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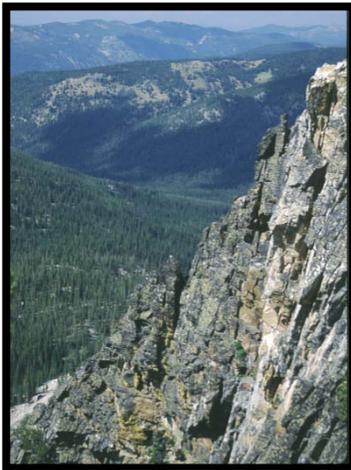
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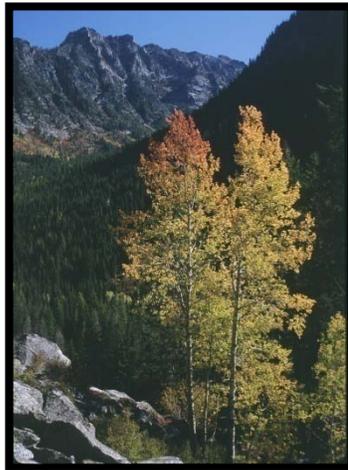
July  
2010

# SOUTHWEST IDAHO ECOGROUP LAND AND RESOURCE MANAGEMENT PLANS

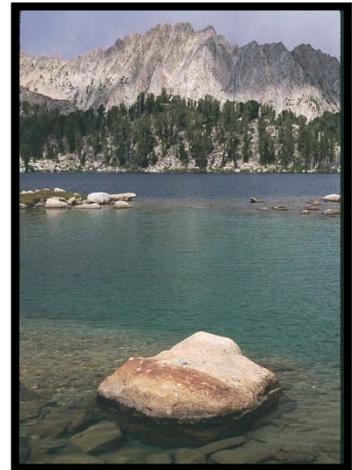
# FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT



Boise National Forest



Payette National Forest



Sawtooth National Forest

Photos by David Ede

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Final Supplement to the Final Environmental Impact Statement for the Southwest Idaho  
Ecogroup Land and Resource Management Plans

USDA Forest Service, Intermountain Region

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**Abstract:** The Final Supplemental Environmental Impact Statement was written to supplement the *Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement* (FEIS) completed in 2003. The Final Forest Plan Amendment was written to add direction to the 2003 *Payette National Forest Land and Resource Management Plan* (Forest Plan) that would provide for viability of bighorn sheep. The Intermountain Regional Forester received five appeals of the decision to implement Alternative 7 as described in the Record of Decision, with appellants contending that the Regional Forester violated the National Forest Management Act and the Hells Canyon National Recreation Area Act on the Payette National Forest by allowing grazing of domestic sheep within or near the range of bighorn sheep, thus threatening the viability of bighorn sheep through disease transmission.

On March 9, 2005, the Chief of the Forest Service concurred that the effects analyzed and the discussion of cumulative effects pertaining to bighorn sheep presented in the FEIS did not adequately address viability and reversed the Intermountain Regional Forester's 2003 decision to approve revised management direction for the Hells Canyon Management Area as it pertains to bighorn sheep and its habitat. The Regional Forester was instructed analyze bighorn sheep viability in the Payette National Forest commensurate with the concerns and questions discussed in the appeal review and amend the Forest Plan accordingly to ensure bighorn sheep viability. The analysis was to be thorough enough to determine compliance with applicable law and regulation, specifically the Hells Canyon National Recreation Area Act.

In September 2008, the Payette National Forest published the *Southwest Idaho Ecogroup Land and Resource Management Plans Draft Supplemental Environmental Impact Statement* (DSEIS). Based on comments received on the DSEIS, the Payette National Forest worked with population and disease modeling experts from the University of California at Davis to improve and develop models based on telemetry data from bighorn sheep populations that utilize habitat on the Payette National Forest. The new and revised models and analyses led to the development of five additional alternatives, which better addressed the issue of bighorn sheep viability. These

new models and alternatives were described in an *Update to the Draft Supplemental Environmental Impact Statement*, which was published in January 2010.

On July 29, 2009, the Regional Forester determined that bighorn sheep merited designation as a sensitive species in Region 4 because of population declines from disease. This document analyzes the alternatives in light of this new designation.

The Forest Plan amendment language accompanies this document. It provides direction that discusses management actions to follow that provide for viability and monitoring requirements to track bighorn sheep presence.

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## Executive Summary

This document discloses the analysis of the effects of current and proposed Payette National Forest management on Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*) viability within the Payette National Forest. The document also supplements the analysis contained in the Final Environmental Impact Statement (FEIS) for the 2003 Payette Land and Resource Management Plan. Specifically, this document presents additional information concerning the following:

- Viability of bighorn sheep at the planning unit scale
- Compliance with the Hells Canyon National Recreation Area Act (PL 94-199)
- Compliance with 36 CFR §292.48 (domestic livestock grazing activities on Other Lands, Wild and Scenic Rivers, and Wilderness Lands in the Hells Canyon National Recreation Area)
- Compliance with the National Forest Management Act
- Compliance with 36 CFR §219.19 (providing habitats that maintain viable populations)
- Management direction needed to provide for bighorn sheep viability
- Suitability of domestic sheep grazing on the Payette National Forest.

After releasing the Draft Supplemental Environmental Impact Statement (DSEIS) in September 2008, the Payette National Forest released an *Update to the Draft Environmental Impact Statement* (Update) that included updates pertaining to the following information:

- Bighorn sheep source habitat model
- Bighorn sheep core herd home range analysis
- Bighorn sheep quantitative risk assessment
- Bighorn sheep disease model
- Regional economic impact analysis
- Non-market economic analysis
- Environmental Justice
- Analysis of alternatives
- Rangeland suitability for domestic sheep grazing
- Cumulative effects analysis.

Based on comments on the DSEIS, the U.S. Forest Service worked with population and disease modeling experts from the University of California at Davis to improve and develop analysis methods and models based on telemetry data from bighorn sheep populations that utilize habitat on and around the Payette National Forest. Updates included revised source habitat and core herd home range analysis, a new risk for contact model, and a disease model. The models and analyses led to the development of five additional alternatives, which better address the issue of bighorn sheep viability and were described in the Update, which was published in January 2010.

With the exception of Alternatives 7E and 7G, the alternatives developed for the DSEIS (Alternatives 7H, 7J, and 7K) are not included for analysis in this document. Instead, this document analyzes the five new alternatives introduced in the Update and Alternatives 1B, 2, 3, 4, 5, 6, and 7 from the FEIS. The effects of management alternatives 1B, 2, 3, 4, 5, 6, and 7 are documented in the FEIS and included in this document for the purpose of thoroughly assessing

effects to bighorn sheep viability as it is tied to the significant issue of disease transmission discussed in the FEIS. These seven alternatives can be combined into two categories based on how they affect the risk of contact between domestic and bighorn sheep. The first category contains Alternatives 1B, 2, 5, and 7 and the second category contains Alternatives 3, 4, and 6. Alternatives in category one did not designate any acres on the Payette National Forest as unsuitable for grazing by domestic sheep and kept all trailing routes open. Alternatives in category two determined rangeland in all of Management Area #1 and a portion of Management Area #2 as unsuitable for grazing domestic sheep. This area classified as unsuited is displayed in the Payette Land and Resource Management Plan on pages III-90 and III-102 and in the FEIS on page F-34

Alternatives 1B, 2, 3, 4, 5, 6, 7, 7E, and 7G were analyzed using the core herd home range analysis and source habitat, contact, and disease models. Alternative 7E designates all land on the Payette National Forest as unsuitable for domestic sheep grazing. Alternative 7G utilized a Geographic Population Range (GPR) and designates all land within the Hells Canyon and Salmon River GPRs as unsuitable for domestic sheep grazing and all trailing routes within the GPRs as closed for use. For a complete description of all alternatives, please see Chapter 2.

In the DSEIS, the economic impact of each alternative to the agriculture sector was analyzed for Riggins, Weiser, and Wilder. Based on public comment, this analysis has been expanded to include both community and regional impact models. Also included is an economic analysis pertaining to bighorn sheep related recreation.

A section on Environmental Justice has been added to the economic analysis. Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, education level, or income with respect to the development, implementation, and enforcement of environmental laws. Environmental Justice seeks to ensure that minority and low-income communities have access to public information relating to human health and environmental planning, regulations, and enforcement.

Throughout the analysis process, the Payette National Forest worked with Cooperators from the States of Idaho, Oregon and Washington and the Tribal governments of the Nez Perce, Shoshone-Bannock, Shoshone-Paiute and the Confederated Tribes of the Umatilla Indian Reservation.

# Final Supplemental Environmental Impact Statement Introduction

## BACKGROUND

Completed in July 2003, the *Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement* (FEIS) (USDA Forest Service 2003b) and Record of Decision (ROD) were the product of regional planning efforts to revise the *Payette National Forest Land and Resource Management Plan* (Forest Plan) (USDA Forest Service 2003a) as required by the 1982 National Forest Management Act (NFMA) implementing regulations (36 CFR §201). The Intermountain Region Forester received five appeals of the decision to implement Alternative 7 as described in the ROD, with appellants contending that the Regional Forester violated NFMA and the Hells Canyon National Recreation Area (HCNRA) Act on the Payette National Forest by allowing grazing of domestic sheep within or near the range of bighorn sheep, thus threatening the viability of bighorn sheep through disease transmission. The HCNRA Act provides direction for the “administration, protection, and development” of the HCNRA (16 USC §460gg-4).

On March 9, 2005, the Chief of the Forest Service (Chief) concurred that the effects analyses and cumulative effects discussion pertaining to bighorn sheep presented in the FEIS did not adequately address viability and reversed the Intermountain Regional Forester’s 2003 decision to approve revised management direction for the Hells Canyon Management Area (MA) as it pertained to bighorn sheep and its habitat. The Chief stated that allowing continued domestic sheep grazing in or near occupied bighorn sheep habitat threatened the viability of bighorn sheep populations within the Hells Canyon area and across the Payette National Forest.

The HCNRA and Hells Canyon MA are two separate and distinct delineations on a map. Only a small portion of the Hells Canyon MA overlaps into the HCNRA. However, the HCNRA does extend alongside the western boundary of the Hells Canyon MA for a considerable distance. Bighorn sheep have repeatedly been documented, in the Hells Canyon telemetry data, traversing back and forth across the boundaries of these two areas and have been present within domestic sheep and goat allotments on the Payette National Forest during the permitted grazing season. Since the Chief instructed the Payette National Forest to conduct a viability analysis at the planning unit scale, the entire Payette National Forest was analyzed, which affected the Salmon River Mountain bighorn sheep population.

To address the issue of bighorn sheep viability, the Regional Forester was instructed to reanalyze bighorn sheep viability on the Payette National Forest; amend the FEIS accordingly; and evaluate and adopt, as necessary, changes to the Forest Plan (USDA Forest Service 2003a) management direction for the Hells Canyon MA and adjacent areas. Specifically, the Regional Forester was instructed to complete a supplement (Supplemental Environmental Impact Statement [SEIS]) to the FEIS.

The Payette National Forest completed the *Southwest Idaho Ecogroup Land and Resource Management Plans Draft Supplemental Environmental Impact Statement* (DSEIS) (USDA Forest Service 2008) and released it for public review and comment in September 2008. The DSEIS responded to the appeal instructions received from the Chief on March 9, 2005, pertaining to the issue of bighorn sheep viability and contained several alternative actions to the

selected in the FEIS. These alternatives were developed to analyze effects to bighorn sheep viability, rangeland resources, tribal rights and interests, and socio-economics.

Over 14,000 comments were received on the DSEIS and its analysis and the Payette National Forest completed a content analysis on the input received. In response to the comments, the Payette National Forest updated its analysis methods and models and developed additional alternatives to assist in comparing effects.

### **Development of Information and Analysis Methods and Alternatives**

After publishing the DSEIS, the Payette National Forest updated the source habitat model and core herd home range analysis, completed a new risk-of-contact model, and developed a disease model. In response to field review and new research on persistent snow levels, the summer and winter bighorn sheep source habitat models were also improved. The core herd home range was recalculated to better represent core herd home ranges for bighorn sheep in both Hells Canyon and the Salmon River Mountains. The qualitative *Risk Analysis for Disease Transmission Between Bighorn Sheep and Domestic Sheep on the Payette National Forest* (USDA Forest Service 2006) was completely removed from the analysis and is no longer utilized in this effort. To assess the risk for contact between bighorn sheep and domestic sheep, the Payette National Forest developed a quantitative foray analysis to predict probabilities of contact. These core herd home range and foray analyses are now based on telemetry data and measured behaviors of bighorn sheep populations that have the potential to interact with domestic sheep on the Payette National Forest. The disease model was developed to provide the Payette National Forest with a relative comparison tool for population persistence over time and cumulative effects. The disease model utilizes the most recent epidemiological science on disease spread through populations.

The new models and analyses led to the development of five new alternatives. To provide the public the opportunity to review and comment on the new analyses and alternatives, the Payette National Forest published the *Update to the Draft Environmental Impact Statement* (Update to the DSEIS) (USDA Forest Service 2010) in January 2010 for a 45 day review and comment period. Public information meetings were held at four different locations in Idaho. The Update to the DSEIS responded to several comments that were received on the DSEIS and analyzed the effects of the new alternatives on bighorn sheep viability, rangeland resources, tribal rights and interests, and socio-economics.

