snakey-Kelly Allotment, there is currently no documented interaction/contact between domestic sheep and bighorn sheep on these allotments. However, there was one incident where a stray domestic sheep was observed three linear miles from bighorn sheep and a Sheep Station employee subsequently removed the domestic sheep.

Existing Measures to Prevent Contact Between Wild and Domestic Sheep on the Snakey-Kelly Allotment

Measures are in place to minimize contacts between wild and domestic sheep. These measures include the full-time presence of herders and guard dogs and daily early morning and late evening patrolling and scanning, with binoculars/spotting scopes, of the planned grazing-area perimeters. In the event bighorn sheep are spotted, whether nearby or far off, herders will immediately contact ARS supervisors, and ARS supervisors will contact the U.S. Forest Service District Ranger and await instructions. In the meantime, herders will monitor the movement of the bighorn sheep and record the day and time of event, location, number and sex of sheep, and approximate distance of the bighorn sheep from the domestic sheep. This information will be reported immediately to ARS supervisors and U.S. Forest Service District Ranger. The Sheep Station will comply with any immediate requests of the Forest Service.

Bighorn Sheep Direct/Indirect Effects

Modified Alternatives 1, 3, and 4

Effects from activities in these three alternatives are the same since each proposes similar livestock grazing and associated activities near occupied bighorn sheep habitat. Bighorn sheep are not directly affected by grazing on any of the ARS properties, because bighorn sheep do not occur there and are not expected to due to distance and separation by non-habitat. The Hilgard bighorn herd in Montana (Lionhead Herd in Idaho) is over 17 miles away from the nearest ARS property (Summer East pasture), and the Tendoy bighorn herd also in Montana is over 23 miles away from the Humphrey property. Similarly, the South Beaverhead heard is roughly 20 miles away from the headquarters and Humphrey properties. Interaction between domestic sheep on ARS properties and existing bighorn sheep herds is not known or expected to occur.

Domestic sheep grazing by ARS on National Forest System (Snakey/Kelly allotments) has the potential to negatively affect the Idaho bighorn herds reintroduced into the Beaverhead range. Due to the proximity of the bighorn herd near and within the Snakey Kelly Allotment and season of use by ARS domestic sheep,

it is possible bighorn sheep and domestic sheep could be in contact with each other for a short period of time. This could result in negative effects to the Beaverhead herds if the contact resulted in disease transmission. However, measures are in place to minimize this risk, as described above.

Alternatives 2 and 5 Direct and Indirect Effects

ARS would no longer conduct Sheep Station sheep grazing on the Snakey/Kelly allotment in both alternatives 2 and 5. Alternative 2 eliminates all domestic sheep grazing by the Sheep Station while alternative 5 eliminates grazing in the National Forest System Snakey/Kelly allotments.

Grazing activities on ARS properties are not known or expected to affect the existing Tendoy, Hilgard/Lionhead, or South Beaverhead bighorn sheep herds, so the alternatives would not change the condition of these bighorn sheep herds.

Ending Sheep Station sheep grazing on the Snakey/Kelly allotments would not completely eliminate this potential source of infection to bighorn sheep in the Beaverhead Mountains because this allotment would still be open to sheep grazing by subsequent permit applications.

Bighorn Sheep Cumulative Effects

The spatial boundary for the discussion of cumulative effects for bighorn sheep is the upper Snake River Region in Idaho as well as the Montana portion of the Centennial Mountain Range, because this area encompasses all Sheep Station grazing activities that occur in occupied and potential bighorn sheep habitat, and considers state management objectives for known bighorn herds in the area. The temporal boundary is 10 years because projections beyond this time period are less likely to be accurate.

The cumulative effects boundary overlaps several bighorn sheep PMUs. Potential threats to bighorn sheep and their habitat include: possibility of disease transmission from contact between bighorn sheep and domestic sheep and goats on public and private lands; conifer encroachment that fragments or degrades habitat; degradation of habitat by noxious weeds that reduce the variety and density of more palatable and nutritious native forage species; disturbance associated with human recreation; competition with other grazers, both native and introduced, particularly on shared ranges during winter and when availability of high-quality forage is restricted by forage dessication; disease transmission, toxic water quality, increased predation risk, and introduction and expansion of nonnative species associated with water developments; and habitat fragmentation or loss, increased human activity, vehicle collisions, disruption of seasonal migration patterns, and increased likelihood of parasite and disease transmission associated with urban development (IDFG 2010).

The contribution of ARS grazing activities to threats to bighorn sheep and their habitat are expected to be focused on the Snakey-Kelly Allotment due to distance of ARS properties from bighorn sheep herds and non-habitat between them.

Although Sheep Station grazing on the Snakey-Kelly Allotment could contribute to possibility of disease transmission to or competition with bighorn sheep, at this time, the expected level of the effects for grazing by ARS on National Forest allotments is not expected to contribute to overall cumulative effects in a way which is detrimental to bighorn sheep management in this portion of Idaho and Montana considering the following points:

- Grazing Sheep Station sheep near occupied bighorn sheep habitat includes the presence of guard dogs and full-time sheep herders, actively watching for bighorn sheep, which affords additional protection measures to reduce the possibility of actual contact between bighorn and domestic sheep.

- In the event bighorn sheep are spotted, herders will immediately contact ARS supervisors, and ARS supervisors will contact the U.S. Forest Service District Ranger and await instructions. The Sheep Station will comply with any immediate requests of the Forest Service.

There are no known or foreseeable planned bighorn sheep reintroductions in any of the areas grazed by the Sheep Station. The proposed action and its alternatives do not preclude bighorn sheep reintroductions; however domestic sheep grazing is one variable that influences sites chosen for reintroduction. Although the risk of contact from Sheep Station activities overlapping bighorn sheep range can only be completely eliminated in alternative 2, additional sources for spread of respiratory disease occur throughout known or suspected bighorn sheep range. Thus, bighorn populations are expected to continue in their current condition and trend, regardless of which alternative is selected.

Greater Sage-grouse (*Centrocercus urophasianus*)

Greater Sage-grouse Affected Environment

Sage-grouse are common on low elevation lands of the Sheep Station, particularly the Headquarters. Annual lek route surveys indicate that sage-grouse habitat on the Headquarters continues to attract numerous sage-grouse for breeding and nesting. The area falls within the Upper Snake Sage-grouse Planning Area identified by the Idaho Department of Fish and Game and the Snake-Salmon-Beaverhead, Idaho, Population of the Snake River Plain Management Zone as identified by Western Association of Fish and Wildlife Agencies (WAFWA). Season length and bag limits have been reduced in Upper Snake Sage Grouse Planning Area following the Hunting Season and Bag Limit Guidelines identified in the 2006 State Plan (Idaho Sage-grouse Advisory Committee 2006). The Idaho grouse hunting season is currently very short and opportunities are limited to areas of southern Idaho. The Upper Snake Sage Grouse Planning Area is located in Area 2. This area is currently restricted to a seven-day season with a one-bird daily bag limit.

This analysis synthesizes information pertinent to the local area including a review of the *Conservation Plan for the Greater Sage-grouse in Idaho* (Idaho Sage-grouse Advisory Committee 2006), Idaho Governor's Sage Grouse Plan (Idaho Governor's Sage-grouse Task Force 2012), *Idaho Sage-grouse Local Working Group's Statewide Annual Report* (Idaho Sage-grouse Advisory Committee 2015, and sage-grouse lek survey data collected on ARS properties. Field visits were conducted in 2008 and 2009 to gather additional information regarding vegetation conditions (summarized in the range resource report), fire disturbance history, and to review habitat conditions and issues with area biologists.

The 2015 status review conducted by the Fish and Wildlife Service found that the greater sage-grouse remains relatively abundant and well-distributed across the species' 173-million acre range and does not face the risk of extinction now or in the foreseeable future http://www.fws.gov/greaterSageGrouse/findings.php. The Service's decision follows an unprecedented conservation partnership across the western United States that has significantly reduced threats to the greater sage-grouse across 90 percent of the species' breeding habitat. The Service has determined that protection for the greater sage-grouse under the Endangered Species Act is no longer warranted and is withdrawing the species from the candidate species list.

The greater sage-grouse occurs in 11 states and two Canadian provinces including: Alberta, California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, Saskatchewan, South Dakota, Utah, Washington, and Wyoming. This bird is widely distributed throughout sagebrush dominated habitats of southern Idaho (Schroeder et al. 1999). A review of greater sage-grouse life history can be found in Connelly et al. (2004). A condensed version of life history specific to Idaho from Idaho Sage-grouse Advisory Committee (2006) is summarized below.

During the spring (normally early March to mid-May), males gather on traditional breeding areas, called leks, for displaying and mating. Females normally begin moving from winter to breeding areas from late February to early March, but actual lek attendance varies somewhat throughout the species range. After breeding, females move away from the lek to establish nests. Evidence suggests that nest sites are selected independent of lek. In Idaho, hens nest an average of 3-5 km (2-3 mi) from their lek of capture but may move more than 18 km (11 mi) to nest.

Three types of seasonal movement patterns have been described for greater sage-grouse: (1) non-migratory; grouse do not make long distance movements (e.g., >10 km (6 mi) one way), (2) one-stage migratory; grouse move between two distinct seasonal ranges, and (3) two-stage migratory; grouse move

among three distinct seasonal ranges. Many sage-grouse populations in Idaho are migratory. Some birds range up to 125 km (77.5 mi) with a home range of 2,764 km^2 (1,067 mi^2). Despite large annual movements, greater sage-grouse show high fidelity to seasonal ranges. Female sage-grouse return to the same area to nest each year and some may nest within 200 m (656 ft) of their previous year's nest.

