

**Hart Mountain
National Antelope Refuge
Comprehensive Management Plan
(Summary Document)**



EDSON FICHTER

Final Environmental Impact Statement

**Prepared by
U.S. Fish and Wildlife Service**



Final Environmental Impact Statement
Summary Document
for the
**COMPREHENSIVE MANAGEMENT PLAN
HART MOUNTAIN NATIONAL ANTELOPE REFUGE**
Lake County, Oregon

Submitted by:
U.S. Department of the Interior
Fish and Wildlife Service

This document is a summary of a larger Final Environmental Impact Statement (FEIS). The FEIS is prepared in compliance with the National Environmental Policy Act (NEPA) and U.S. Fish and Wildlife Service (Service) NEPA procedures.

The FEIS provides an in-depth analysis of alternative comprehensive management plans for Hart Mountain National Antelope Refuge and their effects. It can be obtained by writing the address listed below.

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SUMMARY

INTRODUCTION

This Summary presents an overview of the Final Environmental Impact Statement (FEIS) for the Hart Mountain National Antelope Refuge (NAR) Comprehensive Management Plan. It presents the need for action; environmental and social issues; alternative management scenarios; and environmental and socio-economic consequences of implementing alternatives.

PURPOSE OF AND NEED FOR ACTION

The purpose of the proposed comprehensive management plan is to provide Hart Mountain NAR managers with a sound, workable strategy for managing wildlife, other natural resources, and public use of the Refuge for the 15-year planning horizon. Restoring wildlife habitat, which will be necessary in order to accomplish the purpose of the Refuge outlined in Executive Order 7523, will be the primary focus of this planning period.

A comprehensive management plan is needed because the 1970 Hart Mountain NAR Resource Management Plan (1970 Plan) does not provide adequate guidance in addressing current management issues. A comprehensive management plan reflecting state-of-the-art information and technology is needed. Also, public use of the Refuge is increasing, which necessitates a strategy for providing quality wildlife/wildland-oriented recreation opportunities balanced with protection of the Refuge environment. Public use was not addressed in the 1970 Plan.

HART MOUNTAIN NAR GOALS

Based on the goals of the National Wildlife Refuge System and authorities establishing Hart Mountain NAR (Executive Order 7523), five goals were developed for the Refuge:

- 1) Manage for healthy and balanced populations of pronghorn and other species of native wildlife in their natural^a habitat, to the extent that populations can be influenced on Refuge lands.
- 2) Manage for the conservation and recovery of threatened and endangered species of plants and animals in their natural^a ecosystems.

^a largely natural (or largely native).

- 3) Restore and maintain, on Refuge lands, the structure, species composition, and processes of native^a ecological communities and ecosystems of the northern Great Basin Region.
- 4) Provide opportunities for wildlife/wildlands-dependent recreation and education oriented to the Great Basin ecosystem while maintaining the rugged, remote and undeveloped character of the Refuge.
- 5) Provide high quality nesting and brood-rearing habitat for waterfowl and other migratory birds at the Shirk Ranch area.

Three primary limitations to obtaining these goals were identified:

- Shrub and juniper cover are excessively high throughout Refuge uplands, and periodic fires are lacking in these habitats.
- Stream channels are eroded and riparian vegetation on streambanks is deficient along the majority of Refuge streams.
- Resources are insufficient to manage the increasing number of Refuge visitors, and facilities are inadequately designed.

By resolving core habitat problems, healthy and balanced populations of all native wildlife species of the Refuge would be maintained, to the extent that populations can be influenced on Refuge lands. Resolving core problems will require long-term planning because many of the habitat problems on the Refuge will require substantially longer than 15 years to recover. Habitat restoration will take decades, and even centuries in some areas. The central theme of long-range habitat objectives is to replicate, to the extent possible, the range of habitat conditions under which native wildlife species of the Hart Mountain area adapted. This includes maintaining some habitats under existing conditions.

