RECORD OF DECISION

for

DEPARTMENT OF THE INTERIOR

U.S. FISH AND WILDLIFE SERVICE

HART MOUNTAIN NATIONAL ANTELOPE REFUGE

COMPREHENSIVE MANAGEMENT PLAN

FINAL ENVIRONMENTAL IMPACT STATEMENT

Lake County, Oregon
August 3, 1994

Cover drawing: Edson Fichter, The Spruces Studio, Pocatello, Idaho

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INTRODUCTION

This Record of Decision (ROD) documents my decision and rationale for selecting a strategy for managing Hart Mountain National Antelope Refuge (Hart Mountain NAR) for the next 15 years, relative to the five alternatives presented and evaluated in the Hart Mountain National Antelope Refuge Comprehensive Management Plan Final Environmental Impact Statement (FEIS).

Purpose 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 next 15 years. Restoring wildlife habitat on the Refuge 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. Needed is a comprehensive management plan reflecting state-of-the-art information and technology. Also, a substantial increase in public use of the Refuge requires 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 and Primary Limitations to Reaching Them

Based on the goals of the National Wildlife Refuge System (NWRS) 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.

(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.

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[a] largely natural (or largely native).

(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 reaching 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.

THE DECISION

It is my decision to adopt Alternative D, as described in the FEIS, and to implement it as the Comprehensive Management Plan for guiding management of Hart Mountain NAR for the next 15 years. Features of Alternative D are described in Chapter 2 and Appendix N of the FEIS.

This decision adopts the Refuge goals and long-range objectives outlined in Chapter 1, Section Two of the FEIS.

RATIONALE FOR THE DECISION

My decision to select Alternative D for implementation is based upon the following considerations, which are described in more detail beginning on the next page:

A. Consistency with Executive Order 7523, Service Policy, and NWRS goals;

B. Consistency with Refuge goals, long-range objectives, and ability to resolve core problems;

C. Input from resource professionals;

D. Input from the Hart Mountain Liaison Committee; and

E. Ecological Considerations.

In short, Alternative D provides the best strategy for guiding management of the Refuge by creating and maintaining the range of habitat conditions and characteristics necessary to meet the Executive Order that established the Refuge, U.S. Fish and Wildlife Service (Service) policy, NWRS goals, and Refuge goals and long-range objectives. Progress toward meeting these directives during the 15-year planning horizon will depend on the extent to which core problems are resolved. In other words, resolution of core problems will be the most crucial criteria by which future management is measured. Alternative D will make the most headway toward the resolution of core problems during the 15-year planning horizon in comparison to the other alternatives that were evaluated in the FEIS. Long-range objectives provide guidelines and specific targets for resolving core problems.

A. CONSISTENCY WITH EXECUTIVE ORDER 7523, SERVICE POLICY, AND NWRS GOALS

1. Pronghorn

The Executive Order that established Hart Mountain NAR (Executive Order 7523) specifically directs the Service to manage the Refuge for pronghorn. Alternative D of the FEIS will benefit pronghorn more than any other alternative evaluated. Jim Yoakum, an authority on pronghorn ecology, was extensively involved in developing the Proposed Action (Alternative D); many of his recommendations were used in formulating the alternative.

2. Wildlife Diversity

Executive Order 7523 also directs the Service to manage Hart Mountain NAR for other wildlife (in addition to pronghorn). Within this framework, Service policy and NWRS goals direct that all native wildlife of Hart Mountain NAR be managed in their natural habitats, to the extent possible. More specifically, Service policy directs that Hart Mountain NAR be managed for the widest possible natural diversity of plants and animals native to the Refuge (USFWS 1982: 6 RM 1, 6 RM 2, 6 RM 5, 7 RM 1, 7 RM 3, 7 RM 4, 7 RM 7, 7 RM 8). One goal of the NWRS is to preserve a natural diversity and abundance of animals and plants on refuge lands.