Greater sage-grouse are dependent on sagebrush/grassland habitats. Breeding habitat (areas used for breeding, nesting, and early brood rearing) is characterized by sagebrush canopy coverage of 15-25 percent with a healthy grass and forb understory. During summer, sage-grouse may use a variety of habitats but are generally found in areas with succulent forbs and insects. Winter habitat consists of sagebrush with 10-30 percent canopy cover. During the winter sage-grouse consume 99 percent sagebrush in their diet. In early spring the diet consists largely of sagebrush and some forbs. During later spring and summer, the bird's diet includes insects and forbs. Clutch size varies from 6-9 eggs and incubation time ranges from 25-29 days. Chicks are precocial and grow rapidly. Breeding is common for yearling hens and yearlings often have smaller clutches than adults. Sage-grouse are typically long-lived (4-5 years is not uncommon) with low reproductive rates compared to other game birds. Survival differs among age and gender groups and adult females tend to have higher survival rates than males or juvenile females.

Statewide threats to sage-grouse in Idaho, ranked in order of significance, include: wildfire, linear infrastructure development (power lines and paved roads), annual grassland, livestock, human disturbance, West Nile Virus, prescribed fire, seeded perennial grassland, climate change, conifer encroachment, population isolation, predation, urban/exurban development, sagebrush control, pesticides, agricultural expansion, sport hunting, mines/landfills/gravel pits, and falconry. In Idaho, wildfire poses a substantial threat to sage-grouse populations and habitat. Habitat threats in the Upper Snake planning area are primarily attributed to conversion to croplands and influences from paved roads and power lines, while wildfire played only a minor role in habitat loss (8% of habitat) between 1990 -2003.

Population Trends

Range-wide

Trends in sage-grouse breeding populations are typically monitored through an index based on the peak count of males attending leks during a given lekking season; however, the inherent bias in data collection and unknown relationship between lek counts and population sizes limits the utility of using lek counts to evaluate range-wide population trends. The potential biases in these trend estimates are unknown, which makes comparisons among areas and time periods difficult. Despite problems associated with the collection and analysis of lek count data, these datasets represent the only long-term data available for analyzing trends in sage-grouse populations. (Nielsen et al. 2015)

A recent independent analysis of the peak male lek attendance data collected across the range of the species shows the average range-wide decline, weighted across management zones, was 2.10% per year, for an average total decline of 66% from 1965-2015. Estimates of trend over 2005-2015 for individual management zones, in both core and periphery areas, indicated that recent annual declines were more severe compared to the average declines over the entire analysis period 1965-2015. Garton et al. 2015 and WAFWA (2015) similarly noted long-term range-wide declines despite different methodology.

Idaho

Based on information in the *Idaho Sage-grouse Local Working Group's Statewide Annual Report* (Idaho Sage-grouse Advisory Committee 2015), statewide, 2015 total males at lek routes was up 7.6% from 2014, and up 3.9% from the previous 5-year average. Trends were mixed among Sage-grouse planning areas. Recent sage-grouse productivity in the Upper Snake has typically been similar to or higher than the statewide average. In 2009 through 2015, the number of active leks in the Upper Snake Sage-grouse

Planning Area ranged between 111 and 126 (table 2). The average number of males per lek ranged between 12 and 18 and the total number of males counted at leks ranged from 1,130 to 1,575.

Table 2. Upper Snake Sage-grouse Planning Area lek route data (2010-2015)

	2010	2011	2012	2013	2014	2015
Number of leks	119	111	123	125	126	125
Average number of males/lek	15	18	16	12	12	12
Total males on 14 lek routes	1,572	1,454	1,361	1,130	1,203	1,131

Based on Nielson et al. (2015), the estimated average population decline in Idaho from 1965-2015 was 1.94%. For Snake River Plain Management Zone, it was 0.06% per year (WAFWA 2015). However, modeling indicated positive trends in average males per lek since 1965 in Wyoming, Utah and Idaho (WAFWA 2015).

Garton et al. (2015) aimed to estimate temporal trends in sage-grouse populations, including forecasting abundance and estimating the probability of extinction. They reconstructed population sizes and fitted a model to the reconstructed data with estimating equations defined by population growth, with the assumptions made about the process evaluated with models fit to the existing data. For the Snake-Salmon-Beaverhead Population, as identified by WAFWA, sampling effort for leks in the population increased by 67.1% to 620 leks up from 321 leks in 2007. The average number of leks counted per year from 2008-2013 was 505 leks, up from 323 leks counted per year on average from 2000-2007. The estimated minimum population size was 6,126 males (SE = 229) which represented a 30% decline from the reconstructed estimate of 8,734 males (SE = 1157) based on counts at 371 leks in 2007. The last 6 years (2007-2013) showed a decline of approximately 39% of average values of males counted in the 70s and 80s.The minimum count of males has a 0.36% (SE 0.3%) chance of declining below 20 males in 30 years. Model weighted probabilities of declining below effective population sizes of 50 (3.3%, SE 2.7%) in 30 and 100 years (16.5%, SE 7.4%) are low.

ARS Properties

The Headquarters, Humphrey Ranch, and Henninger properties are located in priority “key” (K) sage-grouse (“core” habitat zone; CHZ) habitat as mapped by IDFG (2012, 2014, figure 4). The CHZ supports the highest breeding densities and largest populations of sage-grouse in Idaho and, therefore, is the State’s highest priority for conservation efforts and policies to address the primary threats to the species (IDFG 2012). As of 2012, the CHZ encompassed approximately 5.68 million acres, included approximately 65 percent of the known active leks, and were occupied by approximately 73 percent of male sage-grouse counted at leks throughout the Idaho Sage Grouse Management Area. The State’s desired future condition for the CHZ is “maintaining or improving the status of the species within this management zone requires Federal agencies, in conjunction with the State and local partners, to work collaboratively to increase the resiliency of the habitat to disturbances, such as fire, and limit habitat fragmentation only to projects that demonstrate, among other things, a significant high value benefit to the State of Idaho”. The State’s desired management focus is “federal agencies should focus on the maintenance and enhancement of the habitats, population and connectivity areas identified in this zone. Federal agencies need to marshal existing and target future Federal resources to reduce the number and size of wildfires, especially in the Southwest Conservation Zone. The Summer West and Summer East properties are located outside of sage-grouse habitat.”

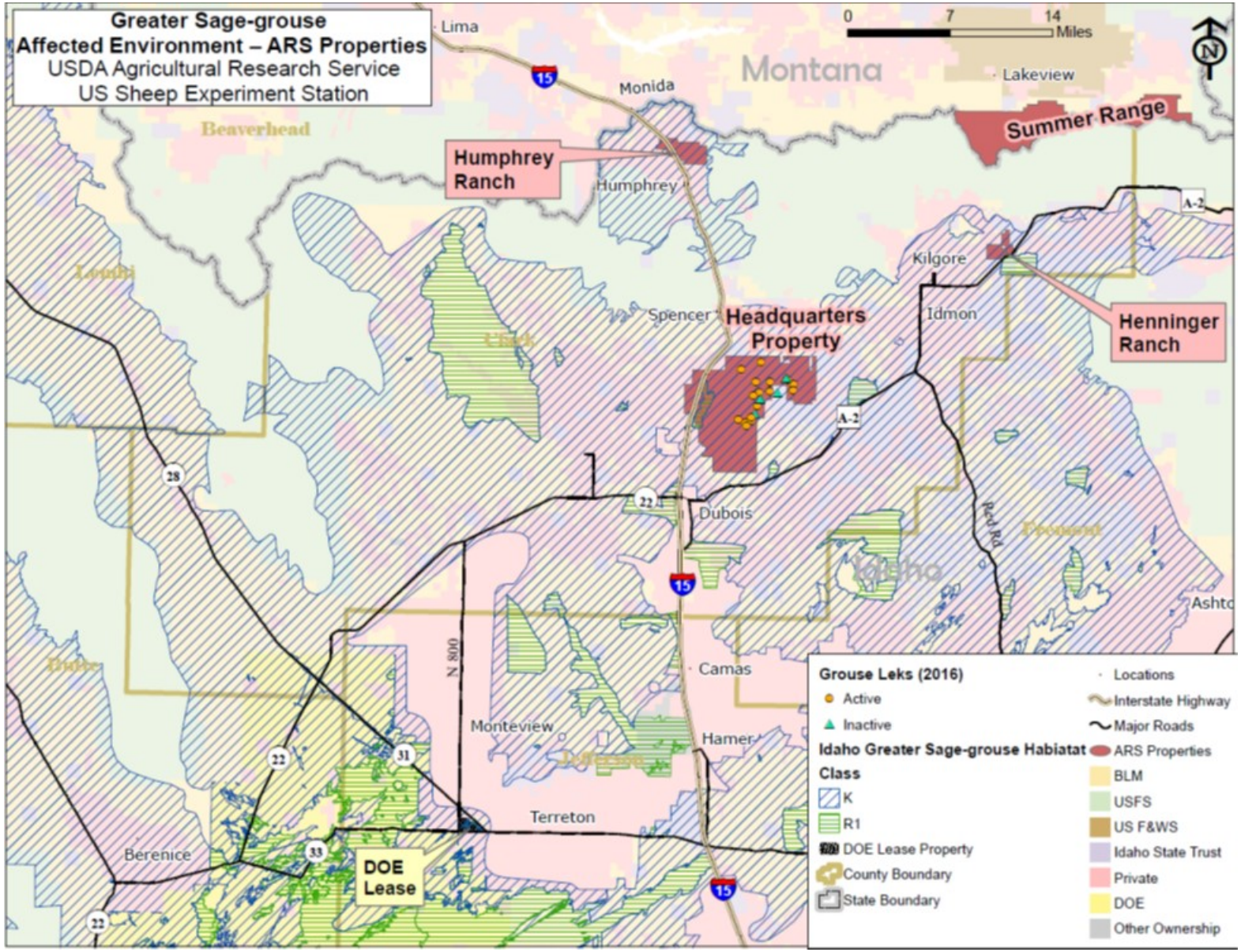

Figure 4. Greater sage-grouse affected environment, ARS properties

Sage-grouse have used the habitat in, on, and around the Sheep Station prior to settlement of the area. Sage-grouse research on the Sheep Station shows that they use the Headquarters area for breeding, nesting, and early brood-rearing activities. In late summer many of the grouse move further north towards Henninger and the foothills of the Centennial mountain range. They spend the late summer and early fall there before returning to the Sheep Station on a gradual migration to the south and lower elevations (such as areas around the Idaho National Laboratory (DOE)). Some sage-grouse stay on the Headquarters property year-round, but most use it seasonally. It plays an important role in population growth and stability as it provides key habitat for pre-nesting, breeding, nesting, and early brood-rearing. Hulet et al. (1986) studied movements and habitat selection of greater sage-grouse at the Sheep Station and found that some birds made very long seasonal migratory movements between the Sheep Station and winter range located towards the Department of Energy Idaho National Laboratory property to the south.