CAUSES OF CORE HABITAT PROBLEMS

Deteriorated upland habitats primarily are a consequence of heavy livestock grazing prior to Refuge establishment and fire suppression. Heavy livestock grazing contributed to high shrub cover by reducing grass and forb cover. Once shrubs became more abundant, less space, water and nutrients remained available for grass and forb establishment and growth. Periodic fires that historically swept across the land have been suppressed. This has allowed increased shrub cover to remain at high levels. A similar scenario holds for the increased distribution of western juniper. Fire is an important component of the ecosystem encompassing Hart Mountain. It maintained shrub cover at lower levels than currently exist and it produced temporary grassland habitats.

Deteriorated riparian habitats primarily are a consequence of heavy to severe livestock grazing. Severe grazing along streams adversely impacted willows and deep-rooted sedges and rushes that stabilize banks by holding soil in place. Unstable streambanks were eroded by high water, ultimately leading to downcut channels and lowered water tables. Lowered water tables and grazing pressure allowed upland grasses and shrubs to replace riparian vegetation in many areas. Upland grasses and shrubs have shallower root systems and do not effectively stabilize banks. They also do not provide habitat conditions required by native wildlife communities of riparian areas. Fire suppression, in conjunction with heavy livestock grazing, also has resulted in degraded aspen stands. Aspen depends on periodic fires.

ISSUES, CONCERNS AND OPPORTUNITIES

Six major issues were identified through public scoping. The title of each issue identifies the resource of concern. Each issue is presented as a question. Of concern are the effects that changes in management direction, or no change, would have on environmental resources and social factors.

Issue 1. How will wildlife populations be affected? Most concerns regard the effects that changes, or no change, in wildlife population management practices would have on 1) big game populations and their management, 2) nongame wildlife species, 3) threatened and endangered animals, and other species of special concern, 4) predator control, and 5) feral animals.

Issue 2. How will habitat be affected? Of primary concern are the effects that changes, or no change, in current habitat management practices would have on riparian and upland habitats, and on threatened and endangered plants. Changes in the habitat management program would directly affect the condition of upland and riparian habitats. Livestock grazing presents the most controversial vegetation management method that the Refuge is evaluating for use on the Refuge.

Issue 3. How will livestock grazing on the Refuge be affected? Domestic livestock grazing on Hart Mountain NAR is, for many members of the public, the most important issue that the Service has addressed in the FEIS. Public viewpoints range from arguments that livestock grazing serves a critical role in management of Refuge habitats to the view that even minimal use of livestock on the Refuge is detrimental to wildlife habitat.

Issue 4. How will recreation opportunities be affected? Opinions expressed by visitors and others regarding available opportunities and facilities on Hart Mountain NAR are many and very diverse. There is general agreement that facilities are rustic and rudimentary, on-site control over users is limited, and roads are rough and sometimes in poor condition. How people view these conditions varies widely. Some maintain that facilities, roads and signing should be improved. Many others

argue that facilities should be kept as they are to preserve the character of the area. Most facilities are not currently accessible to disabled visitors.

To deal with these concerns and conflicts, planning needs to address campground locations and level of development, permanent and seasonal road closures and maintenance levels, information and interpretation, back-country use, use of horses and bicycles, hot springs management, hunting and fishing regulations, and accessibility for disabled visitors.

Issue 5. Are there areas that should be recommended for Wilderness or Research Natural Area study? A number of comments were received requesting that the Service reevaluate Hart Mountain NAR for potential wilderness study areas and consider additional research natural areas. A number of other comments were received expressing opposition to any additional wilderness areas in Lake County. Based on Service policy and the Wilderness Act of 1964, refuge lands must be reviewed for potential wilderness recommendations. Many changes in road status (primarily closures) and land acquisitions have taken place on Hart Mountain NAR since the last wilderness study and research natural area proposals were made 20 years ago.

Issue 6. How will the local economy be affected? Many people are concerned about the effects that changes in Refuge management may have on the local economy. Any change in the livestock grazing program on Hart Mountain can directly affect the permittees presently holding livestock grazing permits and indirectly affect the Lake County economy through changes in business revenue and employment generated by those permittees. In addition, any change in tourism brought about by changes in Refuge management can directly affect local businesses, as well as have indirect effects on the local economy.

ALTERNATIVES

Five alternatives for managing Hart Mountain National Antelope Refuge were developed by the Service in cooperation with a number of resource professionals and interest groups. Following are summaries of each alternative. Refer to Table S-1 for additional details.