There are 302 vertebrate species of wildlife known to occur on the Refuge as well as 100's of invertebrate species of wildlife (e.g., insects, spiders). To manage for healthy populations of all Refuge wildlife (i.e., highest possible natural diversity), the Service must provide adequate habitat for each species. It would be unrealistic to outline habitat needs of each species and subsequently attempt to manipulate Refuge habitats to meet the needs of each species individually.

A more reasonable approach is to provide the range of habitat conditions under which wildlife communities of the Hart Mountain area evolved -- in other words, to provide the range of habitat conditions that existed before habitat was altered during the late 1800s and 1900s (this does not mean that the Service will attempt to replicate exact conditions that existed prior to settlement by Euroamericans).

3. Non-use by livestock

My decision to not allow cattle grazing on Hart Mountain NAR during the 15-year planning horizon was based on the following considerations.

Service policy states that livestock grazing may be permitted on a primary basis when it enhances, supports, or contributes to established wildlife objectives (USFWS 1982: 6 RM 9.1). Refuge staff found little support for the contention that cattle grazing would contribute to reaching long-range objectives, primarily because it would not contribute to the resolution of core problems. I cannot, therefore, permit it on a primary basis. The most relevant suggested uses of cattle (in terms of addressing long-range objectives) were (1) to control cheatgrass and increase the cover of native perennial bunchgrasses, (2) to disseminate seeds of native vegetation, and (3) to create fire-lines. At this time, sufficient information does not exist to show that the first two are practical options for use by the Service on the Refuge. According to the Fire Management Officer for Sheldon-Hart Mountain Refuges, cattle grazing would not be an effective means of creating fire-lines where they will be needed on the Refuge. The potential use of cattle grazing for managing wildlife habitat on Hart Mountain NAR is reviewed in Appendix I of the FEIS.

Service policy also states that livestock may be permitted on a secondary basis when livestock grazing or its management does not conflict with established wildlife objectives (USFWS 1982: 6 RM 9.1). Specifically, the National Wildlife Refuge System Administration Act of 1966 and Service policy (USFWS 1986:5 RM 20.3) direct that a use not be permitted on a refuge unless it is found to be compatible with the purpose for which the refuge was established. Cattle grazing, at the levels evaluated in the FEIS, was not determined to be compatible with the purpose for which Hart Mountain NAR was established.

Some people have difficulty with this assessment, which is understandable given heavy emphasis that previous management of the Refuge placed on the livestock grazing program. However, compatibility standards currently are more strict than they were several years ago. No longer can cattle grazing be permitted because it has not been shown to be incompatible with the purpose of a refuge. We must now determine that it is compatible before we can permit it on a refuge.

Continuation of cattle grazing in Refuge riparian habitats would slow their recovery, continue to adversely impact some areas, and maintain a reduced height

and density of vegetation in meadows and along stream channels. In uplands, it would slow habitat recovery and it would maintain a reduced amount of residual standing herbaceous vegetation and reduced amount of litter cover in some areas. Staff and funding previously allocated to the livestock grazing program will now be available for restoring and maintaining habitat for wildlife. Revenue generated from livestock grazing is not made available for the management of the Refuge; it is deposited into a revenue sharing program of the Service.

4. Wilderness

As part of my decision to adopt the Proposed Action, Refuge lands will be studied for their wilderness potential. This is in accordance with Service policy (USFWS 1992:FWM 610).

5. Public Use

The Refuge Recreation Act of 1962 states that a recreational use can be permitted on a refuge if the use is compatible with, or does not prevent the accomplishment of, the primary purpose for which the refuge was established. Similarly, the National Wildlife Refuge System Administration Act of 1966, and Service policy (USFWS 1986:5 RM 20.3) direct that a use not be permitted on a refuge unless it is found to be compatible with the purpose for which the refuge was established. In addition, one of the goals of the NWRS is "to provide an understanding and appreciation of fish and wildlife ecology and man's role in his environment and to provide refuge visitors with high quality, safe, wholesome, and enjoyable recreational experiences oriented toward wildlife to the extent these activities are compatible with the purpose for which the refuge was established."

