U.S. Department of the Interior Bureau of Land Management

Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska

Fish & Wildlife 2000

National Strategy Plan Series

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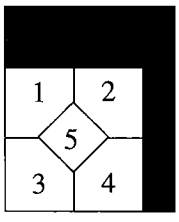
* The Desert Bighorn Sheep Habitat Management Plan is being replaced by the Mountain Sheep Ecosystem Management Strategy Plan.



Cover Photos: 1. Dall Sheep by Mark Newman/Tom Stack & Assoc.©, 2. Rocky Mountain Bighorn Sheep by Fred McClanahan Jr.©, 3. Desert Bighorn Sheep by Jim Yoakum, 4. California Bighorn Sheep by Jim Yoakum, and 5. Petroglyph of Bighorn Sheep by BLM photographer.

Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska

U.S. Department of the Interior
Bureau of Land Managment

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Executive Summary

The *Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska* is an initiative for managing mountain sheep habitats utilizing the concepts of ecosystem management. This plan is one of several national strategic plans developed to implement the Bureau of Land Management's (BLM) *Fish and Wildlife 2000* plan.

BLM assists in the management of habitat for four subspecies of mountain sheep—California bighorn, Dall sheep, desert bighorn, and Rocky Mountain bighorn— in 259 identified mountain sheep bioregions on approximately 58 million acres of public and private land in the 11 Western States and Alaska. Bighorn habitat covers about 20 million acres of BLM land, 27 million acres of other Federal land, 8 million acres of State land, and 3 million acres of private land (Figure 1). It must be remembered, however, that these lands do not encompass all of the sheep habitats in the various states; they include only those habitats that have some BLM lands involved.

Within these varied habitats, Federal and State biologists identified 259 sheep bioregions populated by approximately 18,000 Dall sheep, 16,000 desert bighorns, 10,000 Rocky Mountain bighorns, and 5,500 California bighorns. Mountain sheep bioregions have been identified irrespective of political boundaries as a first step in an ecosystem approach to managing mountain sheep. The strategies identified in this plan focus on these bioregions for future activity planning and management efforts. Implementation of these strategies will be coordinated with other agency initiatives and interested publics.

One of the overall goals of *Fish and Wildlife 2000-A Plan for the Future* was to provide habitat of sufficient quantity and quality to sustain optimum populations and a natural abundance of wildlife on public lands, enhancing economic and societal contributions to the American people. To achieve this overall goal, nine more specific goals are identified and recommendations for management strategies are presented in this document:

1. Increase public awareness of mountain sheep management goals and objectives as they relate to ecosystem management, and enlist support for management programs.

2. Enhance, maintain, or restore mountain sheep habitats through coordination, collaboration, and cooperation with Federal and State agencies, interested publics, universities, and nongovernment organizations (NGOs).

3. Assess mountain sheep habitat conditions and trends to identify management opportunities and needs.

4. Develop and employ a quantifiable landscape and ecosystem-specific standardized monitoring system to track progress of management actions in mountain sheep habitats.

5. Improve management capabilities to provide opportunities for public use of mountain sheep resources through blocking up of land parcels, acquisition of desired private inholdings or other land parcels, and/or development of formal easement agreements.

6. Develop and implement mitigation plans and surface-use stipulations to minimize or avoid impacts to mountain sheep and their habitats from surface-disturbance activities such as mining, livestock grazing, etc.

7. Ensure long-term funding for the maintenance of mountain sheep habitat improvement projects.

8. Fund and support research that will provide information applicable to ecosystem management to benefit mountain sheep.

9. Enhance public understanding of mountain sheep habitat management in relation to other resource programs and uses of the public lands.

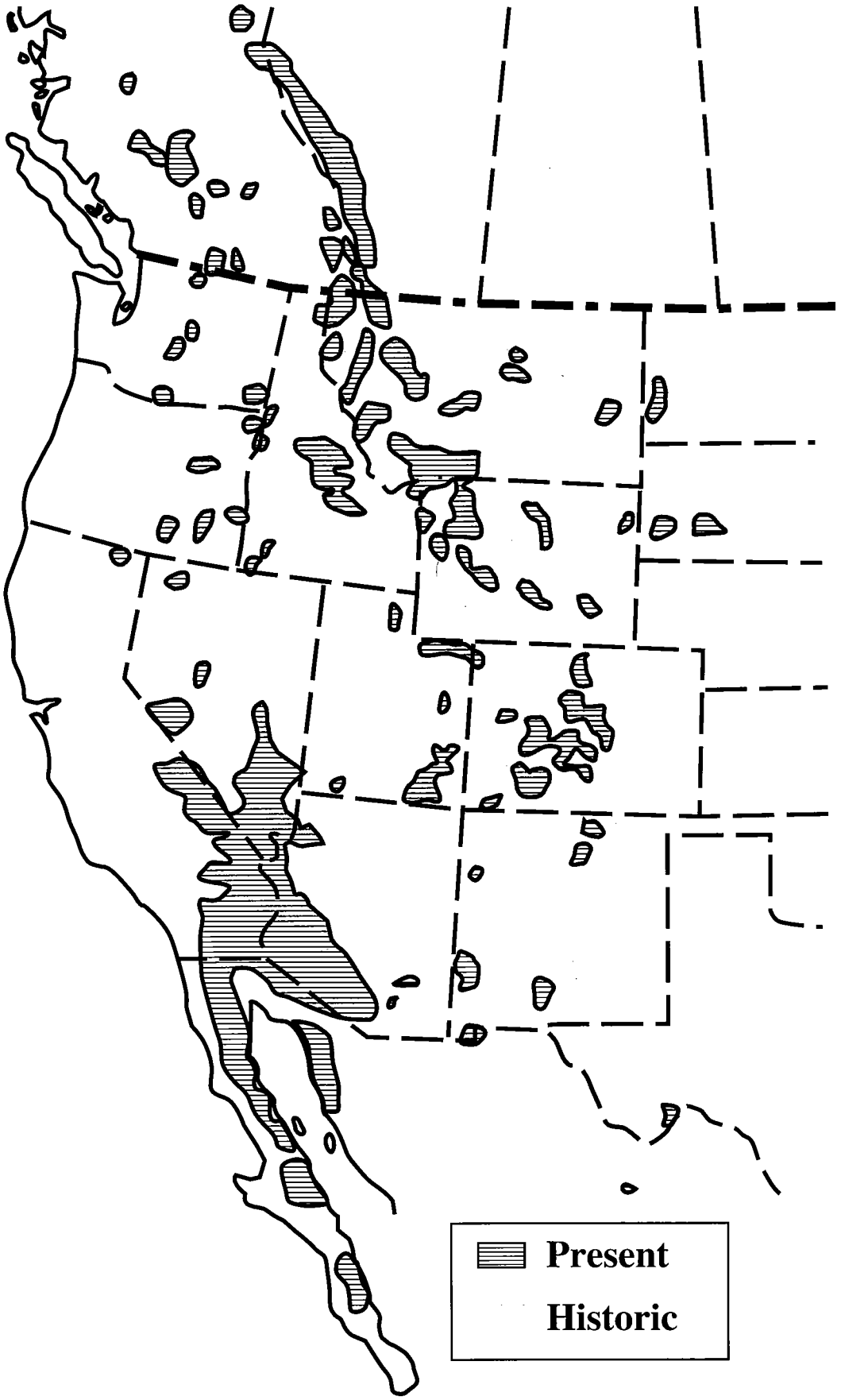

Figure 1. Present and Historic Distribution of Mountain Sheep.

Introduction

In 1986, BLM published the Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands "... to facilitate recovery of desert bighorn in the Southwest, through a balanced program of inventory, on-the-ground projects, monitoring, and research."

In May 1987, BLM's Director approved a strategic plan for the Wildlife and Fisheries Program. *Fish and Wildlife 2000—A Plan for the Future* stated BLM's overall goal for habitat management:

> *"Ensure optimum populations and a natural abundance and diversity of wildlife resources on public lands by restoring, maintaining, and enhancing habitat conditions through management plans and actions integrated with other uses of public lands through coordination with other programs, the States, by management initiatives, and through direct habitat improvement projects."*

To begin to meet this overall goal, BLM began writing a series of strategic plans for habitat management of wildlife, fish, and special status plants on the public lands (see inside front cover). As the concept of ecosystem management began to grow and BLM started moving in the direction of ecosystem/biodiversity management, a decision was made to write a mountain sheep ecosystem management strategy.

Since the principles of ecosystem management and its related facets provide a new philosophy and a fundamental change in management of the public lands and their resources, it seems appropriate to provide the reader with some definitions of terms that will be used throughout this document.

> **Ecosystem Management:** "The integration of ecological, economic, and social principles to manage biological and physical systems in a manner that safeguards the long-term ecological stability, natural diversity, and productivity of the landscape. The primary goal of ecosystem management is to conserve, restore, maintain, and sustain the ecological integrity, productivity, and biological diversity of public lands" (USDI, BLM 1994).

> **Landscape Management:** "To manage a landscape which is a heterogeneous land area composed of a cluster of interacting ecosystems that are repeated in similar forms" (Noss and Cooperrider 1994).

> **Biodiversity:** "The variety of life and its processes; it includes the variety of living organisms, the genetic differences between them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting" (Noss and Cooperrider 1994).

> **Bioregion:** "A territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations; generally, a system of related, interconnected ecosystems. In most cases, formerly called a "Herd Unit" (BLM 1993).

One of the goals of management is the requirement to manage ecosystems to support viable populations, or metapopulations, of the various subspecies of mountain sheep. Viable populations or metapopulations are those having a 99 percent probability of surviving for approximately 30 years despite the foreseeable effects of demographic, environmental, and genetic events and natural catastrophes (Marcot and Murphy 1992).

Why is an Ecosystem Management Strategy for Mountain Sheep Needed?

Mountain sheep were widely distributed in most of the mountain ranges, canyons, and badlands of western North America and Alaska prior to the arrival of Europeans. Sheep populations today, however, are lower than they are believed to have been prior to 1800. From 1850 through 1900, a combination of unregulated hunting, disease, competition for forage with domestic livestock, and human encroachment into sheep habitats caused their distribution to become restricted (Buechner 1960).

After 1900, many remaining habitats were split or fragmented by mining and energy development.

Recreation areas, livestock grazing, urbanization, and road, highway, and canal construction further reduced wild sheep populations and habitats. Fragmentation has forced sheep to remain in small, isolated ranges with fewer opportunities for seasonal movements, migration, maintenance of genetic diversity, and habitat to support life needs. Many of the wild sheep populations have been lost and as a result, the biodiversity of the West has been declining.

Many of these problems can be solved with current techniques. There is widespread public support and interest for mountain sheep programs to increase numbers and distribution. The Federal land management agencies' change to ecosystem management is, among other things, a step in the direction of eventually restoring mountain sheep, their habitats, and associated wildlife species on the public lands.

While BLM took the lead in developing this plan to manage mountain sheep habitats, partnerships were formed with state wildlife management agencies (state agencies), other Federal land management agencies, NGOs, and public and private users of the public lands to cooperate in this management plan. State agencies are responsible for mountain sheep populations and hunting seasons, while BLM and other Federal agencies are responsible for habitat management on the public lands. (BLM also has subsistence harvest management responsibilities in Alaska.)

As a step toward the goal stated in *Fish and Wildlife 2000*, BLM established an interagency Mountain Sheep Ecosystem Management Team in 1993 to update the existing desert bighorn sheep (*Ovis canadensis nelsoni* Merriam and *O. c. mexicana* Merriam) plan to include management of California bighorn sheep (*O. c. californiana* Douglas), Rocky Mountain bighorn sheep (*O. c. canadensis* Shaw), and Dall sheep (*O. dalli dalli* Nelson). All desert bighorns are treated as the subspecies *nelsoni* in this plan, based on the work by Ramey (1994).

This document, *Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska*, identifies and schedules implementation of management actions that are more specific than those identified in *Fish and Wildlife 2000*. It fits under BLM's ecosystem/biodiversity management umbrella and is part of a new philosophy, a fundamental change in the management of the public lands and their resources. This plan provides the strategies.

Brad Mullens

Past management actions and activities were developed to provide guidance for mountain sheep ecosystem management as it was addressed in individual BLM Land Use Plans (LUPs) such as Resource Management Plans (RMPs) and subsequent activity plans such as Habitat Management Plans (HMPs). The goals of this plan, when implemented, will provide better knowledge and a process by which this knowledge can be utilized in the land management decision-making process.

This strategic plan was developed by an interagency team that consisted of the following persons:

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The objectives of this plan are to: (1) identify habitat and population needs of mountain sheep; (2) identify strategies for accomplishing national mountain sheep habitat management goals and objectives; (3) address potential habitat conflicts resulting from other land uses; (4) provide an overview of habitat conditions; (5) identify personnel and funding needs necessary to inventory and monitor mountain sheep habitats using standardized techniques; (6) identify problems in mountain sheep populations (such as

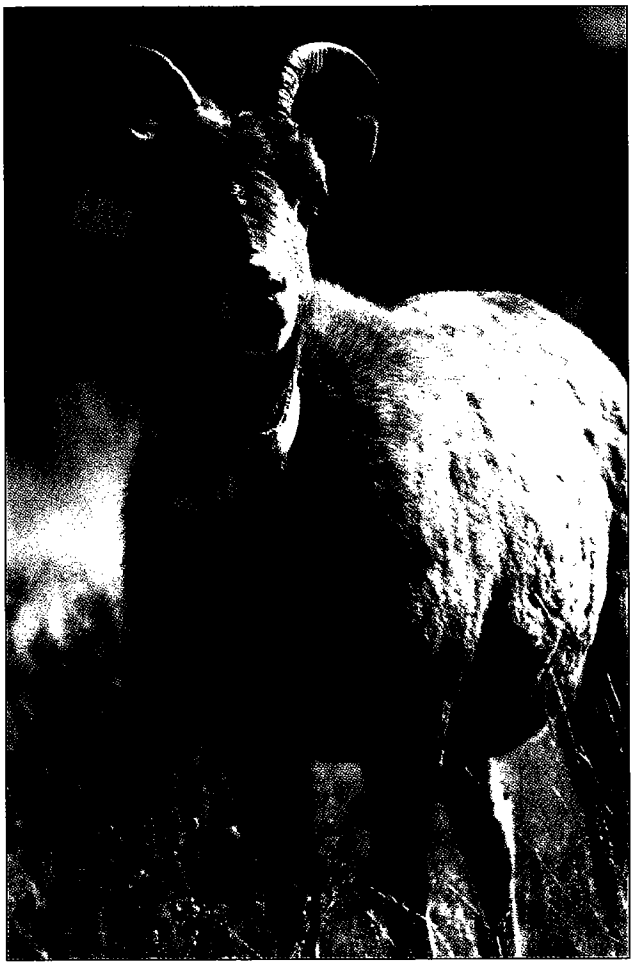
diseases and stress factors) that require research; (7) emphasize partnerships that generate support, awareness, and assistance in accomplishing mountain sheep management goals; and (8) ensure that funding resources are invested for the greatest benefit.

A questionnaire was designed and sent to 138 BLM offices requesting baseline data for this plan. All tables and numerical data reference questionnaire results. Data from the questionnaires were coordinated with state agencies and represent the best information available on mountain sheep habitats.

Biodiversity

Management of mountain sheep will be integrated into BLM's ecosystem management policy (USDI BLM 1994) to maintain and restore biological diversity on BLM lands. Habitats for mountain sheep comprise critical components of this biodiversity. Most populations of mountain sheep use relatively large geographical areas to fulfill their yearlong habitat requirements. While the migratory habits of most mountain sheep may not be as wide-ranging as other big game species, definite altitudinal and lateral migrations do occur seasonally. Mountain sheep, especially young rams, are unpredictable, some moving over 50 miles, while ewes may move between mountain ranges to lamb. Many of these movements cross areas not typically described as mountain sheep habitats. Any migratory species that utilize distinct summer and winter ranges need a variety of habitats throughout the year. Management of these areas requires consideration of the compatibility of potential land-use practices (e.g., domestic livestock grazing, recreational development, right-of-way authorizations, etc.) and their impact on mountain sheep populations/habitats.

Diverse vegetation communities provide a wide variety of forage choices, ranging from grass and grass-like plants to forbs and shrubs, enabling mountain sheep to select a high-quality diet yearlong. A large-scale approach to wildland management that includes ecological landscapes rather than individual habitats will provide benefits to featured species, such as mountain sheep, as well as providing niches and habitats for a rich variety of other wildlife species.



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Ecosystem Management

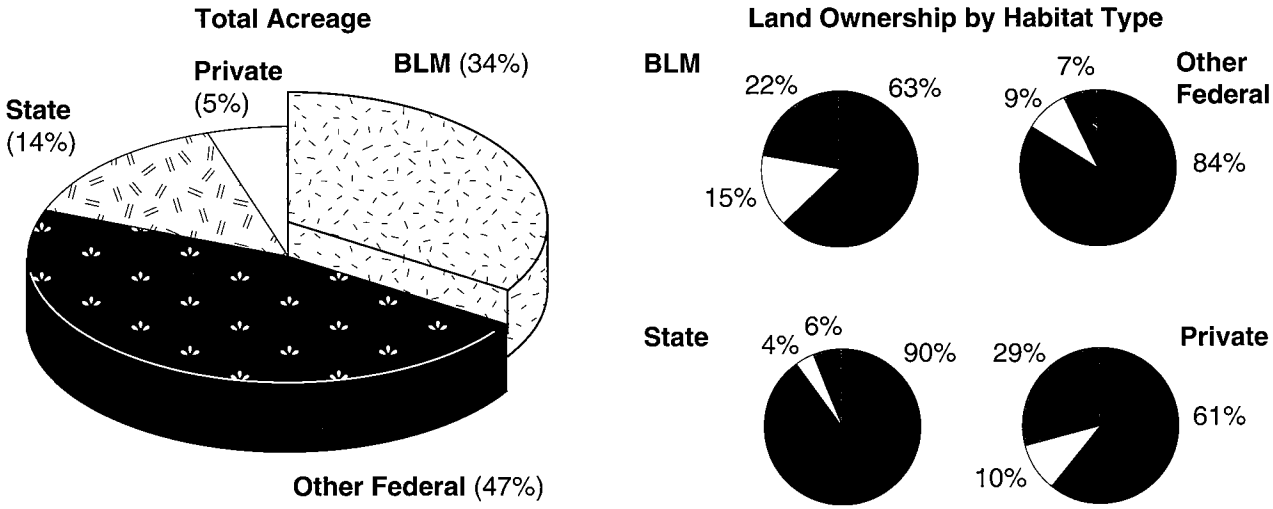
Implementing the mountain sheep habitat goals listed in this plan will facilitate implementing some of the goals stated in "*From Concept to Commitment,*" BLM's ecosystem management plan (USDI, BLM 1994). Inventory, monitoring, and planning will be implemented on a landscape or ecosystem level to recognize vital vegetation communities and important physiographic features necessary for maintaining natural habitat linkages and corridors needed by mountain sheep, and to better identify conflicts. Ecosystem management is a better way to evaluate major issues and problems because of the larger scale at which management occurs. At the ecological landscape level, ecosystems will be restored, maintained, and improved to meet desired ecological objectives that provide for viable mountain sheep population levels and meet public, social, and economic demands.

Addressing biological diversity at the landscape or ecosystem scale will involve the cooperation and collaboration of State and Federal agencies, other landowners, and interested publics.

Status and Importance of the Mountain Sheep Resource

Three subspecies of bighorn sheep (Rocky Mountain, California, and Desert) and one species of thinhorned sheep (the Dall sheep in Alaska) are addressed in this strategic plan.

Mountain sheep habitats in the western United States and Alaska vary from hot, dry deserts to alpine tundra. Approximately 44 million acres of mountain sheep habitat is currently occupied, and about 6 million acres of habitat is suitable but unoccupied. The useable habitats cover approximately 15 million acres of BLM land, 25 million acres of other Federal land, 7 million acres of State land, and 2 million acres of private land (Figure 2). An additional 7.7 million acres of historical habitat is currently unavailable. The estimated land area of occupied habitat for California bighorn sheep is 1.7 million acres; for Dall sheep, 26.9 million acres; for desert bighorn, 11.3 million acres; and for Rocky Mountain bighorn, 4.4 million acres.