The Sheep Station Headquarters standardized lek route is referred to as “Sheep Station” by the State of Idaho. Although a variety of observers and varying count methodologies have occurred on the Headquarters property since 1966, the State has data from the Sheep Station lek route dating continually from 1996 (IDFG data; table 3). Based on the data, the Sheep Station has had fluctuations in the numbers of active leks and male attendance at leks. However, mean total number of males counted appears to have been below average (235) for 2011-2016.

Table 3. Sheep Station lek route data (1996-2016)

Route Name	Year	Date	Total Of Male Count	Number of Leks Counted	Number of active leks
Sheep Station	1996	01-Jan-96	94	16	3
Sheep Station	1997	01-Jan-97	157	16	4
Sheep Station	1998	01-Jan-98	111	16	3
Sheep Station	1999	01-Jan-99	179	16	6
Sheep Station	2000	01-Jan-00	277	17	9
Sheep Station	2001	01-Jan-01	320	18	11
Sheep Station	2002	01-Jan-02	172	18	9
Sheep Station	2003	01-Jan-03	231	18	13
Sheep Station	2004	01-Jan-04	197	18	11
Sheep Station	2005	01-Jan-05	373	18	13
Sheep Station	2006	01-Jan-06	401	19	12
Sheep Station	2007	01-Jan-07	349	19	12
Sheep Station	2008	22-Apr-08	297	19	10
Sheep Station	2009	20-Apr-09	304	21	11
Sheep Station	2010	20-Apr-10	279	21	10
Sheep Station	2011	25-Apr-11	208	6	6
Sheep Station	2012	4/8/2012	218	20	11
Sheep Station	2013	14-Apr-13	165	21	7
Sheep Station	2014	01-Apr-14	232	21	10
Sheep Station	2015	24-Mar-15	171	21	11
Sheep Station	2016	22-Mar-16	201	21	13

There are about 180 miles of pasture fence on the 31,730 acres of the Headquarters Range, Humphrey Ranch, and Henninger Ranch properties. Fence locations, including exclosures, are shown on Map 3 through Map 8 in the FEIS. Most fences are constructed with woven wire on the bottom and barbed-wire strands above. All fences are inspected and repaired annually, which includes replacing decaying posts and wire and removing non-functional fences and related materials.

Sage-grouse are adapted to landscapes with few vertical obstructions or features but currently inhabit areas with many miles of fence (Connelly et al. 2004). Fences can influence predator movements or facilitate the spread of exotic plants (Connelly et al. 2004). Fences and other structures can also pose a hazard to sage-grouse, as they can provide perch sites (posts) for raptors, or grouse may be injured or killed as a result of collisions with wires (Connelly et al. 2004). Fences in proximity to occupied leks or other important habitats or that bisect movement corridors (e.g., low areas or passes used during migratory movements) may be of particular concern (IDFG 2006).

However, IDFG (2006) also acknowledges, while fences pose some potential threat, they are often useful in the development and implementation of grazing management programs intended to achieve overall improvement of sage-grouse habitats. In grazed areas, fences may be used to enhance late brood habitat through exclusion of spring sources and creation of riparian pastures where grazing use can be more carefully controlled. Since the impact of individual fences has not been quantified, grazing managers should consider new or existing fences on a site-specific basis relative to sage-grouse. Idaho Governor's Sage Grouse Plan (Idaho Governor's Sage-grouse Task Force 2012)

Existing Measures to Minimize Effects of Sheep Grazing Activities

There are a number of conservation measures employed by the Sheep Station to minimize effects of sheep grazing and proposed activities. They include the following:

- Most leks have been identified on the ground and have previously been inventoried on an annual basis. As a result, the Sheep Station is able to closely monitor sage-grouse breeding populations and submit data to Idaho Game and Fish personnel.
- The Sheep Station employs a grazing strategy that avoids using active lek sites during the courtship season. During the period when leks are active, temporary troughs for watering sheep are specifically placed in locations and pastures without leks, in order to avoid disturbance. Also, full time sheep herders manage the daily movements of sheep and, thus, are able to assist in keeping sheep away from active leks.
- After courtship season, the temporary water troughs are specifically placed in sites that previously had active leks. Concentrated sheep activity keeps shrub encroachment to a minimum, ensuring that leks persist annually and do not become overgrown with big sagebrush.
- Sheep are moved rapidly through pastures which results in minimal disturbance to nesting or brood rearing sage-grouse that might be in the area, and utilization on forbs and grasses remains light. Pasture sizes on the Headquarters vary between approximately 640 acres to 1100 acres, and sheep are moved through a pasture in six or seven days.

Fire History in Sage-grouse Habitat

Both wildfire and prescribed fire to improve range land has occurred on the headquarters property with records dating back to 1936. As part of ongoing research activities, the Sheep Station burns portions of the Headquarters Range that are required to test research hypotheses. The actual burned area over the past 30 years was 6,054 acres: 10 prescribed burns totaling 4,616 acres and 4 wildfires totaling 1,437 acres. Past prescribed burns ranged from 226 to 758 acres in size (figure 5). Burns have occurred within a

patchy mosaic, each area burning no more than once between. Dense sagebrush cover remains across the Headquarters property.

Research conducted on the Headquarters property includes shrub cover change in response to fire in a mountain big sage-brush community over a 70-year period (Moffet et al. 2015). Using landscape-scale sampling methods and an extensive fire chronosequence, models describing the response of sagebrush, bitterbrush, and horsebrush to time since last burn (TSLB) were developed. Overall, cover for all shrub species had two distinct response phases relative to TSLB.

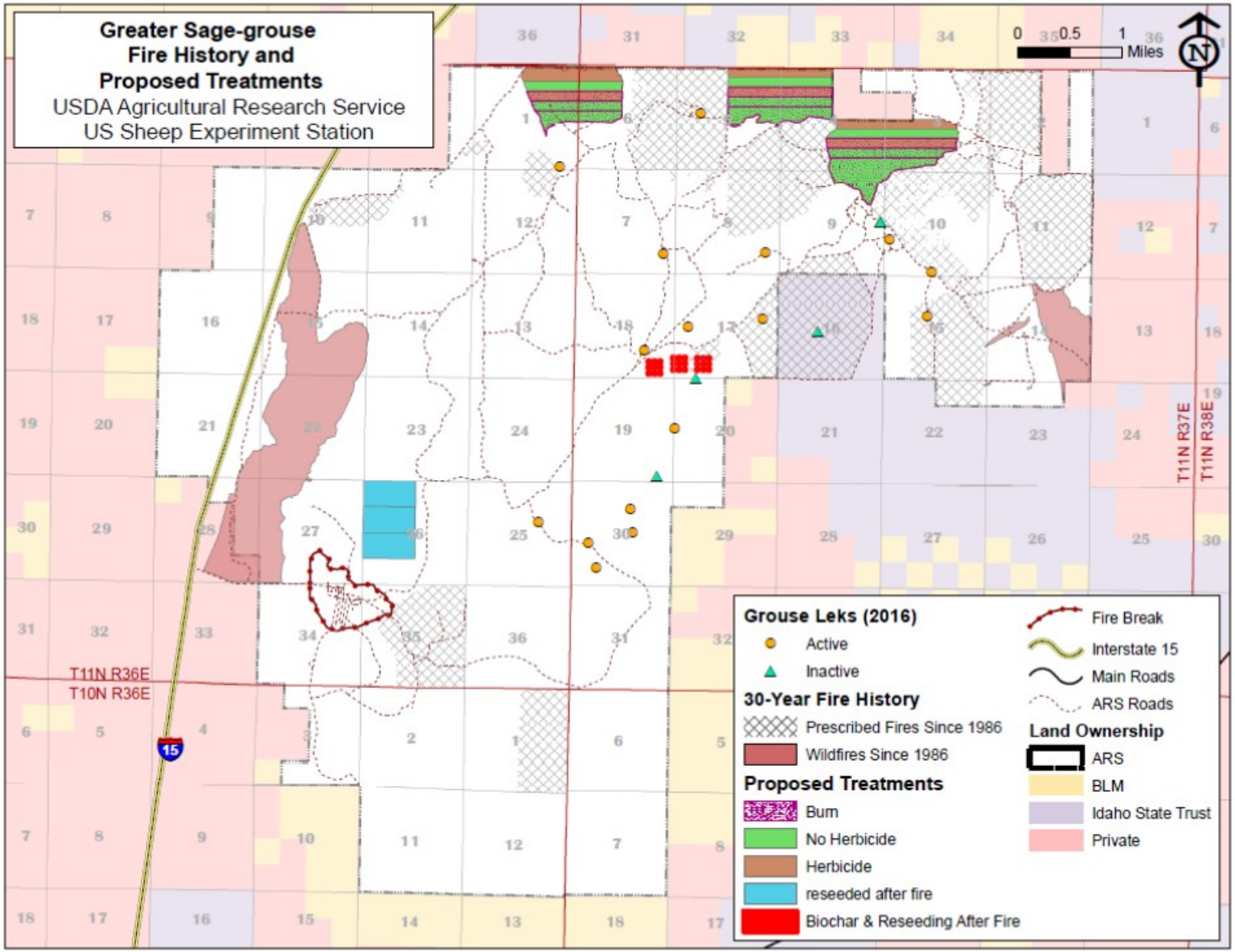

Figure 5. ARS Headquarters Property fire history and proposed treatments in greater sage-grouse habitat

In Phase 1 (when shrub cover changes with each year since the burn), cover changed as a function of time since last burn and sagebrush cover increased each year until it reached steady-state at 19 (± 1.9 SE) year TSLB. In Phase 2 (when expected shrub cover no longer increases or decreases as a result of more years since the burn), cover is unrelated to TSLB. These results, for the most part, agree with previous reports of shrub cover changes after fire in mountain big sagebrush communities.