By closing an additional 103 miles of roads, closing the Guano Creek Campground and replacing it with 3 dispersed camping areas in less sensitive areas, redesigning the Hot Springs Campground to reduce impacts to the riparian area, and changing other aspects of existing public use management, it is my judgement that the public use program outlined in Alternative D will provide wildlife-oriented recreation opportunities and educational experiences while not preventing the accomplishment of the purpose for which Hart Mountain NAR was established. Monitoring of public use and periodic re-assessment of public use management will be necessary to ensure that public use remains compatible with the purpose of the Refuge.

The primary consideration used by Refuge personnel in determining whether particular roads should remain open was the importance of particular roads for providing access for the following Service activities: wildlife and habitat monitoring, law enforcement, prescribed burning, and maintenance of waterholes. Given limited staff and a large area to cover, a road network is necessary to make

habitat monitoring time-efficient. On the other hand, several roads in areas with high wildlife values (Barnhardi Road and roads accessing North and South Hart Mountain) will not be available for monitoring purposes. I decided that adverse impacts associated with vehicle use during monitoring activities in these areas outweigh the benefits associated with time-efficiency in monitoring activities. Other means of accessing these areas will be necessary (e.g., hiking, horseback riding). However, access will be granted to Refuge staff to maintain the radio-repeater and to facilitate prescribed burning. These activities can be conducted during less critical periods for wildlife. None of the roads on the Refuge were left open solely to provide public access.

The main adverse impact of most roads is accelerated soil erosion compared to the surrounding land. Soil erosion from open roads prescribed under Alternative D, however, will not limit the Service's ability to comply with the Executive Order. The roads that I decided to keep open are necessary to periodically assess whether we are meeting our obligation identified in the Executive Order. The impact of a limited number of people driving on most Refuge roads also will not limit the Service's ability to comply with the Executive Order. As public use of the Refuge increases, whether a road should remain open will be reevaluated.

Although creating camping areas in 3 new locations will have some adverse impacts in localized areas, impacts will not hamper efforts to meet the primary objective of the Refuge, which is to provide habitat for pronghorn and other wildlife. The Barry Spring camping area will be located next to one of the maintained roads on the Refuge; being located next to a main road will mitigate cumulative impacts associated with the addition of a camping area. The Flook Lake camping area will be located about one-quarter of a mile off of the Frenchglenn Road. Adverse impacts to wildlife are expected to be minimal because the camping area will be located in the Wyoming big sagebrush vegetation type. Impacts to wildlife will be minimal at the Post Meadow camping because the area will be reserved exclusively for people camping with horses, and therefore is expected to receive minimal use (please refer to the Mitigation and Monitoring section for more information on mitigation measures).

B. CONSISTENCY WITH REFUGE GOALS, LONG-RANGE OBJECTIVES, AND ABILITY TO RESOLVE CORE PROBLEMS

Refuge goals were based on the Executive Order, Service policy, and NWRS goals. Resolving core problems on the Refuge will be a key factor in reaching long-range objectives, which is necessary for Refuge goals to be achieved. Benefits to wildlife will increase to the extent that core habitat problems are resolved. Alternative D will make the most headway in resolving core problems during the next 15 years. Because habitat restoration will be a long process, I recognize that only limited progress will be made in resolving core problems within the next 15 years. Core problems cannot be expected to be completely resolved even within the next 100

years. Alternative D, however, provides the best start of the alternatives evaluated in the FEIS.

Reducing shrub cover, primarily through the use of prescribed burning, will result in drastic changes in wildlife diversity in some areas of the Refuge during the next 15 years. Burned areas will provide early succession habitat for wildlife species that depend on grassland-like habitat. Reduced shrub cover also will provide opportunity for grasses and forbs to increase in cover. When sites that are treated in the next 15 years eventually reach a late stage of succession, we expect that shrub cover will be lower than what currently exists in late succession stands. This will allow the cover of herbaceous vegetation to be higher than what currently exists in late succession stands. The current high amount of shrub cover on the Refuge is attributed primarily to heavy livestock grazing pressure that occurred around the turn of the Century and fire suppression.