Habitat Type	Land Ownership				
	BLM	Other Federal	State	Private	Total
Occupied	12,269,758	23,153,813	7,340,377	1,743,209	**44,507,157**
Unoccupied Suitable	3,017,193	2,002,333	321,013	295,268	**5,635,807**
Unoccupied Historical	4,393,907	2,309,421	510,198	806,554	**8,020,080**
Total Acreage	**19,680,858**	**27,465,567**	**8,171,588**	**2,845,031**	**58,163,044**

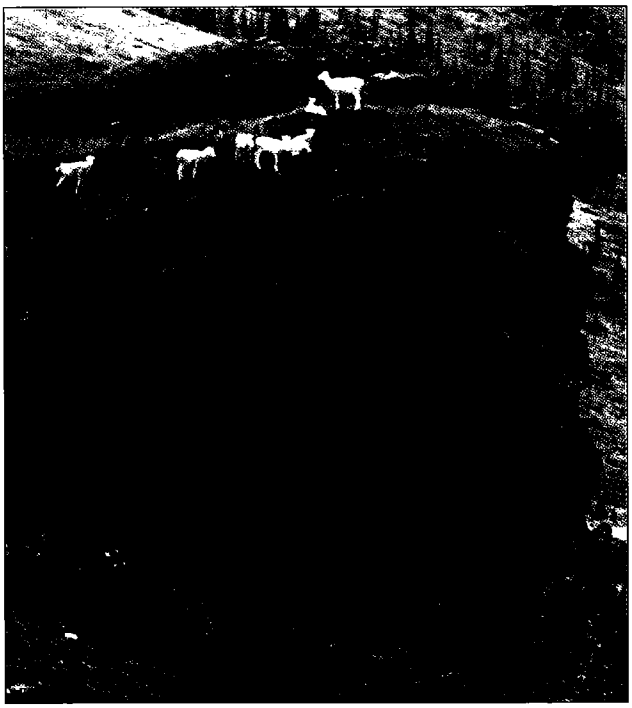
Figure 2. Acres of Mountain Sheep Habitat in the 11 Western States and Alaska.

Within these diverse habitats, biologists have identified 259 sheep bioregions that are populated by approximately 18,000 Dall sheep, 16,000 desert bighorns, 10,000 Rocky Mountain bighorns, and 5,500 California bighorns (Table 1).

Mountain sheep are important to many members of the public, as evidenced by the amount of money they are willing to pay for the opportunity to see or hunt one of these animals. Additionally, several NGOs have consistently generated funds for the benefit of mountain sheep. Funds are generally contributed for research, land acquisition, sheep transplants, habitat enhancement, and fostering of hunter's rights. For example, the Foundation for North American Wild Sheep (FNAWS) has contributed $13 million to various states for mountain-sheep-enhancing activities since 1976. Additionally, state agency mountain sheep programs have benefitted by auctioning hunting permits, raising $3.8 million between 1990 and 1994. All of this was put back into mountain sheep programs in various states.

In Colorado and Nevada, mountain sheep are the official State mammal. Several viewing areas have been constructed throughout the West for the public to see these animals. For example, the bighorn sheep viewing area near Georgetown, Colorado, had over 32,000 visitors during the first 11 months of operation. The coin-operated telescopes at the facility generated $8,000 during the same 11-month period. Additionally, The National Bighorn Sheep Center in Dubois, Wyoming, which was partially funded by BLM, has generated considerable interest in mountain sheep as evidenced by the 23,132 persons that have visited the Center during the 19 months it has been open. During the same period, over 1,000 students also visited the Center.

On all mountain sheep habitats, except private lands, management balances the uses of mountain sheep resources. One use, as decreed by treaties or law, is the right of Native Americans to use certain natural resources for religious ceremonies and/or to maintain a traditional lifestyle. These rights may include the harvesting of game and nongame animals, including mountain sheep. These rights vary from state to state and are discussed in Appendix B.



BLM

Table 1. Estimated Populations of Mountain Sheep Species in Identified Bioregions by State in 1993. [1]

State	California Bighorn	Dall Sheep	Desert Bighorn	Rocky Mountain Bighorn
Alaska		18,230		
Arizona			4,818	120
California	376		4,227	
Colorado			615	2,120
Idaho	1,409			690
Montana [2]				2,255
Nevada	834		4,329	165
New Mexico			158	
Oregon [3]	2,828			550
Utah			1,735	699
Wyoming				3,154
Total	**5,447**	**18,230**	**15,882**	**9,753**

Source: BLM questionnaire, 1993.

[1] Includes only mountain sheep areas that include BLM lands. Population figures are not entire state totals.

[2] Includes North Dakota.

[3] Includes Washington.

Habitat Management Efforts

Landscapes managed for biodiversity benefit many species of wildlife. Mountain sheep, as well as other species, occupy a variety of landscapes that contain diverse physiography, plants, and animals. Proper management of these landscapes helps to ensure biological diversity. Physiographic information, along with data on plant succession, vertical and horizontal structure, and composition over large geographical areas, is essential to managing landscapes for biodiversity. Detailed information on the wide variety of wildlife, human, and domestic animal interactions is also crucial to understanding this complex equation.

Partnerships

Public interest in mountain sheep and their management is currently at a high level. Many publics and NGOs want to help in managing habitats of this highly visible animal. These partnerships are a critical component in the management of mountain sheep. No single entity has the funds or personnel to work alone. Collaboration with interested agencies or groups is vital to maintain and enhance mountain sheep habitats.

Coordination between agencies and private groups is vital to successful management. Partnerships provide the opportunity for management agencies to join with their external customers in public lands management to develop cooperative projects and, in the end, to provide better overall management for the future.

Habitat Inventory

The inventory of wildlife habitats is mandated by the Federal Land Policy and Management Act of 1976 (FLPMA). These inventories are necessary to evaluate individual habitat attributes as well as linkages among them, and their integrated capability to support viable populations and metapopulations of mountain sheep. Habitat attributes include vegetation composition and condition, distribution and type of water, escape cover, visual obstructions, and potential competition from other wildlife species, domestic livestock, and humans. Relationships between habitat attributes, such as the proximity of water sources and foraging areas to escape cover, and the distribution of water sources or foraging areas across the ecological landscape, are other important components of habitat inventory. Obstacles to seasonal and/or daily movements should also be identified. An inventory of occupied habitats is not complete until population attributes such as distribution and demography are tied to the habitat attributes.

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In order to maximize the effectiveness of BLM's decisions and financial returns on investments, inventories must be comprehensive and include appropriate analysis at the first level of planning. This first level is usually the policy level, which includes strategy plans such as this document. Land-use planning documents, such as RMPs or ecosystem plans, are the second level of planning. The inventory intensity needed is related to the management activities proposed and the uniqueness of the ecosystems involved (e.g., riparian and wetland areas), species diversity, and complexity of potential multiple use challenges.

As of the spring of 1993, approximately 8.8 million acres of BLM-managed mountain sheep habitat within 191 bioregions have been inventoried with approximately 12.7 million acres within 69 bioregions still requiring inventories (Table 2). Additional data may be needed on areas that have already been inventoried. The fact that an inventory is available does not necessarily mean that the data are adequate to meet all possible needs.

Habitat Monitoring

Collection and analysis of monitoring data indicates where competing uses and current management actions may impact future management options. Monitoring is a technique of comparing current data with baseline inventory to determine the trend of whatever is being examined. Monitoring also assesses the success of management actions in reaching management objectives. Typically, monitoring takes place at predetermined intervals (3-5 years) after initial baseline values for the habitat have been determined.

Lack of complete inventory and monitoring data limits the ability to quantify habitat availability/quality and carrying capacities for mountain sheep. Without this essential information, determination of habitat potential and development of mountain sheep habitat objectives will be difficult to formulate (Tables 3 and 4).

Monitoring is currently being done on 5.1 million acres of mountain sheep habitat. An additional 16.4 million acres of habitat needs to be monitored (Table 2). About 75 percent of the total acres are not being monitored. Samples of each bioregion can conceivably be analyzed to lessen the required monitoring workload.

Mountain Sheep Habitat Assessment

Habitat assessment on a landscape basis for mountain sheep is completed utilizing all the habitat and population inventory data available. Habitat suitability ratings (satisfactory or unsatisfactory) for sheep bioregions are determined on the basis of availability and spatial arrangement of food, water, cover, space, and other land use practices. Analyses of these data and the use of Global Positioning Systems (GPS) and Geographic Information Systems (GIS) allow identification of areas of concern for habitat management.

Table 2. Mountain Sheep Habitat Inventory and Monitoring Status.

State	Inventory		Monitoring	
	Acres Inventoried	Acres Needing Inventories	Acres Monitored	Acres Needing Monitoring
Alaska	0	1,661,000	0	1,661,000
Arizona	1,527,309	1,676,366	727,625	920,410
California	1,009,743	2,317,049	47,917	4,972,282
Colorado	149,454	680,994	199,606	1,805,230
Idaho	849,994	189,500	235,554	387,200
Montana[1]	86,130	1,113,820	132,360	384,390
Nevada	1,294,036	2,494,957	1,308,274	3,338,939
New Mexico	409,927	1,922,000	105,040	1,500,000
Oregon[2]	924,540	228,130	808,900	311,750
Utah	2,326,922	178,440	1,521,418	827,372
Wyoming	225,620	277,780	57,000	331,832
Total	**8,803,675**	**12,740,036**	**5,143,694**	**16,440,405**

Source: BLM questionnaire, 1993.

[1] Includes North Dakota. [2] Includes Washington.

Table 3. Acreage and Estimated Inventory Costs by State.

State	Dall Sheep		Desert Bighorn Sheep		Rocky Mountain Bighorn Sheep		California Bighorn Sheep	
	Acres Needing Inventories	Cost (000's)	Acres Needing Inventories	Cost (000's)	Acres Needing Inventories	Cost (000's)	Acres Needing Inventories	Cost (000's)
Alaska	1,580,000	$ 305						
Arizona			1,676,366	$ 671				
California			2,134,748	$ 250			182,301	$ 240
Colorado			465,900	$ 120	215,094	$ 442		
Idaho					84,000	$ 118	21,500	$ 44
Montana [1]					1,113,820	$ 126		
Nevada			1,834,450	$ 777	158,340	$ 119	502,167	$ 175
New Mexico			278,707	$ 49	1,622,000	$ 84		
Oregon [2]					44,080	$ 15	184,050	$ 317
Utah					178,440	$ 175		
Wyoming					277,780	$ 238		
Total	**1,580,000**	**$ 305**	**6,390,171**	**$ 1,867**	**2,093,554**	**$ 1,317**	**890,018**	**$ 776**

Source: BLM questionnaire, 1993.

[1] Includes North Dakota. [2] Includes Washington.

Table 4. Acreage and Estimated Monitoring Costs by State.

State	Dall Sheep		Desert Bighorn Sheep		Rocky Mountain Bighorn Sheep		California Bighorn Sheep	
	Acres Needing Inventories	Cost (000's)	Acres Needing Inventories	Cost (000's)	Acres Needing Inventories	Cost (000's)	Acres Needing Inventories	Cost (000's)
Alaska	1,661,000	$ 179						
Arizona			890,410	$ 314	30,000	$ 10		
California			4,030,975	$ 85			941,307	$ 62
Colorado			1,540,440	$ 48	264,790	$ 212		
Idaho					167,960	$ 73	71,240	$ 26
Montana [1]					384,390	$ 88		
Nevada			1,434,799	$ 87	179,240	$ 39	724,900	$ 178
New Mexico			127,040	$ 32	1,500,000	$ 100		
Oregon [2]					43,080	$ 23	268,670	$ 158
Utah			252,478	$ 89	574,894	$ 96		
Wyoming					331,832	$ 174		
Total	**1,661,000**	**$ 179**	**9,276,142**	**$ 655**	**3,476,186**	**$ 833**	**2,006,117**	**$ 424**

Source: BLM questionnaire, 1993.

[1] Includes North Dakota. [2] Includes Washington.

Potential impacts to bighorn habitat should be assessed on all lands regardless of ownership. The resulting coordinated management of private, municipal, and other government lands plus public lands provides the basis for managing the whole ecosystem through partnerships.

Habitat quality has been quantified for only 73 of 214 bioregions (Table 5). The remaining bioregions should also be evaluated using quantifiable methodology and monitoring should be established.

Habitat Limiting Factors

Based on questionnaire responses, the two most frequently identified factors contributing to an unsatisfactory rating for bighorn sheep habitat conditions are related to (1) grazing competition between domestic livestock and mountain sheep, and (2) the distribution of water sources. Dall sheep habitats in Alaska were an exception; here climatic factors were identified as a major problem in limiting forage availability.

Since domestic livestock are herbivores, they may compete directly with mountain sheep for forage and water. Management of domestic livestock on lands occupied by mountain sheep often has an immediate impact on numbers and distribution of mountain sheep. State agencies should be actively involved in ecosystem management to improve mountain sheep habitats and help resolve habitat conflict issues. BLM manages domestic sheep grazing near mountain sheep habitats on public lands in accordance with *Guidelines for Management of Domestic Sheep in Bighorn Sheep Habitats* (Appendix C). These guidelines were originally developed by the Desert Bighorn Council (DBC) Technical Staff in 1989 in response to a request from the BLM, Chief, Division of Wildlife and Fisheries. In May 1992, the document was rewritten by a multiagency workgroup. The final document was approved by all the participants: BLM, FS, FNAWS, DBC, the American Sheep Institute (ASI), and the Western Association of Fish and Wildlife Agencies (WAFWA).

Northern bighorn subspecies, which are found in cool temperature regions, are not as restricted by water distribution as those in warmer climes. Desert bighorns that live in warmer climes, however, have adapted to limited water supplies. Where water is apparently a limiting factor, permanent, properly distributed, water sources can benefit mountain sheep as well as many other animal species found in the area. An analysis of habitat-limiting factors for mountain sheep, cited by BLM wildlife personnel in the questionnaire, is contained in Tables D-2, E-2, F-2, and G-2 in Appendices D through G.

Population Limiting Factors

Based upon questionnaire data, the two most commonly mentioned population-limiting factors having detrimental effects on mountain sheep populations in the contiguous United States are (1) grazing by domestic livestock in mountain sheep habitats, and (2) disease and parasites. Harassment caused by human recreation activities such as off-road vehicle traffic and hiking in lambing areas was the third most commonly mentioned factor.

In Alaska, climate was the most commonly mentioned factor limiting the Dall sheep population.

Table 5. Habitat Quality on 73 Bioregions of Mountain Sheep Habitat by Land Ownership.

Habitat Quality	Land Ownership				
	BLM	Other Federal	State	Private	Total
Satisfactory	3,881,245	1,662,514	435,964	622,958	6,602,681
Unsatisfactory	1,268,575	267,826	37,050	167,186	1,740,637
Unknown	1,532,502	959,184	27,825	126,593	2,646,104
Total	**6,682,322**	**2,889,524**	**500,839**	**916,737**	**11,052,252**

Source: BLM questionnaire, 1993.

Habitat Enhancement Programs

In the past 20 years, many mountain sheep programs have been initiated to improve the quality and quantity of mountain sheep habitat. Challenge cost share funds provided by BLM in cooperation with partners, private groups, and public land permittees have enabled BLM to implement HMPs with goals and objectives that benefit mountain sheep habitats. AMPs, like HMPs and other activity plans, are developed to implement the goals and objectives of RMPs. All plans affecting sheep habitat should have goals and objectives which benefit mountain sheep, and these goals and objectives should be linked in an automated system.

BLM currently has 201 HMPs in force that include goals and objectives for management and enhancement of mountain sheep habitats. Of these HMPs, only 23 have mountain sheep objectives fully implemented. There are also 71 activity plans in force for mountain sheep bioregions that do not have any objectives for mountain sheep (Table 6).

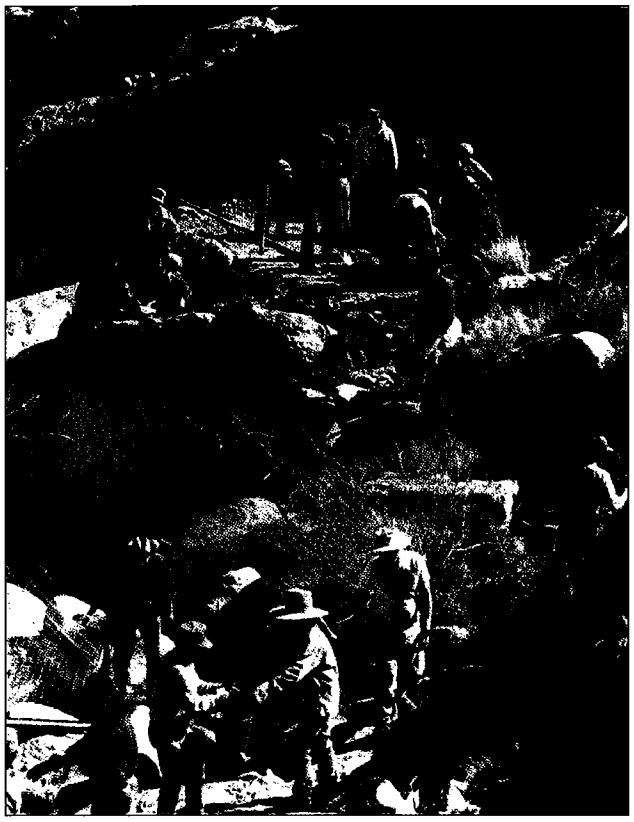

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Table 6. BLM Planning Documents Relating to Mountain Sheep Objectives.

State	Plans Without Mountain Sheep Objectives	Plans With Mountain Sheep Objectives	Objectives Fully Implemented	Objectives Not Fully Implemented
Alaska	4	2	0	6
Arizona	1	30	2	29
California	3	10	0	13
Colorado	2	20	2	20
Idaho	7	24	7	24
Montana	3	11	1	13
Nevada	24	45	5	64
New Mexico	5	3	0	8
Oregon	14	33	7	40
Utah	5	14	1	18
Wyoming	3	9	1	11
Total	**71**	**201**	**26**	**246**

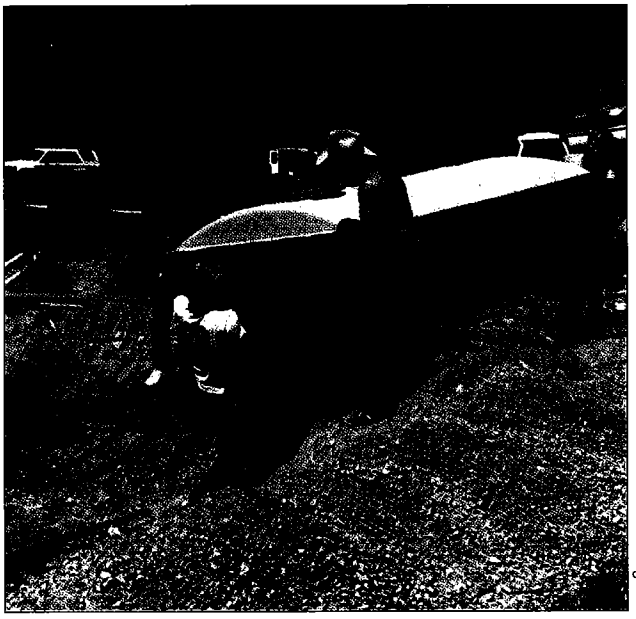
Source: BLM questionnaire, 1993.

Note: The planning documents referenced here pertain only to RMPs, HMPs, etc., that include mountain sheep bioregions within their sphere of influence.

Between 1985 and 1993, BLM has spent at least $4.9 million to enhance and manage mountain sheep habitats. Some of the more common techniques included development of water sources, prescribed burning, mechanical manipulation of vegetation, seasonal use restrictions, and special policies for managing domestic sheep grazing in and near mountain sheep habitats.