Pedersen et al. (2003) modeled the effects of sheep grazing and fire on sage-grouse populations in higher elevation (4,800- 5,400 ft) breeding habitat characterized by mountain big sagebrush (with stands of threetip sagebrush also present) and winter habitat characterized by black sagebrush. Mean (±1 S.D) sage grouse population (n=12) size during spring (week 10) of the last year of the simulation for each of 30 possible combinations of grazing intensity, fire size, and fire frequency resulted in relatively stable population sizes under a small fire, low fire frequency, and light grazing intensity scenario. With respect to fire alone, model simulations suggested that frequent (every 17 years) large wildfires (impacting 10% or more of the spring use habitat) are very detrimental to sage-grouse and could cause local extinctions.

Dahlgren et al. (2015) used 25 years of data across three large landscapes in northern Utah and southwestern Wyoming to assess sage-grouse population change and corresponding land management differences in a case study design. All treated sagebrush areas occurred in mid- to high-elevation breeding and summer habitats and were designed in a mosaic pattern. Sage-grouse lek counts at the Deseret Land and Livestock (DLL) study site increased relative to surrounding populations corresponding with the implementation of small-acreage sagebrush treatments, including prescribed fire, designed to reduce shrub cover and increase herbaceous understory within a prescriptive grazing management framework. The higher lek counts were sustained for nearly 15 years. However, with continued sagebrush treatments and the onset of adverse winter conditions, DLL lek counts declined to levels consistent with surrounding areas. They found low-intensity prescribed fire can create mosaics favorable to sage-grouse, but cautioned that resulting benefits to herbaceous cover may not persist if pastures do not receive periodic growing season rest.

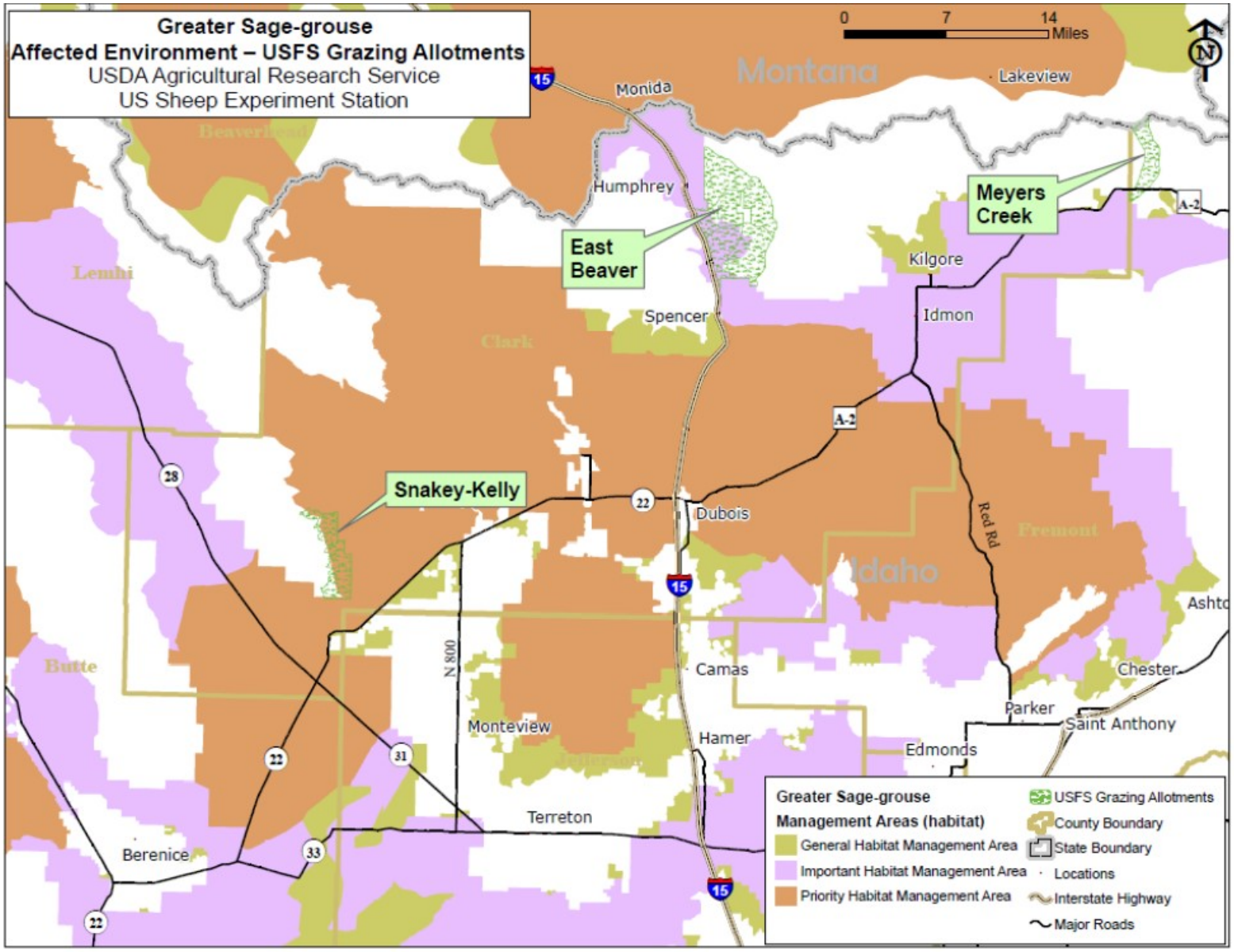

Figure 6.Greater sage-grouse affected environment, U.S. Forest Service grazing allotments grazed by ARS sheep

U.S. Forest Service Grazing Allotments (Snakey-Kelly and East Beaver Allotments)

The Snakey-Kelly and East Beaver Allotments are located within greater sage-grouse habitat while the Meyers Creek Allotment is not (figure 6). The Forest Service recently amended its land management plans for all forests occurring within the range of greater sage-grouse to provide direction for the conservation of greater-sage grouse. The Snakey-Kelly Allotment is almost entirely within the Primary Habitat Management Area[7] and East Beaver Allotment overlaps Important Habitat Management Area[8]. The desired condition for the Greater Sage-Grouse Idaho and Southwest Montana Plan Amendment includes landscape level, human disturbance, sagebrush and conifer canopy cover, and vegetative structure components (USDA Forest Service 2015b). All relevant Record of Decision standards and guidelines are applicable to ARS Sheep Station grazing on Snakey-Kelly and East Beaver Allotments as directed by the District Ranger.

Greater Sage-grouse Direct and Indirect Effects

Modified Alternative 1 - Proposed Action

This alternative would continue grazing practices as currently constituted. From mid-January to mid-April there would be no effect to sage-grouse, because all sheep would be on the Headquarters feedlots. From mid-April through mid-June, 3,300+ sheep would be grazing the Headquarters pastures. Although this could affect sage-grouse breeding, nesting, and early brood-rearing activity, conservation measures are in place that would minimize impacts and interactions of sheep with sage-grouse by avoiding leks, known nesting areas, and known early brood-rearing areas. Therefore, the effects to sage-grouse during this period would not greatly reduce productivity. From late June to early July (2 weeks) about 2,000 sheep would be moved north to graze on the Henninger ranch property. Local data shows that some sage-grouse move toward this area as early as late June. There would be some displacement of sage-grouse on this 1,100 acre property during this two week period. However, key sage-grouse habitat is available on State Trust and private lands adjacent to all but the southeastern corner of the Henninger ranch (figure 4). The remaining 1,300 sheep not on Henninger would be split between two areas: Humphrey ranch and East Beaver (both of which contain very little productive sage-grouse habitat because of their higher elevation). There would be minimal negative effects of displacement of grouse in these areas and overall effects to productivity, movements, or migrations would be minor.

From September to November all of the sheep return to the Headquarters pastures. This coincides with the movement and flocking of the grouse to the Headquarters range in their normal movements to lower elevations preparatory to winter. Some temporary displacement would occur as grouse avoid sheep herds. However, during the autumn season sage-grouse diets are rapidly changing to almost 100 percent utilization of sagebrush, so any dietary overlap with sheep would be minimal. Very few sage-grouse utilize the winter habitat near where sheep would be grazing on Snakey Kelly because it is suboptimal with salt desert shrub habitat being more dominant, and therefore the effects would be negligible.

[7] National Forest System lands identified as having highest habitat value for maintaining sustainable greater sage-grouse populations. The boundaries and management strategies for priority habitat management areas are derived from and generally follow the preliminary priority habitat boundaries. Priority habitat management areas largely coincide with areas identified as priority areas for conservation in the Conservation Objectives Team report.
[8] High value habitat and populations that provide a management buffer for the priority and sagebrush focal management areas and connect patches of priority and sagebrush focal management areas. The areas encompass areas of generally moderate-to-high conservation value habitat and/or populations and in some Conservation Areas, include areas beyond those identified by U.S. Fish and Wildlife Service as necessary to maintain redundant, representative, and resilient populations. The areas are typically adjacent to priority and sagebrush focal management areas but generally reflect somewhat lower greater sage-grouse population status and/or reduced habitat value due to disturbance, habitat fragmentation, or other factors.