Alternative A - Baseline Management (No Action Alternative)

This is the no action alternative. It would continue the management procedures that occurred on Hart Mountain NAR during the period 1971-1990. Management was guided primarily by the 1970 Plan. Vegetation would continue to be managed primarily with cattle grazing. Cattle grazing as the major means of managing wildlife habitat is based on the premise that cattle can be controlled to increase the quantity and quality of forage for wildlife and improve plant vigor and watershed conditions (USFWS 1970, Anderson et al. 1990a). According to this premise,

harvesting course forage plants would make fall and spring regrowth more attractive to wildlife and grazing plants during the growing season would delay plant development thereby making forage more nutritious and palatable. The prescribed burning program would continue to play a minor role in vegetation management, though total acreage burned would be somewhat higher than that burned during 1971-1990.

Public use was not addressed in the 1970 Plan nor in any other planning documents. Regulation and direction of public use has been minimal. It generally was guided by NWRS goals and policy, the Refuge Manual, the Refuge Recreation Act, and the National Wildlife Refuge System Administration Act. Camping at the Hot Springs and Guano Creek campgrounds would continue as would backcountry camping. Camp sites at campgrounds, established through repeated use by visitors, would not be improved. Opportunities for limited, quality hunts would continue to be made available.

Alternative B - Featured Species Management

This alternative features the combined use of livestock grazing, prescribed burning, and herbicide use to manage vegetation on the Refuge. It combines the premise that livestock grazing is needed to improve and maintain vegetative condition, vigor, and forage quality for key wildlife species and watershed values with the premise that increasing interspersed succession stages in upland habitats will enhance wildlife populations and watershed values. Habitat management would emphasize provision for the habitat needs of selected wildlife species, namely pronghorn, mule deer, bighorn sheep and sage grouse. This alternative assumes that enhancing habitat for these species would benefit Refuge wildlife in general. Many of the management actions proposed in this alternative were taken from recommendations submitted by the Lake County Chamber of Commerce's Hart Mountain Liaison Committee (LCCC 1992).

This alternative would provide the largest number of recreational opportunities. Centralized camping would be available at the Hot Springs Campground, Guano Creek Campground, and one other site. Two camping areas would be provided for horseback riders, and camping within 100 yards of designated roads would be available as would backcountry camping. Hunting opportunities would be increased from baseline management. Road management would be as currently managed except that more roads would be open to the public. Additionally, the North Mountain road would be open seasonally, and Blue Sky and South Boundary roads would be open year-round.

Alternative C - Habitat Restoration

This alternative emphasizes habitat restoration while providing forage for livestock. It is based on the premise that (1) natural fire historically was the dominant disturbance factor that maintained a mosaic of succession stages in northern Great

Table S-1. Major features of alternatives presented in the Hart Mountain National Antelope Refuge Comprehensive Management Plan FEIS.

Feature	Alternatives	
	Baseline Management (No Action) (A)	Featured Species Management (B)
<u>HABITAT MANAGEMENT</u>		
Shrub Cover Reduction	2,000-2,700 acres/15 years	6,000-9,000 acres/15 years
Prescribed Burning	≥90%	50-75%
Mechanical Treatment	0%	0%
Herbicide Treatment	0-10%	25-50%
Livestock Grazing	11,000-17,000 AUMs/year	3,900-4,300 AUMs/year
Seeding/planting	willow planting along streams; bitterbrush planting	willow planting along streams; bitterbrush planting; native herb planting in treated areas
Instream Structures	limited	moderate use
Waterhole Management	maintain existing waterholes; new waterholes possible	maintain existing waterholes; new waterholes possible
Biological Monitoring	minimal	moderate (intensive monitoring associated with livestock program)
<u>WILDLIFE POPULATION MANAGEMENT</u>		
Reintroductions	none	none
Predator Control	limited	moderate
<u>RECREATION MANAGEMENT</u>		
Camping	Hot Springs and Guano Creek campgrounds would be unimproved and unregulated; backcountry camping maintained	Hot Springs and Guano Creek campground improved; five additional camping areas developed, (two for horseback riders); camping along two roads; backcountry camping maintained
Roads	240 miles of roads open to public; 42 miles of administrative roads;	363 miles of roads open to public; no administrative roads; no permanent closures, pending further review
Recreation Opportunity Spectrum (ROS) ^a	33% classified as SPNM; 56% classified as SPM; 0% classified as Primitive	26% classified as SPNM; 63% classified as SPM; 0% classified as Primitive
Hiking/Horseback Riding	no developed trails; horseback riding throughout Refuge	3-4 trails developed; horseback riding throughout Refuge
Hunting	limited, quality hunts	increased opportunities
<u>SPECIAL AREA MANAGEMENT</u>		
lands to be evaluated for wilderness or RNA potential	none	none