Specific vegetation projects included improving forage production, providing thermal cover, and opening viewsheds for bighorns.

Adjustment of land ownership patterns can be used to enhance bighorn habitats. Many important portions of mountain sheep habitats in private ownership have been identified for acquisition or exchange because of their proximity to crucial habitats on nearby public lands. Data gathered in response to the questionnaire indicates that 594 parcels of land should be acquired, in some manner, to enhance mountain sheep management (Table 7). BLM, USFS, and State agency land acquisition and exchange programs have been utilized to secure isolated parcels or other areas important to mountain sheep hunting, viewing, or other recreational pursuits. Outright purchase of easements or lands for easements to secure public access to these isolated parcels is another important program that enhances



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mountain sheep habitats. Questionnaire data indicated that 127 easements, totaling 1,053 miles, should be acquired, in some manner, for improved mountain sheep management (Table 8).

Through the planning process, land acquisition options can improve management strategies while, at the same time, reducing conflicts for private landowners.

Table 7. Numbers, Acres, and Estimated Costs of Exchanges and/or Acquisitions in Mountain Sheep Bioregions.

State	Number of Parcels	Number of Acres	Estimated Costs
AK	None Identified	—	—
AZ	78	59,641	7,522,800
CA	264	487,877	10,444,000
CO	39	22,190	1,725,000
ID	13	5,000	1,522,000
MT [1]	30	57,260	—
NV	3	1,300	1,000,000
NM	29	40,200	10,000
OR [2]	30	7,560	4,230,000
UT	47	33,582	515,005
WY	61	61,381	702,000
Total	**594**	**775,991**	**$26,670,805**
Source: BLM questionnaire, 1993.			

[1] Includes BLM lands in North Dakota.
[2] Includes BLM lands in Washington.

Table 8. Number of Easements for Access, Miles, and Estimated Costs.

State	Number of Easements	Number of Acres	Estimated Costs
AK	None Identified	—	—
AZ	16	71	40,000
CA	29	743	846,000
CO	16	44	145,000
ID	8	18	40,012
MT [1]	29	53	8,000
NV	None Identified	—	—
NM	None Identified	—	—
OR [2]	2	5	$50,000
UT	13	80	—
WY	14	39	$312,000
Total	127	1,053	$ 1,441,012
Source: BLM questionnaire, 1993.			

[1] Includes BLM lands in North Dakota.
[2] Includes BLM lands in Washington.

Management Opportunities And Recommended Implementation Strategies

The overall goal for big game habitat management, including mountain sheep habitats, as stated in *Fish and Wildlife 2000-A Strategy for the Future*, is to:

"Ensure sufficient habitat quality and quantity to maintain and enhance viable big game populations, and to sustain identifiable economic and social contributions to the American people."

To achieve this overall goal by the year 2000, the following, specific management goals, recommended strategies, and specific projects, land acquisitions, exchanges, and easements for mountain sheep have been identified. We recognize that the magnitude and costs of the tasks discussed here require partnerships between all land management agencies and our publics. Continued partnerships between agencies, NGOs, and private individuals are essential if the goals and objectives for mountain sheep habitat management are to be achieved.

Partnerships

Goal

Increase public awareness of mountain sheep management goals and objectives as they relate to ecosystem management, and enlist support for management programs.

Increased public interest in mountain sheep resources makes it imperative that effective partnerships be pursued to achieve the habitat and population enhancement strategies presented in this plan. BLM needs to commit to maintaining and increasing working relationships at interagency levels and with private landowners and NGOs such as FNAWS.

Recommended Strategies

1. Review existing MOUs and establish new alliances with State agencies, other land management agencies, and NGOs.
2. Develop mountain sheep action plans and Challenge Cost Share agreements on a landscape and ecosystem basis with State and Federal agencies, NGOs, private landowners, and industry.
3. Improve interagency awareness of mountain sheep habitat management. Accomplish this through participation in workshops, meetings, and task forces. Develop data-sharing agreements with other agencies and NGOs.
4. Identify funding partnerships to implement the goals and strategies of this Plan.
5. Link existing mountain sheep habitat management strategies with mountain sheep strategic plans developed by State Agencies.
    a. Include the participation of NGO partners in all land use decisions and planning efforts that will benefit mountain sheep habitat management.
    b. Facilitate implementation of management objectives of agencies on a landscape and ecosystem basis. Develop a review system to assess progress in implementing mountain sheep habitat goals and objectives.
    c. Ensure that mountain sheep habitat objectives are woven into new or revised land use plans.
6. Join in resolving mountain sheep habitat conflicts with other agencies, adjoining private landowners, and other interest groups. Resolve concerns of affected landowners by asking them to cooperate in investigations.
7. Establish a position of Big Game Program Manager on the Western Fish and Wildlife Staff (Ecosystem Resources Support Group) to guide implementation of this mountain sheep ecosystem management plan for BLM and to strengthen ties with our partners.

Planning for Mountain Sheep Habitat Management

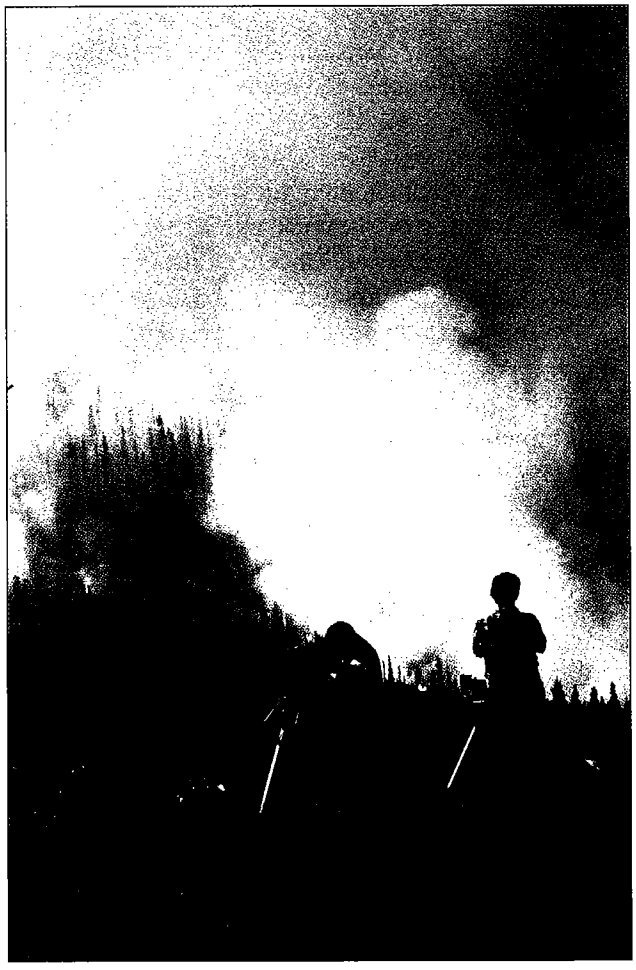
Goal

Enhance, maintain, or restore mountain sheep habitats through coordination, collaboration, and cooperation with Federal and State agencies, interested publics, universities, and NGOs.

In the past, Federal agency planning systems have been a two-tiered process: Land-use plans (LUPs) such as RMPs and Environmental Impact Statements (EISs) fulfill the broad planning issues and management objectives for all natural resources and their uses including fish, wildlife, and special status plants. Activity plans such as HMPs, AMPs, and Area of Critical Environmental Concern (ACEC) plans are site-specific and include an implementation schedule for the broad management objectives of the LUPs. An approved HMP is required before a wildlife reintroduction occurs on public lands. At the present time, there are 201 activity plans that have specific objectives for the management of mountain sheep. Seventy-one bioregions where bighorns occur still require an activity plan for mountain sheep.

With the shift toward landscape/ecosystem management, analysis, and planning, the two-tiered system may change. Land-use decisions will be made on a landscape basis, with many ecosystem plans incorporating both the land-use and activity plan levels in one effort. These ecosystem plans will require an interagency and partnership approach. Bioregions for mountain sheep were identified in order to provide landscape boundaries for planning the future management of many wildlife habitats for all species.

Because boundaries of mountain sheep bioregions usually cross agency administrative boundaries and even state lines, they lend themselves well to landscape analysis and ecosystem management. For coordinated resource management plans to be effectively implemented, everyone must be included: BLM, other Federal administrative units, NGOs, and other interested partners and publics.



BLM

Recommended Strategies

1. Coordinate all related ecosystem planning efforts on a landscape basis with State agency population and habitat goals and other Federal management goals within each mountain sheep bioregion.

   a. Identify sheep goals and objectives in current LUPs; amend them with input from other agencies, NGOs, and landowners.

   b. Resolve habitat objective conflicts with other agency goals and objectives.

2. By the year 2000, include mountain sheep goals and objectives consistent with ecosystem management principles in RMPs.

3. Establish a management oversight committee consisting of BLM, State wildlife agencies, USFS, and other affected agencies and NGOs to assist in developing goals and objectives for each mountain sheep species and subspecies and to determine appropriate management actions. The makeup and operation of these committees must follow guidelines in the Federal Advisory Committee Act of 1973, as amended (PL 92-463).

Habitat Inventory

Goal

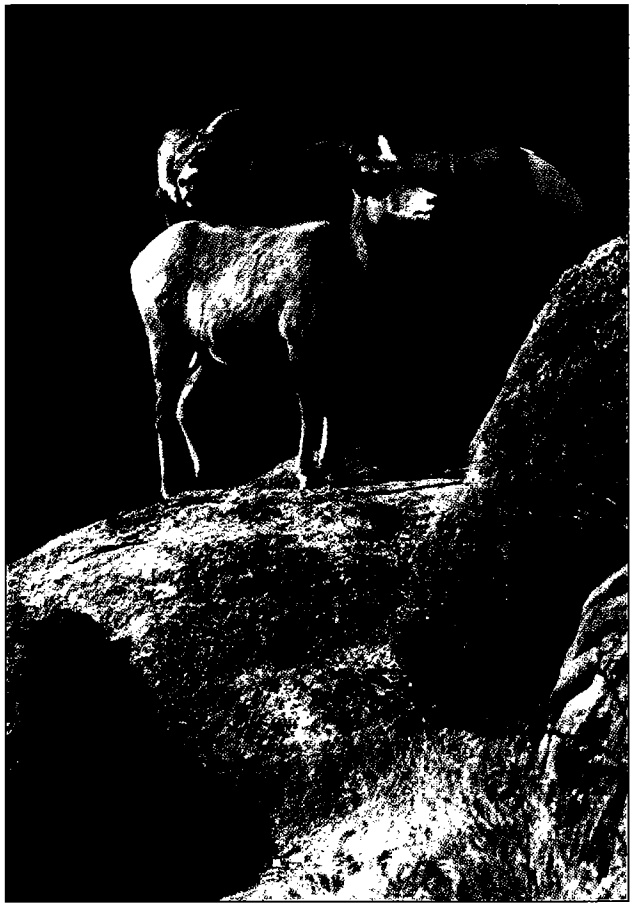
Assess mountain sheep habitat conditions and trends to identify management opportunities and needs.

As stated in the previous section, inventory information which specifically addresses habitat conditions for mountain sheep is lacking in 56 percent of the identified mountain sheep bioregions. Data on population demographics, distribution, and harvest statistics, which are essential information, may be obtained from State agencies.

It is critical to automate the massive amounts of data from a landscape perspective so that information may more easily be shared with customers and managers.

Recommended Strategies

1. Standardize, through a comprehensive automated process, mountain sheep habitat analysis methods based on landscape uses and proposed uses.



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   a. Identify all mountain sheep data currently available and prioritize mountain sheep bioregions that currently lack inventories.

   b. Evaluate all mountain sheep habitats for existing condition and potential.

   c. Integrate mountain sheep vegetation assessments with interagency programs, State agencies, universities, and other Federal agencies.

2. Identify issues impacting mountain sheep habitats and populations and establish a standardized GIS database, in cooperation with affected agencies and NGOs, to facilitate sharing of mountain sheep management data.

Habitat Monitoring

Goal

Develop and employ a quantifiable landscape and ecosystem-specific standardized monitoring system to track progress of management actions in mountain sheep habitats.

Evaluation of monitoring data is a technique used to determine the effectiveness of management actions. Information from monitoring needs to furnish data that allows evaluation of management objectives. Monitoring should examine mountain sheep habitat, long-term population trends, and potentially conflicting uses, as well as impacts to landscapes.

Recommended Strategies

1. Establish coordinated, standardized monitoring methodologies that address the ecological requirements and management actions for the landscape involved. At the very least, this would include monitoring procedures based on a common ecological map of the United States that utilizes data on climate, geology, soils, vegetation, and topography, as a minimum.

2. Establish monitoring schedules for mountain sheep bioregions.

a. Set priorities, based on issues, through collaboration with affected state wildlife management agencies, NGOs and other Federal agencies.

b. Develop a long-range cost-sharing program to assure future implementation of this strategic plan.

3. Coordinate all monitoring studies in mountain sheep bioregions with other agencies and NGOs.

4. Design, where needed, vegetation studies that will differentiate between forage utilization by mountain sheep, domestic livestock, and feral horses and burros. All studies should document animal numbers and period(s) of use.

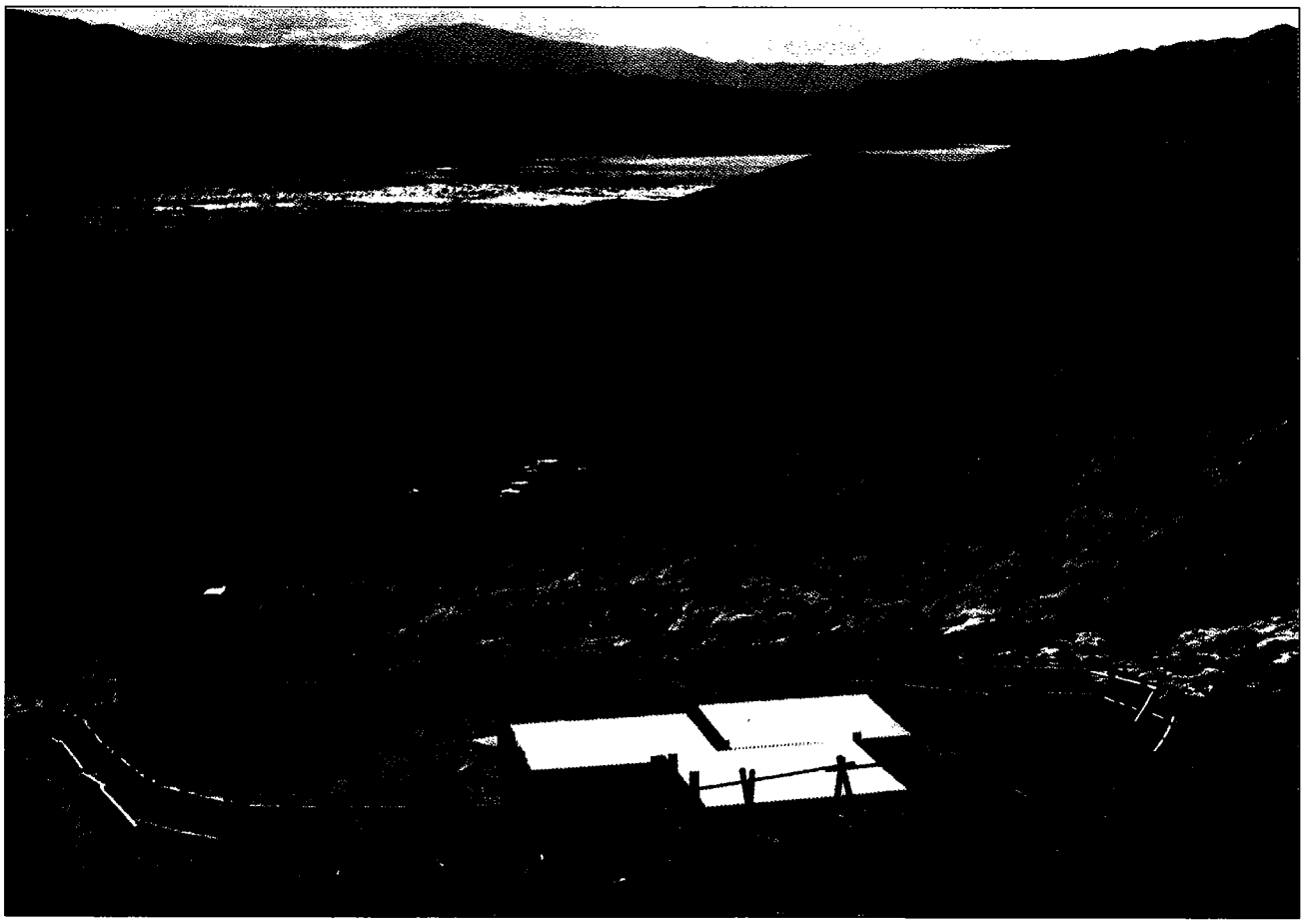
5. Design water utilization studies that will determine the utilization and functional capability of water developments in meeting objectives for mountain sheep range expansion and habitat improvement.

Land Tenure Cooperation or Adjustments

Goal

Improve management capabilities to provide opportunities for public use of mountain sheep resources through blocking up of land parcels, acquisition of desired private inholdings or other land parcels, and/or development of formal easement agreements.

A variety of habitat types is essential for the growth, maintenance, and overall health of mountain sheep populations. Occasionally, opportunities arise to acquire or consolidate important habitats. By securing these habitats through exchange, acquisition, donation, or partnership alliances, we can more effectively accomplish our goals for management and protection of the mountain sheep resource. It is necessary to act quickly when these opportunities arise. Through partnerships and agreements with NGOs, lands can be



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acquired by them and later transferred to a land management agency when all regulatory mandates are met.

The diverse and extensive lands administered by the BLM, USFS, and other Federal agencies are managed to benefit all of the Nation's publics. In many instances, public access is a key element in meeting management objectives. Conversely, in some cases, control of public access is desirable to assist in meeting management objectives. According to data from the questionnaire, 127 easements for public access are needed to allow more effective management of mountain sheep habitats (Table 8). By working cooperatively with others to control public access into important mountain sheep habitats, either by closing existing roads or trails or opening new ways to enter these lands, we can improve management for mountain sheep habitats and populations. Additional opportunities for recreation, ecotourism, and other resource management objectives due to improved access can also significantly benefit local economies.

Recommended Strategies

1. Acquire an estimated 776,000 acres of land and 1,000 miles of easements, primarily through exchange, to consolidate surface management of essential mountain sheep habitat (Tables 7 and 8).

    a. Develop plans for mountain sheep habitat acquisition, using the Congress, States, and NGOs as sources for matching or cost-share funds.

    b. Establish a database of land tenure adjustment needs for each bioregion, in each appropriate agency office, to be used as input into a Statewide land exchange pool.

2. Review all existing withdrawals and proposed land exchanges to ensure that mountain sheep habitat management goals are consistent with ecosystem planning objectives.

3. Actively negotiate with appropriate agencies, organizations, or individuals to secure selected lands that would benefit management of mountain sheep habitats.

Habitat Protection

Goal

Develop and implement mitigation plans and surface-use stipulations to minimize or avoid impacts to mountain sheep and their habitats from surface-disturbance activities such as mining, livestock grazing, etc.

The availability of a variety of habitat types is essential for the growth, maintenance, and overall health of mountain sheep populations. Mountain sheep are wilderness animals that are extremely vulnerable to competition from domestic livestock, other native ungulates and feral burros, as well as to human intrusion into their habitats. They can survive only as long as there are sufficient, relatively remote natural areas. At one time, mountain sheep were considerably more numerous than today and were widespread over the Western United States and Alaska. As the white man turned former mountain sheep ranges into domestic livestock pastures, distribution of the native sheep was reduced to the most inaccessible and wild mountain ranges in the west (Buechner 1960).

The introduction of domestic sheep into mountain sheep ranges devastated bighorn herds. Scabies and pneumonias, introduced by the domestic sheep, were the most probable causes of the decline (Buechner 1960). Conflict between domestic and mountain sheep today is one of the most important factors to consider before mountain sheep are reintroduced into historic ranges.