All proposed prescribed fire treatments would occur in the fall. Targeted burn intensity is low and burned areas would be rested from grazing (B. Taylor personal communication). Planned prescribed fire would initially create a temporary loss of nesting, brood-rearing, fall, and winter habitat for sage-grouse in the 160 acre patches totaling 700 acres over the 5 years of planned burns. This small loss of habitat would temporarily displace grouse for a 5-10 year period until shrubs begin to reestablish and the areas return to use by brood-rearing grouse. It would take a total of 20-40 years for each burned area to return to a later mid-seral or pre-burn state. This may cause grouse to shift use of traditional areas until the area has recovered or provides optimal herbaceous requirements during each specific season of use. Given that the proposed acreage is minimal compared to the large amount of similar habitat available across the 27,930-acre Headquarters property, these small scale fires would impact only about 2.5% of key sage-grouse habitat on the Headquarters property. Benefits to habitat overall would be derived from activities that increase a mosaic of shrubs, forbs, grasses; and maintain lek sites. There would be less desirable effects from temporary displacement of grouse and seasonal dietary overlap of grouse and sheep.

Although fences on ARS properties may facilitate the spread of exotic plants, facilitate predation, or result in collisions of grouse with wires, the majority of pasture fences on the Headquarters Property are located on the southern portion of the property away from the majority of documented leks and most pasture fences at least one-half mile from known leks. Sheep grazing tends to prevent many weeds from becoming established. Some weed species have spread over time on to ARS properties from adjacent lands where cattle graze. Weed locations are recorded on maps as they are found. Invasive plant species infestations are mapped and are targeted for treatment using an adaptive management/integrated pest management approach. Furthermore, the State of Idaho’s desired future condition for the Federal agencies within the CHZ is to maintain or improve the status of greater sage-grouse by working collaboratively with State and local partners to increase the resiliency of the habitat to disturbances and limit habitat fragmentation only to projects that demonstrate, among other things, a significant high value benefit to the State of Idaho (Idaho Governor's Sage-grouse Task Force 2012). ARS research on domestic sheep grazing provides a significant high benefit value to the State of Idaho.

Given grazing conservation measures in place, combined with small, low-frequency proposed prescribed burns and post-burn area resting, proposed actions are not expected to impact sage-grouse population stability. The overall balance between positive and negative effects to grouse would have a fairly neutral result. Sage-grouse populations would be maintained at levels similar to those present, and habitat on the Sheep Station would be maintained in a healthy condition overall and well distributed.

Alternative 2

Alternative 2 represents the no grazing alternative with a 65 percent reduction in the total number of sheep grazed, with remaining sheep maintained in feed lots. Grazing would be discontinued on all other properties. The direct and indirect effects to sage-grouse could be both beneficial from reduced grazing, and detrimental where vigorous forb and herb cover is decreased. A study performed on the Sheep Station (Bork et al. 1998) showed that areas of fall sheep grazing exhibited significantly greater live forb and herb cover than at control plots, and areas of spring sheep grazing exhibited significantly greater live shrub cover than control plots. Each of these components of sage-grouse habitat would be somewhat reduced, and the mosaic across the landscape would decrease to a moderate extent over the long term. However, displacement of sage-grouse from habitat and associated behavioral disturbances from livestock would be reduced. Overall, many of the potential benefits of reduced livestock would likely be offset by the loss of a mosaic among forb, grass, and shrub cover no longer created through Sheep Station activities.

Modified Alternative 3

The effects of alternative 3 differ from those of the proposed action. The differences are in the details of the temporal grazing in Henninger and at Headquarters and the 20 percent reduction of total numbers of sheep from modified alternative 1. Instead of high-intensity short-duration grazing on Henninger, this alternative would result in low-intensity long-duration grazing. It would allow 340 sheep to graze from early June to sometime in mid-September when they would bring about 200 head back to Headquarters. The effects of longer duration grazing, even with fewer sheep, could cause long-term avoidance of that area by sage grouse during the season of sheep use. The direct effects of displacement on Henninger would be more pronounced than a two-week high intensity use of the area. The indirect effects of having low-intensity and long-duration grazing would be decreased forb availability and abundance for sage-grouse. Sheep would have a longer duration to select for and thereby reduce succulent forbs important to post-nesting hens and new chicks. This alternative would place a large number of sheep (2,300-2,640) on the Headquarters pastures for a longer period of time causing additional detrimental effects to sage-grouse productivity during the nesting and brood-rearing seasons. It would be more difficult to implement avoidance conservation measures prescribed in those areas because of the increased duration of grazing in occupied habitat. The direct impacts could include disruption of nesting and brood-rearing activities, as well as seasonal (rather than short term temporary) displacement to suboptimal habitats. In addition, indirect impacts of long-term grazing plus prescribed fire would result in decreased forb abundance and diversity.

Modified Alternative 4

The effects of alternative 4 are the same as those of the proposed action (modified alternative 1) until early July through September. During that time, to minimize potential conflicts with grizzly bears, 2000 sheep would not graze the Summer Pasture (Toms) creek or Meyers Creek (National Forest System land), but would instead be placed in the West Pasture (Odell and Big Creek) on the Centennial range. Due to the fact that very few sage-grouse use the area and the habitat found throughout the Centennial range is interspersed with conifers, the direct and indirect effects to sage-grouse of this alternative are the same as the proposed action and any differences are negligible.

Modified Alternative 5

The effects of modified alternative 5 are similar to the proposed action. However due to the 30 percent reduction in total sheep numbers (from 3,330 to 2330), less disturbance would occur during the breeding and brood-rearing season. The conservation measures in place would largely neutralize these effects. In addition the sheep would not be grazed southwest of Headquarters at Snakey Kelly allotments, but would instead be put in the feed lot from October into April. This change in winter grazing would have negligible effects on sage-grouse or their habitat, so the effects would remain similar to those of Modified Alternative 1, but reduced because of fewer sheep numbers.

Greater Sage-grouse Cumulative Effects

The spatial boundary for the discussion of cumulative effects for sage-grouse is the Upper Snake Sage Grouse Planning Area because it is the population boundary as managed by the Idaho Department of Fish and Game. The temporal boundary is 10 years, because projections beyond this time period are similar to those being described but with decreased precision. As previously described, habitat threats in the Upper Snake Planning Area are primarily attributed to conversion to croplands and influences from paved roads and power lines, and, to a lesser degree, wildfire (Idaho Sage-grouse Advisory Committee 2006).The expected level of effects from this project would not combine with overall cumulative effects in a way that is detrimental maintaining healthy sage-grouse populations and habitat in the Upper Snake Planning Area, considering the following points:

- The Sheep Station is involved in addressing the management strategies and practices that enhance and conserve rangeland ecosystems under changing environmental conditions. They do this by evaluating the effects of fire (fire season, fire interval, and fire size) on post-fire recovery of sagebrush and other vegetation and, more specifically, developing science-based grazing and prescribed burn management strategies and decision support systems that can be used to guide managers to maintain or improve the ecological function of western rangelands.
- No new road construction is planned under this decision.
- There are eight miles of transmission line on ARS Headquarters property. Although Idaho Power is currently upgrading its existing transmission lines through the Headquarters Property, this line upgrade is occurring within the existing transmission line right of way. Line upgrade or reconstruction would be accessed by existing roads and no additional towers would be constructed. Short term, minor disturbance would occur at temporary pulling and tensioning sites, material staging sites, and splicing sites. An estimated five or six pulling, tensioning and splicing sites would affect vegetation and soil on about six acres. Native vegetation would be retained or reestablished after upgrade operations are complete.

Consistency with Idaho Governor's Sage Grouse Plan (Idaho Governor's Sage-grouse Task Force 2012)

The State's desired future condition for the CHZ is "maintaining or improving the status of the species within this management zone requires Federal agencies, in conjunction with the State and local partners, to work collaboratively to increase the resiliency of the habitat to disturbances, such as fire, and limit habitat fragmentation only to projects that demonstrate, among other things, a significant high value benefit to the State of Idaho". The State's desired management focus is "federal agencies should focus on the maintenance and enhancement of the habitats, population and connectivity areas identified in this zone. Federal agencies need to marshal existing and target future Federal resources to reduce the number and size of wildfires, especially in the Southwest Conservation Zone.

The action alternatives are consistent with the Idaho Governor's Sage Grouse Plan for the CHZ, particularly with respect to Sheep Station research activities contributing to National Program 215 that include evaluating the effects of fire (fire season, fire interval, and fire size) on post-fire recovery of sagebrush and other vegetation.; evaluating selective herbicide treatment as an alternative to fire to restore sagebrush in areas where fire has been suppressed and sagebrush is becoming decadent; evaluating post-fire grazing strategies that are sustainable, complement healthy post-fire recovery of shrub communities, and provide suitable habitat for sage grouse and other wildlife; evaluating the utility of various plant products in restoring mechanically degraded sites (e.g., barrow pits) and improving compromised, three-tip sage-dominated grazing pastures; validating the utility of remote sensing for assessing vegetation (including exotic weeds) across extensive landscapes; and developing range management programs and solutions that result in sustainable livestock enterprises, which contribute to our nation's food security while conserving and protecting critical ecosystem services derived from rangelands.

Pygmy Rabbit (*Brachylagus idahoensis*)

Pygmy rabbit was found to be "not warranted for listing" by the USDI Fish and Wildlife Service in September, 2010 (USDI Fish and Wildlife Service 2010).

The effects to pygmy rabbits under alternatives 1, 4, and 5 are similar. Temporary displacement of pygmy rabbits would occur in these alternatives. Pygmy rabbits would persist with population numbers and trends similar to the current condition, considering that they still exist in the same areas they were found in the 1950s, despite the last 50 years of grazing and land management in the area. From mid-March through mid-May, conservation measures taken to avoid sheep/grouse interactions on leks could create increased disturbance to rabbits. As areas close to leks are avoided, thicker more dense patches of sagebrush habitat may be used. This could directly impact feeding and/or breeding activities of rabbits. Only minimal dietary overlap between sheep and rabbits would occur, so the effects would be negligible. Because pygmy rabbits live in older, taller, denser stands of sagebrush and mixed shrubs, prescribed or wildland fires can eliminate, fragment, or degrade portions of pygmy rabbit habitat until shrub cover returns to a mature state. A study in Utah at similar elevations showed that pygmy rabbits would only venture 50 meters from the edge of mechanical treatments. Prescribed fire research in occupied pygmy rabbit habitat should consider design features that include narrow burn strips or an unburned sagebrush matrix to allow for continued occupancy by pygmy rabbit. Modified alternative 3 grazes a larger number of sheep at Headquarters for a longer duration. The effects of that alternative would be a longer temporal disturbance with additional displacement of pygmy rabbits. Alternative 2 would eliminate any interaction with or displacement of rabbits because all of the sheep would be on feedlots.