Non-use of riparian areas by cattle during the next 15 years will allow riparian areas to recover unhindered by adverse impacts associated with cattle grazing. Additionally, reintroduction of fire, through prescription will be critical for restoring the health and structural diversity in aspen stands. Permitting residual herbaceous cover to remain from one growing season to the next will benefit riparian wildlife communities.

Better planning and management of public use will provide the public with higher quality wildlife-oriented recreation opportunities and will reduce adverse impacts to wildlife and their habitat. In keeping with the goal of providing "opportunities for wildlife/wildlands-dependent recreation and education oriented to the Great Basin while maintaining the rugged, remote, and undeveloped character of the Refuge," Alternative D will provide a relatively high amount of semi-primitive non-motorized areas. Additionally, camping areas will remain primitive and most roads will not be maintained. Alternative D will provide the best representation of native northern Great Basin ecological systems compared to the other alternatives.

C. INPUT FROM RESOURCE PROFESSIONALS

Input from natural resource professionals weighed heavily in my decision to select Alternative D for implementation. Chapter 5 of the FEIS provides a summary of meetings. The following discussion presents concerns, suggestions, and other input from professionals that I consider most relevant to my decision, and how their input was incorporated, or not incorporated, into the FEIS.

Input During the Development of Alternatives

Near the onset of the planning process, the Service hosted a 2-day planning workshop in August 1991. Based on this workshop, professors of OSU's

Department of Rangeland Resources submitted a report on their observations of the workshop (Krueger et al. 1991). In the report, they pointed out that wildlife are a product of their habitat, and that habitat is always changing due to the process of succession. The authors also made the observation that periodic vegetation treatment would be required on the Refuge to maintain vegetation conditions that occur in various stages of succession. They suggested that desired habitat conditions must be clearly defined and that objectives should consider the needs of wildlife in the context of ever-changing vegetation. These considerations are reflected in the long-range habitat objectives that I have adopted as part of my decision.

Krueger et al. (1991) pointed out that exact replication of pre-settlement conditions cannot realistically be attained because of introduction of non-native plants. They also explained that pristine conditions are not an automatic result of wildfires because existing fuel loads are much different than what had occurred during pre-settlement conditions. Writers of the EIS were careful to inform readers that the Service recognizes that conditions have changed and that exact replication is not expected.

In their discussion on managing the land, Krueger et al. (1991) argued that fire, livestock grazing, mechanical devices, and herbicides are excellent tools when used to direct vegetation change toward a defined objective and within the ecological potential of the area. The report did not provide specific objectives and did not specify how the listed tools could be used to reach particular objectives. Given the long-range objectives listed in Chapter 1 of the FEIS, available information indicates that prescribed burning (and limited use of mechanical treatments and herbicide applications) and rest from livestock grazing would best direct vegetation change toward these objectives.

Correspondence between Dr. William Krueger and Jim Yoakum (Wildlife Consultant) transpired after Krueger et al. (1991) submitted their report. Krueger (1991, 1992a) and Yoakum (1992b) agreed that high sagebrush cover is a problem on the Refuge, but that cattle could not effectively be used to reduce it. Krueger (1991, 1992a, 1992b) presented evidence that cattle can be used, under some circumstances, to delay the phenology of forbs and grasses to improve late season forages for pronghorn and sage grouse. However, none of the long-range objectives call for such an action. Delaying the phenology of forbs and grasses has not been shown to be necessary for Refuge wildlife, and it probably occurred rather infrequently on the Refuge during the past 20 years (Appendix M). Please refer to Appendix I for further discussion of this subject.