Over 11,600 comments were received on the Update to the DSEIS and its analysis. The Payette National Forest completed a content analysis on the input received. In response to the comments, the Payette National Forest has completed its analysis and documented potential effects.

The Payette National Forest developed several alternatives (Alternatives 7A through 7K) that were analyzed in the DSEIS. In this Final Supplemental Environmental Impact Statement (FSEIS), the Payette National Forest analyzes the alternatives identified in the Forest Plan FEIS (Alternatives 1B, 2, 3, 4, 5, 6, and 7); two of the alternatives analyzed in the DSEIS (Alternatives 7E and 7G); and the five new alternatives developed since the DSEIS (Alternatives 7L through 7P). The Selected Alternative will become part of Alternative 7, the selected alternative in the ROD for the FEIS tied to the 2003 Forest Plan.

Alternate management strategies to Alternative 7 were developed utilizing issues developed and comments received on the FEIS, as well as comments received on the DSEIS and Update to the DSEIS. The issues used for this process are found in the FEIS (USDA Forest Service 2003b, pp 1–14, 15, 19, and 23) and the DSEIS and remain the same for the FSEIS:

### 1) Terrestrial Wildlife Habitat and Species

Issue Statement 1: Forest Plan management strategies may affect habitat for terrestrial wildlife species, including species that are listed or proposed for listing under the Endangered Species Act, Region 4 sensitive species, Species of special interest, species at risk, and Forest Management Indicator Species.

Issue Statement 2: Forest Plan management strategies may affect disruption, vulnerability, and disease risk to terrestrial wildlife species.

### 2) Rangeland Resources

Issue Statement: Forest Plan management strategies may affect rangeland resources, including lands considered suitable for livestock grazing and the form of livestock grazing management authorized under permit for the Forests.

### 3) Tribal Rights and Interests

Issue Statement: Forest Plan management strategies may affect the availability of resources and the use of traditional places important to American Indian rights and interests.

## **Terrestrial, Wildlife, Habitat, and Species**

To better address the issue of bighorn sheep viability, the Payette National Forest developed and analyzed several new alternative management approaches. To create a reasonable range of alternatives, the Forest Service developed a bighorn sheep source habitat model and core herd home range analysis, a new quantitative contact model, and a disease model to assist with a relative comparison between alternatives for population persistence and cumulative effects analysis.

## **Tribal Rights and Interests**

The FEIS *Tribal Rights and Interest* section included an analysis of the effects Forest Service management would have on the ability of the agencies to meet general Federal trust duties and treaty-specific statutory obligations. The availability of traditional and/or culturally important terrestrial and aquatic plant and animal species in sufficient and desirable quantities to satisfy off-reservation reserved rights is of particular interest. Tribal interests and uses are protected through various Federal statutes, laws, policies, and regulations (Appendix H in the Forest Plan [USDA Forest Service 2003a]). The Federal trust doctrine requires Federal agencies to manage the lands under their stewardship with full consideration for all valid tribal rights and interests.

The Forest Service is responsible for providing habitats that maintain viable populations of native and desired non-native species, including economically and culturally important species, such as bighorn sheep (36 CFR §219.19). The persistence of these species depends on the availability of well-distributed, suitable habitats that support populations within a planning area (i.e., National Forest) (CFR §219.19). The FEIS included an analysis of species in the *Terrestrial Wildlife Habitat and Species* section, which was used in determining effects to tribal rights and interests. A more thorough analysis for bighorn sheep is now complete and is provided in

Chapter 3 of this FSEIS. The Federal tribal statutory duties are also being reassessed to determine the effects of bighorn sheep availability for Tribal harvest and on the opportunity to hunt bighorn sheep in areas historically or culturally important to tribal members.

Consistent with 36 CFR §219.2(c)(3) and 36 CFR §219.15, this analysis will supplement the *Tribal Rights and Interests* section of the 2003 Forest Plan FEIS for the Payette National Forest to (1) identify other affected tribes; (2) specifically identify the effects of alternatives on the availability of bighorn sheep; and (3) disclose the effects on Tribal members opportunity to hunt bighorn sheep in areas historically used or traditionally important. For the purposes of this analysis and document, the associated use of traditional cultural properties important to American Indian rights and interests is tied specifically to the amount of summer source habitat available to bighorn sheep.

The *Tribal Rights and Interest* section is based on viability of the bighorn sheep and the amount of areas on the Payette National Forest not suited for domestic sheep grazing. Two assumptions remain for the analysis of tribal rights and interests:

- 1) Bighorn sheep viability is directly related to the ability of tribal members to harvest a bighorn sheep
- 2) The area of the Payette National Forest not suited to domestic sheep grazing is directly related to tribal members harvesting bighorn sheep in locations that are culturally important.

As such, the Federal tribal trust responsibilities continue to be reassessed to determine the effects on the availability of bighorn sheep and on the use of traditional cultural properties.

### **Socio-Economic Analysis**

Multiple statutes, regulations, and executive orders identify the general requirement for applying economic and social evaluation in support of Forest Service planning and decision making. These include, but are not limited to, the Multiple-Use Sustained Yield Act of 1960 (74 Stat. 215; 16 USC 528–531), National Environmental Policy Act (NEPA) of 1969 (83 Stat. 852; 42 USC 4321, 4331–4335, 4341–4347), and the Forest and Rangeland Renewable Resources Planning Act of 1974.

In direct response to public comment, the socio-economic analysis displays effects to the agriculture industry at the community level and the regional level. Information tied to the benefits of the sale of domestic sheep products and the fees charged for grazing on National Forest System lands are included in the analysis. Where economic effects cannot be quantified, a qualitative discussion of nonmarket and social values has been added. Direction provided in 40 CFR §1502.23 and Forest Service Handbook 1909.15 (July 6, 2004) and 22.35 (January 14, 2005) provides for qualitative analysis to evaluate the effects of nonmarket values. Therefore, the alternatives' nonmarket aspects are discussed qualitatively where appropriate and are described in other resource sections of the SEIS.

In addition, EO 12898, issued in 1994, orders Federal agencies to identify and address environmental justice effects, which are any adverse human health and environmental effects of agency programs that disproportionately impact minority and low-income populations. EO 12898 also directs agencies to consider patterns of subsistence hunting and fishing when an agency action may affect fish or wildlife.

## **Rangeland Resources**

The rangeland resources section includes a comparison of National Forest System lands identified as suited for domestic sheep grazing by alternative. Rangeland suitability determinations continue to be the decision to be made for this resource.

## **Public Participation**

Public scoping and involvement on the FEIS was extensive and spanned a 7-year period. The risk for disease transmission from domestic sheep to bighorn sheep and the subsequent population declines was identified early and noted as a concern by the U.S. Fish and Wildlife Service (USFWS). It was assumed for the FEIS that disease transmission can occur. Only one comment was received during the 7-year period that questioned this assumption. Tribal consultation, both informal and formal, was also extensive during the 2003 Forest Plan development process.

The Notice of Intent (NOI) to prepare a DSEIS and amend the Forest Plan was published in the Federal Register in April 2007 (FR 72:18197–18198). The Forest Service has a long-standing policy that supports the commitment to encourage cooperation among Federal, State, local, and tribal governments (USDA Forest Service 2007). Cooperating status was requested and granted beginning in August 2007 (USDA Forest Service Agreements 2007–2008) to the States of Idaho, Oregon, and Washington and the tribal governments of the Nez Perce, Shoshone-Bannock, and Shoshone-Paiute Tribes and the Confederated Tribes of the Umatilla Indian Reservation. Prior to the first meeting, each Cooperating Agency and Tribal Representative was designated to represent their State or tribe by their respective Governor or Tribal Chair (letters from Agencies and tribes available from Payette National Forest). Representation was re-verified halfway through the process.

At the August 2007 meeting and again at the May 2009 meeting, the Forest Service reviewed the established operational protocols and National Environmental Policy Act (NEPA) process. The roles and responsibilities of the Forest Service and the Cooperating Agencies and Tribal Representatives were also discussed. In those reviews, it was emphasized that the Forest Service retained the authority to make decisions for the SEIS, act as an expert, and author the document. The States and tribes were to act as technical experts, bringing their knowledge and data to the analysis; inform the Forest Service of pertinent policy expertise; provide comments; and review information. Meetings with the Combined Team continued through January 2010. Documentation of the meetings is available from the Forest Service.

The DSEIS was released for public comment in September 2008. During the comment period, from September 2008 through March 2009, the Forest Service conducted several public meetings and provided presentations to public groups as requested. The Forest Service received over 14,000 public comments. The full response to public comment is included in the FSEIS (Appendix A). The Forest Interdisciplinary Team (IDT) reviewed the comments and determined what additional work was necessary. In May 2009, this information was shared with the Cooperating Agencies and States and Tribal Representatives.

An Update to the DSEIS was released in January 2010. Following release of the document the Payette National Forest held five public meetings in Idaho at Boise, McCall, Weiser, Lapwai, and Lewiston. During the comment period, from January through February 2010, the Forest Service conducted four public meetings and provided presentations to public groups as

requested. The Forest Service received approximately 12,000 public comments on the Update to the DSEIS. The full response to public comment is included in the FSEIS (Appendix A).

## Disease Review

Considerable debate about the science behind disease transmission has emerged since the SEIS process began. Even so, the preponderance of scientific literature still supports disease transmission between domestic and bighorn sheep, and that this issue is significant and warrants consideration of effects analysis and management direction that prevents contact between the species.

Bighorn sheep are a New World species and are closely related to domestic sheep, which are an Old World species. Domestication and intense artificial selection have probably helped domestic sheep develop a resistance to important diseases (Jessup 1985). However, bighorn sheep can be highly susceptible to diseases carried by domestic sheep.

A long history of large-scale, rapid, all-age die-offs in bighorn sheep exists across Canada and the United States, many associated with domestic animal contact (Shackleton 1999). Although limited knowledge of transmission dynamics exists (Garde et al. 2005), extensive scientific literature supports the relationship between disease in bighorn sheep populations and contact with domestic sheep, including both circumstantial evidence linking bighorn die-offs in the wild to contact with domestic animals and controlled experiments where healthy bighorn sheep exposed to domestic sheep displayed subsequently high mortality rates (Foreyt 1989, 1990, 1992a,b; Foreyt et al. 1994; Onderka et al. 1988; Onderka and Wishart 1988; Garde et al. 2005). Recent serological analyses document the lethality of pathogens (e.g. *Mannheimia haemolytica* serotype A1) in bighorn sheep that are not lethal to domestic sheep (Dassanayake 2009), and the transference of pathogens from domestic sheep to bighorn sheep that result in bighorn sheep mortality (Lawrence et al. Forthcoming.).

In a summary of risk to wild sheep from *Pasteurella* and *Mannheimia* spp., Garde et al. (2005) makes the following conclusions:

- 1) These bacteria can cause pneumonia in bighorn sheep, but there are benign commensal strains in the upper respiratory tract
- 2) Domestic sheep, goats, and llamas have been reported with these bacteria species
- 3) Wild sheep and mountain goats have been reported with these bacteria species
- 4) Transmission is by direct contact and aerosolization
- 5) These bacteria species do not persist in the environment
- 6) Acute-to-chronic die-offs in bighorn sheep can result in low to 100 percent mortality, although they can be present in healthy sheep
- 7) These bacteria are considered opportunistic and can result in pneumonia outbreaks
- 8) These bacteria can cause clinical disease in domestic sheep and goats, but are rarely primary pathogens.

## **Alternative Arguments**

There are scientists and others, primarily from agricultural disciplines, who contend disease transmission between bighorn sheep and domestic sheep is not a relevant factor in bighorn sheep distribution and population declines. The following contentions are summarized from comments received during the public scoping process and public meetings:

- The mechanisms and causal agents leading to epizootic disease events in bighorn sheep are not completely understood.
- The hypothesis that bighorn sheep have a high likelihood of contracting fatal respiratory disease following contact with domestic sheep has not been scientifically demonstrated in wildland conditions.
- Bighorn sheep die-offs have occurred in the absence of domestic sheep.
- Evidence that domestic sheep contact with bighorn sheep will result in a disease transmission does not exist.
- Sources of error or omission and data limitations have not been presented by those advocating that disease transmission does occur between the species.
- The peer review process does not support the contention that disease transmission occurs between the species.
- Research evaluating disease transmission between the species lacks proper experimental design that is not accounted for in the results.
- Current, ambient levels of pathogens occur in bighorn sheep, regardless of how those pathogens were introduced, making separation from domestic sheep irrelevant.
- Given the probabilities of contact from off-forest private lands sources, excluding domestic sheep on Federal lands is futile.

Some of these contentions are accurate. We do not understand all of the mechanisms involved in potential disease transmission between the species. However, we have learned a tremendous amount from recent research on pathogen transfer between the species, and the fact that some pathogens that are non-lethal in domestic sheep have high lethality in bighorn sheep (Dassanaye et al. 2009). We also know that specific pathogens are transmitted from domestic sheep to bighorn sheep, resulting in bighorn sheep mortality (Lawrence et al. Forthcoming).

Other arguments criticize publications where findings very clearly infer disease transmission between the species, citing improper experimental design or other flaws in research design. However, the referenced papers are in widely recognized scientific publications and underwent rigorous peer review prior to publication.