Disturbances to mountain sheep by activities such as recreation and development also are detrimental to sheep. They cause stress-related problems that result in disease and lowered reproductive rates (Buechner 1960).

Recommended Strategies

1. Ensure that mountain sheep habitat goals and objectives are included in the development of land use plans, surface use stipulations, and mitigation plans for mines and linear corridors (e.g., highways and canals). Follow the grazing guidelines formulated by the interagency group in 1992 (Appendix C) prior to recommending a site for transplanting mountain sheep.

Habitat Improvement

Goal

Ensure long-term funding for the maintenance of mountain sheep habitat improvement projects.

Habitat improvement projects for mountain sheep are designed to enhance the availability and quality of forage, enhance populations, and improve animal distribution. In addition to benefits to sheep, habitat improvement projects also benefit other wildlife species found in the same habitats. Proposals for mountain sheep habitat improvements are developed and coordinated through agency planning processes such as land use plans and ecosystem management plans. However, adequate funding for long-term maintenance is not always included in the planning process.

Recommended Strategies

1. Identify habitat improvement projects in mountain sheep bioregions by priority.

    a. Develop challenge cost-share and other cooperative funding agreements with Federal and State agencies, NGOs such as FNAWS, Nevada Bighorns Unlimited, and other customers, as appropriate, to meet mountain sheep habitat management objectives (Table 9).

    b. Establish maintenance agreements with other agencies, NGOs, and volunteer organizations to share costs and labor and to encourage active public support.

2. Ensure funding for habitat maintenance projects and facilities (Tables D-5, E-5, F-5 and G-5), including annual maintenance during the life of the project. **Funding for project maintenance must be assured to protect initial investments**.

3. Evaluate the effectiveness of habitat improvement projects and practices in accomplishing biological and sociological objectives.

Research

Goal

Fund and support research that will provide information applicable to ecosystem management to benefit mountain sheep.

Conduct research on habitat problems, disease, competition, habitat fragmentation, and human pressures on mountain sheep species to provide an automated database for making resource management decisions. Well-planned research projects, in most cases, require a long-term commitment of personnel and funding.

To maximize the return on investments in time and money and the usefulness of the data, cooperative interagency, and often interstate, research plans and projects are essential.

Recommended Strategies

1. Assist NBS, USFS Research Stations, State agencies, and universities in developing cooperative research projects to provide data that can

Table 9. Types of New Development Projects Needed in Mountain Sheep Bioregions to Meet Habitat Objectives.

Type of Habitat Improvement Project	Units
Spring Development (No.)	106
Dams and Reservoirs (No.)	35
Water Catchments (No.)	392
Well and Water Storage (No.)	17
Water Pipelines (Miles)	35
Management Fences (Miles)	5,138
Weed/Pest Control (Acres)	4,065
Mech. Veg. Manip. (Acres)	2,670
Prescribed Fire (Acres)	154,469
Fertilization (Acres)	3,498
Reseed/Plant (Acres)	3,453
Livestock Exclosures (No.)	55

Source: BLM questionnaire, 1993.

be used to improve ecosystem management of mountain sheep habitats.

2. Work with NBS, USFS, State agencies, and universities to coordinate research needs for mountain sheep habitats at regularly scheduled interagency planning meetings.

3. Assist State agencies in funding research into the effects of reintroductions or augmentations on existing herds.

4. Identify genetic factors, parasites/diseases, and environmental conditions that should be considered prior to moving sheep.

5. Evaluate the effectiveness of implementing research recommendations by looking for increased use of habitats or expansion of ranges by mountain sheep.

6. Make results of mountain sheep research projects available to field personnel in sheep bioregions in a timely manner.

Outreach

Goal

Enhance public understanding of mountain sheep habitat management in relation to other resource programs and uses of the public lands.

The successful implementation of this plan depends upon the active support, participation, and contributions of people interested in the management of mountain sheep and the associated species found on public and State lands. Information must be gathered cooperatively and data shared with the public, NGOs, and other agencies.

In these times of dwindling budgets, all Federal and State agencies that have shared interests in the management of mountain sheep and their habitats must be brought into the picture. Outreach efforts must include developing partnerships to achieve common goals, and educating partners and publics regarding BLM's mission and programs as they relate to managing mountain sheep and their habitats. Avenues must be opened for feedback from our publics to ensure that we are sensitive to public desires concerning mountain sheep management.

Public awareness of mountain sheep resources is vital for the proper management and protection of both the animals and their habitats. Recognition of these resources by agency managers and interdisciplinary specialists is also very important. As agencies move further into ecosystem management, increased internal and external awareness of the mountain sheep resources in bioregions or metapopulation areas is essential for the success of this ecosystem plan.

Recommended Strategies

1. Actively participate in professional meetings, organizations, and workshops.

   a. Support publication of technical papers in professional journals.

   b. Sponsor or cosponsor professional meetings, mountain sheep workshops, and habitat management seminars.

2. Meet annually with local NGOs to review progress toward common goals, exchange information, and coordinate joint management actions at national, State, and local levels.

   a. Report progress annually, tracking accomplishments in implementating this plan and providing information on Challenge Cost-Share projects and monies.

   b. Sponsor field trips to showcase mountain sheep habitat management projects.

   c. Continue to involve NGOs in mountain sheep project work.

3. Develop and distribute information on ecosystem management and biodiversity that illustrates the importance of mountain sheep and their associated habitats in relation to other species within the landscape.

4. Publish a full-color distribution poster for each subspecies of mountain sheep in each of the next 4 years.

5. Actively support BLM'sWatchable Wildlife initiative by working closely with the Wildlife Appreciation Program Manager.

a. Assist in developing State wildlife viewing guides for states that have not yet published one.

b. Identify and install signs at wildlife viewing areas for mountain sheep and cooperatively develop interpretive materials to inform the public about mountain sheep habitat and population management principles.

6. Actively support the continuation of multiple uses of the public lands, including hunting.

a. In conjunction with State agencies, develop and enforce public access plans for Federal and State lands.

b. Produce educational materials to inform the public on the role of hunting in managing the ecosystem for the benefit of present as well as future generations.

c. Provide user information at interpretive sites, popular trailheads, and agency offices.

d. Provide assistance, where appropriate, to State agencies in enforcing State wildlife protection laws and regulations.

Future Activities and Plan Revisions

Long-range plans, such as this, that encompass vast areas must be dynamic if they are to continue to be useful as management guidelines. Therefore, the goals and objectives noted in this plan will be revised as necessary. Information from inventory, monitoring, and research will be utilized for formally updating the plan every 10 years. The number of mountain sheep bioregions that eventually support viable populations of sheep will be the ultimate measure of this program's success.

Life histories of the four subspecies of mountain sheep discussed in this plan have been prepared, but space limitations have precluded their inclusion in this document. They will be included in a separate 1996 BLM document on the life histories of all native big game animals found on BLM public lands.

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Appendix A
Laws, Regulations, And Policies

The following laws, regulations and policies provide the foundation for management of wildlife species (including mountain sheep) on public lands.

Federal Land Policy and Management Act, 1976 - Sec. 102. (a) "The Congress declares that it is the policy of the United States that.... (8) the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals;...." The Act further provides for the designation of Areas of Critical Environmental Concern (ACECs) to protect and prevent irreparable damage to important resource values, including fish and wildlife resources and other natural systems or processes. Requires that all public lands and their resources be inventoried and other values be prepared and maintained on a continuing basis.

National Environmental Policy Act, 1981 - 42 U.S.C. 4321-4347 SUBCHAPTER I.—POLICIES AND GOALS 4331. (A) The Congress declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures ... (b)(3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; ... (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources. Requires that actions taken or permitted by Federal agencies be analyzed to determine their effects on the environment.

Endangered Species Act, 1973 - Provides that all Federal agencies shall use their authorities to carry out programs for the conservation of endangered and threatened species, including the ecosystems upon which these species depend.

Title 43, Code of Federal Regulations, Part 24, 1985 - Sets forth the Department of the Interior's Fish and Wildlife Policy. Declares that it is the intent of the Secretary of the Interior to strengthen and support the mission of the States to conserve and effectively manage the nation's fish and wildlife. For the BLM, this includes conservation and rehabilitation of fish and wildlife and their habitats.

BLM Manual 6500, 1988 - Declares that it is BLM policy to manage habitat with emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on the public lands. The Manual further states that to carry out the above policy, the BLM will do inventory, planning, research, monitoring, and maintenance; will communicate, cooperate, and automate; and will hire professional staff.

Appendix B
Summary of Wildlife Management Laws and Regulations Regarding Native Americans

In Alaska, the Federal Government is required by Title VIII of the Alaska National Interest Lands Conservation Act (ANILCA; 16 U.S.C. 3111-3126) of 1980,.... to provide a priority for "customary and traditional" subsistence uses of wildlife, fish and other wild renewable resources by rural residents on public lands in Alaska. The right to subsistence hunting in Alaska is not restricted to Native American peoples, but is extended to Alaska residents who meet certain legal requirements as established under ANILCA. The law is intended to allow subsistence uses on the public lands by rural residents, consistent with sound management principles and conservation of fish and wildlife populations.

The Act allows for direct personal or family consumption of food, shelter, fuel, clothing, tools or transportation; the making and selling of handicraft articles out of inedible by-products of these fish and wildlife resources; the bartering or sharing with family and other tribal members; and trading.

Implementation of Alaska's Federal Subsistence Program requires all Federal agencies to participate with other agencies in the management of wildlife for subsistence harvesting on public lands. This requirement is unique in two major respects: (1) it operates under a dual state and Federal management system and (2) the Federal Government through the Federal Subsistence Board sets seasons, bag limits and methods of take on Federal public lands. As a result, Federal biologists in Alaska analyze population data, make recommendations on seasons and bag limits and, in some cases, collect population data to comply with the ANILCA directive to protect and maintain healthy populations on over 93 million acres. Under the dual system currently operating in Alaska, the State manages sport hunting on all nonrestricted lands, but the Federal Government manages the Federal subsistence hunting. The State also manages subsistence hunting and fishing on State and private lands. Federal subsistence regulations contain provisions for the taking of Dall sheep.

In Arizona, there are 23 Native American reservations. Persons residing on those reservations can hunt on the reservation proper at any time. Any hunting off the reservation must be in conformance with Arizona Department of Game and Fish regulations.

Hunting by the Ute Mountain Tribe in Colorado is governed by the Brunot Agreement which established "The Brunot Agreement Area" which includes virtually the entire southwest quarter of the State. Tribal members may hunt deer and elk during tribal established seasons according to all season dates, manner of taking, and bag and possession limits identical to those established by the Colorado Wildlife Commission. Deer and elk may be hunted out of season only by authorized tribal members and only for a specific number of animals during a mandated period of time.

Tribal members may hunt all other animals listed in the Consent Decree with a tribal license only in accordance with tribal hunting seasons which must be identical to Colorado hunting seasons and other regulations, except that bag and possession limits may be different from those established by the Colorado Wildlife Commission. In addition to a tribal hunting license, proper and complete identification of their tribal membership status must be carried at all times.

Game animals not included in the lists of Decreed Wildlife, may be hunted in the Brunot Agreement Area by Native Americans, only in accordance with Colorado hunting laws and regulations as they pertain to all persons. Animals not listed include antelope, mountain goat, bighorn sheep, and moose.

Idaho does not have any special concessions for Native Americans regarding hunting on lands outside reservations. Native Americans hunting on lands outside the reservation must comply with Idaho Fish and Game Department laws and regulations. Hunting on reservation lands is done under tribal laws.

A court case in Montana recently decided that the Confederated Salish Kootenai Tribes of the Flathead Reservation had rights to hunt on "ceded territory" on open and unclaimed lands (never had fee title established). The decision was based on the Treaty of 1855. The decision is currently under appeal. The Montana Department of Fish, Wildlife and Parks is currently working with the Sioux, Gros Ventre, Cree, and Assiniboin Tribes on agreements for wildlife management on reservations in the State.

In Nevada, the Shoshone Tribe, under the 1865 Treaty of Fort Ruby, contended that they should be able to continue their customary hunting practices. The State contested this idea arguing the tribe did not reserve their right to hunt anywhere at anytime they wished when they signed the Treaty. At the present time, the matter is being heard in the 9th District Court. There was an interim agreement that allowed the tribe to take a specified number of deer and sage grouse and one elk each year, but this agreement has also expired and hunting by tribal members outside the reservation is in accordance with Nevada Division of Wildlife seasons and bag limits.

In New Mexico, Native Americans, because they are a sovereign nation, can hunt on reservation lands under regulations established by the tribe. Any hunting off the reservation must be done in conformance with New Mexico Department of Game and Fish laws.

In Oregon, Native American hunting on reservation and ceded lands is under tribal jurisdiction. When hunting off reservation and ceded lands, Native Americans must comply with all Oregon Department of Fish and Wildlife laws and regulations.

Utah has no special regulations that govern Native Americans hunting off reservation lands. If a tribal member wants to hunt off reservation, they must comply with Utah Division of Wildlife Resources laws and regulations. Hunting on reservation lands is done under tribal laws.

Washington State has 26 Federally recognized tribes within its boundaries. As a general rule, a member of a tribe in Washington hunts on a reservation according to tribal rules. For most tribes, the open season is August 1 through Feb. 28, but bag limits vary between tribes. Off the reservations, Native Americans can hunt on open and unclaimed lands. These hunts are generally for deer and elk, but some other species may be taken.

Wyoming does not have any special concessions to Native Americans regarding hunting on lands outside the reservation. Hunting within reservations is governed by tribal laws. Hunting on public lands off a reservation is regulated by Wyoming Game and Fish Department regulations.

Appendix C
Grazing Guidelines for Management of Domestic Sheep in Bighorn Sheep Habitats

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
WASHINGTON D.C. 20240

June 18, 1992

In Reply Refer To:
6630(240/220)

EMS TRANSMISSION 6/24/9
Instruction Memorandum No. 92-264
Expires 9/30/93

To: AFO's, SCD

From: Director

Subject: Guidelines for Domestic Sheep Management in Bighorn Sheep Habitats

Attached is a copy of the revised guidelines for domestic sheep management in bighorn sheep habitats which replace those issued via Information Bulletin No. 92-212. These guidelines were prepared by representatives of the organizations listed below at a meeting in Denver, Colorado, on May 22-23, 1992. The guidelines represent consensus among the participants and should be followed in current and future bighorn/domestic sheep use areas.

Foundation for North American Wild Sheep;
Desert Bighorn Council;
American Sheep Industry Association;
Western Association of Fish and Wildlife Agencies;
Veterinarians from California (Dr. Dave Jessup), Idaho (Dr. Dave Hunter), and Wyoming (Dr. Tom Thorne);
An Immunobiologist from Idaho (Dr. Alton Ward);
BLM - Division of Rangeland Resources; and
BLM - Division of Wildlife and Fisheries.

Please note that these guidelines will be reviewed every 3 years. Should you have any questions on these guidelines, please contact Jim Fox (202/653-9193) or Dave Almand (202/653-9202).

1 Attachment
1 - Guidelines for Domestic Sheep Management in Bighorn Sheep Habitats (3 pp)

Guidelines for Domestic Sheep Management in Bighorn Sheep Habitats

The Bureau of Land Management desires progressive bighorn sheep management compatible with appropriate grazing on public lands by domestic sheep.

It is recognized by State and Federal Agencies, bighorn sheep organizations, and the domestic sheep industry that:

- There appears to be some diseases that are shared by domestic and bighorn sheep. There is evidence that if bighorn and domestic sheep are allowed to be in close contact, health problems and die-offs may occur. Some diseases may be transmitted between both species;
- There are bighorn sheep die-offs that occur with no apparent relationship to contact with domestic sheep;
- The above two observations are both valid and not mutually exclusive;
- Bacterial pneumonias are not the only diseases of concern, although perhaps they are the most catastrophic;
- The risks of disease transmission are often unknown; they may, however, be site specific, and;
- Reasonable efforts must be made by domestic sheep permittees and wildlife and land management agencies to minimize the risk of disease transmission, and to optimize preventive medical and management procedures, to ensure healthy populations of bighorn sheep and domestic sheep.

In recognition of the above factors, the guidelines set forth below should be followed in current and future bighorn/domestic sheep use areas.

1. State wildlife and Federal land management agencies, bighorn interest groups, and domestic sheep industry cooperation and consultation are necessary to maintain and/or expand bighorn sheep numbers.
2. When agency and industry agreement has been reached to maintain and/or expand bighorn numbers, the agencies and the domestic sheep industry will be held harmless in the event of disease impacting either bighorns or domestic sheep.
3. Domestic sheep grazing and trailing should be discouraged in the vicinity of bighorn sheep ranges.
4. Bighorn sheep and domestic sheep should be spatially separated to discourage the possibility of coming into physical contact with each other.
5. Buffer strips surrounding bighorn sheep habitat should be encouraged, except where topographic features or other barriers prevent physical contact between bighorn and domestic sheep. Buffer strips could range up to 9 miles (13.5 kilometers) depending upon local conditions and management options.
6. Domestic sheep should be closely managed and carefully herded where necessary to prevent them from straying into bighorn sheep areas.
7. Trailing of domestic sheep near or through occupied bighorn sheep ranges may be permitted when safeguards can be implemented to adequately prevent physical contact between bighorns and domestic sheep.

8. Unless a cooperative agreement has been reached to the contrary, bighorn sheep should only be reintroduced into areas where domestic sheep grazing is not permitted, and the allotment(s) in which bighorns are to be introduced should not have been used for domestic sheep grazing for two or more years prior to the bighorn release.

9. In certain special circumstances, extraordinary precautions will be followed to protect federally listed threatened or endangered subspecies; State listed subspecies; Federal candidate subspecies; and BLM Category II populations (BLM Rangewide Plan for Managing Habitat of Desert Bighorn Sheep).

10. For desert bighorn sheep (*Ovis canadensis nelsoni, O.c. mexicana,* and *O.c. cremnobates)*, the following additional guidelines are recommended:

    a. No domestic sheep grazing should be allowed within buffer strips less than 9 miles (13.5 kilometers) surrounding desert bighorn habitat, except where topographic features or other barriers prevent physical contact.

    b. Domestic sheep trailed and grazed outside the 9 mile (13.5 kilometer) buffer and in the vicinity of desert bighorn ranges should be closely managed and carefully herded.

    c. Unless a cooperative agreement has been reached to the contrary, domestic sheep should be trucked rather than trailed, when trailing would bring domestic sheep closer than 9 miles (13.5 kilometers) to occupied desert bighorn sheep ranges, especially when domestic ewes are in estrus.

11. These guidelines will be reviewed every 3 years by a work group comprised of representatives from the livestock industry, State wildlife agencies, BLM and bighorn sheep organizations.