In 1991, affidavits were submitted to the Service by Derek Bailey (Western Range Service, Nevada), Micheal Borman (Western Range Service, Nevada), and Robert Kindschy (Bureau of Land Management, Oregon) regarding the compatibility of cattle grazing with Refuge purposes and their use as a means to enhance wildlife habitat on the Refuge. Bailey (1991) concluded that cattle grazing is compatible

with management of the Refuge as a range and breeding ground for pronghorn (he did not address compatibility with other wildlife). Borman (1991) and Kindschy (1991) concurred. Bailey (1991) described several ways in which cattle can be used to enhance habitat on the Refuge for pronghorn (primary emphasis), mule deer, sage grouse, and waterfowl. Borman (1991) and Kindschy (1991) concurred with Bailey's conclusions. Yoakum (1992), under contract to the Service, reviewed Bailey's affidavit. He noted that the affidavit (1) only addressed compatible factors of cattle grazing (literature on non-compatible factors was not reviewed), (2) it predominantly reviewed literature that was more than 10 years old, and (3) it did not account for differences in pronghorn ecology among geographic regions. Regarding item 3, Bailey (1991) placed heavy emphasis on the co-evolution of pronghorn and large herbivores such as bison and cattle, but failed to recognize that bison did not inhabit the Great Basin to any large degree (Yoakum 1992). Yoakum generally found the affidavit to be selective and incomplete.

During the development of alternatives, Refuge personnel consulted with a number of professionals regarding strategies for managing the Refuge's wildlife. During one 2-day meeting on the Refuge (USFWS 1992a), Jim Yoakum and Dr. David Dobkin recommended that the Service should, above all else, manage for healthy ecological systems; they felt wildlife would benefit accordingly. In riparian areas, this means managing for effective water cycling. In particular, they recommended (1) managing for a mosaic of successional stages within vegetation types in uplands, (2) using prescribed burning as the primary means of managing vegetation, (3) monitoring vegetation response after prescribed burns, (4) removing all fences not being used, (5) burning decadent aspen stands to obtain structural diversity, and (6) providing places for the public to stay when they visit the Refuge. They pointed out that the Service should let the public know that we may have to wait 20 years or more to get desired results. In regard to cattle grazing, they surmised that there was no biological basis for grazing riparian meadows. These recommendations are reflected in Alternative D. Although Dr. John Crawford, of OSU's Department of Fisheries and Wildlife, was unable to attend the meeting, he reviewed a preliminary draft of alternatives (Refuge files). He characterized one of the alternatives, which later became Alternative D, as an ecologically sound approach.

In 1990, prior to the initiation of alternative development for the EIS, Richard Voss, Gary Ivey, and Mike Rule from Malheur NWR, and Mike Smith and Bill Pyle from Sheldon-Hart Mountain Refuges met at the Shirk Ranch to discuss management options (Refuge files). Prescribed burning and haying were suggested as the 2 primary management practices for meadow enhancement. It also was suggested that meadows be treated every 3 years. As outlined in Alternative D, prescribed burning will be the principal vegetation treatment practice for the Shirk Ranch, although haying also will be used if necessary.

Refuge personnel requested Dennis Lassuy, a Fish and Wildlife Biologist (Fish and Wildlife Enhancement, Service), to provide recommendations on riparian

management. In a letter he submitted after visiting the Refuge in 1990, he stressed the importance of healthy riparian areas, including abundant streamside vegetation, for native trout. He also recommended rest from cattle grazing, possible use of instream rehabilitation projects, and he suggested that the Service allow beavers to become (or remain) established within drainages.

Review of Alternative D Prior to the Release of the DEIS

Refuge personnel presented preliminary alternatives to Jim Yoakum and Gary Anderson, Lake District Fish Biologist for Oregon Department of Fish and Wildlife (ODFW), to obtain their professional views on the alternatives, especially the Proposed Action (Refuge files). Yoakum stated that the Proposed Action would be the best from the biological standpoint, and pointed out that there is no biological basis for using livestock to manage for any wildlife species on the Refuge. In regard to livestock grazing in riparian areas, Anderson felt that the fewer the disturbances in these areas the better. Yoakum recommended adding another alternative that had a cattle grazing program that would fit between the Proposed Action and Alternative B. He felt that under a limited cattle grazing program, cattle could utilize forage that was above and beyond the needs of wildlife. Based on this recommendation, another alternative was added (Alternative C).