There are contentions that argue the lack of evidence of disease transmission between domestic sheep and bighorn in wildland environments. Arguably, much of the evidence is circumstantial; however, the compilation of cases throughout several decades does contribute to an increasing body of evidence that overwhelmingly demonstrates bighorn sheep near domestic are at risk for disease transmission, even though “contact” may not have actually been observed. Monello et al. (2001) state that bighorn sheep herds classified in a “pneumonia induced die-off” category were located significantly closer (<24 km) to domestic sheep allotments than those in a non-die-off category (>40 km). George et al. (2008) document a winter die-off in Colorado that affected three bighorn sheep herds that were traced to contact with a single domestic ewe.

Additional arguments state that since disease pathogens have already been transferred to domestic sheep, separation at this point is moot, or that private lands provide risks to bighorn sheep that cannot be offset, regardless of actions taken on Federal lands. These contentions claim that management on Federal lands to provide separation will not be effective due to changed conditions that cannot be offset. The uncertainty in these contentions poses all of the risk to be borne by bighorn sheep. They do not consider that pathogens likely evolve as they move within and between species, or existing or new diseases that are virulent to bighorn sheep (e.g., mycoplasmas) may still be transferred between domestic and bighorn sheep. Recent serological research (Dassanayake et al. 2009), demonstrates that pathogens, in this case *Mannheimia haemolytica* serotype A1, that are not lethal to domestic sheep are transferrable to bighorn sheep and highly lethal to them. In another recent experiment (Lawrence et al. Forthcoming), pathogens were tagged and followed as they passed from domestic to bighorn sheep and resulted bighorn sheep mortality.

The disease review sections of this document, particularly Chapter 3, consider a large body of peer reviewed and published literature, spanning several decades, that redresses most of these allegations. While there clearly are gaps in the knowledge base on the causal factors and mechanisms of bighorn sheep die-offs and disease transmission between these species, the vast majority of literature supports the potential for disease transmission between the species, documents bighorn sheep die-offs near domestic sheep, and supports the management option of keeping these species separate to prevent disease transmission. Further, there is no peer reviewed literature that suggests bighorn sheep can be grazed with domestic sheep without concern for disease transmission between the species. Scientists from both sides of the issue also recommend that the species be kept separate until the disease transmission science is better understood.

The analysis conducted in this document recognizes these uncertainties but clearly focuses on the Forest Service's responsibility to provide habitats that support viable populations of bighorn sheep, particularly given the risks that the species currently faces relative to the devastating impacts of disease.

### **Management Recommendations**

Leading bighorn sheep disease experts recommend separating bighorn sheep from domestic sheep, either spatially, temporally, or both, (Schommer and Woolever 2001, Singer et al. 2001, Garde 2005). Experts also recommend developing site-specific solutions for each bighorn sheep population and domestic sheep allotment and developing a management strategy appropriate for the complexity of the management situation (Schommer and Woolever 2001). Each of the alternatives takes this approach; however, given the complexity of the issue on the Payette National Forest, each alternative has pros and cons associated with minimizing the risk of contact between domestic and bighorn sheep.

# Chapter 1.

## Purpose and Need

Consistent with 36 CFR §219.20(a), the following pages will supplement the Purpose and Need for the Proposed Action section, page 1-5, of Chapter 1 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

### INTRODUCTION

The purpose of the 2003 Final Environmental Impact Statement (FEIS) for the *Payette National Forest Land and Resource Management Plan* (Forest Plan) (USDA Forest Service 2003a) was to revise the previous Forest Plan (USDA Forest Service 1988) to meet legal and regulatory requirements and to address changes, issues, and concerns that had arisen since it was originally released. The need for the revision was identified as the legal timeframe for revision had arrived, and significant change in conditions and demands in the areas covered by the Forest Plan (USDA Forest Service 1988) had been identified. The Preliminary Analysis of the Management Situation Summary (USDA Forest Service 1997) identified the threat for disease transmission from livestock to bighorn sheep as a potential reason for population decline. This concern translated into a need for change topic revision of the Forest Plan (USDA Forest Service 1988) and was further validated during regulatory agency consultation with the U.S. Fish and Wildlife Service (USFWS). As such, bighorn sheep were identified as a species of special interest for the Forest Plan revision effort. The bighorn sheep need for change topic was then translated into a significant issue used in effects analysis, alternative formulation, and development of management direction. The following significant issues were tied to concerns regarding bighorn sheep viability:

#### Terrestrial Wildlife Habitat and Species

Issue Statement 1: Forest Plan management strategies may affect habitat for terrestrial wildlife species, including species that are listed or proposed for listing under the Endangered Species Act, Region 4 sensitive species, species of special interest, species at risk, and Forest Management Indicator Species.

Issue Statement 2: Forest Plan management strategies may affect disruption, vulnerability, and disease risk to terrestrial wildlife species.

#### Rangeland Resources

Issue Statement: Forest Plan management strategies may affect rangeland resources, including lands considered suitable for livestock grazing and the form of livestock grazing management authorized under permit for the Payette National Forest.

#### Tribal Rights and Interests

Issue Statement: Forest Plan management strategies may affect the availability of resources and the use of traditional places important to American Indian rights and interests.

In addition to the USFWS concern over the viability of bighorn sheep, several comments from tribal governments and the public were received supporting concern for the species. It was

assumed during the FEIS analysis that disease transmission from domestic sheep was a threat to bighorn sheep as supported by laboratory research and the overwhelming majority of published science. It continues to be recognized that the exact mechanisms of the transfer are not fully understood.

The Payette National Forest included direction to the Forest Plan (USDA Forest Service 2003a) as a guideline and an objective for the Hells Canyon Management Area (MA) #1 that read:

**Guideline**—Within bighorn habitat emphasis areas, close sheep allotments as they become vacant, or convert them to cattle where appropriate, to eliminate the risk of disease transmission from domestic to wild sheep. Do not convert cattle allotments to sheep allotments within occupied bighorn sheep habitat.

**Objective**—Coordinate with Idaho Department of Fish and Game, Oregon Department of Fish and Game, and domestic sheep permittees to reduce the risk of disease transmission between domestic and wild sheep.

Several entities appealed the 2003 FEIS, stating that the Forest Service violated National Forest Management Act (NFMA) and the Hells Canyon National Recreation Area (HCNRA) Act on the Payette National Forest by allowing grazing of domestic sheep in or near the range of bighorn sheep, thus threatening the viability of bighorn sheep through disease transmission. One appellant stated, “The Hells Canyon National Recreation Area Act...requires livestock grazing to be compatible with native wildlife protection...the selected alternative fails to address the issues of ongoing conflicts of domestic sheep grazing and wild bighorn sheep in a way that assures the ultimate survival of the bighorn population in a manner sufficient to meet its obligation under the HCNRA Act.”

The Appeal Reviewing Officer found the following:

The Payette Forest Plan (USDA Forest Service 2003a) does not contain any direction for protecting or maintaining bighorn sheep or their habitat in the Hells Canyon MA, in particular for the protection of bighorn sheep from the documented current and likely future threat of disease transmission from domestic sheep. By permitting the presence of domestic sheep within occupied bighorn sheep range, the Payette National Forest does not appear to be managing the habitat to maintain viable populations of bighorn sheep.

Based on the above analysis, the viability of bighorn sheep populations within the Hells Canyon area, and across the Payette National Forest, appears to be threatened by allowing continued grazing of domestic sheep in or near occupied bighorn sheep habitat. As documented in the FEIS and relevant scientific literature, without immediate removal of domestic sheep from occupied bighorn sheep habitat, bighorn within that habitat are likely at risk of extirpation. Bighorn sheep habitat is contiguous between the Payette National Forest and National Forest System land to the north, east and south, and bighorn sheep appear to move between the two identified habitat areas (Hells Canyon and Snake River) within the Payette National Forest. Transmission of disease to bighorn sheep on the Payette National Forest that are part of the Hells Canyon population will place the entire Payette National Forest population at substantial risk.

While the Hells Canyon MA is thus not specifically included in the HCNRA Act, it is clear that by permitting the presence of domestic sheep within adjacent occupied bighorn sheep range, and with documented movement of bighorn sheep between the NRA and the Payette National Forest, the Payette National Forest is not managing livestock grazing in the Hells Canyon MA in a manner compatible with the protection and maintenance of bighorn sheep or their habitat in the HCNRA.

The Appeal Reviewing Officer's decision stated the following:

Serious questions are raised in the SW Idaho Ecogroup FEIS, supported by applicable scientific literature, about the viability of bighorn sheep populations in the Hells Canyon MA (MA#1) of the Payette National Forest, and indeed across the Payette National Forest. However, the effects analysis does not address bighorn sheep viability. Management direction in the Payette NF LRMP for the Hells Canyon MA does not adequately provide for habitat to insure the maintenance of a viable bighorn sheep population within the Payette National Forest (36 CFR §219.19). It also does not adequately protect bighorn sheep populations and habitat in the Hells Canyon NRA (36 CFR §292.48). I find the Payette National Forest LRMP is not in compliance with NFMA regulations concerning wildlife viability of bighorn sheep, and may not be in compliance with the Hells Canyon NRA Act and its implementing regulations. The Regional Forester's decision to approve revised management direction in the Payette LRMP for the Hells Canyon MA is reversed.

The Regional Forester is instructed to do an analysis of bighorn sheep viability in the National Forest commensurate with the concerns and questions discussed above, and amend (supplement) the SW Idaho Ecogroup FEIS accordingly. Changes to the management direction of the Payette LRMP for MA #1 (Hells Canyon) and adjacent areas shall be evaluated, and adopted as necessary to ensure bighorn sheep viability. The analysis should be extensive enough to support determinations of compliance with applicable law and regulation, specifically the Hells Canyon NRA Act, 36 CFR §219.19 and 36 CFR §292.48.

This set of instructions from the Appeal Reviewing Officer created an additional purpose and need for this Supplemental Environmental Impact Statement (SEIS) that will be discussed in the section below. The HCNRA and the Hells Canyon MA are two separate and distinct delineations on a map. Only a small portion of the Hells Canyon MA overlaps into the HCNRA. However, the HCNRA does extend alongside the western boundary of the Hells Canyon MA for a considerable distance. Bighorn sheep have repeatedly been documented, in the Hells Canyon telemetry data, traversing back and forth across the boundaries of these two areas and have been present within domestic sheep and goat allotments on the Payette National Forest during the permitted grazing season. In instructing the Payette National Forest to conduct a viability analysis at the planning unit scale, the entire Payette National Forest was analyzed, which also affects the Salmon River Mountain bighorn sheep population.

Considerable debate about the science has surrounded the disease transmission issue since the SEIS process began. Even so, the preponderance of science literature still supports the notion that the issues are significant and warrant consideration of effects analysis and management direction.

Consistent with 36 CFR §219.20(a), the following pages will supplement the Decisions to be Made section, page 1-8, of Chapter 1 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

## **DECISIONS TO BE MADE**

### **Decisions to be Made in the Final Supplemental Environmental Impact Statement Process**

The SEIS assessment involves conducting a viability analysis for bighorn sheep on the Payette National Forest. The assessment includes a review of the available bighorn sheep source habitat, its distribution across the Payette National Forest, and its contiguity. Additional considerations include how bighorn sheep are now using and how have they have used the habitat at a landscape scale internal to the Payette National Forest and between adjacent Federal lands. The relative risk for contact with permitted domestic sheep is also considered.

The Responsible Official for this analysis, amendment, and decision is the Forest Supervisor. Given the information gathered in the above analyses, the Responsible Official decides which alternative to select and what Forest Plan amendment management direction is developed.

The following decisions will be made for the Final SEIS and Amendment to the Forest Plan (USDA Forest Service 2003a):

- Which alternative to select for implementation
- What management direction to develop that will assist with implementing the selected alternative
- Does the selected alternative and its implementation language comply with federal law and regulation, in particular NFMA and the HCNRA Act
- A determination of rangeland suitability for the selected alternative.

Consistent with 36 CFR §219.20(a), the following pages will supplement the National or Regional Issues section, page 1-31, of Chapter 1 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

## **ISSUES**

### **National or Regional Issues**

The Payette National Forest received several appeals on the 2003 ROD for the FEIS on the Forest Plan (USDA Forest Service 2003a). One appeal point dealt with bighorn sheep viability and the effects of disease transmission from domestic sheep to bighorn sheep on the rapidly declining populations. The Appeal Reviewing Officer in the Washington Office remanded the direction found in the Forest Plan (USDA Forest Service 2003a) regarding bighorn sheep management. The Chief instructed the Regional Forester to analyze bighorn sheep viability on the Payette National Forest commensurate with the concerns and questions discussed in the appeal review and amend the Forest Plan (USDA Forest Service 2003a) accordingly to ensure bighorn sheep viability. The analysis was to be thorough enough to determine compliance with

applicable laws and regulations, specifically the HCNRA Act, 36 CFR §219.19, and 36 CFR §292.48.

The purpose of this SEIS and Amendment to the Forest Plan (USDA Forest Service 2003a) is to respond to the instructions received from the Appeal Reviewing Officer on March 9, 2005, regarding appeals to the 2003 ROD.