Appendix D
California Bighorn Sheep Statistics

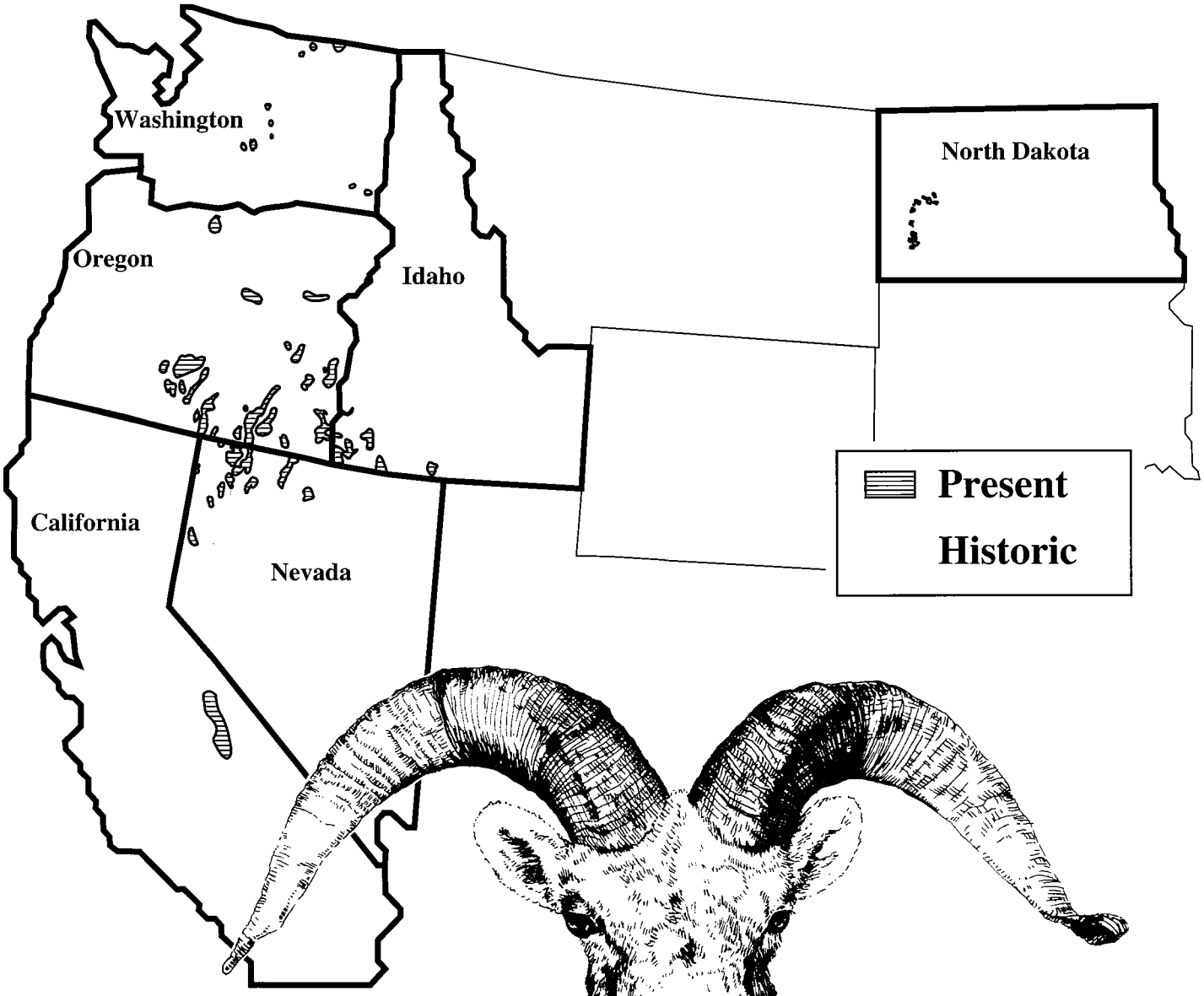

Figure D-1. Present and Historic Distribution of California Bighorn Sheep in the Western United States. (Note: California bighorns were never native to North Dakota. When the Audubon subspecies of bighorns were extirpated in North Dakota, they were replaced with the California bighorn subspecies. Therefore, there is no historical distribution of the California subspecies shown on the map.)

Table D-1. Acres of California Bighorn Habitat by Land Ownership.

State	Habitat Type	Land Ownership								
		BLM Acres	%	Other Fed. Acres	%	State Acres	%	Private Acres	%	Total Acres
California	Occupied	9,200	2	477,295	98	1,000	<1	2,000	<1	489,495
	Unoccupied Suitable	50,000	83	0	0	0	0	10,000	17	60,000
	Unoccupied Historical	111,336	23	321,613	65	1,993	<1	57,870	12	492,812
	Subtotal	**170,536**	**16**	**798,908**	**77**	**2,993**	**<1**	**69,870**	**7**	**1,042,307**
Idaho	Occupied	233,907	76	66,000	21	4,680	2	4,630	1	309,217
	Unoccupied Suitable	33,700	34	60,000	60	1,180	1	5,400	5	100,280
	Unoccupied Historical	156,690	52	77,600	26	18,660	6	46,220	15	299,170
	Subtotal	**424,297**	**60**	**203,600**	**29**	**24,520**	**3**	**56,250**	**8**	**708,667**
Nevada	Occupied	305,725	87	10,000	3	0	0	37,651	11	353,376
	Unoccupied Suitable	303,138	85	24,169	7	0	0	30,651	9	357,958
	Unoccupied Historical	361,466	91	0	0	0	0	35,656	9	397,122
	Subtotal	**970,329**	**88**	**34,169**	**3**	**0**	**0**	**103,958**	**9**	**1,108,456**
Oregon/ Washington	Occupied	483,070	80	23,840	4	60,540	10	33,730	6	601,180
	Unoccupied Suitable	58,980	60	2,540	3	22,640	23	14,080	14	98,240
	Unoccupied Historical	539,940	87	26,300	4	11,640	2	45,000	7	622,880
	Subtotal	**1,081,990**	**82**	**52,680**	**4**	**94,820**	**7**	**92,810**	**7**	**1,322,300**
	Grand Total	**2,647,152**	**63**	**1,089,357**	**26**	**122,333**	**3**	**322,888**	**8**	**4,181,730**

Source: BLM questionnaire, 1993.

Note: Total percentages may not equal 100 percent due to rounding errors.

Table D-2. Habitat Limiting Factors for California Bighorn Sheep Based on Percentage of Respondents.[1]

Habitat Limiting Factors	Percent of Respondents by Priority (1=Highest)											
	BLM Lands			Other Fed. Lands			State Lands			Private Lands		
	1	2	3	1	2	3	1	2	3	1	2	3
Grazing	78	4	4	20	10	11	18	8	14	32	18	21
Timber Management	1			1	2			2		2	2	
Fire Management	10	17	10	2	5		1	6		3	2	1
Habitat Fragment.	2	12	4		2	2	1			3	5	1
Habitat Conversion	1	1	1				1			2	5	1
Mining	1	5	4			1						
Wild Horse/Burro	6	4	1	1						4		
Water Distribution	24	9	6	5	1			1		1	4	1
Human Recreation	4	4	9	1	1	2	1	1	4		2	2
Wilderness Restrict.	5	2	2		1	1						

[1] For example, out of 80 bioregions reporting California bighorn data, 78 percent of the reporting biologists stated that "grazing" by domestic livestock was the number one problem limiting habitat for California bighorns on BLM lands.

Table D-3. Population Limiting Factors for California Bighorn Sheep Based on Percentage of Respondents.[1]

Population Limiting Factors	Percent of Respondents by Priority (1=Highest)											
	BLM Lands			Other Fed. Lands			State Lands			Private Lands		
	1	2	3	1	2	3	1	2	3	1	2	3
Grazing	68	4	3	8	11	9	11	8	12	31	18	11
Diseases	9	11	8	5	1		4	5		8	9	4
Fire Management	2	6	10	2	4			2		1	4	2
Habitat Fragment.	6	2	4	1	1	4	1	1		2		2
Mining	1	4	2								2	
Wild Horse/Burro	6	4								4		
Human Recreation	2	2	2		1	1			4			1
Water Avail/Alloc.	21	8	6	2					1	4	1	2
Natural Predators	6	10	5	1	2	1	1			2	2	1
Wilderness Restrict.	5		8		1	1					2	

[1] For example, out of 80 bioregions reporting California bighorn data, 68 percent of the reporting biologists stated that "grazing" by domestic livestock was the number one problem limiting population growth for California bighorns on BLM lands.

Table D-4. California Bighorn Sheep Bioregions by State.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
CA	Central Sierra Nevada	186,535	0	96	<1	4	75
	Domeland Wilderness - Chi	35,000	28	57	0	15	0
	Hays Canyon	66,000	85	0	0	15	25
	Northeastern California	164,717	42	40	0	18	0
	Southern Sierra Nevada	590,055	6	91	<1	3	276
	Subtotal	**1,042,307**	**16**	**77**	**<1**	**7**	**376**
ID	Big Jacks Creek	8,717	86	0	6	8	114
	Cottonwood Can./So. Hills	179,250	24	70	2	4	60
	Jarbidge River	13,360	95	0	4	1	80
	Jim Sage/Cotterel Mtns.	80,450	84	0	6	10	0
	Little Jacks Creek	60,440	96	0	1	3	400
	Lower Bruneau River	13,640	95	0	3	2	0
	Middle Mtn./Expansion	176,650	29	44	7	20	0
	Owyhee River	152,180	98	0	0	2	675
	Sheep Creek, ID	7,380	91	0	9	0	0
	Upper Bruneau River	16,600	81	0	7	13	80
	Subtotal	**708,667**	**60**	**29**	**3**	**8**	**1,409**
NV	Bilk Creeks N. (Potential)	65,500	87	0	0	13	0
	Black Rock Range	101,630	97	0	0	3	23
	Calico Range	33,901	100	0	0	0	13
	Capitol Peak (Potential)	18,859	54	22	0	24	0
	Dogskin Mtns. NV	13,140	99	0	0	1	0
	Double H Mtns. Area	28,648	99	0	0	1	35
	Granite Range	185,789	92	0	0	8	65
	Jackson Mountains	176,640	97	0	0	3	140
	McGee Mountain Area	26,453	100	0	0	0	65
	Montana Mountain Area	33,068	99	0	0	1	27
	Pahrah Mountains, NV	21,930	46	0	0	54	0
	Petersen Mountains, NV/CA	16,880	77	0	0	23	0
	Pine Forest	150,240	94	0	0	6	140
	Pueblo Mountains	14,600	100	0	0	0	120
	Selenite Range - Potential	9,485	97	0	0	3	0
	Shawave Mountains - Potential	23,200	100	0	0	0	3
	Sheep Creek Range	48,000	52	0	0	48	20
	Snowstorm Mountains	13,800	82	0	0	18	75

Table D-4. California Bighorn Sheep Bioregions by State *(continued)*.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
NV	So. Fk. Little Humboldt River	21,420	93	0	0	7	11
(cont.)	So. Santa Rosa-Sawtooth	33,273	8	90	0	2	57
	The Granites	17,920	98	0	0	2	20
	Virginia Mountains, NV	54,080	73	0	0	27	20
	Subtotal	**1,108,456**	**88**	**3**	**0**	**9**	**834**
OR/	Abert Rim	20,000	100	0	0	0	135
WA	Aeneas Mountain	24,960	2	0	80	18	70
	Aldrich Mountain	13,440	52	24	15	9	50
	Alvord Desert	19,520	98	0	0	2	30
	Alvord Peak	3,000	100	0	0	0	70
	Battle Mountain	70,300	85	0	0	15	53
	Burnt River	15,500	97	0	0	3	60
	Chopaka Mountain	9,880	55	0	39	6	0
	Coglan Buttes	5,000	100	0	0	0	25
	Coleman Rim	10,000	100	0	0	0	0
	Daugherty Rim	10,000	100	0	0	0	15
	Deschutes River Canyon	46,300	69	6	0	25	35
	Devil's Garden	10,000	100	0	0	0	0
	Diablo Mountain	10,000	100	0	0	0	20
	Fish Creek Rim	10,000	100	0	0	0	40
	Hadley Creek	5,000	20	80	0	0	50
	John Day River Canyon	67,000	69	0	0	31	73
	Kit Canyon	5,000	100	0	0	0	0
	Klickitat Co.	9,000	30	0	22	48	0
	Lincoln Cliffs	400	30	20	0	50	26
	Little Vulcan Mountain	6,600	13	15	27	45	180
	Lone Mountain	23,000	100	0	0	0	20
	Malheur River	76,500	95	0	0	5	40
	Mill Creek	5,000	20	40	0	20	12
	Mt. Hull	5,660	26	49	5	20	70
	North Catlow Rim	6,300	90	0	0	10	45
	Oak Creek (Cleman Mts.)	10,860	6	0	88	6	45
	Orejana Rim	24,000	100	0	0	0	10
	Pueblo Mountains, Oregon	14,600	96	0	0	4	120
	Quilomene	21,260	1	0	99	0	30

Table D-4. California Bighorn Sheep Bioregions by State *(concluded)*.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
OR/ WA *(cont.)*	Rehart Rim	5,000	100	0	0	0	15
	Sheeplick Draw	5,000	100	0	0	0	0
	Sheeprock	5,000	100	0	0	0	12
	Sheepshed Mountains	30,760	98	0	0	2	30
	South Catlow Rim	3,600	100	0	0	0	40
	Steens Mountain	22,100	90	0	3	7	275
	Swakane	9,920	10	39	32	19	30
	Tower Owyhee	298,200	88	10	0	2	470
	Trout Creeks	160,300	99	0	0	1	170
	Umptanum	31,680	17	0	61	22	200
	Upper John Day	10,600	10	30	0	60	20
	Upper Owyhee	161,100	93	0	6	1	240
	Upton Mountain	20,960	95	0	3	2	12
	Subtotal	**1,322,300**	**82**	**4**	**7**	**7**	**2,838**
	Grand Total	**4,181,730**	**63**	**26**	**3**	**8**	**5,457**

Source: BLM questionnaire, 1993.

Note: Total percentages may not equal 100 percent due to rounding errors.

Table D-5. New Habitat Development and Maintenance Projects Needed in California for California Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
4	$35,000	Spring Development (No.)	0	0
5	$60,000	Water Catchments (No.)	2	$2,000
3,000	$15,000	Prescribed Fire (Acres)	0	0
Total	**$110,000**		**Total**	**$2,000**
Source: BLM questionnaire, 1993.				

Table D-6. New Habitat Development and Maintenance Projects Needed in Idaho for California Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
14	$60,000	Water Catchments (No.)	14	$ 12,501
Total	**$60,000**		**Total**	**$ 12,501**
Source: BLM questionnaire, 1993.				

Table D-7. New Habitat Development and Maintenance Projects Needed in Nevada for California Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
4	$17,000	Spring Development (No.)	5	$3,500
6	$18,000	Water Pipelines (Miles)	6	$1,000
22	$22,000	Livestock Exclosures (No.)	14	$ 10,000
10	$66,000	Fence Modifications (Miles)	5	$2,000
1	$35,000	Water Development (No.)	0	0
Total	**$ 158,000**		**Total**	**$ 16,500**
Source: BLM questionnaire, 1993.				

Table D-8. New Habitat Development and Maintenance Projects Needed in Oregon/Washington for California Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
17	$ 23,000	Spring Development (No.)	14	$5,015
3	$60,000	Dams and Reservoirs (No.)	10	$3,036
50	$19,121	Water Catchments (No.)	52	$8,842
1	$ 5,000	Well and Water Storage (No.)	0	0
13	$40,015	Management Fences (Miles)	2	$5,000
640	$13,005	Weed/Pest Control (Acres)	1,041	$8,010
20	$10,000	Mech. Veg. Manip. (Acres)	0	0
42,214	$90,690	Prescribed Fire (Acres)	0	0
160	$33,000	Fertilization (Acres)	0	0
520	$10,500	Reseed/Plant (Acres)	0	0
2	$ 2,000	Livestock Exclosures (No.)	0	0
Total $306,331			**Total $29,903**	

Source: BLM questionnaire, 1993.

Appendix E
Dall Sheep Statistics

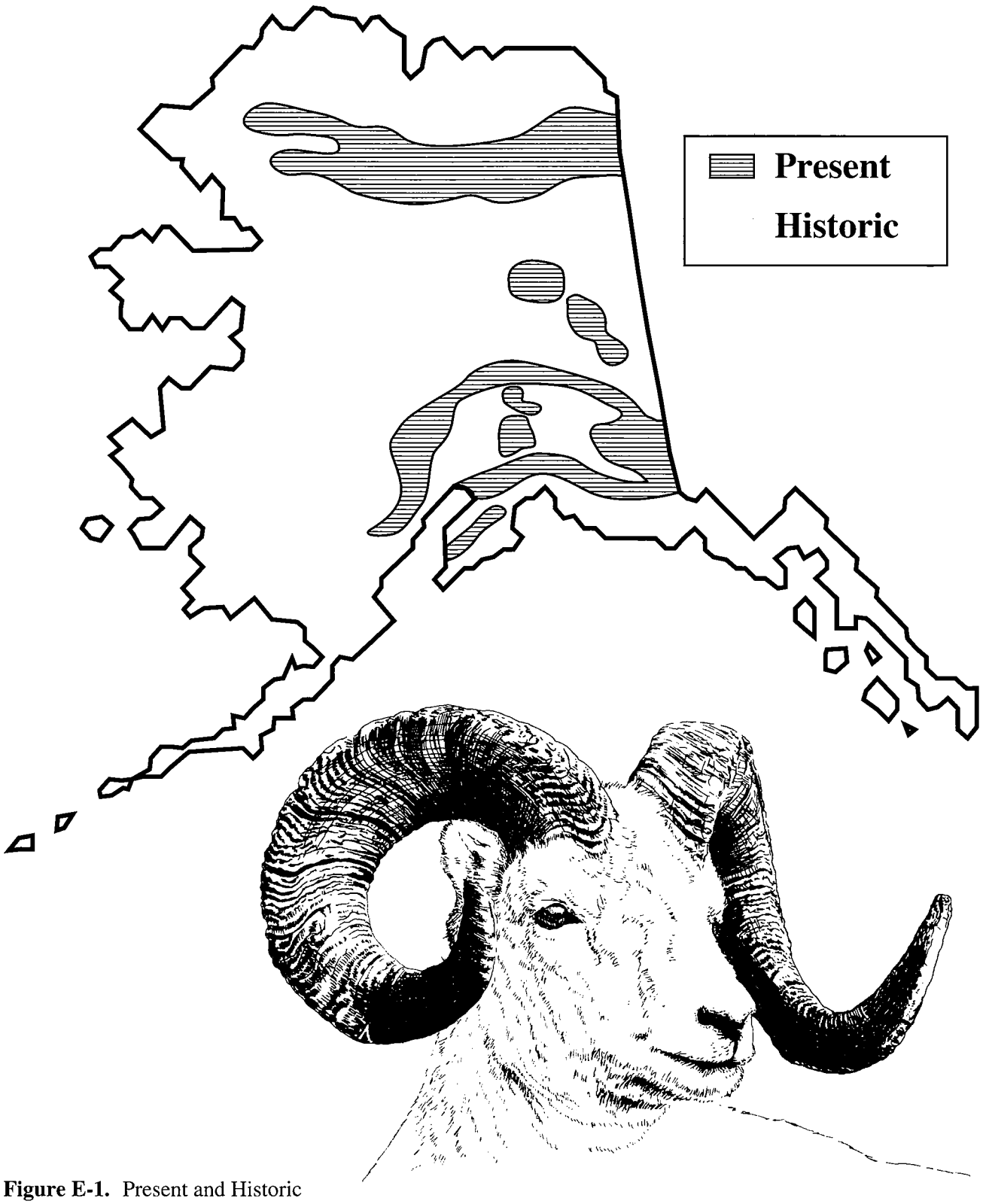

Figure E-1. Present and Historic Distribution of Dall Sheep in Alaska.

Table E-1. Acres of Dall Sheep Habitat by Land Ownership.

State	Habitat Type	Land Ownership								
		BLM Acres	%	Other Fed. Acres	%	State Acres	%	Private Acres	%	Total Acres
Alaska	Occupied	2,089,040	8	17,773,080	66	6,514,480	24	594,700	2	26,971,300
	Unoccupied Suitable	238,000	51	50,000	11	180,000	38	0	0	468,000
	Unoccupied Historical	438,000	66	0	0	230,000	34	0	0	668,000
	Total	**2,765,040**	**10**	**17,823,080**	**63**	**6,924,480**	**25**	**594,700**	**2**	**28,107,300**
Source: BLM questionnaire, 1993.										

Table E-2. Habitat Limiting Factors for Dall Sheep Based on Percentage of Respondents.[1]

Habitat Limiting Factors	Percent of Respondents by Priority (1=Highest)											
	BLM Lands			Other Fed. Lands			State Lands			Private Lands		
	1	2	3	1	2	3	1	2	3	1	2	3
Climate	67			50			67			67		17
Human Recreation		50			50	17		33	17		33	17
Fire Management	33			17			17					
Volcanic Ash			50					17				
Habitat Fragment.			25									
Energy Development			25			17			17			17
Mining Impacts		17						17			17	
Military Activities					17	17					17	
Human Access & Dev.		17								33		

[1] For example, out of 6 bioregions reporting Dall sheep data, 67 percent of the reporting biologists stated that "climate" was the number one problem limiting habitat for Dall sheep in Alaska on BLM lands.