Pygmy Rabbit Affected Environment

The pygmy rabbit was found not warranted for federal listing by the USDI Fish and Wildlife Service in 2010. A condensed version of life history specific to Idaho from the Idaho Fish and Game Comprehensive Wildlife Conservation Strategy (2006) is summarized below.

The pygmy rabbit is a sagebrush obligate inhabiting areas characterized by cold winters, warm summers, and scant precipitation. Elevations range from 900-2380 m (2800-7800 ft). Habitat comprises dense, tall stands of big sagebrush growing on deep, friable soils that allow the rabbits to dig rather extensive burrow systems (Janson 2002). Landscape features includes alluvial fans and hillsides, swales within rolling topography, floodplains, brushy draws, riparian channels, edges of rock and lava outcroppings, and mima mounds (low, circular mounds of loose, unstratified soils that support distinctly taller patches of sagebrush). Sagebrush is the primary food item of pygmy rabbits and may comprise up to 99 percent of the winter diet (Green and Flinders 1980). Native forbs and grasses comprise a larger proportion of the diet (30-40 percent) in spring and summer. Under deep snow conditions, dense and structurally diverse stands of big sagebrush facilitate subnivean burrowing, providing access to forage and protection from predators and thermal extremes (Katzner and Parker 1997).

This species occurs in the Great Basin and adjoining intermountain regions. Populations are widely scattered across this landscape in association with tall, dense sagebrush aggregations with deep, loose soils of alluvial origin that allow burrowing. In Idaho, pygmy rabbits occur across the southern half of the state. The species is considered rare in Idaho, though data on abundance and population trends are generally lacking. Recent surveys for presence of pygmy rabbits have augmented statewide distribution data and documented relatively abundant populations in localized areas.

Loss, alteration, and fragmentation of sagebrush-steppe habitat and apparent declines in pygmy rabbit populations have elevated concern for this species (Knick and Rotenberry 1995). Since settlement by Europeans, sagebrush-steppe landscapes in Idaho and across the sagebrush biome have been greatly

altered, resulting in loss and fragmentation of habitat for many sagebrush obligate species, including the pygmy rabbit. Agents of habitat loss and degradation include agricultural conversion, urbanization (and related infrastructure networks), prescribed and wildland fire, invasive plants (e.g. cheatgrass), conifer encroachment, vegetation treatments that remove sagebrush, and unsustainable livestock grazing (Connelly et al. 2004). Fragmentation of pygmy rabbit habitat has implications for this small mammal with limited dispersal capabilities, including reducing overall population size, isolating disjunct populations, increasing susceptibility to disease and other localized threats, and reducing gene flow among populations (Gilpin 1991).

Although extensive data on population numbers and the current distribution are somewhat lacking, research in the late 1970s showed that pygmy rabbits occurred on portions of ARS properties and they were abundant in those locations. Limited data obtained from the Idaho Department of Fish and Game showed four different point locations for pygmy rabbits on ARS properties and many locations on lands adjacent to the ARS properties. Suitable habitat exists not only on ARS properties, but on adjacent BLM, National Forest System, DOE Idaho National Laboratory, and private lands. The range assessment on ARS properties (July 2009) showed that two of the seven sites measured on ARS properties have similar shrub cover components to those measured on ARS properties in the late 1970s where pygmy rabbits occurred.

Pygmy Rabbit Direct and Indirect Effects

Modified Alternative 1 - Proposed Action

This alternative would continue grazing practices as currently constituted. From approximately mid-January to mid-April there would be no effect to pygmy rabbits, because all sheep would be on the Headquarters feedlot. Temporary disturbances to rabbits would begin as sheep are released to graze in the Headquarters pastures in mid-April. This disturbance may be exacerbated when sheep are moved to avoid interactions with grouse on leks. This may move sheep into areas of thicker more dense patches of sagebrush habitat, which, if occupied, are key to pygmy rabbit survival. This could also have small direct impacts on feeding and/or breeding activities of rabbits. There is very little dietary overlap between sheep and pygmy rabbits, so lasting effects of grazing to the vegetation needed by pygmy rabbits would be negligible.

From June through mid-September sheep would be grazing on the Henninger, Humphrey, and East Beaver pastures to the north. Pygmy rabbits are not expected to occur in these areas because of the habitat changes associated with higher elevations and soil types. No effect to pygmy rabbits is expected from activities in these pastures. During mid-September through mid-October, while all sheep are back on the Headquarters pastures there would be some displacement of pygmy rabbits or disruption of normal behaviors, but the effects would be minor. Late fall/winter grazing to the south would minimally affect pygmy rabbits. Dietary preference of pygmy rabbits switches from a mixture of shrubs, grasses and forbs, to about 99 percent sagebrush during the winter months. Grazing sheep on the Kelly, and Snakey pastures to the south could temporarily disturb rabbits in that area. Effects would be minimal due to the fact that two thirds of the total number of sheep grazed would be spread out over multiple pastures for about a month and a half each. More rabbits would be affected by winter grazing, but the disturbance would last for a shorter period of time, over a larger area and thus, is not expected to be of concern.

The proposed prescribed burning would have the potential to eliminate, fragment, and/or degrade a small amount of habitat (500 acres) by removing sagebrush. Pygmy rabbits select areas of dense mature sagebrush and ideally at a very late seral stage. The highest quality habitat may take 50 or more years to return to pre-burn conditions. Therefore, the small size and juxtaposition of prescribed burns would be

important in minimizing long-term degradation of pygmy rabbit habitat. The small size of the proposed burning indicates minimal effects to pygmy rabbit and their available habitat.

Alternative 2

The direct and indirect effects to pygmy rabbits could be both beneficial and detrimental in nature. A study performed on the Sheep Station (Bork et al. 1998) showed that areas grazed in the spring by sheep exhibited significantly greater live shrub cover than in control plots. The same study showed that areas grazed in the fall by sheep exhibited significantly greater live forb and herb cover than at control plots. This shows that in the absence of spring grazing and other activities, shrub cover would decrease in some areas resulting in small reductions in pygmy rabbit habitat. Although displacement and behavioral disturbances to pygmy rabbit would be reduced, potential benefits would be offset by the change in forb, grass, and shrub cover no longer created through Sheep Station activities.

Modified Alternative 3

The differences of modified alternative 3 compared to the proposed action are in the details of the temporal grazing in Henninger and at Headquarters and the approximate 20 percent reduction of total numbers of sheep. This alternative would place a larger number of sheep on the Headquarters pastures for a longer period of time causing additional potential for displacement and disruption of pygmy rabbit daily activities. Increased utilization by sheep would result in further reductions in shrub cover important to pygmy rabbits. On Henninger, the change is unlikely to affect pygmy rabbits because they are not known or expected to occur in that pasture.

Modified Alternative 4

The effects of modified alternative 4 are the same as those of the proposed action. To minimize potential conflicts with grizzly bears, 2,000 sheep would not graze the Summer Pasture (Toms Creek) or Meyers Creek (National Forest System land) July through September. Instead, sheep would be placed in the West Pasture (Odell and Big Creek) on the Centennial range. Pygmy rabbits are not expected to occupy these areas of the Centennial range because habitat is naturally fragmented and interspersed with conifers.

Modified Alternative 5

The effects of modified alternative 5 are similar to the proposed action. However due to the 30 percent reduction in total sheep numbers (from 3,330 to 2,330), less disturbance would occur during the spring and early summer. In addition, sheep would not be grazed southwest in Snakey Kelly, but would instead be put in the feed lot from October into April. This change in winter grazing would have a small positive effect on pygmy rabbits and their habitat.

Pygmy Rabbit Cumulative Effects

The spatial boundary for the discussion of cumulative effects for pygmy rabbits is the Upper Snake Sage Grouse Planning Area because pygmy rabbit distribution is similar to sage-grouse distribution, and landscape conditions and threats for that area are described in the sage-grouse Conservation Plan. The temporal boundary is 10 years because projections beyond this time period are similar to those being described but with decreased precision. The combined effects from this project and other planned projects in the cumulative area boundary would be unlikely to reduce pygmy rabbit populations or habitat beyond a critical threshold for the following reasons:

- Observational data indicates that pygmy rabbits are persisting in the same areas they were found in the 1950s, despite the last 50 years of grazing and land management.
- Fire in the Upper Snake Planning Area has played only a minor role in loss of sagebrush habitat.

American Black Bear (*Ursus americanus*)

Black Bears are common in ARS properties in the forested portions of the Centennial Range. Statewide, they are managed as game species and legally hunted.

Black Bear Affected Environment

The status of the American black bear in Idaho and Montana is secure (S5). The species is considered a game species and is hunted in the spring and fall in both Montana and Idaho. The species has no federal status. Black bears are common in the foothills and the high elevation areas of the Centennial Mountain Range. Encounters can occur in suitable habitat in Odell, Big Mountain, and Toms Creek allotments, Henninger Ranch, and Humphrey Ranch. Black bears generally do not occupy the Headquarters pasture, though individual bears may occasionally travel along the riparian areas of Beaver Creek, which has thick cover adjacent to the stream. Sheep herders encounter black bears on an annual basis, but most encounters do not lead to lethal control (Farr 2008, personal communication). More often, sheep are moved to a new area, guard dogs discourage further incidents, or black bears discontinue interest in the domestic sheep as a food source. A review of known black bear control actions on ARS properties indicates that past black bear conflicts with sheep have resulted in 11 black bears being killed in 1988 in the Odell Creek pasture during the period of the Yellowstone fire, and employees killing two black bears related to other incidents. No black bears have been trapped and relocated from ARS properties. If a black bear is suspected of killing sheep, Sheep Station staff contacts Wildlife Services to investigate the matter and implement control actions if necessary. Mitigation measures to deter bears were discussed previously in the grizzly bear section. The use of guard dogs, full time sheep herders, and trash removal are instrumental in minimizing potential depredations, conflicts, and control actions.