The first need for this SEIS and Amendment to the Forest Plan (USDA Forest Service 2003a) is to conduct a bighorn sheep viability analysis on the Payette National Forest that looks at the effects of disease transmission from domestic to bighorn sheep, evaluates how the effects impact the persistence of bighorn sheep populations over time; and adds language to the Forest Plan (USDA Forest Service 2003a) that adequately addresses the management concern. Second, the analysis will determine whether or not the Payette National Forest is providing adequate bighorn sheep habitat, well distributed across the planning unit, to provide for a viable population of bighorn sheep as required by NFMA:

NFMA—36 CFR §219.19

*36 CFR §219.19—“Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.”*

*36 CFR §219.27—“The minimum specific management requirements to be met in accomplishing goals and objectives for the National Forest System are set forth in this section. These requirements guide the development, analysis, approval, implementation, monitoring and evaluation of forest plans.*

*(a) Resource Protection. All management prescriptions shall— [...]*

*(6) Provide for adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species and provide that habitat for species chosen under Sec. 219.19 is maintained and improved to the degree consistent with multiple-use objectives established in the plan;”*

Third, the analysis will determine compliance with the HCNRA Act. Domestic sheep and goat grazing allotments cross over and into or are immediately adjacent to the HCNRA. Analysis needs to be completed to determine if Payette National Forest management is compatible with the HCNRA Act as stated below:

### **Hells Canyon National Recreation Area Act**

The HCNRA Act (PL 94-199) was enacted on December 31, 1975, and the Act provides direction for the “administration, protection, and development” of the HCNRA (16 USC §460gg-4). According to the HCNRA Act, grazing is identified as one of several traditional and valid uses of the recreation area, and the continuation of grazing can occur as compatible with the provisions of the HCNRA Act.

The HCNRA Act and its implementing regulations require that the Payette National Forest manage livestock grazing in the Hells Canyon MA in a manner compatible with the protection and maintenance of bighorn sheep or their habitat within the HCNRA. This requirement was considered and used in developing the alternatives.

**Significant Issues**

Significant issues identified in the FEIS that carry forward into this analysis include the following:

1. Terrestrial Wildlife Habitat and Species

Issue Statement 1: Forest Plan management strategies may affect habitat for terrestrial wildlife species, including species that are listed or proposed for listing under the Endangered Species Act, Region 4 sensitive species, species of special interest, species at risk, and Forest Management Indicator Species.

Issue Statement 2: Forest Plan management strategies may affect disruption, vulnerability, and disease risk to terrestrial wildlife species.

2. Rangeland Resources

Issue Statement: Forest Plan management strategies may affect rangeland resources, including lands considered suitable for livestock grazing and the form of livestock grazing management authorized under permit for the Payette National Forest.

3. Tribal Rights and Interests

Issue Statement: Forest Plan management strategies may affect the availability of resources and the use of traditional places important to American Indian rights and interests.

## Chapter 2. Alternatives Considered

Consistent with 36 CFR §219.20(a), the following pages will supplement the Introduction section, page 2-1, of Chapter 2 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

### INTRODUCTION

In response to updated information and methodology, the Payette National Forest has developed an additional set of alternatives. The updated analysis incorporates results from an improved bighorn sheep source habitat model, a core herd home range analysis, a quantitative contact risk analysis, and a disease model. The contact risk analysis is a quantitative risk analysis that assesses the probability for contact between bighorn and domestic sheep and goat allotments on the Payette National Forest. The quantitative contact analysis was used to develop the new alternatives and replaces the *Risk Analysis of Disease Transmission Between Domestic Sheep and Bighorn Sheep on the Payette National Forest* (risk analysis) (USDA Forest Service 2006).

The disease model was also used to develop five additional alternatives. Outputs from this model assisted with determining the effects of domestic sheep grazing on the Payette National Forest to bighorn sheep populations beyond the administrative boundary of the Payette National Forest and allowed for comparing alternatives.

As with the original range of alternatives developed for the Draft Supplemental Environmental Impact Statement (DSEIS), this new set also responds to the direction outlined in the March 9, 2005, Decision for Appeal of the *Payette National Forest Land and Resource Management Plan* (Forest Plan) (USDA Forest Service 2003a). This decision found that the management direction in the Forest Plan does not adequately provide for habitat to ensure the maintenance or a viable bighorn sheep population within the Payette National Forest (36 CFR §219.19). The decision also found that the Forest Plan does not adequately protect bighorn sheep populations and habitat in the Hells Canyon National Recreation Area (HCNRA) (35 CFR §292.48). The Payette National Forest was found not compliant with National Forest Management Act (NFMA) regulations concerning wildlife viability of bighorn sheep and may not be compliant with the HCNRA Act and its implementing regulations. The Payette National Forest was instructed to amend the Forest Plan as necessary to ensure bighorn sheep viability.

Since this document supplements the *Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement* (FEIS), the Payette National Forest developed bighorn sheep management strategies to Alternative 7, the alternative selected in the FEIS. Similar to the DSEIS, Alternatives 1B, 2, 3, 4, 5, 6, and 7 from the Forest Plan FEIS were considered for this Final Supplemental Environmental Impact Statement (FSEIS). Also included in this analysis are Alternatives 7E and 7G from the DSEIS. The following new alternatives were developed and analyzed in the FSEIS: Alternatives 7L, 7M, 7N, 7O, and 7P.

In addition to utilizing the updated information and methodology, the Payette National Forest continued to use the issues developed and the comments received on the FEIS and the DSEIS for this process. The issues used are found in the FEIS (pages 1-14, 1-19, and 1-23):

- 1) Terrestrial Wildlife Habitat and Species,
- 2) Rangeland Resources, and
- 3) Tribal Rights and Interests.

Public scoping and involvement on the FEIS was extensive and spanned a 7-year period. The 5-month public comment period on the DSEIS resulted in over 14,000 comments and the 45 day comment period on the update to the DSEIS resulted in about 12,000 comments. Tribal consultation was on going as the Payette National Forest continued to work with Cooperators from the States of Idaho, Oregon, and Washington and the Nez Perce and Shoshone-Bannock Tribes.

Consistent with 36 CFR §219.20(a), the following pages will supplement the Development of Reasonable Range of Alternatives section, pages 2-1 through 2-2, of Chapter 2 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

## **DEVELOPMENT OF REASONABLE RANGE OF ALTERNATIVES**

To develop the reasonable range of alternatives for bighorn sheep management, the Payette National Forest used all public comments, tribal and regulatory agency consultation, and the Appeal Decision instructions received on the FEIS and the Forest Plan (USDA Forest Service 2003a). In addition, the Payette National Forest used comments received on the DSEIS (USDA Forest Service 2008) and the update (USDA Forest Service 2010); findings from science meetings held in California, Arizona, and Utah; findings from a meeting held in Idaho and sponsored by the Idaho Woolgrowers; and feedback from the recognized cooperators at scheduled meetings.

As with the alternatives developed for the DSEIS, the additional alternatives for this FSEIS were developed to fulfill the purpose and need for the proposed action and address the significant issues. Alternative 7 is carried into detailed study for comparison purposes only as it was found to not be compliant with NFMA and Alternative 7G is carried into detailed study because it was selected as the Preferred Alternative for the DSEIS.

The following significant issues were used to develop alternatives:

- 1) Terrestrial Wildlife Habitat and Species

Issue Statement 1: Forest Plan management strategies may affect habitat for terrestrial wildlife species, including species that listed or proposed for listing under the Endangered Species Act, the Region 4 sensitive species, Species of special interest, species at risk, and Forest Management Indicator Species.

Issue Statement 2: Forest Plan management strategies may affect disruption, vulnerability and disease risk to terrestrial wildlife species.

## 2) Rangeland Resources

Issue Statement: Forest Plan management strategies may affect rangeland resources, including lands considered suitable for livestock grazing and the form of livestock grazing management authorized under permit for the Payette National Forest.

## 3) Tribal Rights and Interests

Issue Statement: Forest Plan management strategies may affect the availability of resources and the use of traditional places important to American Indian rights and interests.

One key assumption carried forward from the 2003 FEIS is that disease transmission from domestic sheep to bighorn sheep is a threat to the wild sheep species. Although the Payette National Forest did receive numerous comments in response to the DSEIS contending that disease transmission leading to die-offs in bighorn sheep is not a valid concern, the overwhelming majority of peer-reviewed and published science supports the assumption of transmission and transmission from domestic sheep to bighorn sheep has been demonstrated in laboratory settings (Dassanayke et al. 2009, Lawrence et al. Forthcoming) (see previous discussion on alternative arguments). No published source has yet to demonstrate that transmission is disproven in a laboratory setting. Even with the controversy over this issue, scientists from both sides of the issue have recommended the separation of the two sheep species as the appropriate measure to be taken.

### **Risk of Contact**

Prior to developing the new alternatives, the Payette National Forest improved upon and/or developed three critical baseline analyses and models: (1) bighorn sheep source habitat model; (2) risk for contact between bighorn sheep and domestic sheep on the Payette model, which includes a core herd home range and foray analyses, and (3) a disease model that was developed to assess extirpation probabilities for bighorn sheep populations and assist with cumulative effects beyond the boundary of the Payette National Forest.

The bighorn sheep source habitat model used for the DSEIS was improved upon for the FSEIS and now more accurately depicts where the highest quality bighorn sheep habitat exists and its connectivity in and around the Payette National Forest. As before, summer and winter habitat was modeled separately.

The risk of contact model was used to depict contact potential events between bighorn sheep and domestic sheep on the Payette National Forest using the core herd home range analysis and a newly developed foray analysis. Both analyses were developed using the vast dataset that exists for the bighorn sheep populations within the area of concern for this project. The core herd home range analysis was recalculated to display herd home ranges for 15 herds and one area of concern in and around the Payette National Forest. According to the improved core herd home range model, herds continue to overlap, and connectivity between the individual herds creates the larger bighorn sheep metapopulation. The core herd home range replaced the Geographic Population Range (GPR). The foray analysis assesses the probability of bighorn sheep traveling to the variety of landscapes on the Payette National Forest.

The disease model was developed to help assess extinction probabilities for bighorn sheep populations based on the potential spread of disease within and beyond the boundary of the Payette National Forest that could affect the larger bighorn sheep metapopulation. The disease

model helps inform the Forest Service about whether or not each alternative provides adequate bighorn sheep habitat to help ensure viable populations. All of these models are more thoroughly described and documented in the Chapter 3 and in the *Modeling and Analysis Technical Report* (Appendix L).

Consistent with 36 CFR §219.20(a), the following pages will supplement the Alternatives Considered but Eliminated from Detailed Study section, pages 2-9, of Chapter 2 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

### **ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY**

The following alternatives were eliminated from detailed study for a variety of reasons. The most compelling reason was their reliance on the theory and data from the 2006 *Risk Analysis of Disease Transmission Between Domestic Sheep and Bighorn Sheep on the Payette National Forest*. Since the issuance of the DSEIS the Payette National Forest improved upon and/or developed three critical baseline analyses and models: (1) bighorn sheep source habitat model; (2) risk for contact between bighorn sheep and domestic sheep on the Payette model, which includes a core herd home range and foray analyses, and (3) a disease model that was developed to assess extirpation probabilities for bighorn sheep populations and assist with cumulative effects beyond the boundary of the Payette National Forest. Thus, these alternatives did not use all available and pertinent data.

#### **Alternative 7A**

Alternative 7A was developed by the Payette National Forest after carefully considering the risk analysis (USDA Forest Service 2006). According to the analysis, a portion of the Smith Mountain Allotment is rated as very high risk and a portion of the Curren Hill Allotment is rated as high risk. The risk analysis rated the following entire allotments as high risk: French Creek, Bear Pete, and Marshall Mountain (USDA Forest Service 2006). Alternative 7A would designate the very high risk portion of the Smith Mountain Allotment and the high risk portion of the Curren Hill Allotment as unsuitable for domestic sheep grazing.

This alternative utilized only one component of the Salmon River GPR—a map provided by Idaho Department of Fish and Game (IDFG) biologists showing the GPR based on best professional judgment and data known at the time. The portions of the following allotments that fall within the IDFG delineation would be designated as unsuitable for domestic sheep grazing: Shorts Bar, Hershey Lava, French Creek, North Fork Lick Creek, Little French Creek, Vance Creek, Marshall Mountain, Bear Pete, Josephine, Victor-Loon, Twenty Mile, Fall/Brush, and Lake Fork.

Trailing routes that fall within the Smith Mountain and Curren Hill allotments and those allotments within the IDFG delineation would be closed to domestic sheep use.

Alternative 7A was removed from detailed consideration by the DSEIS interdisciplinary team (IDT) and Cooperators in lieu of Alternative 7G, which used all components of the Salmon River GPR. The DSEIS IDT and Cooperators believed that Alternative 7A did not utilize all available and pertinent data.

### **Alternative 7B**

The risk analysis (USDA Forest Service 2006) was also used to develop Alternative 7B, which would designate the following areas as unsuitable for domestic sheep grazing: the very high rated portion of the Smith Mountain Allotment and all allotments that were rated as high risk, including Curren Hill, French Creek, Bear Pete, and Marshall Mountain. This alternative would also designate some lands outside of the GPRs as unsuitable for domestic sheep grazing. Finally, this alternative would remove trailing route use inside of closed areas identified by either allotment closure or GPR closure.