^a abbreviations for ROS classes: SPNM = Semiprimitive Non-Motorized, SPM = Semiprimitive Motorized

Table S-1. Continued

Alternatives		
Habitat Restoration (C)	Native Community Restoration (Proposed Action) (D)	Custodial Maintenance (E)
11,000-16,000/15 years 60-80% 20-40% 0%	22,000-40,000 acres/15 years ≥90% 0-5% 0-5%	0 acres/15 years
0-2,500 AUMs 1 of 3 years max.	0 AUMs/year	0 AUMs/year
willow planting along streams; bitterbrush planting; native herb planting in treated areas	willow planting along streams; bitterbrush planting; native herb planting in treated areas	none
moderate use	limited use	none
maintain existing waterholes; no new waterholes developed	maintain existing waterholes; no new waterholes developed	no waterhole maintenance or development
heavy emphasis (prescribed burning and livestock programs)	heavy emphasis (prescribed burning program)	limited
sharp-tailed grouse possible	sharp-tailed grouse possible	none
limited	limited	none
Hot Springs campground redesigned; Guano Creek camp- ground closed; three additional camping areas developed, (one for horseback riders); backcountry camping maintained	Hot Springs campground redesigned; Guano Creek camp- ground closed; three additional camping areas developed, (one for horseback riders); backcountry camping maintained	no overnight camping
202 miles of roads open to public; 34 miles of administrative roads;	162 miles of roads open to public; 20 miles of administrative roads;	50 miles of roads open to public; no administrative roads
32% classified as SPNM; 57% classified as SPM; 0% classified as Primitive	45% classified as SPNM; 44% classified as SPM; 0% classified as Primitive	63% classified as SPNM; 0% classified as SPM; 26% classified as Primitive
no developed trails; horseback riding limited to open roads	no developed trails; horseback riding throughout Refuge	no developed trails; horseback riding throughout Refuge
limited, quality hunts	limited, quality hunts	no hunting
46,284 acres for wilderness; 11,276 acres for RNAs	80,541 acres for wilderness; 11,276 acres for RNAs	222,054 acres for wilderness; 0 acres for RNAs

Basin upland habitats, and (2) herbivores played a minor role in influencing these habitats prior to introduction of domestic livestock. However, it maintains that a limited amount of forage can periodically be made available for livestock without significant ecological impacts if several preconditions are met prior to permitting livestock grazing, and several guidelines are followed during the grazing period.

This alternative emphasizes the use of prescribed burning as the primary means of restoring and maintaining upland habitats. Mechanical treatments or herbicides would be used to reduce shrub cover in areas where prescribed burning would not be feasible. Minimizing impacts from livestock would be the primary means of restoring riparian areas. Structural devices would be used to speed recovery in some areas, and prescribed burning would be used to restore aspen stands.

Recreational use associated with the uniqueness of the area would be emphasized. Camping would be available at the Hot Springs Campground, at several dispersed sites, and in the backcountry. Camp sites at campgrounds would be improved to mitigate impacts. Hunting opportunities would continue as under baseline management, with limited, quality hunts being emphasized. Road management would be as currently managed, except that additional duplicate roads and roads with excessive erosion would be closed. Use of roads on North and South Hart Mountain by Refuge staff would be restricted to once per year or less (except access to the radio-repeater).