Black Bear Direct/Indirect Effects

The direct and indirect effects to black bears are the similar to those described for grizzly bears. However, encounters are more likely to occur annually and lethal control would be implemented on occasion. Estimated figures for past lethal control of black bears on ARS properties indicates that only a small number of black bears (less than 20) have been removed over the last 15 years, and that most conflicts end without lethal control. It is estimated that black bear removals would occur at a similar rate in the alternatives that graze sheep in the Centennial Range (alternatives 1, 4, and 5). Most years, no black bears would be killed. However, in drought years with poor food production, more bears would be taken. These figures amount to an average of one bear being killed per year. In alternatives 2 and 3, control actions for black bear are likely to be unnecessary since sheep would not be grazed in typical suitable habitat except for the small area west of Beaver Creek on Humphrey Ranch. As a result, it is likely that no black bears would be killed from Sheep Station activities under these alternatives. In all alternatives, black bear populations are estimated to remain secure. The proposed action and its alternatives are not expected to limit habitat connectivity as is discussed in more detail in the "Connectivity" section of the wildlife report.

Black Bear Cumulative Effects

None expected. The species is common in the Centennial Mountain Range despite legal hunting pressure and occasional control actions. Spring and fall hunting seasons that occur in Idaho and Montana are most likely to determine local black bear population statistics.

Fish and Amphibians

Fish and Amphibians Affected Environment

Fish habitat on ARS properties is limited to just a few perennial streams and lakes. In Idaho, Beaver Creek intersects Humphrey Ranch for about 1.5 miles and the Headquarters property for approximately 0.75 miles. It has substantial flow during spring run-off, and, in some areas supports stocked rainbow trout, brown trout and brook trout. During summer periods, the stream becomes a dry channel along lower sections near the Headquarters property because of decreased summer water flows and the geology of the area. Thus, it does not support a year-round fishery there.

The *Management Plan for Conservation of Yellowstone Cutthroat Trout in Idaho* (IDFG 2007) indicates that Yellowstone cutthroat trout are found in a few isolated tributaries to Beaver Creek, but none are on or immediately adjacent to ARS properties. Henninger Ranch has two intermittent streams, Dry Creek and Moose Creek, neither of which support a fishery.

The Montana portions of ARS properties include several drainages: Odell Creek allotment contains two branches of Odell Creek and the headwaters of Corral Creek. Big Mountain Allotment contains Spring Creek. The Toms Creek allotment contains Hell Roaring Fork and three headwater branches of Toms Creek. Odell Creek was observed to be fish bearing on ARS properties during 2008 field surveys conducted by the project biologist who observed a population of brook trout in the west branch of Odell Creek. Montana Heritage database records indicate that Odell Creek and Hell Roaring Fork Creek have westslope cutthroat trout populations.

Four lakes are within the Montana portions of ARS properties including Big Odell Lake, Little Odell Lake, Blair Lake, and Lillian Lake. Montana Fish Wildlife and Parks informed us during scoping that stocked sport fisheries are currently managed in Blair, Lillian, and Odell Lakes within the project area and could be desirable for stocked westslope cutthroat trout.

- During field surveys conducted in 2008 and 2009, the wildlife biologist identified the following amphibians:
- Spotted frogs and confirmed breeding populations in the west fork of Odell Creek, Big Odell Lake, Little Odell Lake, and Blair Lake;
- Boreal western toads on Big Odell Lake; and
- Western chorus frog on the stock watering pond on Humphrey property.

Arctic grayling use spawning habitats in lower reaches of Red Rock, Odell, and Corral Creeks downstream of the ARS properties. This downstream population is one of two confirmed native Arctic grayling populations in the 48 contiguous states. Although two distinct populations historically inhabited waters in Michigan and Montana, the Michigan population is now extinct. Healthy stream and vegetation conditions demonstrated in the range and watershed reports indicated that downstream sedimentation from ARS activities is not a concern. On August 19, 2014: The U.S. Fish and Wildlife Service announced today that protecting the Upper Missouri River Distinct Population Segment (DPS) of Arctic grayling under the Endangered Species Act is not warranted at this time. The efforts made by Federal, State, and private partners – who have worked to address the factors that negatively influence Arctic grayling populations – have helped bring the species to the point that it does not meet the definition of threatened or endangered under the Endangered Species Act at this time. http://www.fws.gov/mountain-prairie/species/fish/grayling/grayling.htm

Interdisciplinary review of current aquatic conditions found that sheep grazing and associated activities are having minimal effects to streams and that healthy aquatic and riparian habitat conditions are being maintained for perennial streams and lakes. Most channel segments were rated as in "Proper Functioning Condition" by the interdisciplinary team, and the concerns in those segments rated otherwise are attributed to historical and other uses such as an old gravel pit (lower Beaver Creek, Headquarters), an old mining road (Spring Creek), and irrigation ditches associated with intermittent streams on Humphrey and Henninger Ranch. Stable stream channels, non-erosive banks, functioning flood plains, dense willows, and the vigor of riparian vegetation are characteristic in all of the fish-bearing streams and lakes and where amphibians are expected to occur (Summer Range). Field observation on Blair Lake, little Odell Lake, Big Odell Lake, Odell Creek and other areas indicate that quality amphibian habitat is abundant, remains occupied with breeding individuals, and effects to habitat are minimal.

Fish and Amphibians Direct, Indirect, and Cumulative Effects

Observed conditions indicate that all of the alternatives would have negligible effects to stream hydrology and associated fish habitat, as well as riparian habitats and associated amphibian populations. There would not be a change in fisheries or amphibian habitat between the proposed action (modified alternative 1) and those areas of alternatives 2-5 where grazing no longer would occur. In those areas, vegetative conditions and soil compaction immediately at vacated stream crossings and watering areas would rehabilitate naturally. Downstream effects to fisheries and amphibian habitats from Sheep Station activities would remain negligible. No cumulative effects would occur.

Effects to fisheries and amphibians and associated aquatic resources are minimal, and would maintain the current condition in the proposed action (modified alternative 1), as well as in alternatives 3, 4, and 5. Areas of bare soil would occur at stream crossings. However, these effects are limited to the narrow trail width approaching the streams, which varies between five feet (typical) and 15 feet (atypical). No effects would occur to arctic grayling or westslope cutthroat trout because they occur well downstream of the project, and proposed activities would not degrade downstream habitats. No effects would occur to Yellowstone cutthroat trout because they occur in tributaries outside of and unaffected by ARS properties and activities. No effect would occur to sport fisheries that occur in the larger lakes. Effects to spotted frogs, boreal western toads, chorus frogs, and other amphibians would be rare and limited to the loss of a few individual animals (adult amphibians or larvae) in localized areas associated with watering activities in springs and lakes. No effects would occur from the small localized use of herbicides to remove invasive weeds since those activities occur outside of wetland and riparian areas. Although the location of effects may differ among alternatives because of varying locations grazed, the overall health of aquatic resources would continue similar to the current condition without threat to fish, amphibians or associated habitat.

Connectivity

Numerous scoping comments were received indicating the importance of the Centennial Mountain Range as a component of contiguous habitat for carnivores, providing linkage between the Greater Yellowstone ecosystem, Central Idaho, and the Northern Continental Divide Ecosystem. The area is relatively free of human disturbances and provides varying amounts of suitable habitat for wide-ranging carnivores including grizzly bears, wolves, black bears, wolverines, mountain lions and Canada lynx. The area’s east west juxtaposition between the relatively intact ecosystems of Greater Yellowstone and Central Idaho identifies it as a logical pathway for wide-ranging carnivores to migrate between populations and habitats in those ecosystems.

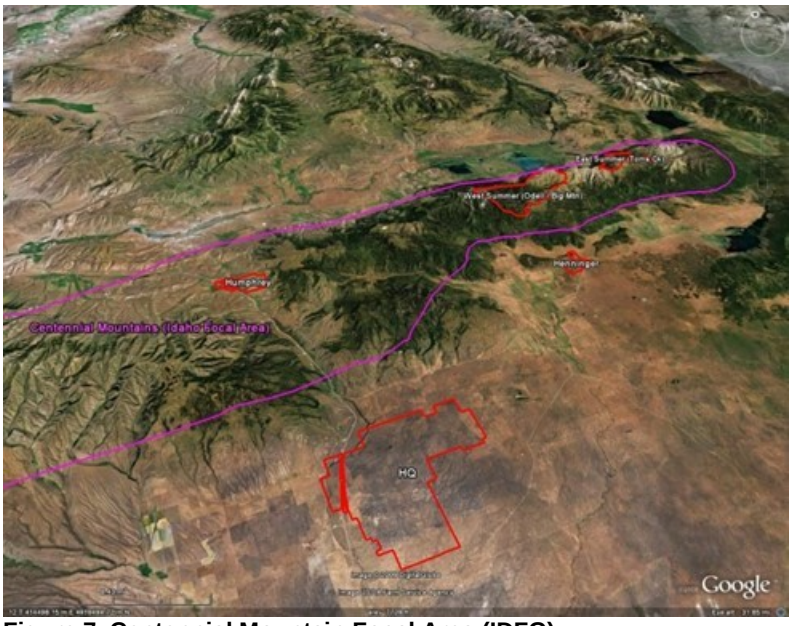

Figure 7. Centennial Mountain Focal Area (IDFG)

Background

The Western Governor's Association developed the *Wildlife Corridors Initiative Report* (2007) and established the Western Wildlife Habitat Council to identify key wildlife corridors in the west, and coordinate implementation of needed policy options and tools for preserving those landscapes. Primary drivers for this initiative are to address changes in land use, transportation, energy development, oil and gas, and climate change while preserving sensitive wildlife habitats. Statewide maps prepared for the corridors are depicted as large polygons or arrows that indicate where more detailed corridor mapping is needed. The Idaho Comprehensive Wildlife Conservation Strategy (CWCS) incorporated these key wildlife corridors through the delineation of "focal areas" which include the Centennial Mountains as an area of core grizzly bear habitat.