Table E-3. Population Limiting Factors for Dall Sheep Based on Percentage of Respondents.[1]

Population Limiting Factors	Percent of Respondents by Priority (1=Highest)											
	BLM Lands			Other Fed. Lands			State Lands			Private Lands		
	1	2	3	1	2	3	1	2	3	1	2	3
Climate	83	17		67			83			67	17	
Natural Predators	17	17	66				17	17	50		17	17
Human Recreation	17	17	17		17		17	17	17	33	33	
Military Activities	17				33							
Disease								17				

[1] For example, out of 6 bioregions reporting Dall sheep data, 83 percent of the reporting biologists stated that "climate" was the number one problem limiting population growth for Dall sheep on BLM lands.

Table E-4. Dall Sheep Bioregions.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
AK	Alaska Range West	3,279,300	8	21	68	3	5,000
	Brooks Range	21,300,000	7	80	10	3	11,000
	Chugach Mountains	780,000	19	4	75	2	600
	Steese	717,600	30	0	70	0	30
	Talkeetna Mountains	1,340,000	1	0	98	1	1,250
	White Mountains	690,400	86	14	0	0	350
	Total	**28,107,300**	**10**	**63**	**25**	**2**	**18,230**

Source: BLM questionnaire, 1993.

Table E-5. New Habitat Improvement Projects Needed by the Year 2000 in Alaska for Dall Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
505	$ 12,500	Prescribed Fire (Acres)	5	$ 1,000
Total	**$ 12,500**		**Total**	**$ 1,000**

Source: BLM questionnaire, 1993.

Appendix F
Desert Bighorn Sheep Statistics

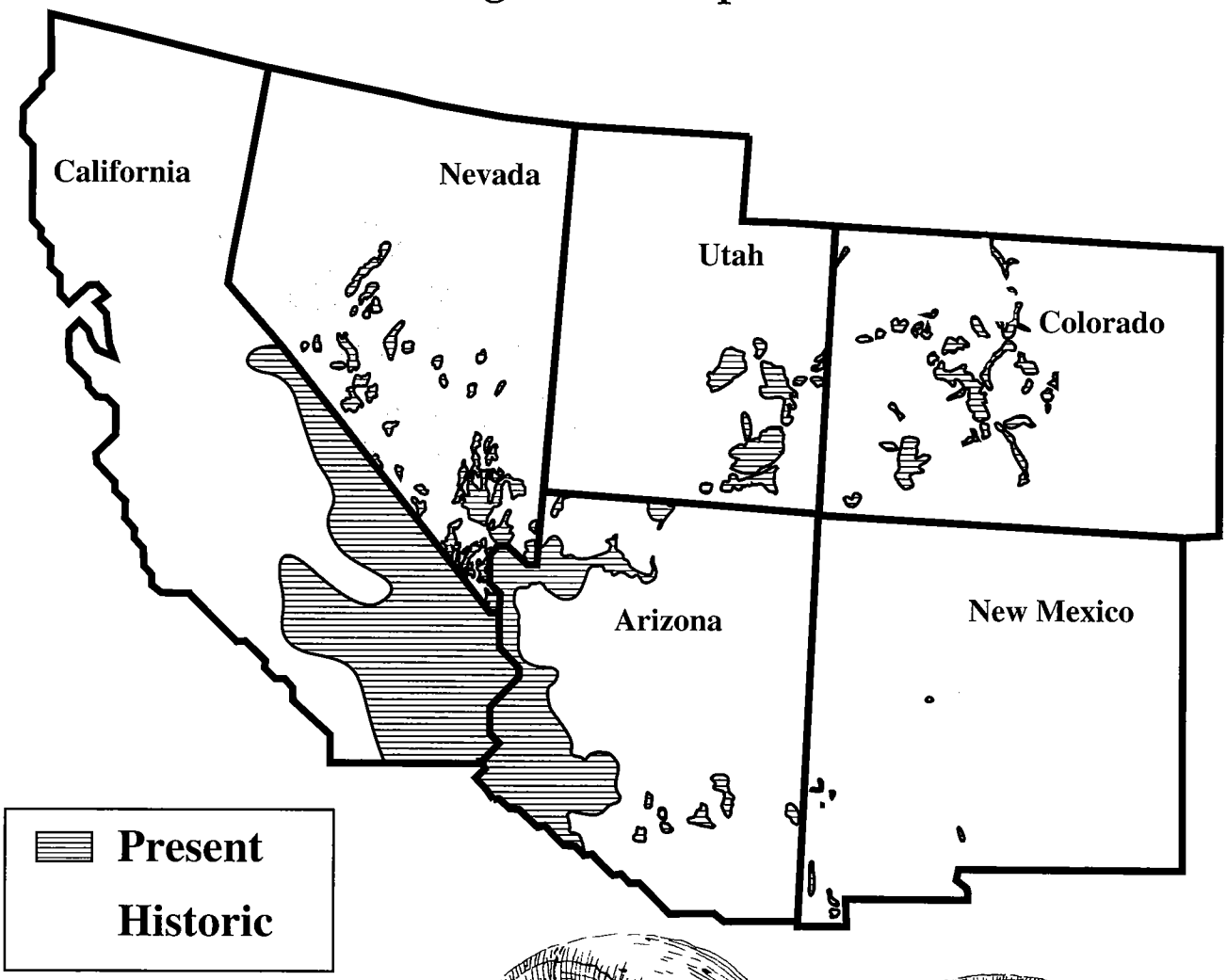

Figure F-1. Present and Historic Distribution of Desert Bighorn Sheep in the Western United States.

Table F-1. Acres of Desert Bighorn Habitat by Land Ownership.

State	Habitat Type	Land Ownership								
		BLM Acres	%	Other Fed. Acres	%	State Acres	%	Private Acres	%	Total Acres
Arizona	Occupied	2,660,765	72	874,522	24	80,087	2	91,215	2	3,706,589
	Unoccupied Suitable	79,023	54	49,424	34	12,423	8	5,782	4	146,652
	Unoccupied Historical	236,800	85	0	0	7,808	3	32,592	12	277,200
	Subtotal	**2,976,588**	**72**	**923,946**	**22**	**100,318**	**2**	**129,589**	**3**	**4,130,441**
California	Occupied	1,722,208	49	1,058,049	30	355,295	10	351,823	10	3,487,375
	Unoccupied Suitable	268,308	57	161,711	35	13,440	3	24,542	5	468,001
	Unoccupied Historical	102,074	94	1,499	1	1,246	1	3,661	3	108,480
	Subtotal	**2,092,590**	**51**	**1,221,259**	**30**	**369,981**	**9**	**380,026**	**9**	**4,063,856**
Colorado	Occupied	106,000	97	1,480	1	0	0	1,400	1	108,880
	Unoccupied Suitable	452,695	94	9,880	2	2,000	<1	16,846	3	481,421
	Unoccupied Historical	67,000	99	0	0	640	1	0	0	67,640
	Subtotal	**625,695**	**95**	**11,360**	**2**	**2,640**	**<1**	**18,246**	**3**	**657,941**
Nevada	Occupied	2,106,186	83	373,130	15	8,000	<1	41,080	2	2,528,396
	Unoccupied Suitable	456,888	98	7,680	2	0	0	770	<1	465,338
	Unoccupied Historical	627,322	89	0	0	0	0	76,870	11	704,192
	Subtotal	**3,190,396**	**86**	**380,810**	**10**	**8,000**	**<1**	**118,720**	**3**	**3,697,926**
New Mexico	Occupied	180,859	59	2,000	1	37,120	12	88,360	29	308,339
	Unoccupied Suitable	31,176	29	69,808	65	3,888	4	2,952	3	107,824
	Unoccupied Historical	171,026	37	155,269	34	38,126	8	94,691	21	459,112
	Subtotal	**383,061**	**44**	**227,077**	**26**	**79,134**	**9**	**186,003**	**21**	**875,275**
Utah	Occupied	836,895	69	289,922	24	90,360	7	2,600	<1	1,219,777
	Unoccupied Suitable	111,953	76	28,721	19	7,470	5	55	<1	148,199
	Unoccupied Historical	131,290	84	7,000	4	12,200	8	5,370	3	155,860
	Subtotal	**1,080,138**	**71**	**325,643**	**21**	**110,030**	**7**	**8,025**	**<1**	**1,523,836**
	Grand Total	**10,348,468**	**69**	**3,090,095**	**21**	**670,103**	**4**	**840,609**	**6**	**14,949,275**

Source: BLM questionnaire, 1993.
Note: Total percentages may not equal 100 percent due to rounding errors.

Table F-2. Habitat Limiting Factors for Desert Bighorn Sheep Based on Percentage of Respondents.[1]

Habitat Limiting Factors	Percent of Respondents by Priority (1=Highest)											
	BLM Lands			Other Fed. Lands			State Lands			Private Lands		
	1	2	3	1	2	3	1	2	3	1	2	3
Grazing	71	17	12	33	22	9	25	29	29	17	21	20
Fire Management		2	4	1	1	3		1	2			2
Habitat Fragment.	9	6	5	2	2	2	5	4	2	4	3	2
Habitat Conversion	1	1		1		1	2			6	4	2
Mining	5	6	6	1			5	3	2	8	2	5
Exotic Game Animals	1	1	1		1	1	1	1	1	1	1	1
Wild Horse/Burro	6	15	5	3	3		1	6	1		3	1
Water Distribution	25	21	15	10	9		9	10	9		5	6
Human Recreation	3	6	16	8	5	4	2	6	11	1	4	9
Wilderness Restrict.	6	5	6	1	1	1		1	1			

[1] For example, out of 92 bioregions reporting desert bighorn sheep data, 71 percent of the reporting biologists stated that "grazing" by domestic livestock was the number one problem limiting habitat for desert bighorn sheep on BLM lands.

Table F-3. Population Limiting Factors for Desert Bighorn Sheep Based on Percentage of Respondents.[1]

Population Limiting Factors	Percent of Respondents by Priority (1=Highest)											
	BLM Lands			Other Fed. Lands			State Lands			Private Lands		
	1	2	3	1	2	3	1	2	3	1	2	3
Grazing	65	22	13	18	21	14	18	28	27	11	22	18
Diseases	8	9	3	4		2	6	1	2	4	2	1
Habitat Fragment.	4	6	4		1	2	2	6	2	3	4	1
Mining	4	4	9				5	1	2	8	2	1
Wild Horse/Burro	3	12	9		3		2	2	4		2	1
Human Recreation	5	10	4	5	3	2	3	8	1		5	5
Water Avail/Alloc.	22	13	13	2	11	4	5	4	12		4	5
Natural Predators	6	8	10	2		5	1	2	4	2	2	1
Wilderness Restrict.	9		8	3	1	1	3	3	1			1

[1] For example, out of 92 bioregions reporting desert bighorn sheep data, 65 percent of the reporting biologists stated that "grazing" by domestic livestock was the number one problem limiting population growth for desert bighorn sheep on BLM lands.

Table F-4. Desert Bighorn Sheep Bioregions by State.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
AZ	Aguila/GraniteMtns.	68,160	70	30	0	0	65
	Aravaipa	48,000	60	32	4	4	82
	Aubrey Hills	15,200	88	0	0	12	73
	Belmont Complex	149,760	97	0	2	1	45
	Bill Williams Complex	760,320	95	0	2	3	200
	Black Mountains	547,968	42	44	3	11	2,000
	Buckskin Mountains	60,000	99	0	1	0	39
	Crater Range	65,920	100	0	0	0	10
	Galiuro Bighorn Sheep Pop.	72,600	14	75	5	6	60
	Gila Bend Mountains	303,800	80	18	<1	1	115
	Gila-Tinajas Altos Mtns.	103,488	97	0	2	1	150
	Grand Wash Cliffs	45,000	100	0	0	0	150
	Kanab Creek	70,000	43	57	0	0	110
	Maricopa Mountains	180,960	99	0	<1	1	86
	Mohawk Mountain	58,240	82	15	2	1	44
	Muggins Mountains	53,246	62	38	0	0	15
	Needles Peak/Mohave	57,440	66	19	0	15	97
	New Water Mtns./Kofa NWR	79,695	98	0	1	1	116
	Palomas Plain	186,220	83	16	1	0	200
	Paria Cyn/Vermillion Cliffs	73,300	95	4	0	<1	168
	Peloncillo	103,040	66	0	23	11	66
	Plomosa Mtns. (N of I-10)	46,700	100	0	0	0	210
	Saddle Mountain	6,080	100	0	0	0	5
	Sand Tank/Sauceda	459,520	65	34	1	0	160
	Sierra Estrella Mountain	92,160	30	55	10	5	25
	Silverbell Bighorn Sheep	30,924	55	8	14	23	99
	Table Top Mountain	21,440	84	16	0	0	30
	Trigo/Dome Rock Mtns.	277,280	25	74	1	<1	218
	Virgin Mountains	50,000	100	0	0	0	180
	Whitlock	43,980	78	0	22	0	0
	Subtotal	**4,130,441**	**72**	**22**	**3**	**3**	4,818
CA	North Central Mojave	410,086	74	0	4	22	513
	Northern Mojave	1,567,832	45	54	<1	1	967
	Peninsular Ranges	630,636	29	2	45	24	426
	San Gabriel Mountains	74,729	0	80	0	20	500

Table F-4. Desert Bighorn Sheep Bioregions by State *(continued)*.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
CA *(cont.)*	South Central Mojave	908,406	68	16	5	11	1,006
	Southern Mojave/Sonoran	302,123	67	23	4	6	513
	Western Transverse Range	59,964	90	8	2	0	37
	White Mountains - Calif.	110,080	21	75	2	2	265
	Subtotal	**4,063,856**	**51**	**30**	**9**	**10**	**4,227**
CO	Camel Back/Dominquez	140,400	92	3	1	4	150
	Devils-Mee Canyon	95,001	90	6	0	4	125
	Domenquez (West Gunnison)	190,000	95	0	<1	4	140
	Lower Dolores River	69,000	100	0	0	0	20
	Palisades/Sewemup	28,100	95	0	0	5	5
	Upper Dolores	135,440	98	0	<1	1	175
	Subtotal	**657,941**	**95**	**2**	**1**	**2**	**615**
NV	Arrow Canyon/Elbow	102,840	55	42	0	3	262
	Bare Mountain	20,900	98	0	0	2	46
	Burnt Cabin Summit	13,440	100	0	0	0	0
	Clan Alpine	130,410	99	0	0	1	75
	Desatoya Mtns., NV.	37,740	100	0	0	0	95
	East Range, NV.	113,995	76	0	0	24	84
	Eldorado/Newberry	159,100	42	58	0	0	459
	Excelsior Range, NV	11,910	98	0	0	2	73
	Fairview/Slate, NV	31,120	81	16	0	3	0
	Gabbs Valley Range, NV	192,080	90	0	0	10	171
	Gold Mountain	108,288	100	0	0	0	0
	Golden Gate Range	92,160	100	0	0	0	0
	Goldfield	17,856	100	0	0	0	0
	Grant Range	46,000	100	0	0	0	84
	Grapevine Mountain	30,016	100	0	0	0	0
	Last Chance Range	32,910	99	0	0	<1	107
	Lone Mountain, NV	47,040	100	0	0	0	50
	Magruder/Palmetto	92,928	100	0	0	0	0
	McCullough-Highland	160,900	100	0	0	0	88
	Meadow Valley/Delamar Mtn.	180,420	100	0	0	0	120
	Monte Cristo	76,672	100	0	0	0	63
	Montezuma	37,824	100	0	0	0	0
	Mormon Mountains	188,442	100	0	0	0	409

Table F-4. Desert Bighorn Sheep Bioregions by State *(continued)*.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
NV *(cont.)*	Muddy Mountains	164,600	0	0	0	0	800
	North Hiko Range	23,480	98	0	0	2	55
	Pahranagat	73,800	85	15	0	0	50
	Pancake Range	31,000	100	0	0	0	165
	River Mountains	39,700	32	63	0	5	212
	Sand Springs	50,090	95	5	0	0	0
	Seaman Range	170,240	100	0	0	0	0
	Silver Peak	177,216	100	0	0	0	88
	Sonoma Range (Potential)	104,954	64	0	0	36	0
	South Egan Range	89,860	100	0	0	0	36
	South Hiko	26,480	100	0	0	0	70
	Specter Range	25,230	100	0	0	0	28
	Spring Mountains	291,700	80	20	0	0	125
	Stillwater Range	118,595	99	0	0	1	143
	Stonewall Mountain	10,220	66	34	0	0	147
	Tobin Range	87,855	97	0	0	3	24
	Virgin Mt/Gold Butte	149,200	69	30	0	1	157
	Wassuk Range, NV	138,715	55	31	0	16	43
	Subtotal	**3,697,926**	**86**	**10**	**1**	**3**	**4,329**
NM	Bootheel	492,715	42	13	11	34	125
	Brokeoff/Guadalupe Mtns.	130,000	49	36	10	5	0
	Caballo Mountains	55,104	85	0	8	7	0
	Cornudas Mountains	24,000	88	0	8	4	0
	Ladron Mountain ACEC	34,560	56	28	9	7	33
	Organ Mountains	74,496	25	72	0	3	0
	Sacramento Mountains	64,400	9	81	1	9	0
	Subtotal	**875,275**	**44**	**26**	**9**	**21**	**158**
UT	Arches-Professor	68,000	22	74	4	0	60
	Colo-Dolores	106,500	94	0	6	<1	50
	Horseshoe Bowknot Bend	20,180	96	0	4	0	0
	Kaiparowits Plateau	223,600	57	37	6	0	120
	New Foundland Mtns.	23,880	85	0	10	5	0
	North San Juan/Needles	106,251	48	47	5	<1	80
	North San Rafael Swell	200,000	90	0	9	<1	300
	Potash	193,000	39	58	2	1	750

Table F-4. Desert Bighorn Sheep Bioregions by State *(concluded)*.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
UT	South San Juan	191,225	75	16	7	2	125
(cont.)	South San Rafael Swell	391,200	89	0	11	0	250
	Subtotal	**1,523,836**	**71**	**21**	**7**	**1**	**1,735**
	Grand Total	**14,949,275**	**69**	**20**	**5**	**6**	**15,882**

Source: BLM questionnaire, 1993.

Note: Total percentages may not equal 100 percent due to rounding errors.

Table F-5. New Habitat Development and Maintenance Projects Needed in Arizona for Desert Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
4	$ 73,000	Spring Development (No.)	29	$46,100
0	0	Dams and Reservoirs (No.)	6	$16,000
66	$ 1,188,000	Water Catchments (No.)	104	$ 483,030
0	0	Well and Water Storage (No.)	2	$3,500
18	$ 10,000	Management Fences (Miles)	18	$5,000
16,700	$ 33,040	Prescribed Fire (Acres)	2,000	$10,000
Total	**$ 1,304,040**		**Total**	**$ 563,630**

Source: BLM questionnaire, 1993.

Table F-6. New Habitat Development and Maintenance Projects Needed in California for Desert Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
7	$ 88,000	Spring Development (No.)	29	$46,100
20	$325,000	Water Catchments (No.)	53	$ 2,401,000
1	$30,000	Well and Water Storage (No.)	0	0
10	$30,000	Water Pipelines (Miles)	0	0
3	$10,000	Management Fences (Miles)	3	$5,000
3,000	$600,000	Weed/Pest Control (Acres)	3,000	$150,000
Total	**$ 1,083,000**		**Total**	**$ 2,602,100**

Source: BLM questionnaire, 1993.

Table F-7. New Habitat Development and Maintenance Projects Needed in Colorado for Desert Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
3	$9,000	Spring Development (No.)	0	0
17	$28,300	Water Catchments (No.)	2	$500
400	$4,000	Weed/Pest Control (Acres)	0	0
500	$10,000	Mech. Veg. Manip. (Acres)	0	0
1,300	$25,200	Prescribed Fire (Acres)	0	0
540	$32,500	Fertilization (Acres)	0	0
Total	**$ 109,000**		**Total**	**$ 500**
Source: BLM questionnaire, 1993.				