Alternative D - Native Community Restoration (Proposed Action)

This is the preferred alternative. It would focus management on restoring habitats and ecosystem processes as the primary means of maintaining viable populations of all native wildlife species on the Refuge. This alternative is based on the following premises: (1) natural fire historically was the dominant disturbance factor that maintained a mosaic of successional stages in northern Great Basin upland habitats, (2) herbivores played a minor role in influencing these habitats prior to introduction of domestic livestock, (3) any use by livestock would slow habitat recovery, and (4) native wildlife communities depend on habitat conditions created by native processes. Livestock would not be used as a management option during this planning period on Hart Mountain NAR. It would however, be reevaluated after 15 years.

This alternative emphasizes the use of prescribed burning as the primary means of restoring and maintaining upland habitats, and passive restoration for rehabilitating riparian areas. Mechanical and herbicide treatments may be used on an experimental basis to determine the most effective means of reducing shrub cover in areas where prescribed burning would not be feasible. Once these areas are restored and contain sufficient native grass cover to support a fire, prescribed burning would be used to maintain them.

Recreational use associated with the uniqueness of the area would be emphasized. Backcountry camping would continue under a permit system. Camping also would be available at the Hot Springs Campground, and at several dispersed sites. Camp sites at campgrounds would be improved. Hunting opportunities would continue as under baseline management, with limited, quality hunts being emphasized. Redundant roads, short spur roads, roads travelling through sensitive riparian areas, and roads causing excessive erosion would be rerouted or closed. Use of roads on North and South Hart Mountain by Refuge personnel would be restricted to prescribed burning activities and maintenance of the radio-repeater.

Alternative E - Custodial Maintenance

This alternative emphasizes the total exclusion of human intervention in terms of wildlife habitat and population management. The foundation of this alternative rests on the premise that if left alone, the Refuge would return to a natural state. All natural fires would be permitted to burn, except under circumstance in which they threaten developed areas on the Refuge (e.g., headquarters, CCC Camp, Hot Springs Campground), or significant cultural resources. This conflicts with current Service fire policy.

Day-use by the public would be permitted, but no overnight camping would be allowed. Hunting and fishing would not be permitted.

CONSEQUENCES OF IMPLEMENTING THE ALTERNATIVES

Effects of implementing the alternatives are summarized in the following discussion and in Tables S-2 and S-3.

Effects on Wildlife

Alternative D (Proposed Action) would provide the most benefits to wildlife during the 15-year planning horizon and over the long term. All featured species of wildlife would benefit over the long term, except possibly mule deer, as would wildlife diversity. Benefits to wildlife would be increased to the extent that habitat is restored (next section). Reducing shrub cover, increasing early and mid succession stages of upland habitats, maintaining residual grass and forb cover, and allowing riparian areas to recover, are key components to benefiting Refuge wildlife. Alternative C is second to Alternative D in terms of benefits to featured species (e.g., pronghorn, sage grouse, trout) and wildlife diversity. Alternative A would provide the least amount of benefits to wildlife, relative to the other alternatives.

Table S-2. Predicted effects of alternatives on issues^a after 15 years of implementation.

ISSUES	ALTERNATIVES				
	BASELINE MANAGEMENT (A)	FEATURED SPECIES MANAGEMENT (B)	HABITAT RESTORATION (C)	NATIVE COMM. RESTORATION (D)	CUSTODIAL MAINTENANCE (E)
1. WILDLIFE					
Pronghorn	0	0	+	+	0
Bighorn Sheep	0	0	+	+	0
Mule Deer	0	0	0	0	0
Sage Grouse	0	+	+	+	0
Trout	0	0	+	+	+
Diversity	0	0	+	+	0
Predator Control	0	++	0	0	-
Feral Horses	+	+	--	--	+
2. HABITAT^b					
Uplands	0	+	++	++	0
Riparian Areas	0	+	++	++	+
Other Wetland	0	0	+	+	+
3. LIVESTOCK PROGRAM					
Ave. # AUMs/yr.	0	--	---	---	---
4. RECREATION					
# acres SPNM	0	-	0	++	+++
Camping Opp's	0	++	+	+	---
Open Roads	0	+	-	--	---
Hunting Opp's	0	+	0	0	---
Wildlife Viewing	0	0	+	+	--
5. SPECIAL AREAS					
Recommended areas to study	0	0	++	++	+++
6. LOCAL ECONOMY					
Total Business Revenue	0	++	+	+	--
Revenue from Agriculture	0 ^c	-	--	--	--
Revenue from Tourism	0	++	+	+	--

^a Information provided in this table is intended to allow readers to make general comparisons of effects that alternatives may have on particular issues. Pluses (+ 's) and minuses (- 's) cannot meaningfully be added within columns to determine the "best" alternative because each issue has a different and unknown weighting factor. They can only be compared within a particular row.