Critical review of preliminary alternatives also was sought from Dr. John Crawford and other members of the OSU Gamebird Research Program, Department of Fisheries and Wildlife (Refuge files). Crawford and 5 graduate students have conducted extensive research on sage grouse on the Refuge. Crawford suggested that mosaics of different succession stages be created in the more productive big sagebrush areas. However, in Wyoming big sagebrush, he felt that it would be more important to treat as much as possible to begin the restoration process. Another point he made was that perennial bunchgrasses eventually would outcompete cheatgrass if not continually disturbed. Additionally, he felt that efforts focused on restoring uplands is as important to riparian recovery as are efforts focused on the riparian areas themselves (i.e., a watershed perspective is needed). In regard to cattle grazing, Crawford contended that there are no values of cattle grazing on the Refuge, given current conditions. He stated that using cattle in meadows to increase forb availability to sage grouse has merit, but only if meadows are in healthy condition. He also pointed out that examples of high rangeland productivity obtained by intensive herd management in the Texas and the Midwest require a tremendous amount of fencing and aren't applicable on Hart Mountain NAR. This input is consistent with the strategy outlined in Alternative D, except that Alternative D does not call for extensive shrub reduction in Wyoming big sagebrush.

In a similar meeting with Refuge staff, Larry Conn, District Biologist for ODFW, was asked to provide input on the Proposed Action and other alternatives. Potential uses of cattle were solicited. In the meeting, no substantial needs for

cattle grazing were identified for Hart Mountain NAR, given current habitat conditions. He suggested that habitats on the Refuge should be restored to healthy condition before they are grazed by cattle. However, he suggested reducing the number of years of non-use by cattle to 5-8 years, followed by a re-evaluation of habitat conditions. I decided, however, that a re-evaluation of cattle grazing will not be necessary until after the 15-year planning horizon because few areas will be restored to healthy condition within 15 years, and because there are no long-range objectives for which cattle can reasonably be used.

Pam Dupee, a Fishery Biologist for ODFW, and Tim Cummings, a Fishery Biologist from the Lower Columbia Fishery Resource Office (Service) were asked for their input on strategies for restoring stream habitat and fish populations on the Refuge. Dupee led efforts in 1991 and 1992 to survey stream habitat and fish in Rock and Guano creeks. Dupee and Cummings agreed that livestock grazing should not be permitted in riparian habitats until they have fully recovered. Cummings contended that the most important management strategy for restoring riparian areas is to allow vegetation to establish on banks; then the system can stabilize and proceed toward recovery. He went on to say that we must stop the processes that impact vegetation (e.g., cattle grazing). Dupee and Cummings recommended to continue the current moratorium on fishing until we are confident that the population can withstand harvest. Food for trout is not a limiting factor, Dupee added; with sufficient water, the recovery rate should be high.

The Service asked Dupee and Cummings for a summary report of habitat conditions on Rock and Guano creeks and recommendations for restoring stream habitats. Kim Jones (1993), leader of the ODFW Aquatic Inventories Project for Oregon submitted a letter that addressed our request. Jones noted that instream habitat on Rock and Guano creeks, based on intensive habitat surveys, is poor to fair depending on stream reach. He contended that recovery of pool spacing, pool depth, silt load, sand levels, amount of undercut banks, large woody debris, and other riparian and channel characteristics will occur only in the absence of grazing pressures. He maintained that instream structures are not appropriate mitigation in lieu of protection. Jones also recommended a full stream resurvey every 5 years. These recommendations are reflected in Alternative D.

Dr. David Dobkin, Director of the High Desert Ecological Research Institute, concurred with strategies of the Proposed Action after reviewing a preliminary draft under contract to the Service (Refuge files). However, he pointed out 2 strategies that he did not agree with: use of mechanical treatment and herbicides to reduce shrub cover. As disclosed in the FEIS, mechanical treatments and herbicides will only be used when prescribed burning is not feasible.