Table F-8. New Habitat Development and Maintenance Projects Needed in Nevada for Desert Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
28	$157,031	Spring Development (No.)	55	$33,402
5	$65,000	Dams and Reservoirs (No.)	5	$6,000
60	$297,310	Water Catchments (No.)	115	$37,631
2	$ 8,000	Management Fences (Miles)	2	$2,000
1,980	$13,841	Prescribed Fire (Acres)	0	0
4	$ 4,000	Livestock Exclosures (No.)	4	$8,000
Total	**$545,182**		**Total**	**$87,033**
Source: BLM questionnaire, 1993.				

Table F-9. New Habitat Development and Maintenance Projects Needed in New Mexico for Desert Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
17	$26,059	Water Catchments (No.)	39	$7,211
18	$100,000	Management Fences (Miles)	20	$5,000
30,000	$100,000	Prescribed Fire (Acres)	0	0
4	$ 4,000	Livestock Exclosures (No.)	8	$10,000
2	$32,024	Catchment Reconstruction (No.)	2	$1,000
Total	**$262,083**		**Total**	**$23,211**
Source: BLM questionnaire, 1993.				

Table F-10. New Habitat Development and Maintenance Projects Needed in Utah for Desert Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
5	$25,000	Spring Development (No.)	20	$15,000
0	0	Dams and Reservoirs (No.)	4	$8,000
24	$ 138,020	Water Catchments (No.)	20	$6,600
2	$20,000	Well and Water Storage (No.)	0	0
2	$4,000	Water Pipelines (Miles)	0	0
500	$25,000	Mech. Veg. Manip. (Acres)	0	0
1	$1,000	Livestock Exclosures (No.)	0	0
Total	**$ 213,020**		**Total**	**$29,600**
Source: BLM questionnaire, 1993.				

Appendix G
Rocky Mountain Bighorn Sheep Statistics

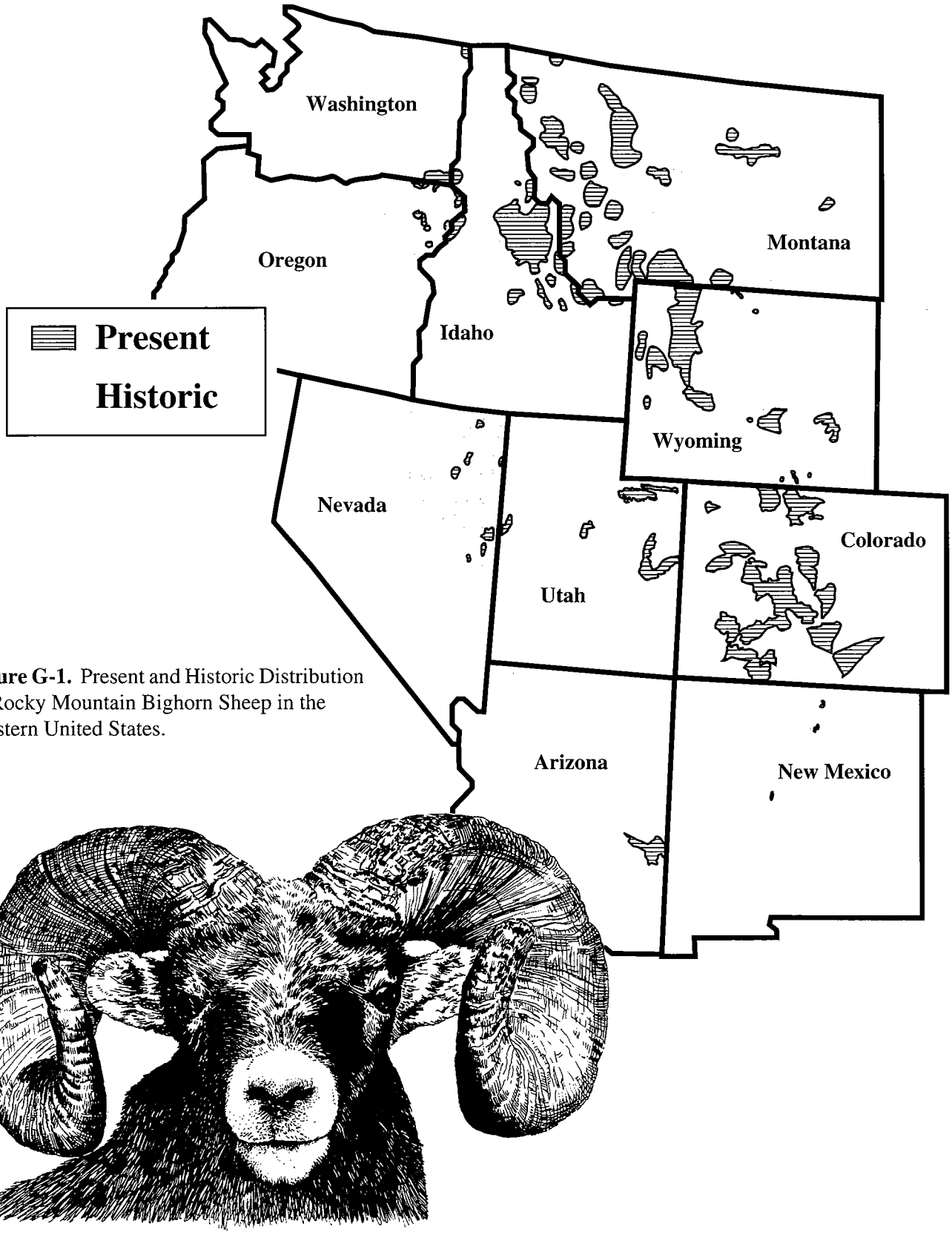

Figure G-1. Present and Historic Distribution of Rocky Mountain Bighorn Sheep in the Western United States.

Table G-1. Acres of Rocky Mountain Bighorn Habitat by Land Ownership.

State	Habitat Type	Land Ownership								
		BLM Acres	%	Other Fed. Acres	%	State Acres	%	Private Acres	%	Total Acres
Arizona	Occupied	20,000	67	0	0	2,000	7	8,000	27	30,000
	Unoccupied Suitable	10,000	100	0	0	0	0	0	0	10,000
	Unoccupied Historical	0	0	0	0	0	0	0	0	0
	Subtotal	**30,000**	**75**	**0**	**0**	**2,000**	**5**	**8,000**	**20**	**40,000**
Colorado	Occupied	260,668	33	365,800	47	40,280	5	114,300	15	781,048
	Unoccupied Suitable	37,280	35	58,000	54	320	<1	12,320	11	107,920
	Unoccupied Historical	0	0	108,200	100	0	0	0	0	108,200
	Subtotal	**297,948**	**30**	**532,000**	**53**	**40,600**	**4**	**126,620**	**13**	**997,168**
Idaho	Occupied	117,758	20	436,840	75	22,240	4	8,340	1	585,178
	Unoccupied Suitable	10,000	30	20,000	60	1,280	4	2,000	6	33,280
	Unoccupied Historical	152,796	35	253,160	59	8,840	2	17,800	4	432,596
	Subtotal	**280,554**	**27**	**710,000**	**68**	**32,360**	**3**	**28,040**	**3**	**1,051,054**
Montana	Occupied	418,370	55	201,140	26	33,900	4	113,660	15	767,070
	Unoccupied Suitable	301,720	54	164,360	30	19,960	4	68,700	12	554,740
	Unoccupied Historical	263,620	38	198,300	29	65,600	10	158,520	23	686,040
	Subtotal	**983,710**	**49**	**563,800**	**28**	**119,460**	**6**	**340,880**	**17**	**2,007,850**
Nevada	Occupied	46,500	37	76,540	61	0	0	3,200	3	126,240
	Unoccupied Suitable	152,670	74	41,040	20	0	0	11,560	6	205,270
	Unoccupied Historical	0	0	0	0	0	0	0	0	0
	Subtotal	**199,170**	**60**	**117,580**	**35**	**0**	**0**	**14,760**	**4**	**331,510**

Table G-1. Acres of Rocky Mountain Bighorn Habitat by Land Ownership *(concluded)*.

State	Habitat Type	Land Ownership								
		BLM Acres	%	Other Fed. Acres	%	State Acres	%	Private Acres	%	Total Acres
New Mexico	Occupied	0	0	0	0	0	0	0	0	0
	Unoccupied Suitable	17,000	89	2,200	11	0	0	0	0	19,200
	Unoccupied Historical	85,000	100	0	0	0	0	0	0	85,000
	Subtotal	**102,000**	**98**	**2,200**	**2**	**0**	**0**	**0**	**0**	**104,200**
Oregon	Occupied	21,080	10	160,000	75	7,560	4	24,520	12	213,160
	Unoccupied Suitable	0	0	1,200,000	100	0	0	0	0	1,200,000
	Unoccupied Historical	23,260	2	1,040,000	98	0	0	2,600	<1	1,065,860
	Subtotal	**44,340**	**2**	**2,400,000**	**97**	**7,560**	**<1**	**27,120**	**1**	**2,479,020**
Utah	Occupied	471,680	61	200,000	26	36,705	5	69,055	8	777,440
	Unoccupied Suitable	338,502	86	0	0	42,572	11	10,710	3	391,784
	Unoccupied Historical	470,211	81	54,380	9	26,085	5	28,146	6	578,822
	Subtotal	**1,280,393**	**73**	**254,380**	**15**	**105,362**	**6**	**107,911**	**7**	**1,748,046**
Wyoming	Occupied	179,847	16	764,175	67	46,130	4	152,945	13	1,143,097
	Unoccupied Suitable	66,160	31	52,800	25	13,840	7	78,900	37	211,700
	Unoccupied Historical	440,514	55	66,100	8	87,360	11	202,286	25	796,260
	Subtotal	**686,521**	**32**	**883,075**	**41**	**147,330**	**7**	**434,131**	**20**	**2,151,057**
	Grand Total	**3,904,636**	**36**	**5,463,035**	**50**	**454,672**	**4**	**1,087,562**	**10**	**10,909,905**

Source: BLM questionnaire, 1993.

Note: Total percentages may not equal 100 percent due to rounding errors.

Table G-2. Habitat Condition Limiting Factors for Rocky Mountain Bighorn Sheep Based on Percentage of Respondents.[1]

Habitat Limiting Factors	Percent of Respondents by Priority (1=Highest)											
	BLM Lands			Other Fed. Lands			State Lands			Private Lands		
	1	2	3	1	2	3	1	2	3	1	2	3
Grazing	69	5	5	35	39	35	46	37	34	48	34	28
Timber Management		3	1		3		1				1	1
Fire Management	17	3	6	17	1	3	11	3	3	1	7	4
Habitat Fragment.	1	8	8	6	4	6	3	3	4	4	7	10
Energy Development		3	1		1			3	1		3	1
Mining	3	4		1	3		1	4		4	3	
Water Distribution	6	13	10	4	4	7	3	10	8	3	6	6
Native Ungulates	6	11	6	3	6	7	3	6	7		4	7
Human Recreation	8	6	15	3	10	10	3	4	14	3	4	6
Wilderness Restric.	4		1	6		1						

[1] For example,out of 72 bioregions reporting Rocky Mountain bighorn sheep data, 69 percent of the biologists stated that "grazing" by domestic livestock was the number one problem limiting habitat for Rocky Mountain bighorn sheep on BLM lands.

Table G-3. Population Limiting Factors for Rocky Mountain Bighorn Sheep Based on Percentage of Respondents. [1]

Population Limiting Factors	Percent of Respondents by Priority (1=Highest)											
	BLM Lands			Other Fed. Lands			State Lands			Private Lands		
	1	2	3	1	2	3	1	2	3	1	2	3
Livestock Forage Comp	49	5	4	28	32	37	34	37	34	48	28	27
Disease	35	15	3	27	8	4	27	8	6	22	15	4
Timber Harvest Impac	1	1		1	1		3			1	3	
Fire Management	4	8	1	4	8	1		8	3		10	1
Habitat Fragmentation		4	4		3	1		1	1	3	7	8
Habitat Conversion		4	4		3	1		1	1	3	7	8
Energy Development			1			1			3			4
Human Recreation	6	4	11	6	3	11	3	3	10	1	3	4
Water Avail/Alloc.	6	4	3		7		1	4	3	1	3	3
Natural Predators	8	7	8	6	6	6	7	7	6	7	4	6
Wilderness Restrict	1		1	1	2	2						

[1] For example, out of 72 bioregions reporting Rocky Mountain bighorn data, 49 percent of the reporting biologists stated that "livestock forage competition" was the number one problem limiting population growth for Rocky Mountain bighorn sheep on BLM lands.

Table G-4. Rocky Mountain Bighorn Sheep Bioregions by State.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
AZ	Gila Box	40,000	75	0	5	20	120
	Subtotal	**40,000**	**75**	**0**	**5**	**20**	**120**
CO	Alamosa & Conejos Canyons	73,600	7	70	17	6	150
	Arkansas Canyon	86,550	66	18	6	10	160
	Beaver Creek	12,360	52	0	40	8	27
	Beaver Creek, Canyon City	104,380	20	47	7	26	385
	Browns Canyon	83,910	28	62	4	6	125
	Buffalo Peaks	45,620	13	43	1	43	150
	Cross Mountain	12,000	100	0	0	0	8
	Derby Creek	186,640	14	84	0	2	95
	Georgetown	44,740	80	10	1	9	260
	Gunnison Gorge	31,000	71	29	0	0	125
	La Garita	25,000	5	61	16	18	125
	Mount Maestas	32,168	30	0	6	64	160
	Ouray	56,000	4	89	0	7	0
	Shelf Road	35,200	60	0	4	36	100
	Trickle Mountain	168,000	48	46	< 1	6	250
	Subtotal	**997,168**	**30**	**53**	**4**	**13**	**2,120**
ID	Birch Creek	32,500	28	62	9	1	40
	Cronks Canyon	41,140	24	73	2	1	30
	East Fork Sheep	177,400	20	73	4	3	200
	Lemhi Range	61,314	34	55	4	7	35
	Lost River	140,040	11	78	4	7	145
	Morgan Creek	75,840	26	66	5	3	150
	Mud Springs Gulch	32,500	28	62	9	1	40
	Salmon/Lemhi East	244,000	33	65	2	0	30
	Salmon/Lemhi West	111,000	36	61	3	0	40
	Salmon West	102,000	38	61	1	0	62
	Soda Point/Wasatch Mtns.	33,220	1	85	2	12	0
	Subtotal	**1,050,954**	**27**	**68**	**3**	**2**	**772**
MT	Beartrap	27,400	38	0	3	59	170
	Blacktail Ridge	151,700	52	0	18	30	0
	Centennial	25,300	92	<1	<1	7	0
	East Madison	56,500	3	29	6	62	110
	Elkhorn Mountains	95,360	30	34	5	31	0

Table G-4. Rocky Mountain Bighorn Sheep Bioregions, by State *(continued)*.

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
MT *(cont.)*	Lost Creek	25,600	32	60	1	7	0
	Missouri River Breaks	795,000	65	20	5	10	200
	Pioneers and Highland Mtns	246,360	44	32	4	20	425
	Pryor Mountains	88,050	26	48	4	22	160
	Rocky Hills	87,100	70	0	16	14	0
	Rocky Mtn. East Front	13,000	100	0	0	0	900
	Sleeping Giant	95,360	52	1	2	45	60
	Tendoy Mountains	285,200	35	56	4	5	25
	Upper Rock Creek	15,920	13	36	0	51	205
	Subtotal	**2,007,850**	**49**	**28**	**6**	**17**	**2,255**
NM	Lower Basin and Range	19,200	88	12	0	0	0
	So. Colorado Plateau/San Juan	85,000	100	0	0	0	0
	Subtotal	**104,200**	**97**	**3**	**0**	**0**	0
NV	Badlands	27,500	100	0	0	0	70
	Mt. Grafton	48,000	99	0	0	1	15
	Mt. Moriah	228,400	48	52	0	0	50
	Pilot Range	27,610	48	0	0	52	30
	Subtotal	**331,510**	**60**	**35**	**0**	**5**	**165**
OR	Grande Ronde River - WA	16,300	30	0	0	70	300
	S.F. Walla Walla	2,500	48	0	0	52	0
	Snake River Breaks - OR&WA	2,451,260	71	4	0	25	600
	Wenaha Wildlife Area	8,960	2	0	84	14	150
	Subtotal	**2,479,020**	**2**	**97**	**<1**	**<1**	**1,050**
UT	Book Cliffs	500,000	90	0	5	5	0
	Deep Creek Mountains	172,440	100	0	0	0	0
	Desolation-Gray Canyon	237,626	90	0	9	1	50
	Dry Fork-Ashley Creek	7,059	46	0	15	39	0
	Nine Mile Canyon	108,033	86	0	10	4	0
	Pilot Mountain	50,897	76	0	7	17	30
	Rattlesnake	525,425	45	38	6	11	300
	Stansbury Mountain	77,752	26	70	2	2	0
	Upper Green River Corridor	68,814	77	0	15	8	319
	Subtotal	**1,748,046**	**73**	**14**	**6**	**7**	**699**
WY	Cedar Mountain	20,100	88	0	3	9	0
	Douglas Creek	84,960	18	50	2	30	165
	Dubois Badlands	11,398	44	0	39	17	64

Table G-4. Rocky Mountain Bighorn Sheep Bioregions, by State *(concluded).*

State	Bioregion Name	Number of Acres	Percent BLM	Percent Other Federal	Percent State	Percent Private	Current Pop. Estimate
WY *(cont.)*	Encampment	153,400	8	78	3	11	55
	Ferris/Seminoe	130,900	56	17	9	18	40
	Franc's Peak	654,970	5	85	3	7	1,500
	Laramie Peak	195,700	15	42	6	37	175
	Shell Canyon	57,224	55	17	1	27	70
	South Bighorns	350,000	43	0	14	43	5
	Sweetwater Rocks	403,840	74	0	7	19	0
	Temple Peak	18,648	56	0	12	32	60
	Whiskey Mountain	69,917	12	77	10	1	1,020
	Subtotal	**2,151,057**	**32**	**41**	**7**	**20**	**3,154**
	Grand Total	**10,909,805**	**35**	**51**	**5**	**9**	**10,335**

Source: BLM questionnaire, 1993.

Note: Total percentages may not equal 100 percent due to rounding errors.

Table G-5. New Habitat Development and Maintenance Projects Needed in Colorado for Rocky Mountain Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
5	$10,000	Spring Development (No.)	0	0
12	$51,000	Water Catchments (No.)	6	$10,000
3	$ 3,000	Management Fences (Miles)	0	0
1,200	$36,000	Mech. Veg. Manip. (Acres)	0	0
3,305	$92,000	Prescribed Fire (Acres)	0	0
2,080	$16,500	Fertilization (Acres)	0	0
502	$25,000	Reseed/Plant (Acres)	0	0
0	0	Livestock Exclosures (No.)	1	$4,000
Total	**$233,500**		**Total**	**$14,000**

Source: BLM questionnaire, 1993.

Table G-6. New Habitat Development and Maintenance Projects Needed in Idaho for Rocky Mountain Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
37	$ 3,070,000	Water Catchments (No.)	12	$6,000
17	$ 16,000	Management Fences (Miles)	15	$7,500
12,015	$130,000	Prescribed Fire (Acres)	2	$ 10,000
3	$3,000	Livestock Exclosures (No.)	3	$1,000
Total	**$ 3,219,000**		**Total**	**$ 24,500**
Source: BLM questionnaire, 1993.				

Table G-7. New Habitat Development and Maintenance Projects Needed in Montana for Rocky Mountain Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
3	$ 31,500	Spring Development (No.)	3	$1,500
25	$ 1,750,000	Dams and Reservoirs (No.)	50	$ 50,000
11	$ 18,500	Water Catchments (No.)	12	$1,010
10	$ 40,000	Well and Water Storage (No.)	4	$1,000
10	$ 20,000	Water Pipelines (Miles)	0	0
30	$ 90,000	Management Fences (Miles)	105	$ 52,500
0	0	Weed/Pest Control (Acres)	2,000	$1,000
10,080	$ 56,000	Prescribed Fire (Acres)	0	0
2,000	$ 40,000	Reseed/Plant (Acres)	0	0
15	$ 15,000	Livestock Exclosures (No.)	10	$1,004
20	$ 500	Road Closures (Miles)	6	$ 250
Total	**$ 2,061,500**		**Total**	**$ 108,264**
Source: BLM questionnaire, 1993.				