^b Amount of habitat in healthy condition.

^c The costs for ranchers associated with reduced grazing below levels identified in Alternative A will occur in one of two ways:
 - Ranchers will cut back local production. Their loss will equal foregone revenue minus associated variable costs.
 - Ranchers will switch to private pasture, incurring an additional cost to their operation.

KEY (expressed as changes to populations or amount)

Large increase +++
 Moderate increase ++
 Slight increase +
 No significant change 0
 Slight decrease -
 Moderate decrease --
 Large decrease ---

Table S-3. Predicted effects of alternatives on issues^a for the long-term (over 50 years).

ISSUES	ALTERNATIVES				
	BASELINE MANAGEMENT (A)	FEATURED SPECIES MANAGEMENT (B)	HABITAT RESTORATION (C)	NATIVE COMM. RESTORATION (D)	CUSTODIAL MAINTENANCE (E)
1. WILDLIFE					
Pronghorn	0	+	++	++	+
Bighorn Sheep	0	+	+	++	+
Mule Deer	0	0	0	0	-
Sage Grouse	--	0	+	++	0
Trout	-	+	+	++	++
Diversity	-	+	++	++	+
Predator Control	0	++	0	0	-
Feral Horses	0	0	--	--	+
2. HABITAT^b					
Uplands	-	+	++	+++	+
Riparian Areas	-	+	++	+++	++
Other Wetland	0	+	++	++	+
3. LIVESTOCK PROGRAM					
Ave. # AUMs	0	--	---	---	---
4. RECREATION					
# acres SPNM	0	-	0	++	+++
Camping Opp's	0	++	+	+	---
Open Roads	0	+	-	--	---
Hunting Opp's	0	+	0	0	---
Wildlife Viewing	0	0	+	++	--
5. SPECIAL AREAS					
Recommended areas to study	0	0	++	++	+++
6. LOCAL ECONOMY					
Total Business Revenue	0	++	++	++	--
Revenue from Agriculture	0 ^c	-	--	--	--
Revenue from Tourism	0	++	++	++	--

^a Information provided in this table is intended to allow readers to make general comparisons of effects that alternatives may have on particular issues. Pluses (+ 's) and minuses (- 's) cannot meaningfully be added within columns to determine the "best" alternative because each issue has a different and unknown weighting factor. They can only be compared within a particular row.

^b Amount of habitat in healthy condition.

^c The costs for ranchers associated with reduced grazing below levels identified in Alternative A will occur in one of two ways:
 - Ranchers will cut back local production. Their loss will equal foregone revenue minus associated variable costs.
 - Ranchers will switch to private pasture, incurring an additional cost to their operation.

KEY (expressed as changes to population or amount)

Large positive increase	+++
Moderate positive increase	++
Slight positive increase	+
No significant change	0
Slight negative decrease	-
Moderate negative decrease	--
Large negative decrease	---

Effects on Habitat

In line with effects on wildlife, Alternative D (Proposed Action) would make the most progress in resolving core habitat problems; benefits to wildlife would increase to the extent that these problems are resolved. Alternative D would result in the highest amount of habitat diversity in upland habitats, would reduce shrub cover to the greatest extent, and would allow riparian areas to recover at the fastest rate of any alternative. Prescribed burning would be a key to managing upland habitats and some riparian habitats such as aspen. Alternative C would provide similar results, except to a lesser extent. Riparian area recovery would be similar in Alternatives C and D. Although Alternative B would make considerable progress in restoring riparian habitat compared to baseline management, the limited acres of shrub reduction would not substantially improve upland habitat conditions. Alternative E, although highly beneficial from the standpoint of wetland recovery, would do very little to restore upland habitats, which comprise 94 percent of the Refuge. Limited recovery of upland and riparian habitats would occur under Alternative A.