When first developed, the Forest Service believed Alternative 7B accurately reflected 2007 grazing practices on the Payette National Forest. However, further examination revealed that Alternative 7B only reflected how the westside of the Payette National Forest was grazed in 2007 not the east side. Therefore, this alternative was removed from detailed consideration by the DSEIS IDT and Cooperators in lieu of Alternative 7K, which more closely, though not exactly, reflected how the west and east sides of the Payette National Forest were grazed in 2007.

### **Alternative 7C**

The HCNRA Act and the HCNRA Comprehensive Management Plan (CMP) were considered when developing Alternative 7C. The HCNRA Act states, “Where domestic livestock grazing is incompatible with protection, restoration, or maintenance of fish and wildlife or their habitats;...the livestock use shall be modified as necessary to eliminate or avoid the incompatibility. In the event an incompatibility persists after modification or modification is not feasible, the livestock use shall be terminated.” Wildlife Standard Wld-S8 in the HCNRA CMP states, “Prevent the spread of diseases from domestic sheep by maintaining separation of the two species. Vacant allotments would not be stocked with domestic sheep unless a vaccine or other technique is found that eliminates the incompatibility.” Alternative 7C would designate all National Forest System lands within the HCNRA as unsuitable for domestic sheep grazing. Alternative 7C would also remove trailing route use within the HCNRA.

Two Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*) metapopulations exist on the Payette National Forest, one within the Hells Canyon of the Snake River and the other among the Salmon River Mountains. However, this alternative did not address domestic sheep grazing on areas utilized by the Salmon River metapopulation and was removed from detailed consideration by the DSEIS IDT and Cooperators.

### **Alternative 7D**

Alternative 7D would designate all lands within the modeled Hells Canyon GPR on the west side of the Payette National Forest as unsuitable for domestic sheep grazing. Portions of the following allotments fall within the Hells Canyon GPR and would be considered unsuitable: Curren Hill, Smith Mountain, Boulder Creek, and Price Valley.

Similar to Alternative 7A, this alternative utilizes one component of the Salmon River GPR—a map provided by IDFG biologists showing the GPR based on best professional judgment and data known at the time. Utilizing this component, this alternative would designate portions of the following allotments that fall within the IDFG delineation as unsuitable for domestic sheep grazing: Shorts Bar, Hershey Lava, French Creek, North Fork Lick Creek, Little French Creek,

Vance Creek, Marshal Mountain, Bear Pete, Josephine, Victor-Loon, Twenty Mile, Fall/Brush, and Lake Fork.

This alternative was removed from consideration by the DSEIS IDT and Cooperators in lieu of Alternative 7G, which removed domestic sheep grazing from both the modeled Hells Canyon GPR and the Salmon River GPR. Alternative 7D does not utilize all available and pertinent data.

### **Alternative 7F**

Current Bureau of Land Management (BLM) guidelines (Desert Bighorn Council Technical Staff 1990) recommend a minimum 8.4-mile wide buffer strip between ranges used by domestic and bighorn sheep. This alternative utilizes those management guidelines for the Hells Canyon metapopulation and would designate lands within modeled and mapped ranges of individual rams and within 8.4 miles of known locations on the west side of the Payette National Forest as unsuitable for domestic sheep grazing. For the west side of the Payette National Forest, this alternative would designate portions of the following allotments that fall within the bighorn sheep ram home range as unsuitable for domestic sheep grazing: Curren Hill, Smith Mountain, Boulder Creek, and Price Valley. The ram home range was created by merging the home range analysis for all collared rams that came onto the Payette National Forest.

The Forest Service took a slightly different approach for the Salmon River metapopulation when developing this alternative. Instead of using the BLM guideline of 8.4 miles, the Forest Service used the 9-mile buffer recommended by Western Association of Fish and Wildlife Agencies (WAFWA). This alternative would designate areas within 9 miles of all known bighorn sheep locations identified prior to August 2007 as unsuitable for domestic sheep grazing, which would affect portions of the following allotments: Marshall Mountain, Bear Pete, Brundage, Jug Handle, and Victor-Loon.

In addition, this alternative would designate trailing routes that fell within this alternative as closed to domestic sheep use. Similar to Alternative 7G, this alternative considers the portions of allotments that exist within the Hells Canyon and Salmon River GPRs as unsuitable for domestic sheep grazing. However, this alternative also designates the area contained within a 9-mile buffer around each GPR as unsuitable. The following allotments are affected by this Alternative: Smith Mountain, Curren Hill, Boulder Creek, Price Valley, Surdam, Shorts Bar, Hershey-Lava, French Creek, Bear Pete, Marshall Mountain, Vance Creek, Little French Creek, Josephine, Victor-Loon, Grassy Mountain, Slab Butte, Cougar Creek, Twenty Mile, Brundage, Bill Hunt, Fall/Brush Creek, North Fork Lick Creek, Lake Fork, and Jughandle.

The DSEIS IDT and Cooperators removed this alternative from detailed consideration because domestic sheep suitability was determined according to two different standards: a 9-mile buffer within the Salmon River metapopulation and the ram GPR for the Hells Canyon metapopulation. The ram GPR was developed as described above, but included the telemetry points for rams only.

### **Alternative 7I**

This alternative would designate lands within all modeled source habitat and all areas within 1 mile of modeled source habitat within the entire Payette National Forest as unsuitable for domestic sheep grazing.

The Combined Team removed this alternative early in the process because experts believed it would be difficult for the wildlife managers to implement and the modeled GPRs already included the suitable source habitat currently known to be used by bighorn sheep.

### **Alternative 7J**

This alternative was developed by the Cooperators and presented to the Forest Service during an IDT and Cooperators meeting. The intent of this alternative was to locate landmarks, such as watershed divides, to manage separation since stray domestic sheep tend to wander downhill when separated from the band. Keeping the permitted sheep from going over a divide may be a way to manage them and avoid “downhill drift” into bighorn sheep herds. Areas considered unsuitable for domestic sheep grazing were altered to adjust for expected animal behavior (downhill movement patterns) and to include a portion of the Little Salmon River 4<sup>th</sup> hydrologic unit. This alternative would designate the following areas as unsuitable for domestic sheep grazing: the Brownlee 4<sup>th</sup> field hydrologic unit, the Hells Canyon 4<sup>th</sup> field hydrologic unit, a portion of the Little Salmon 4<sup>th</sup> field hydrologic unit, a portion of the Weiser 4<sup>th</sup> field hydrologic unit, the combination of 4<sup>th</sup> field west side and 4<sup>th</sup> and 6<sup>th</sup> on the east side near Lick Creek, the Lower Salmon 4<sup>th</sup> field hydrologic unit, the Middle Salmon/Chamberlain 4<sup>th</sup> field hydrologic unit, the South Fork Salmon 4<sup>th</sup> field hydrologic unit, the Lower Middle Fork Salmon 4<sup>th</sup> field hydrologic unit, the Upper Middle Fork Salmon 4<sup>th</sup> field hydrologic unit, and two 6<sup>th</sup> field hydrologic units of the North Fork Payette 4<sup>th</sup> field hydrologic unit around Lick Creek summit. Trailing routes within the hydrologic units listed above and the entire Salmon River driveway would also be closed to domestic sheep use. The following allotments would be affected by this alternative: Smith Mountain, Curren Hill, Boulder Creek, Price Valley, Shorts Bar, Hershey-Lava, French Creek, Bear Pete, Marshall Mountain, Little French Creek, Josephine, Victor-Loon, North Fork Lick Creek, Lake Fork, and Jughandle.

### **Alternative 7K**

Alternative 7K implemented recent out of court settlement to determine areas unsuitable for domestic sheep grazing and represents similar use patterns as approved for the 2007 through 2010 grazing seasons. In this alternative, the following areas would be considered unsuitable for domestic sheep grazing: all of the Curren Hill Allotment; the Smith Mountain Allotment in the 6<sup>th</sup> field hydrologic units rated as very high in the risk analysis (USDA Forest Service 2006); the Shorts Bar Allotment, the northern portion of the Hershey Lava Allotment; and the entire French Creek Allotment. In addition to trailing routes within the areas noted above, this alternative would designate the Salmon River Driveway south of the intersection with the Hornet Creek Road and Marshal Mountain as closed to domestic sheep use.

### **Alternatives 5K, 10K, 15K, 20K, 25K, and 30K**

The new risk analysis model enabled the IDT to measure the risk for contact between bighorn sheep and domestic sheep as the distance between the domestic sheep allotment and the core herd home range increased. Several distances were modeled—5 kilometers (km), 10 km, 15 km, 20 km, 25 km, and 30 km—and thus became the alternative names. These alternatives attempted to calculate the distance required to keep the two sheep species separated and to discover how far allotments had to be from the core herd home range for the risk for contact to approach zero. These alternatives were dropped from detailed study for two reasons: (1) these boundaries would be difficult to locate on the landscape and thus manage and (2) these alternatives were not sensitive to actual landscape conditions such as bighorn sheep source habitat.

Consistent with 36 CFR §219.20(a), the following pages will supplement the Alternatives Considered in Detail section, pages 2-44, of Chapter 2 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

### **ALTERNATIVES CONSIDERED IN DETAIL**

The Appeal Reviewing Officer instructed the Regional Forester to further analyze and evaluate the viability of bighorn sheep for all the alternatives in the Forest Plan (USDA Forest Service 2003a). As such, in addition to analyzing the new alternative, the original alternatives are also reviewed.

#### **Elements Common to All Alternatives**

The alternatives considered in detail all pertain exclusively to National Forest System lands on the Payette National Forest and not to other Ecogroup Forests or to surrounding National Forest System or BLM lands.

#### **Alternatives 1B, 2, 5, 7**

The seven alternatives evaluated in the FEIS for the Forest Plan can be combined into two categories based on how they affected the risk of contact between domestic and bighorn sheep. The first category contains Alternatives 1B, 2, 5, 7, which designates all acres on the Payette National Forest as suitable for domestic sheep grazing. All trailing routes remained open in these alternatives.

Alternative 7 was chosen as the alternative to be implemented in the Record of Decision for the FEIS, which was subsequently appealed. The portion of Alternative 7 tied to bighorn sheep viability, disease transmission between domestic sheep and bighorn sheep, and compliance with the HCNRA Act was remanded to the Regional Forester for improved and additional analysis. To meet the appeal requirements related to the potential impacts of disease transmission from domestic sheep on the Payette National Forest, modifications to Alternative 7 were developed and are analyzed in Chapter 3. Because this alternative was found to not be compliant with the NFMA, it cannot be selected as the final decision. For Alternative 7, zero acres are identified as unsuitable for domestic sheep.

#### **Issues Used to Develop the Alternative**

**Terrestrial Wildlife Habitat and Species:** These alternatives provide little or no habitat on the Payette National Forest to provide for bighorn sheep viability. These alternatives do not address disease transmission between domestic sheep and bighorn sheep.

Rangeland Resources: This set of alternatives respond to rangeland resources by determining 100,310 acres on the Payette National Forest as suited for domestic sheep grazing.

Tribal Rights and Interests: Alternatives 1B, 2, 5 and 7 provide little or no long-term harvest ability of bighorn sheep for tribal members and thus do not respond to this issue.

### **Alternatives 3, 4, 6**

These alternatives were also proposed in the FEIS and are grouped together as the second category of alternatives. These alternatives would designate zero acres of suitable rangeland portions of the Smith Mountain Allotment overlapping current bighorn sheep habitat as available for domestic sheep grazing. All trailing routes would remain open.

#### **Issues Used to Develop the Alternative**

Terrestrial Wildlife Habitat and Species Issue 2: These alternatives address disease transmission from domestic sheep to bighorn sheep by determining 7,228 acres as unsuitable for domestic sheep grazing.

Rangeland Resources: These alternatives affect rangeland resources by determining 7,228 acres as unsuited and 93,082 acres as suited for domestic sheep grazing.

Tribal Rights and Interests: Alternatives 3, 4, and 6 greatly reduce the harvest ability for tribal members.

### **Alternative 7E**

Alternative 7E would designate zero acres within the Payette National Forest as suitable for domestic sheep grazing and would leave no trailing routes open to use within the entire Payette National Forest.

The following allotments would be affected by this Alternative: Smith Mountain, Curren Hill, Boulder Creek, Price Valley, Surdam, Shorts Bar, Hershey-Lava, French Creek, Bear Pete, Marshall Mountain, Vance Creek, Little French Creek, Josephine, Victor-Loon, Grassy Mountain, Slab Butte, Cougar Creek, Twenty Mile, Brundage, Bill Hunt, Fall/Brush Creek, North Fork Lick Creek, Lake Fork, and Jughandle.

#### **Issues Used to Develop this Alternative**

Terrestrial Wildlife Habitat and Species Issue 2: This alternative would address disease transmission from domestic sheep to bighorn sheep by determining all 100,310 acres of capable domestic sheep grazing land as unsuitable for domestic sheep grazing and closing all trailing routes within the Payette National Forest. Alternative E would provide the most habitat for viable populations of bighorn sheep.

Rangeland Resources: This alternative would have the greatest affect on rangeland resources by determining all 100,310 of capable acres as unsuitable for domestic sheep grazing.

Tribal Rights and Interests: Because Alternative 7E would remove the risk for contact between bighorn and domestic sheep on the Payette National Forest it could provide the greatest long-term ability to harvest bighorn sheep in all traditional locations influenced by the Payette National Forest.