In 2007, a workshop was conducted with numerous biologists in attendance, to examine connectivity issues between the Greater Yellowstone Ecosystem and the Northern Rocky Mountains. The summary notes for this workshop, (Beckman et al. 2008) indicated:

- There is a need or desire to provide linkage habitats for wildlife, particularly wide ranging carnivores, between the Greater Yellowstone Ecosystem, Central Idaho, and the Northern Rocky Mountains.
- General agreement among the group that loss of linkage is due to rapid loss of valley bottom habitats from human population expansion and associated infrastructure.
- Themes emerged regarding issues related to livestock grazing and carnivore conservation including mistrust, lack of information sharing, ineffective compensation programs, and economic shifts (such as changes in livestock industry coupled with housing development in open spaces).
- The group is planning to reconvene in the future to identify and prioritize specific connectivity issues in the Centennial region.

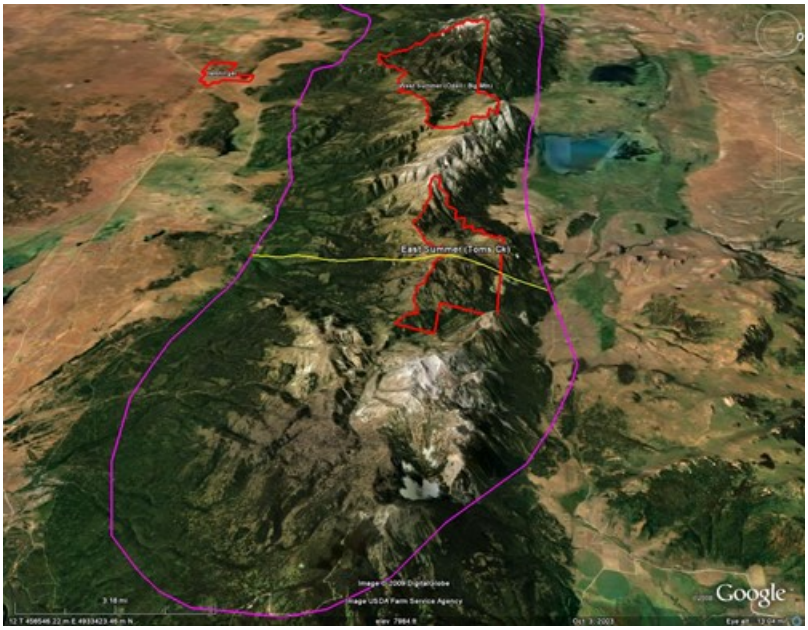

Figure 8. Centennial Mountain Focal Area, ARS properties, and available habitat for carnivore movement

The extent to which the Centennial Mountains are used by various carnivores is described previously in the individual species analyses (i.e. Canada lynx/wolf/grizzly bear existing condition sections). Beckman (scoping letters 2009, 2011) suggests that habitat quality is high, and various mapping exercises indicate that the area is an important connection between Greater Yellowstone Ecosystem and Central Idaho, particularly important for grizzly bears over the long term. In addition, he points out that a higher number of carnivore observations in eastern half of the Centennial Mountain Range compared to the western half of the range could indicate a bottleneck; and that if a bottleneck is occurring, the cause is unknown, and it is also unknown whether sheep station activities are contributing to that bottleneck.

In reviewing these comments it is important to consider the following points:

- Sheep Station activities use only a small proportion of Centennial Mountain Range in comparison to available carnivore habitat, approximately 10 percent (and less than 1 percent if considering the area occupied by domestic sheep at any given time).
- The primary linkage corridor of concern is in relation to the two species which are federally listed, grizzly bears and Canada lynx and suitable habitat that exists within and adjacent to ARS properties. However very few grizzly bear encounters have occurred on ARS properties. The range is thought to be secondary habitat for Canada lynx with no evidence of reproduction. There is no record of mortality for either species in association with the Sheep Station activities.
- Other species such as wolves, black bears, and mountain lions are not federally listed, are widespread, and are legally hunted in the region. Thus, Sheep Station activities are unlikely to be the major influence on movements and occupancy of those populations.
- Sheep grazing and associated activities in the Centennial range are "permeable", meaning that they do not form a physical or permanent barrier to carnivore travel and occupancy. Sheep bands only occupy two pastures at any given time, are moved rapidly through the area, and are temporary, using the Centennial Range only for a portion of the summer.

- Interstate 15 is a restrictive barrier in the area including the physical barrier of the highway corridor, disturbances from frequent motorized traffic, and increased human use and occupancy.
- In a proactive approach to further investigate the situation, an informal meeting occurred between the Sheep Station and Wildlife Conservation Society (WCS). The parties agreed to explore research questions for consideration pertaining to the use of ARS properties by carnivores, carnivore migration patterns in the Centennial Mountains, and effects of non-lethal control measures (such as moving sheep to avoid conflicts) on sheep production. If funded, rigorous experimental design would be used to obtain statistically solid answers to these questions, and thus improve knowledge of how to maintain large carnivores on the landscape while at the same time maintaining sheep production in those same landscapes. Once drafted, research proposals would be submitted into the outyear ARS budgeting process, and potentially become part of the approved Sheep Station research plan.

Connectivity Direct and Indirect Effects

Modified Alternatives 1, 4, and 5

A review of the information discussed previously for individual carnivores indicates that Sheep Station activities are unlikely to reduce connectivity in the Centennial Range. ARS properties have minimal infrastructure on both Montana and Idaho parcels. Roads are few and closed to public use, so motorized traffic is kept to a minimum. Large carnivores can travel through and occupy habitat on ARS properties mostly without disturbance because of the large scale of available habitat, with sheep bands occupying only a small acreage at any given time in comparison to available habitat. Similarly, sheep are in the Centennial Mountain Landscape for a relatively short duration (July/August), with limited stay in any one area, and absent from each pasture one out of every three years. The range assessment demonstrates that utilization of available forage is light, particularly in the Centennial Range, which indicates that competition for available forage between sheep and the potential prey base (deer, elk, other species) is not a concern. At times, harassment from full-time sheep herders and/or guard dogs may cause individual carnivores to temporarily avoid a particular location when occupied by sheep. This avoidance would last only a few days as sheep are moved rapidly through the meadows, hillsides, and other forage areas throughout the high mountain pastures. Should encounters occur that threaten livestock on ARS properties, lethal control actions would occur for wolves, black bears, and mountain lions, presumably at levels similar to past actions. Wildlife control actions related to livestock depredation and large carnivores has been limited over the past decade (see individual species write-ups for details). Should the need for lethal control increase for wolves beyond past levels (based on an increasing population or pack expansion), removal would only occur within approved management thresholds, because authorization would be granted or denied to APHIS Wildlife Services by the State wildlife agencies commensurate with their responsibilities for overall pack/population management. Lethal control of grizzly bears is not part of this proposal and would not occur without re-initiating consultation with the USDI Fish and Wildlife Service. There have been four grizzly bear encounters involving Sheep Station activities in the last decade, and no grizzly bears have been removed as a result.

Conclusion

In summary, the connectivity of carnivore habitat on Sheep Station and surrounding lands in the Centennial Range remains relatively undisturbed because human activity is low and sheep grazing activities are of short duration during the summer months while moving through pastures quickly. Sheep station policy is to proactively avoid encounters with carnivores, implemented through full time herders, guard dogs, movement of sheep, and occasional hazing of individual carnivores. Lethal control is implemented on the wide-ranging carnivores only when livestock is being killed or repeatedly threatened, and would not occur for grizzly bears. The Sheep Station is exploring research proposals which would

describe and quantify carnivore movements in the Centennial Range, evaluate the effects of current grazing practices on carnivores, and address the effects of avoidance and other non-lethal control measures on sheep production and animal husbandry practices. Sheep station activities are permeable to carnivores, while other more restrictive barriers occur in the area such as the Interstate 15 corridor, landscape settlement/residences, and legal hunting seasons.

The effects of modified alternatives 4 and 5 are essentially the same as the proposed action. Lethal control actions on carnivores other than grizzly bears would occur on a limited basis when livestock are being killed. The varying numbers or concentrations of sheep relative to each alternative would not substantially change habitat conditions or carnivore movements within the corridor in comparison to the proposed action. The Centennial Range would continue to function as high quality habitat for wide-ranging carnivores, and would not be limited as a migration corridor or linkage.

Under modified alternatives 1, 4, and 5, carnivore use of the Centennial Mountain range would continue similar to the current condition, with additional potential for certain species (or individuals) to more fully utilize the current habitat within a given home range. Changes in the effectiveness of the Centennial Range as a wildlife migration corridor remain speculative, but are unlikely since evidence suggests that Sheep Station activities have a minimal effect to wide ranging carnivore use of the habitat. Grizzly bear would continue to occupy the range, but the already rare potential for encounters with Sheep Station activities would be eliminated. Long-ranging movements of grizzly bear in search of food sources would continue without potential of harassment from Sheep Station activities. Wolf conflicts which typically occur near the Humphrey Ranch property would no longer involve Sheep Station activities, however livestock conflicts on adjacent allotments and private lands could still occur, and warrant lethal control actions on a case by case basis. Black bears would continue to occupy the habitat without the need for lethal control. Mortality would continue based on black bear hunting season quotas which maintain sustainable populations. There would be no effect on wolverine movements since conflicts do not occur with Sheep Station activities and wolverine habitat would not change. Effects to mountain lion use of the Centennial Range are minimal since conflicts have only rarely occurred with domestic sheep, and lions predominately use the lower elevation areas of Henninger/Humphrey, which represent a small fraction of the overall corridor.

The direct and indirect effects of alternative 2 and modified alternative 3would be the same. Centennial Range would continue to function as a wildlife corridor similar to its current condition. However, removal of individual wide-ranging carnivores would be limited to encounters on private and other federal lands, and not as a result of Sheep Station activities.

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