Alternatives C, D, and E would maintain higher residual vegetation cover in wetland habitats because of the sharp reduction in or elimination of cattle grazing. Alternative A would provide the lowest amount. Maintenance of residual cover in Alternative B would be intermediate between A and C. The amount of herbaceous residual cover would be second lowest in Alternative B.

Effects on the Livestock Grazing Program

All alternatives, except for A, would adversely affect the livestock grazing program. Alternative B proposes a reduction by two-thirds. Implementation of Alternative C could result in as much as a 95 percent cut in the program. Alternatives D (Proposed Action) and E prescribe no use of cattle for the 15-year planning period. The amount of livestock grazing that would be permitted in Alternative C would be no more than 2,500 AUMs one of every three years in contrast to about 4,000 AUMs per year in Alternative B. The average number of AUMs removed from the Refuge under baseline management is about 12,800 per year.

Effects on Recreation Opportunities

Alternative B would maximize recreation opportunities by offering the most camping, hunting, and road access of all the alternatives. However, the primitive and undeveloped character of the Refuge may be diminished somewhat, and roadless areas would be reduced. Alternative E would provide the least amount of recreation opportunities, for there would not be any camping or hot springs use, and road access would be extremely limited. Although this would substantially increase non-motorized areas, use would be limited because people would only be allowed to go on foot or horseback for one day at a time. Alternative D would offer a high degree of recreation opportunities while still maintaining the primitive and undeveloped character of the Refuge. Alternative C is similar to D except that D offers more roadless areas, with the second highest amount of road closures (second to Alternative E). Alternative A maintains the primitive and undeveloped character of the Refuge by having very few facilities. However, the lack of

direction and information provided for visitors fosters user conflicts and degraded camping areas.

Effects on Special Management Areas

No foreseeable changes would occur in management of special areas within the 15-year planning horizon. Determinations as to whether or not wilderness or Research Natural Areas (RNAs) would be added to Hart Mountain NAR cannot be made at this time. Areas proposed by various alternatives would be recommended for study. Initiation of the study process for particular areas by no means guarantees that these lands will be designated as wilderness or RNA, whichever the case may be.

Alternatives A and B do not recommend additional areas be studied to determine wilderness or Research Natural Area potential. Alternative E proposes the largest proportion of the Refuge to be studied for wilderness potential (nearly all of it) because road closures are extensive. Alternatives C and D propose nearly equal amounts of land to be recommended for study.

Socio-economic Impacts

A decisional analysis of interests affected by Hart Mountain NAR indicates that Alternative D (Proposed Action), followed by Alternatives B and C would maximize gains when all interests are considered (note that Table S-4, explained below, only presents economic benefits). A more conservative decisional approach, minimizing losses from alternative actions at Hart Mountain NAR, would focus on Alternative C, followed by Alternative D.

Selection of Alternatives B, C, D, or E would impact cattle grazing adversely. The magnitude of impact would depend on whether ranchers could find alternative pasture in the local area (impacts would be low), or whether they would need to reduce production (impacts would be more substantial).

By the 15-year benchmark, increased business revenue associated with recreation/tourism under Alternatives B, C, or D would exceed adverse impacts on agriculture if ranchers are able to find alternative local pasture. If not, business revenues will be greater at the 15-year benchmark only under Alternative B. At the 50-year benchmark, net business revenues would have increased by \$157,000 to \$697,000, depending on assumptions used, for all alternatives save E. Inclusion of non-market beneficial effects would increase these net differentials further. Total market and non-market economic benefits for each alternative, relative to Alternative A, are identified in Table S-4.

Table S-4. Total market and non-market economic benefits for each alternative, relative to the Baseline Management Alternative (Alternative A).

<u>Basic Assumption(s)</u>	<u>Alternative</u>			
	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
	----- thousands of annual dollars -----			
At 15 years:				
low impact on grazing:	735	248	266	-707
higher impact on grazing:	642	22	-11	-984
At 50 years:				
low impact on grazing:	1,045	568	702	-786
higher impact on grazing:	952	342	425	-1,063