## **Alternative 7G**

In the DSEIS, populations of bighorn sheep were identified using the GPR model. The GPR was developed utilizing the risk analysis (USDA Forest Service 2006) that is no longer in effect for the FSEIS. Alternative 7G uses the GPRs as boundaries only (not tied to the risk analysis) and would designate zero acres within the Hells Canyon and Salmon River GPRs as suitable for domestic sheep grazing. This alternative would leave no trailing routes open within the GPRs.

The following allotments would be affected by this alternative: Smith Mountain, Curren Hill, Boulder Creek, Price Valley, Shorts Bar, Hershey-Lava, French Creek, Bear Pete, Marshall Mountain, Vance Creek, Little French Creek, Josephine, Victor-Loon, Twenty Mile, Fall/Brush Creek, North Fork Lick Creek, and Lake Fork.

### **Issues Used to Develop this Alternative**

Terrestrial Wildlife Habitat and Species Issue 2: This alternative would address disease transmission from domestic sheep to bighorn sheep by determining all 61,842 suitable acres within the GPRs as unsuitable for domestic sheep grazing and closing all trailing routes within the GPRs.

Rangeland Resources: This alternative would affect rangeland resources by determining 61,842 suitable acres as unsuitable for domestic sheep grazing and 38,468 acres as suited.

Tribal Rights and Interests: Alternative 7G would consider no land within the GPRs as suitable for domestic sheep grazing, thus reducing contact between the two species and potentially providing for greater tribal harvest opportunity.

## **Alternative 7L**

Alternative 7L was developed using the updated quantitative risk analysis and landmarks, such as watershed divides, streams, roads, and allotment boundaries, to make implementation easier. This alternative would attempt to remove only the very highest risk areas from domestic sheep grazing while keeping suitable range land open.

On the Westside of the Payette National Forest, zero acres of the Curren Hill and Surdam Allotments would be designated suitable for domestic sheep grazing, while the eastern 35 percent of the Smith Mountain Allotment and all of Boulder Creek and Price Valley Allotments would be designated as suitable for domestic sheep grazing. On the eastside of the Payette National Forest, zero acres of the Shorts Bar and North Fork Lick Creek Allotments would be designated suitable for domestic sheep grazing. The southwest 25 percent of the Hershey-Lava Allotment, the very eastern 15 percent of the French Creek Allotment, the eastern 40 percent of the Bear Pete Allotment, and the western 70 percent of the Marshall Mountain Allotment would be designated suitable for domestic sheep grazing.

### **Issues Used to Develop the Alternative**

Terrestrial Wildlife Habitat and Species Issue 2: This alternative would address disease transmission from domestic sheep to bighorn sheep by determining all 35,999 suitable acres as unsuitable for domestic sheep grazing and closing all trailing routes within the alternative area.

Rangeland Resources: This alternative would affect rangeland resources by determining 35,999 suitable acres as unsuitable for domestic sheep grazing and 64,311 acres as suited.

Tribal Rights and Interests: Alternative 7L would consider 64,311 acres as suitable for domestic sheep grazing, thus reducing contact between the two species and potentially providing for greater tribal harvest opportunity.

### **Alternative 7M**

Alternative 7M was developed using the updated quantitative risk analysis and landmarks, such as watershed divides, streams, roads, and allotment boundaries, to make implementation easier. This alternative was designed to remove more risk from the landscape and keep grazing outside of the core herd home range areas.

On the westside of the Payette National Forest, zero acres of the Curren Hill, Surdam, and Boulder Creek Allotments would be designated suitable for domestic sheep grazing. The eastern 25 percent of the Smith Mountain Allotment would be designated suitable for domestic sheep grazing. The eastern 85 percent of the Price Valley Allotment would be designated suitable for domestic sheep grazing. On the eastside of the Payette National Forest, zero acres of the Shorts Bar, French Creek, Marshall Mountain, North Fork Lick Creek, and Lake Fork Allotments would be designated suitable for domestic sheep grazing. The southwestern 25 percent of the Hershey-Lava Allotment and eastern 30 percent of the Bear Pete Allotment would be designated suitable for domestic sheep grazing. The northern 50 percent of the Victor-Loon Allotment, western 25 percent of the Twenty Mile Allotment, and southern 90 percent of the Jughandle Allotment would be designated suitable for domestic sheep grazing.

### **Issues Used to Develop the Alternative**

Terrestrial Wildlife Habitat and Species Issue 2: This alternative would address disease transmission from domestic sheep to bighorn sheep by determining 57,065 suitable acres as unsuitable for domestic sheep grazing and closing all trailing routes within the alternative area.

Rangeland Resources: This alternative would affect rangeland resources by determining 57,065 suitable acres as unsuitable for domestic sheep grazing and 43,245 acres as suited.

Tribal Rights and Interests: Alternative 7M would consider 43,245 acres within the alternative area as suitable for domestic sheep grazing, thus reducing contact between the two species and potentially providing for greater tribal harvest opportunity.

### **Alternative 7N**

Alternative 7N was developed using the updated quantitative risk analysis and landmarks, such as watershed divides, streams, roads, and allotment boundaries, to make implementation easier. This alternative was designed to remove most of the high risk area and replace grazing areas of lower risk.

On the west of the Payette National Forest, zero acres of the Curren Hill, Surdam, and Boulder Creek Allotments are designated suitable for domestic sheep grazing. The eastern 25 percent of the Smith Mountain allotment and eastern 85 percent of the Price Valley Allotment are designated suitable for domestic sheep grazing. On the eastside of the Payette National Forest, zero acres of the Shorts Bar, Grassy Mountain, Vance Creek, Hershey-Lava, Little French Creek, French Creek, Marshall Mountain, and North Fork Lick Creek Allotments would be designated suitable for domestic sheep grazing. The western 85 percent of the Josephine Allotment, eastern 25 percent of Bear Pete Allotment, northern 50 percent of the Victor-Loon

Allotment, and western 25 percent of the Twenty Mile Allotment would be designated suitable for domestic sheep grazing.

### **Issues Used to Develop the Alternative**

Terrestrial Wildlife Habitat and Species Issue 2: This alternative would address disease transmission from domestic sheep to bighorn sheep by determining all 61,918 suitable acres as unsuitable for domestic sheep grazing and closing all trailing routes within the alternative area.

Rangeland Resources: This alternative would affect rangeland resources by determining 61,918 suitable acres as unsuitable for domestic sheep grazing and 38,392 acres as suited.

Tribal Rights and Interests: Alternative 7N would consider 38,392 acres within the alternative area as suitable for domestic sheep grazing, thus reducing contact between the two species and potentially providing for greater tribal harvest opportunity.

### **Alternative 7O**

Alternative 7O was developed using the updated quantitative risk analysis and landmarks, such as watershed divides, streams, roads, and allotment boundaries, to make implementation easier. This alternative was designed to remove all areas of major risk and keep allotments as intact as possible while reducing monitoring to minimal levels.

On the westside of the Payette National Forest, zero acres of the Curren Hill, Surdam, and Boulder Creek Allotments would be designated suitable for domestic sheep grazing. The eastern 25 percent of the Smith Mountain Allotment and eastern 85 percent of the Price Valley Allotment would be designated suitable for domestic sheep grazing. On the eastside of the Payette National Forest, zero acres of the Shorts Bar, Grassy Mountain, Vance Creek, Hershey-Lava, Little French Creek, French Creek, Josephine, Bear Pete, Marshall Mountain, Victor-Loon, North Fork Lick Creek, and Lake Fork Allotments would be designated suitable for domestic sheep grazing. The western 25 percent of the Twenty Mile Allotment and southern 90 percent of the Jughandle Allotment would be designated suitable for domestic sheep grazing.

### **Issues Used to Develop the Alternative**

Terrestrial Wildlife Habitat and Species Issue 2: This alternative would address disease transmission from domestic sheep to bighorn sheep by determining all 68,718 suitable acres as unsuitable for domestic sheep grazing and closing all trailing routes within the alternative area.

Rangeland Resources: This alternative would affect rangeland resources by determining 68,718 suitable acres as unsuitable for domestic sheep grazing and 31,592 acres as suited.

Tribal Rights and Interests: Alternative 7O would consider 31,592 acres within the alternative area as suitable for domestic sheep grazing, thus reducing contact between the two species and potentially providing for greater tribal harvest opportunity.

### **Alternative 7P**

Alternative 7P was developed using the updated quantitative risk analysis and landmarks, such as watershed divides, streams, roads, and allotment boundaries, to make implementation easier. This alternative was designed to balance bighorn sheep protection and the amount of suitable rangeland.

On the westside of the Payette National Forest, zero acres of the Curren Hill, Surdam, and Boulder Creek Allotments would be designated suitable for domestic sheep grazing. The eastern 35 percent of the Smith Mountain Allotment and eastern 85 percent of the Price Valley Allotment would be designated suitable for domestic sheep grazing. On the eastside of the Payette National Forest, zero acres of the Shorts Bar, Little French Creek, French Creek, Marshall Mountain, and North Fork Lick Creek Allotments would be designated suitable for domestic sheep grazing. The southwest 25 percent of the Hershey-Lava Allotment, western 85 percent of the Josephine Allotment, eastern 25 percent of Bear Pete Allotment, northern 50 percent of Victor-Loon Allotment, and western 25 percent of the Twenty Mile Allotment would be designated suitable for domestic sheep grazing.

### **Issues Used to Develop the Alternative**

**Terrestrial Wildlife Habitat and Species Issue 2:** This alternative would address disease transmission from domestic sheep to bighorn sheep by determining all 54,204 suitable acres as unsuitable for domestic sheep grazing and closing all trailing routes within the alternative area.

**Rangeland Resources:** This alternative would affect rangeland resources by determining 54,204 capable acres as unsuitable for domestic sheep grazing and 46,106 acres as suited.

**Tribal Rights and Interests:** Alternative 7P would consider 46,106 acres within the alternative area as suitable for domestic sheep grazing, thus reducing contact between the two species and potentially providing for greater tribal harvest opportunity.

Consistent with 36 CFR §219.20(a), the following pages will replace the Effects on Bighorn Sheep in the Comparison of Alternatives section, page 2-75, of Chapter 2 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

## **COMPARISON OF ALTERNATIVES**

### **Comparison of Alternative Effects on Resource Issue and Indicators**

#### **Terrestrial Wildlife Habitat and Species**

**Effects on Bighorn Sheep:** Alternatives were evaluated on their merits for providing separation and minimizing the likelihood of contact between bighorn sheep and domestic sheep on seven bighorn sheep herds on, and adjacent to, the Payette National Forest. The alternatives were compared on the basis of outputs from the summer source habitat model, the risk of contact model (the core herd home range and foray analyses), and the disease model.

#### ***Source Habitats Model***

Those alternatives that provided the highest amount of summer source habitat and the least suited rangelands open to domestic sheep grazing were generally considered the best options for bighorn sheep population persistence (Table 2-19a).

The configuration of source habitats, bighorn sheep use of these habitats, and the geographical proximity of bighorn sheep to domestic sheep allotments are significant factors in evaluating the potential for contact and disease transmission. Hence, we infer that overlap between bighorn sheep core herd home ranges and domestic sheep allotments will result in repeated contacts that will result in a disease outbreak.

Table 2-19a displays percent of bighorn sheep core herd home ranges that overlap with domestic sheep allotments. This table suggests that Alternatives 1, 2, 5, 7 and 3, 4, 6 pose significant threats to the Muir Creek and Upper Hells Canyon bighorn sheep populations; Alternatives 7G and 7L pose threats to the Upper Hells Canyon population.

**Table 2-19a. Overlap between Bighorn Sheep Core Herd Home Ranges and Domestic Sheep Allotments between Alternatives**

Core Home Range	Total Acres	1B, 2, 5, 7 (%)	3, 4, 6 (%)	7E (%)	7G (%)	7L (%)	7M, 7N, 7O, 7P (%)
Big Canyon	45,688	0.00	0.00	0.00	0.00	0.00	0.00
Little Salmon	26,199	0.00	0.00	0.00	0.00	0.00	0.00
Main Salmon South Fork	187,380	0.00	0.00	0.00	0.00	0.00	0.00
Muir Creek	285,539	5.97	0.68	0.00	0.00	0.00	0.00
Myers Creek	154,961	0.00	0.00	0.00	0.00	0.00	0.00
Upper Hells Canyon	592,005	15.83	10.84	0.00	0.02	3.13	0.00
Sheep Mountain	21,459	0.00	0.00	0.00	0.00	0.00	0.00
Big Creek	113,975	0.00	0.00	0.00	0.00	0.00	0.00

We further evaluated distances from bighorn sheep core herd home ranges to domestic sheep allotments, the inference being the greater distances between the species offers the greatest probability for persistence of bighorn sheep herds (Table 2-19b). These analyses suggested the Little Salmon, Main Salmon South Fork, Upper Hells Canyon, and Muir populations are potentially at risk for all alternatives except Alternative 7E. These results may explain why contact scenarios, and resulting disease modeling, indicate moderate-to-high risk extirpation probabilities for these bighorn sheep populations under most alternatives, even when probabilities of disease outbreak given contact are assumed to be low.