Table G-8. New Habitat Development and Maintenance Projects Needed in Nevada for Rocky Mountain Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
2	$ 5,000	Spring Development (No.)	0	0
0	0	Water Catchments (No.)	1	$ 1,000
0	0	Management Fences (Miles)	4	$ 4,000
Total	**$ 5,000**		**Total**	**$ 5,000**
Source: BLM questionnaire, 1993.				

Table G-9. New Habitat Development and Maintenance Projects Needed in New Mexico for Rocky Mountain Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
500	$35,000	Spring Development (No.)	0	0
45,000	$45,000	Prescribed Fire (Acres)	0	0
Total	**$80,000**		**Total**	**0**
Source: BLM questionnaire, 1993.				

Table G-10. New Habitat Development and Maintenance Projects Needed in Oregon/Washington for Rocky Mountain Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
2	$3,000	Spring Development (No.)	0	0
25	$5,000	Weed/Pest Control (Acres)	25	$2,500
2,650	$ 14,000	Prescribed Fires (Acres)	0	0
500	$ 10,000	Fertilization (Acres)	0	0
225	$ 11,000	Reseed/Plant (Acres)	0	0
Total	**$ 43,000**		**Total**	**$2,500**
Source: BLM questionnaire, 1993.				

Table G-11. New Habitat Development and Maintenance Projects Needed in Utah for Rocky Mountain Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
8	$18,000	Spring Development (No.)	6	$3,000
13	$60,000	Water Catchments (No.)	8	$9,000
2	$10,000	Water Pipelines (Miles)	2	$1,000
12	$37,000	Management Fences (Miles)	12	$2,000
4,200	$69,110	Prescribed Fire (Acres)	0	0
200	$14,000	Reseed/Plant (Acres)	0	0
Total	**$ 208,110**		**Total**	**$15,000**
Source: BLM questionnaire, 1993.				

Table G-12. New Habitat Development and Maintenance Projects Needed in Wyoming for Rocky Mountain Bighorn Sheep.

Development		Type of Project	Maintenance	
Number	Cost		Number	Cost
12	$41,000	Spring Development (No.)	6	$2,375
2	$ 8,000	Dams and Reservoirs (No.)	0	0
9	$47,000	Water Catchments (No.)	6	$3,425
3	$30,000	Well and Water Storage (No.)	0	0
5	$28,000	Water Pipelines (Miles)	4	$2,125
5,005	$42,000	Management Fences (Miles)	7	$1,125
450	$18,600	Mech. Veg. Manip. (Acres)	400	$1,000
9,000	$121,000	Prescribed Fire (Acres)	600	$ 20,000
218	$ 7,000	Fertilization (Acres)	0	0
6	$10,000	Reseed/Plant (Acres)	0	0
Total	**$352,600**		**Total**	**$ 30,050**
Source: BLM questionnaire, 1993.				

Appendix H
Questionnaire Used To Gather Data

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE
2850 Youngfield Street
Lakewood, Colorado 80215-7076

In Reply Refer To:
6630 (SC-210)

Information Bulletin No. CO-93-204

To: State Directors

From: State Director, Colorado

Subject: Mountain Sheep Ecosystem Management Strategy TeamQuestionnaire DD 8/13/93

Attached is a questionnaire to gather information concerning mountain sheep species habitat on public lands. The data gathered through this information request will be used to prepare a Bureauwide strategic plan for Mountain Sheep Ecosystem Management. The Mountain Sheep Ecosystem Management Strategy Plan will recommend funding needs, opportunities, and management actions for implementing the mountain sheep portion of the big game goals and objectives stated in the Bureau's Fish and Wildlife 2000. As with other strategy plans, the Mountain Sheep Ecosystem Management Strategy Plan will be used to identify our strengths and support needs for our managers, administrative officials, conservation organizations, and Congressional delegations. Our existing strategy plans are already gaining support within and outside the Bureau.

A letter is being sent to participating State Wildlife Management Agency Directors, along with a copy of the questionnaire to encourage their continuing support and involvement in the Mountain Sheep Ecosystem Management Strategy Plan. In this letter we are requesting that they provide us with information on mountain sheep distribution within their state. Statewide BLM maps will be provided to each State Wildlife Management Agency representative on the team or the agency contact representative by Ray Boyd, Wildlife Biologist at the Service Center.

The questionnaire is designed to collect information at the Resource Area level. Each BLM State Office Wildlife Program Leader is requested to provide the necessary statewide coordination with the State Wildlife Management Agency to ensure its involvement at the field level and acknowledgement of the information being requested.

We are changing our approach; we are sending out the questionnaire to let the field know what kinds of data we are after. In about a month, we will be sending a database to each person so that they can fill in the data and we will not have to input everything again at the Service Center. This should eliminate errors such as transposition of figures, etc.

California, Montana, and Oregon BLM Offices are requested to coordinate the questionnaire with other State Wildlife Agencies in adjacent states where BLM administers land occupied by mountain sheep. In addition, California biologists should respond to the questionnaire by metapopulation and bioregion for desert bighorn sheep rather than on a Resource Area basis.

Alaska is to respond to the questionnaire by District instead of Resource Area. The Eastern States Office will not receive any questionnaires. Attachment 2 is an example of a completed questionnaire for your information.

All questions regarding the questionnaire should be directed to: Ray Boyd (SC-210), 303-236-6310 or Don Armentrout (CA-060.27), 909-697-5239.

2 Attachments:

1 - Mountain Sheep Habitat Management Questionnaire (8 pages)

2 - Example of Completed Questionnaire (8 pages)

Distribution
WO (240)
SC-100

INSTRUCTIONS FOR FILLING OUT MOUNTAIN SHEEP QUESTIONNAIRE

IF YOU DO NOT HAVE ANY MOUNTAIN SHEEP IN YOUR RESOURCE AREA, PLEASE WRITE "NO SHEEP" IN THE UNIT NAME LINE, PUT YOUR NAME, STATE, DISTRICT AND RESOURCE AREA CODE ON THE FIRST PAGE AND SEND TO THE SERVICE CENTER ADDRESS BELOW.

PLEASE read these instructions before you fill out the questionnaire.

You will have to make a copy of the entire questionnaire for each mountain sheep biological unit/bioregion in your Resource area before you start to fill it out.

Please enter the biological unit/bioregion name on each page of the questionnaire (this will help us if the questionnaire gets separated).

Be sure to work with your local State Wildlife Agency contact while filling out portions of the questionnaire.

If a mountain sheep biological unit/bioregion occurs in two or more Resource Areas, decide among yourselves who is going to be responsible for reporting the area. Please do not fill out two questionnaires for the same biological unit/bioregion.

Hold your completed questionnaires until you receive a database diskette from the Service Center. At this time follow the User directions and input your mountain sheep data into the database.

IF YOU HAVE ANY QUESTIONS, OR ARE NOT CLEAR ON WHAT WE WANT, PLEASE CALL: RAY BOYD, SC-213, (303) 236-6310, OR DON ARMENTROUT, CA-060.27, (909) 697-5239.

WHEN YOU HAVE COMPLETED THE QUESTIONNAIRE(S), SEND A COPY OF YOUR COMPLETED QUESTIONNAIRES TO YOUR DISTRICT WILDLIFE PROGRAM LEAD. THEN SEND A COPY OF THE QUESTIONNAIRES AND THE COMPLETED DISKETTE BY AUGUST 13, 1993 TO:

Ray Boyd
Bureau of Land Management
Service Center, SC-210
Denver Federal Center, Bldg. 50
Denver, CO 80225

DEFINITIONS

BIOLOGICAL UNIT/BIOREGION - A territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations, generally, a system of related, interconnected ecosystems. In most cases, formerly called a "Herd Unit."

METAPOPULATION -A system of local populations linked by dispersal.

OCCUPIED HABITAT - Habitat which has mountain sheep present at some time of the year.This can include yearlong habitat, lambing areas, winter ranges, and movement corridors.

UNOCCUPIED HISTORICAL HABITAT - Habitat which is known to have been previously occupied by mountain sheep but has no sheep at the present time.

UNOCCUPIED SUITABLE HABITAT - Habitat which has no sheep at the present time, has not been recorded as historical habitat, but which apparently contains suitable physical and biological characteristics necessary for mountain sheep.

QUESTIONNAIRE TO DETERMINE MANAGEMENT OPPORTUNITIES AND STATUS OF MOUNTAIN SHEEP HABITATS ON BLM LANDS

BIOLOGICAL UNIT/BIOREGION NAME [1/]

_____

[1/]Please copy this questionnaire and complete for each Biological Unit/Bioregion in your Resource Area.Biological Unit/ Bioregion is to include all suitable habitat whether mountain sheep are present or not.

BIOLOGIST NAME _____ DATE_____

BLM ADMINISTRATIVE UNIT (IE:CO0548) _____

BLM PHONE NUMBER (____) - _____ - _____

STATE WILDLIFE AGENCY NAME _____

STATE WILDLIFE AGENCY CONTACT _____

SUBSPECIES OF MOUNTAIN SHEEP - WRITE IN APPROPRIATE ABBREVIATION

ROCKY MOUNTAIN (RM)CALIFORNIA (CA)DESERT (DE)DALL'S (DA)

_____

LAND OWNERSHIP OF MOUNTAIN SHEEP HABITAT

ACRES	BLM	OTHER FEDERAL	STATE	PRIVATE	TOTAL
OCCUPIED					
UNOCCUPIED SUITABLE					
HISTORICAL UNOCCUPIED					
TOTAL					

BIOLOGICAL UNIT/BIOREGION NAME_____

HABITAT QUALITY

HAS HABITAT QUALITY BEEN DETERMINED BY A QUANTIFIABLE METHOD FOR THIS BIOLOGICAL UNIT/BIOREGION ?YES ____NO ____

METHOD(S) USED _____

IF YES, COMPLETE THE TABLE BELOW:

ACRES IN EACH CATEGORY

ACRES	BLM	OTHER FEDERAL	STATE	PRIVATE	TOTAL
SATISFACTORY					
UNSATISFACTORY					
UNKNOWN					
TOTAL					

HABITAT CONDITION LIMITING FACTORS

SELECT THE THREE MOST IMPORTANT LIMITING FACTORS, BY NUMBER, FROM THE ATTACHED LIST AND ENTER, IN ORDER, UNDER THE APPROPRIATE LAND OWNERSHIP HEADING

BLM	OTHER FEDERAL	STATE	PRIVATE

ECOLOGICAL SITE INVENTORY

BLM ACRES FOR WHICH BASELINE SOIL AND VEGETATION CONDITION INVENTORIES HAVE BEEN COMPLETED WITHIN THIS BIOLOGICAL UNIT/BIOREGION_____

BLM ACRES THAT NEED TO BE INVENTORIED WITHIN THIS BIOLOGICAL UNIT/ BIOREGION_____

FUNDING NEEDED FOR VEGETATION INVENTORIES BY YEAR 2000 (BLM $$)_____

HABITAT LIMITING FACTORS

THESE ARE BROAD CATEGORIES WITHIN THE SCOPE OF THIS UMBRELLA PLAN. MORE SPECIFIC DESCRIPTIONS OF IMPACTS SHOULD BE PROVIDED IN RESOURCE MANAGEMENT PLANS AND RELATED ACTIVITY PLANS.

1. LIVESTOCK GRAZING IMPACTS
2. TIMBER MANAGEMENT IMPACTS
3. FIRE MANAGEMENT IMPACTS
4. HABITAT FRAGMENTATION
5. HABITAT CONVERSION
6. ENERGY DEVELOPMENT IMPACTS
7. MINING IMPACTS
8. EXOTIC GAME ANIMAL COMPETITION
9. FERAL ANIMAL COMPETITION
10. WILD HORSE AND BURRO COMPETITION
11. WATER DISTRIBUTION
12. COMPETITION BETWEEN MOUNTAIN SHEEP AND OTHER NATIVE WILDUNGULATES
13. HUMAN RECREATION IMPACTS
14. WILDERNESS RESTRICTIONS ON MOUNTAIN SHEEP MANAGEMENT
15. LIST OTHERS:

_____

_____

_____

_____

BIOLOGICAL UNIT/BIOREGION NAME _____

MONITORING

IS MONITORING CURRENTLY BEING DONE TO IDENTIFY VEGETATION TRENDS ON BLM LANDS IN THIS BIOLOGICAL UNIT/BIOREGION?
YES _____ NO _____IF YES, HOW MANY ACRES?_____

IF YES, WHAT MONITORING METHOD? _____

ACRES THAT NEED TO BE MONITORED IN THIS BIOLOGICAL UNIT/BIOREGION

_____

ADDITIONAL FUNDING NEEDED FOR MONITORING, PER YEAR, 1995-2000

_____

LAND USE PLANNING

ARE THERE EXISTING PLANNING DOCUMENTS (ie: HMP, RMP, MFP, ETC.) FOR THIS BIOLOGICAL UNIT/BIOREGION THAT HAVE MOUNTAIN SHEEP OBJECTIVES?
YES _____NO _____

LIST THE NAME AND TYPE OF PLANNING DOCUMENT(S) THAT CONCERN THIS BIOLOGICAL UNIT/BIOREGION (ie: RED MOUNTAIN HMP, ETC.)

_____

HAVE OBJECTIVES RELEVANT TO MOUNTAIN SHEEP BEEN FULLY IMPLEMENTED?
YES _____NO _____

WHAT ADDITIONAL RESOURCES (ie: PEOPLE, MONEY, EQUIPMENT, ETC.) ARE NEEDED TO FULLY IMPLEMENT THE EXISTING MOUNTAIN SHEEP OBJECTIVES ?

_____

_____

_____

BIOLOGICAL UNIT/BIOREGION NAME_____

HABITAT IMPROVEMENT PROJECTS

TYPE(S) OF PLANNED HABITAT PROJECT(S) AND TOTAL ESTIMATED COSTS BASED ON YOUR MANAGEMENT OBJECTIVES, BY THE YEAR 2000.

DEVELOPMENT		TYPE OF PROJECT	MAINTENANCE	
NUMBER	COST		NUMBER	COST
		SPRING DEVELOPMENT (#)		
		DAMS AND RESERVOIRS (#)		
		WATER CATCHMENTS (#)		
		WELL AND WATER STORAGE (#)		
		WATER PIPELINES (MILES)		
		MANAGEMENT FENCES (MILES)		
		WEED/PEST CONTROL (ACRES)		
		MECH. VEG. MANIP. (ACRES)		
		PRESCRIBED FIRE (ACRES)		
		FERTILIZATION (ACRES)		
		RESEED/PLANT (ACRES)		
		LIVESTOCK EXCLOSURES (#)		
		OTHERS (LIST)		
TOTAL				

ESTIMATE TOTAL MOUNTAIN SHEEP PROJECT EXPENDITURES, 1985 TO 1993, IN <u>THIS</u> BIOLOGICAL UNIT/BIOREGION (BLM$$) _____

BIOLOGICAL UNIT/BIOREGION NAME _____

MOUNTAIN SHEEP POPULATION GOALS

USING STATE WILDLIFE MANAGEMENT AGENCY STRATEGIC PLANNING POPULATION GOALS FOR THIS BIOLOGICAL UNIT/BIOREGION:

ESTIMATED POPULATION SIZE (1993) _____

ESTIMATED POPULATION BY YEAR 2000 _____

POPULATION GOAL (CARRYING CAPACITY) _____

POPULATION LIMITING FACTORS

LIST THE TOP THREE POPULATION LIMITING FACTORS, BY NUMBER, FROM THE ATTACHED LIST FOR THIS BIOLOGICAL UNIT/BIOREGION.

BLM	OTHER FEDERAL	STATE	PRIVATE

LAND TENURE ADJUSTMENTS

LAND OWNERSHIP ADJUSTMENT AND ACCESS NEEDS WITHIN THIS MOUNTAIN SHEEP BIOLOGICAL UNIT/BIOREGION BY THE YEAR 2000.

1. EXCHANGES AND ACQUISITIONS:

NUMBER OF PARCELS _____

ACRES _____

2. EASEMENTS (ACCESS)

NUMBER OF EASEMENTS _____

MILES _____

POPULATION LIMITING FACTORS

THESE ARE BROAD CATEGORIES WITHIN THE SCOPE OF THIS UMBRELLA PLAN. MORE SPECIFIC DESCRIPTIONS OF IMPACTS SHOULD BE PROVIDED IN RESOURCE MANAGEMENT PLANS AND RELATED ACTIVITY PLANS.

1. LIVESTOCK FORAGE COMPETITION
2. DISEASES
3. TIMBER HARVEST IMPACTS
4. FIRE MANAGEMENT
5. HABITAT FRAGMENTATION
6. HABITAT CONVERSION
7. ENERGY DEVELOPMENT
8. MINING ACTIVITIES
9. COMPETITION FROM EXOTIC WILDLIFE
10. COMPETITION FROM FERAL ANIMALS
11. COMPETITION FROM WILD HORSES AND/OR BURROS
12. HUMAN RECREATION IMPACTS
13. WATER AVAILABILITY/ALLOCATION
14. NATURAL PREDATORS
15. FERAL PREDATORS
16. WILDERNESS RESTRICTIONS ON MOUNTAIN SHEEP MANAGEMENT

OTHERS: (LIST)

BIOLOGICAL UNIT/BIOREGIONNAME _____

OTHER MANAGEMENT NEEDS

PLEASE IDENTIFY OTHER MANAGEMENT ACTIONS THAT ARE NEEDED TO ACHIEVE HABITAT MANAGEMENT GOALS AND OBJECTIVES FOR THIS MOUNTAIN SHEEP BIOLOGICAL UNIT/BIOREGION THAT ARE NOT ALREADY COVERED IN THIS QUESTIONNAIRE. EXAMPLES OF SUCH NEEDED ACTIONS INCLUDE: FORAGE ALLOCATION ADJUSTMENTS, SEASONAL STIPULATIONS, MINERAL WITHDRAWALS, ROAD CLOSURES, DOMESTIC SHEEP (LIVESTOCK) PROBLEMS, EXOTIC ANIMAL PROBLEMS, ACEC DESIGNATIONS, WSA OR WILDERNESS PROBLEMS, ETC.

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RESEARCH NEEDS

RESEARCH NEEDS WITHIN THIS BIOLOGICAL UNIT/BIOREGION.

TYPE OF RESEARCH	ESTIMATED COST REGARDLESS OF FUNDING SOURCE(S)

Appendix I
List of Acronyms

ACEC	Area of Critical Environmental Concern
AMP	Allotment Management Plan
ASI	American Sheep Institute, Inc.
BLM	Bureau of Land Management
DBC	Desert Bighorn Council
FNAWS	Foundation for North American Wild Sheep
FS	U.S. Forest Service
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
GPS	Global Positioning System
HMP	Habitat Management Plan
LUP	Land Use Plan
NBS	National Biological Service
NGO	Nongovernment Organization
RMP	Resource Management Plan
WAFWA	Western Association of Fish and Wildlife Agencies

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13. ABSTRACT *(Maximum 200 words)*

The strategy plan describes ecosystem management strategies for the four subspecies of mountain sheep found on BLM lands in the 11 western states and Alaska. The habitat of these animals covers about 58 million acres of public and private lands in 259 identified mountain sheep bioregions. These 259 bioregions are populated by approximately 18,000 Dall sheep; 16,000 desert bighorns; 10,000 Rocky Mountain bighorns; and 5,500 California bighorns. The mountain sheep bioregion boundaries were identified irrespective of political boundaries as the first step in an ecosystem approach to management of these species. An interagency team was assembled to design and write the document.

14. SUBJECT TERMS

- Dall Sheep
- Desert Bighorn Sheep
- Rocky Mountain Bighorn Sheep
- California Bighorn Sheep
- Ecosystem Management
- Mountain Sheep

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