**Table 2-19b. Distance (in km) from Bighorn Sheep Core Herd Home Ranges to Domestic Sheep Allotments**

Herd Home Range	1B, 2, 5, 7	3, 4, 6	7E	7G	7L	7M	7N	7O	7P
Big Canyon	35	35	No allotments	42	42	43	51	51	43
Little Salmon	1	1	No allotments	1	1	1	8	8	1
Main Salmon South Fork	0	0	No allotments	5	3	11	12	22	12
Upper Hells Canyon	0 <sup>a</sup>	0 <sup>a</sup>	No allotments	0 <sup>a</sup>	0 <sup>a</sup>	0	0	0	0
Muir Creek	0 <sup>a</sup>	0 <sup>a</sup>	No allotments	15	7	13	13	13	13
Myers Creek	6	6	No allotments	21	20	20	30	30	20
Sheep Mountain	12	16	No allotments	20	20	20	20	20	20
Big Creek	38	38	No allotments	39	39	40	40	43	39

<sup>a</sup> Domestic sheep allotment overlaps bighorn sheep core herd home range

Table 2-19c summarizes alternative outcomes and ranks the alternatives on their ability to provide separation between source habitats potentially occupied by the two species (1 being the best and 8 being the worst). Obviously, those alternatives that do not contain overlap between core herd home ranges and domestic sheep allotments are considered better for bighorn sheep than those where overlap occurs.

**Table 2-19c. Relative Ranking of Alternatives Based on Protection of Bighorn Sheep Summer Source Habitats and Rangeland Remaining Suited for Domestic Sheep Grazing**

Alternative	Summer Source Habitat Protected (%)	Summer Source Habitat Protected (Acres)	Suited Rangeland Habitat for Domestic Sheep (%)	Suited Rangeland Habitat for Domestic Sheep (Acres)	Relative Ranking of Alternatives For Providing Separation Between Domestic and Bighorn Sheep
1B, 2, 5, and 7	0.00	0	100.00	100,310	9
3, 4, and 6	9.20	33,918	92.79	93,082	8
7G	71.43	263,338	38.35	38,468	6/7
7L	85.64	315,715	64.11	64,311	6/7
7M	91.94	338,934	43.11	43,245	5
7N	91.56	337,532	38.27	38,392	2/3
7O	94.05	346,696	31.49	31,592	2/3
7P	90.16	332,372	45.96	46,106	4
7E	100.00	368,641	0.00	0	1

***Risk of Contact Model***

Alternatives were ranked based on the frequency of interspecies contact modeled through the core herd home range and foray analyses. Logically, if the likelihood of contact is greater, the potential for disease transmission and resulting disease outbreaks was also greater. Table 2-19d displays the relative ranking of alternatives based on the number of contacts per year.

**Table 2-19d. Relative Ranking of Alternatives Based on Modeled Contact between Bighorn Sheep and Domestic Sheep Allotments**

Herd Name	1B, 2, 5, 7	3, 4, 6	7G	7L	7M	7N	7O	7P	7E
Big Canyon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Little Salmon	0.07	0.07	0.04	0.04	0.03	0.01	0.01	0.03	0.00
Main Salmon South Fork	1.01	1.01	0.35	0.31	0.19	0.08	0.04	0.12	0.00
Upper Hells Canyon	0.15	0.15	0.09	0.13	0.05	0.03	0.03	0.05	0.00
Muir Creek	0.06	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Myers Creek	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sheep Mountain	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Contacts per year	1.33	1.28	0.49	0.49	0.27	0.12	0.08	0.20	0.00
Relative Ranking of Alternatives For Minimizing Contact	8/9	8/9	6/7	6/7	4/5	2/3	2/3	4/5	1

Alternative 7E is the only alternative that prevents interspecies contact and some level of contact is expected for all bighorn sheep populations, except Big Canyon, in the action alternatives. Alternatives 7N and 7O reveal low contact rates (0.12 and 0.08, respectively). Although these are the lowest contact rates, the potential for contact exists in the Main Salmon South Fork and Upper Hells Canyon herds—two populations that contribute to the largest populations on, or adjacent to, the Payette National Forest. Alternatives 1, 2, 5, 7; 3, 4, 6; 7G; and 7L have moderate-to-high contact rates that involve four to seven of the populations. Alternatives 7M and 7P have moderate contact rates that affect the Main Salmon South Fork, Little Salmon, and Upper Hells Canyon populations, with the greatest contact risk to the Main Salmon South Fork (highest current population).

### *Disease Model*

Alternatives were compared using low (0.05), moderate (0.25), and high (1.0) probabilities of a disease outbreak given contact. Under all alternatives, the Sheep Creek population has a high probability of extirpation due to recurrent disease outbreaks that have reduced this population to 11 individuals (all ewes in older age classes). For Alternative 7E, the probability of a disease outbreak for all herds is 0. Action alternatives were ranked from 1 to 8, with 1 having the highest likelihood of population persistence.

When the inference for a disease outbreak given contact is assumed to be low (0.05), all populations have a high probability of persistence under Alternatives 7M, 7N, 7O, and 7P. Under Alternatives 1, 2, 5, 7 and 3, 4, 6, the Little Salmon, Main Salmon South Fork, and Upper Hells Canyon populations have a high probability of extirpation. Under Alternatives 7G and 7L, the Upper Hells Canyon population has a moderate probability of extirpation.

Under moderate assumptions (0.25) for a disease outbreak given contact, the Upper Hells Canyon population has a high probability of extirpation under all alternatives except 7N and 7O. Little Salmon and Main Salmon South Fork have a high probability of extirpation under Alternatives 1, 2, 5, 7; 3, 4, 6; 7G; and 7L. Alternatives 7N, 7O; 7P, and 7M possibly have the highest persistence levels for maintaining the Main Salmon South Fork and Little Salmon populations.

Under high probability assumptions (1.0) for a disease outbreak given contact, all populations show a high probability of extirpation under Alternatives 1B, 2, 5, 7 and 3, 4, 6. Big Canyon, Muir Creek, and Myers Creek may persist under Alternatives 7G, 7L, 7M, 7N, 7O, and 7P. Little Salmon, Main Salmon South Fork, and Upper Hells Canyon have a high probability of extirpation under all alternatives, with the exception of Alternative 7O; Little Salmon and Main Salmon South Fork have a moderate probability of extirpation.

Assumptions regarding the probability of a disease outbreak given contact have substantial implications for the estimating the persistence of these bighorn sheep populations on, and

adjacent to, the Payette National Forest. However, for all scenarios, the relative rankings of the action alternatives are similar, with Alternatives 7N and 7O offering the greatest persistence probabilities for all populations. Alternatives 1B, 2, 5, 7 and 3, 4, 6 consistently had the highest probabilities of extirpation. The remaining alternatives fell in between 1B, 2, 5, 7; 3, 4, 6; and 7N/7O, with Alternatives 7M and 7P generally contributing to higher population persistence than Alternatives 7G and 7L.

### Summary and Determinations

The results the three separate models (source habitat, risk of contact, and disease) result in a similar ranking of alternatives. The severity of the outcomes from the disease model depends largely on assumptions made relative to probability of a disease outbreak given contact. However, even though these assumptions varied, the alternative rankings for this model remained unchanged.

Alternative 7E provides the greatest protection to bighorn sheep habitats, the least likelihood of contact, and the highest probabilities of persistence for all bighorn sheep populations. This alternative would **have a Beneficial Impact** on bighorn sheep as a sensitive species.

Of the action alternatives, 7N and 7O protect the most source habitat and retain the least suited rangeland for domestic sheep. Contacts per year are low (0.12 and 0.08, respectively). At moderate probabilities for a disease outbreak given contact (0.25), several herds showed moderate-to-high persistence probabilities. The Upper Hells Canyon had a low probability of persistence under this alternative. For bighorn sheep, as a sensitive species, these alternatives **May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability to the Population or Species.**

Alternatives 7M and 7P are viewed as middle-ground alternatives and have similar outputs from the three models. The main difference between the alternatives is that 7M shows core herd home ranges that contact domestic sheep allotment boundaries. The risk of contact is also considered moderate (0.27 and 0.20 respectively). Under Alternative 7M, at a moderate probability for disease outbreak given contact (0.25), the disease model suggests that the Little Salmon, Main Salmon South Fork, and Upper Hells Canyon populations may not persist, whereas under 7P, the Main Salmon South Fork and Little Salmon have a 21 percent likelihood of extirpation. Hence, Alternative 7P may allow the persistence of bighorn sheep in the Main Salmon South Fork population. For bighorn sheep, as a sensitive species, **Alternative 7P May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or Loss of Viability to the Population or Species. Alternative 7M Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species.**

Alternatives 7G; 7L; 1, 2, 5, 7; and 3, 4, 6 would have the highest risks of contact and protect the least amount of source habitats. These alternatives would likely not ensure bighorn sheep populations on, and adjacent to, the Payette National Forest. For bighorn sheep, as a sensitive species, these alternatives **Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species.**

Alternatives are thus ranked from the highest to lowest probability for bighorn sheep persistence:

**7E–7N/7O–7P–7M–7G/7L–1B, 2, 5, 7/3, 4, 6**

### **Cumulative Effects Summary**

The risk of contact model was run under two potential cumulative effects scenarios:

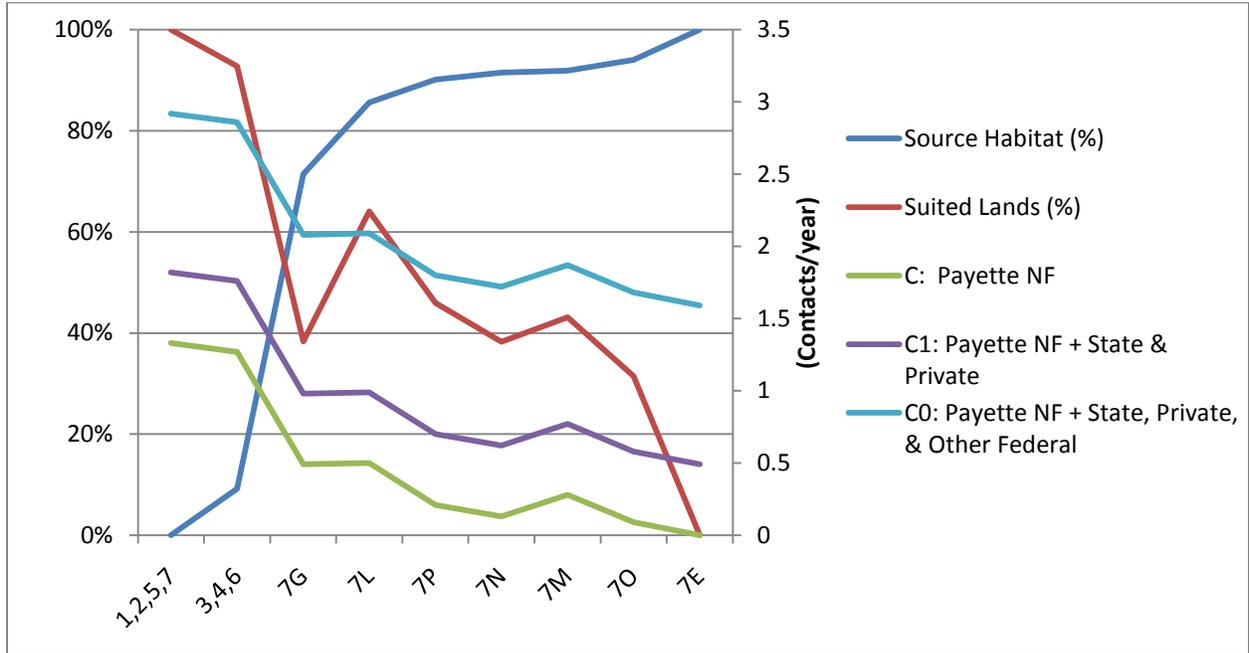
- (1) C0—domestic sheep management on BLM, the Nez Perce National Forest, State, and private lands would be managed as they are currently
- (2) C1—domestic sheep grazing on all adjacent Federal lands would be curtailed (i.e., analogous to Alternative 7E in this document), while existing domestic sheep grazing would continue on State and private lands

The risk of contact model suggests an additional 1.59 contacts per year for C0. The majority of the additional contacts were from Federal lands along the Main Fork of the Salmon River. If domestic sheep grazing is curtailed on all Federal, State, and private lands adjacent to the Payette National Forest (C1), the model predicts an additional 0.49 contacts per year. Hence, under Alternative 7E, which removes domestic sheep grazing on the Payette National Forest, the modeled contact rates would be 1.59 and 0.50 for C0 and C1, respectively, under a cumulative effects scenario.

The implications of these additional contacts, particularly from adjacent Federal lands, would be substantial and contribute more to contact risk between the species than any of the action alternatives. Modeled contacts per year would increase among the alternatives from 0.08–1.33 to 1.68–2.92 for the action alternatives (Table W-29 in the Terrestrial Wildlife Habitat and Species). Although the disease model was not run for the cumulative effects analysis, cumulative effects would dramatically increase the extinction probabilities for all scenarios.

Even 0.50 additional contacts per year pose a substantial increase in contact risk. Modeled contacts per year would increase among the alternatives from 0.08–1.33 to 0.58–1.82. The largest bighorn sheep populations (Main Salmon South Fork and Upper Hells Canyon) under Alternatives 7N and 7O, which were the most favorable action alternatives, would likely not persist under this cumulative effects scenario. The relative ranking of the alternatives presented above would remain the same, but the probabilities of contact would increase 0.50 for each alternative. Figure 2-4 displays source habitats; suited rangelands that remain open for domestic sheep grazing; and the probabilities of contact for each of the alternatives, including the cumulative effects scenarios.

**Figure 2-4. Comparison of alternatives in terms of percentage of bighorn sheep summer source habitat protected; percentage of suited rangelands that remains open for domestic sheep grazing; and the modeled contacts per year due to forays outside of the herd home ranges.**



Note: C shows the modeled contact rates with allotments on the Payette National Forest alone. C0 and C1 are cumulative effect scenarios. C0 shows the modeled contact rates for alternatives plus additional contact estimates for Federal, State, and private lands adjacent to the Payette National Forest. C1 shows modeled contact rates for alternatives plus additional contact estimates for State and private lands adjacent to the Payette National Forest.

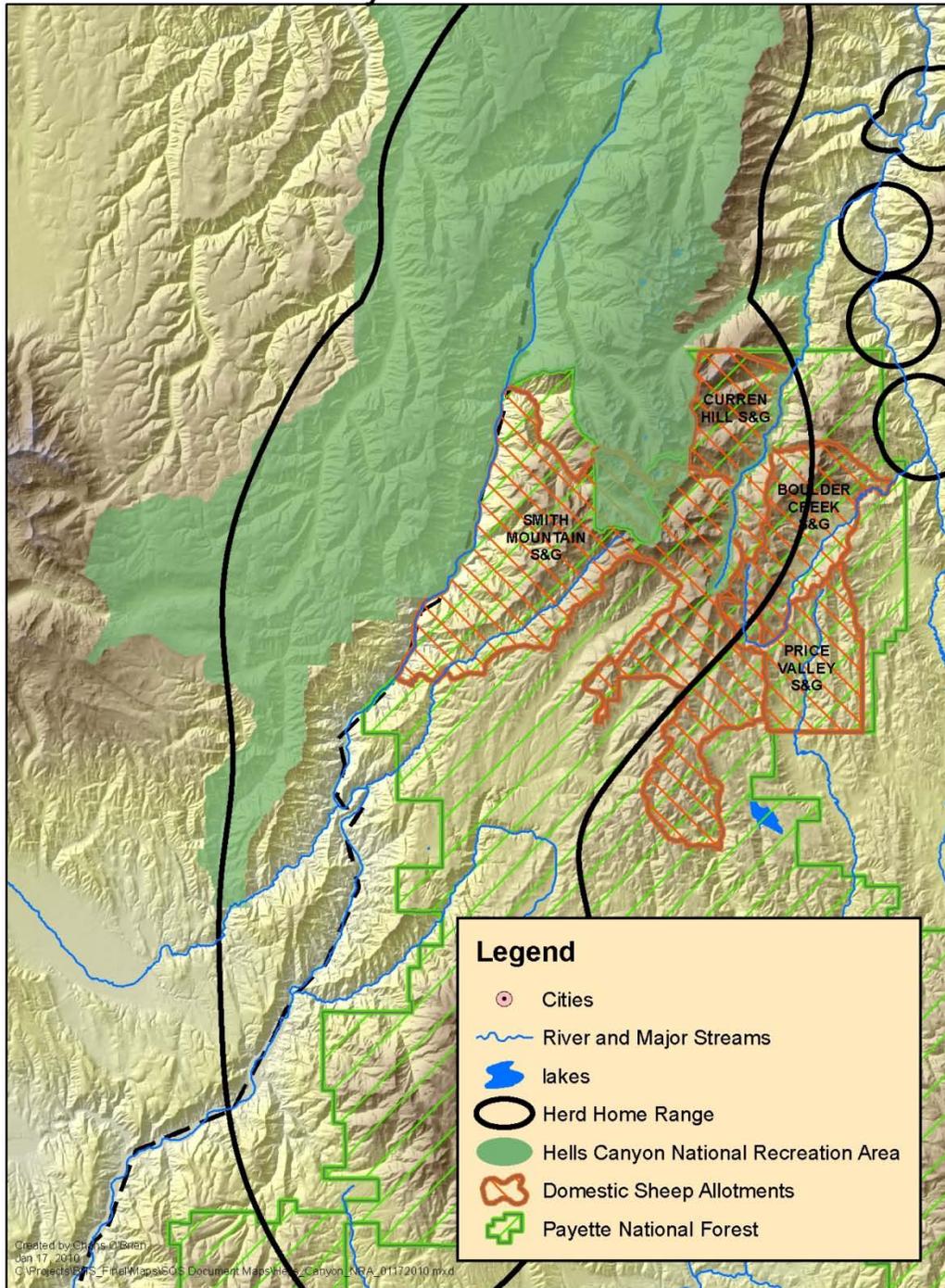
Consistent with 36 CFR §219.20(a), the following pages update and add to the Compliance with the Hells Canyon National Recreation Area Act (P.L. 94-199) section, pages 2–131 of Chapter 2 of the 2003 Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement.

### **COMPLIANCE WITH THE HELLS CANYON NATIONAL RECREATION AREA ACT (P.L. 94-199)**

Several bighorn sheep herds utilize the HCNRA and move freely back and forth to other National Forest and BLM lands, including the Payette National Forest. Bighorn sheep habitat is extensive and interconnected throughout the canyon area and up into the high elevation mountain peaks of the Seven Devils and into the Salmon River drainage (Figure 2-5 and Chapter 3, Bighorn Sheep Core Herd Home Range analysis). Starting in 1994, a sample of bighorn sheep in the HCNRA was fitted with telemetry radio collars and monitored bi-weekly. A core herd home range analysis was completed for each of these 16 herd populations using this information. This analysis demonstrates the interconnectivity between the herd units and the extent which bighorn sheep move across the landscape. In addition, bighorn sheep foray in and out of domestic sheep allotments located on the Payette National Forest, often returning to the HCNRA. Permitted domestic sheep grazing allotments on the Payette National Forest lie in and immediately adjacent to the HCNRA and inside the core herd home range of the Upper Hells Canyon and Muir Creek herds. In consideration of the above information, the following determinations have been made regarding compatibility with the HCNRA Act and the HCNRA CMP for the action alternatives.

Figure 2-5. Hells Canyon National Recreation Area on the Payette National Forest

### Hells Canyon National Recreation Area on the Payette National Forest



**Alternatives 1B, 2, 5, 7; 3, 4, 6; and 7L**

Alternatives 1B, 2, 5, 7; 3, 4, 6; and 7L would allow domestic sheep grazing on the Payette National Forest within the boundary of the HCNRA or within modeled bighorn sheep core herd home range outside the HCNRA boundary. The core herd home range is where 95 percent of the bighorn sheep locations recently occurred according to radio telemetry data (see Chapter 3, Bighorn Sheep Core Herd Home Range Analysis). Allotments lying within core herd home range have a 100 percent probability of a bighorn sheep contacting that allotment (see Tables 2-19a and 2-19b). Probabilities of contact between bighorn sheep herds and domestic sheep allotments have been calculated for the Payette National Forest using a quantitative risk for contact analysis.

The Smith Mountain and Curren Hill Allotments are within and adjacent to the HCNRA. The majority of these allotments are within core herd home range, which would present a very high risk of disease transmission from domestic sheep to bighorn sheep. The risk would be higher when and if the bighorn sheep population increases. Enough separation between the two species is needed to maintain bighorn sheep on the HCNRA (Schommer and Woolever 2001); therefore, Alternatives 1B, 2, 5, 7; 3, 4, 6; and 7L are not in compliance with the compatibility requirements of the HCNRA Act (Table 2-84).

**Alternative 7E**

Alternative 7E would remove domestic sheep grazing from the Payette National Forest within the boundary of the HCNRA and within modeled bighorn sheep core herd home range. It would also designate all of the Payette National Forest as unsuited for domestic sheep grazing. Eliminating domestic sheep grazing in HCNRA and surrounding area is compatible with the HCNRA Act and its implementing regulations by providing for the protection, restoration, and maintenance of bighorn sheep and their habitat. Alternative 7E is in compliance with the HCNRA CMP by removing the potential for contact between bighorn and domestic sheep and may allow the population to recover and expand (Table 2-84).

**Alternatives 7G**

Alternative 7G would eliminate domestic sheep grazing from the Payette National Forest within the boundary of the HCNRA. It would also eliminate domestic sheep grazing at least 6 air miles from the boundary of the HCNRA. Only a small sliver of the core herd home range would be within suitable area for domestic sheep grazing.

Eliminating domestic sheep grazing in the HCNRA and surrounding area is compatible with the HCNRA Act and its implementing regulations by providing for the protection, restoration, and maintenance of bighorn sheep and their habitat. Alternative 7G would be in compliance with the HCNRA CMP by maintaining a separation between bighorn and domestic sheep at the current population levels (Table 2-84). If bighorn sheep populations increase, the likelihood of contact may increase and this evaluation may need to be revisited. Monitoring should be conducted to assess future locations of bighorn sheep and ensure no contact occurs with domestic sheep on permitted allotments.

### Alternatives 7M, 7N, 7O, 7P

Alternatives 7M, 7N, 7O, and 7P would eliminate domestic sheep grazing from the Payette National Forest within the boundary of the HCNRA and within modeled bighorn sheep core herd home range. The contact model results indicate a 4 percent or less risk rating for each of the alternatives. These results indicate mixing of the two species would occur once every 25 years or less, which is considered a low risk of disease transmission.

Eliminating domestic sheep grazing in the HCNRA and surrounding area is compatible with the HCNRA Act and its implementing regulations by providing for the protection, restoration, and maintenance of bighorn sheep and their habitat. All four alternatives would be in compliance with the HCNRA CMP by maintaining a separation between bighorn and domestic sheep at current population levels (Table 2-84). In all four alternatives, grazing would continue within 2 miles of the modeled bighorn sheep core herd home range. If that grazing continues near core herd home range, some effective monitoring both inside and outside of herd home ranges, is recommended to help detect bighorn sheep before contact is made.

**Table 2-84. Compatibility with the Hells Canyon National Recreation Area Act for each Alternative**

Alternative	Compatible	Not Compatible
7E, 7G	No grazing in HCNRA, or within 6 air miles of HCNRA	
7M, 7N, 7O, 7P	No grazing in HCNRA, or within 2 air miles of HCNRA. Mixing of the two species would occur once every 25 years or less, which is considered a low risk of disease transmission. Monitoring recommended.	
1B, 2, 5,7, 3,4,6, 7L		Grazing in and adjacent to HCNRA, contact probability 100%.

### OCCUPIED HABITAT

For detailed discussion regarding occupied habitat, see report *Occupancy, Risk and the Potential for Contact between Bighorn Sheep and Domestic Sheep on the Payette National Forest* (Appendix M in USDA Forest Service 2010).

The delineation of occupied habitat is an important concept used by managers and researchers in understanding the distributions of species on landscapes and the implications of natural and anthropogenic perturbations on those species and their habitats. Researchers and managers have a long history of developing models that infer habitat suitability based on species' habitat requisites and the potential for species to occur in, or occupy, these suitable habitats.

Considerable effort has been placed on monitoring species and their habitats to this end. However, there is a difference between identifying suitable habitat and inferring that habitat is occupied. Relative to this issue on Payette National Forest Service administered lands, guidance from the 1982 planning regulations (36 CFR §219.19) state that, "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area."

Documenting bighorn sheep occupied habitat on the Payette National Forest has several challenges, and the availability of suitable habitat does not infer occupied habitat for a number of

reasons. Substantial declines of bighorn sheep populations, contractions in the species geographical distribution, translocations for the recovery of bighorn sheep, population depressions as a result of disease epizootics, and bighorn sheep behavior all influence the likelihood that suitable habitats are occupied. These factors also influence the rate at which habitats are acquired and occupied and the likelihood of persistence once occupied.

Analyses that only address suitable habitat and the inference that suitable habitat is an accurate proxy for occupied habitat is not useful in assessing the persistence of bighorn sheep populations. The distribution and abundance of bighorn sheep have been significantly reduced from pre-Euroamerican settlement conditions. Because disease epizootics are an integral factor in bighorn sheep persistence, analyses need to incorporate factors that contribute to the potential risk of these epizootics and address factors such as the availability and connectivity of suitable bighorn sheep habitats, bighorn sheep behavior and movement patterns, proximity of bighorn sheep to domestic sheep, likelihood of contact between the species, risk of disease transmission in contact events, and the perturbations in bighorn sheep populations as a result of disease transmission.

Clifford et al. (2009) utilized a contact and disease transmission model to assess potential implications of various grazing management strategies on the persistence of a Sierra Nevada bighorn sheep (*O. c. sierrae*) population. Building on concepts in that analysis, the Forest Service is conducting a similar analysis to assess the risks of contact and disease transmission between domestic sheep and bighorn sheep on the Payette National Forest. Per the Chief's remand, the primary purpose of this analysis is to provide a basis for the management of bighorn sheep habitats on the Payette National Forest such that habitats are maintained to support viable populations of bighorn sheep (36 CFR §219.19). A risk assessment approach that incorporates the species life requisites, the potential for contact between domestic sheep and bighorn sheep, and the influences of transmitted diseases on population dynamics provides a much better framework for management recommendations that will provide habitats to support viable populations of bighorn sheep.