Input After the Release of the DEIS

Three letters were received from ODFW during the public comment period for the DEIS. George Keister (Regional Non-game biologist), Larry Conn (District Biologist),

and Mitch Willis (Research Biologist) of ODFW, expressed their general agreement with Alternative D. They pointed out several concerns. One concern pertained to the amount of prescribed burning and its potential short-term consequences on sage grouse. However, during a meeting with Keister, Conn, and Al Polanz (Regional Supervisor) on the Refuge, ODFW agreed that the level of prescribed burning called for in Alternative D is not excessive, but that the Service should proceed slowly and monitor. Recommended acreages for burning outlined in their letter were similar to what is outlined in Alternative D (comment 344, Appendix O). Although they stated that low intensity cattle grazing can be used to enhance use of meadows by sage grouse, they prefaced the statement by adding that benefits would only occur after riparian zones and meadows are restored. Few riparian meadows will be restored within the next 15 years. They agreed that predator control is not needed on the Refuge at this time.

Also of ODFW, Gary Anderson (Lake District Fish Biologist) stated that Alternative D would best serve the restoration and maintenance of fish habitats on the Refuge. Marc Liverman, Grassland Habitat Biologist for ODFW, also stated support for Alternative D with the exception of several concerns with the alternative. He contended that there is little justification for keeping as many roads open as the alternative describes or for retaining any interior fences. The roads issue was discussed previously. Removal of all interior fences cannot feasibly be accomplished during the next 15 years; Alternative D will provide a start.

We also received a letter from the Oregon Chapter of The Wildlife Society (Oregon Chapter of TWS) expressing their support for Alternative D. The Wildlife Society is a professional, nonpartisan national organization for wildlife managers, biologists, researchers, and other professionals that are actively involved with research and stewardship of wildlife and their habitat. In their letter, they noted that Alternative D is "consistent with the current Oregon Chapter of TWS position on using fire and livestock grazing as a management tool on wildlife refuges. The Oregon Chapter of TWS supports the option to use fire and grazing when specific, identified management objectives may be achieved through these practices." They also viewed Alternative D as the most ecologically favorable alternative of those evaluated in the DEIS. They emphasized the importance of monitoring to track habitat recovery. Appendix N was added to the FEIS in response to this and similar comments. Two of the 5 Oregon Chapter of TWS members that reviewed the DEIS maintained that strictly controlled livestock grazing should remain an option on the Refuge. At this time, however, there are no long-range objectives for which cattle can be used.

Dr. William Krueger and Dr. John Buckhouse of OSU's Department of Rangeland Resources submitted a letter during the public comment period for the DEIS (Krueger and Buckhouse 1993). Their main concern was that cattle grazing was not included as part of the Preferred Alternative, and as such, they presented a number of potential uses of cattle grazing. However, they did not identify which long-range objectives each of the applications was meant to address (objectives

were defined in Chapter 1 of the DEIS). Potential applications do not appear to have been developed for use in directing vegetation change toward the Service's defined objectives for the Refuge. For instance, none of the long-range objectives defined in Chapter 1 call for enhanced forage quality, but Krueger and Buckhouse (1993) inferred that livestock should be considered for use in accomplishing this objective on the Refuge. In an earlier report (Krueger et al. 1991), the authors emphasized the importance of defining management objectives. They went on to explain that livestock grazing is an excellent tool when it is "used to direct vegetation change toward a defined objective and within the ecological potential of the area." In other words, the extent to which livestock should be used, if used at all, depends on the task at hand.

Without agreement on goals and objectives, disagreement on the means to accomplish objectives is imminent. However, Krueger and Buckhouse (1993) did not raise any concerns regarding Refuge goals or long-range objectives. Other potential applications identified in their letter, such as using cattle to disseminate seeds, restore riparian areas, and control cheatgrass, although they were found to address some objectives, have little or no supportive documentation for the type of environment that exists on Hart Mountain NAR (Appendix I addresses this in further detail).

Edward Chaney (Northwest Resource Information Center, Idaho), William Platts (Don Chapman Consultants, Idaho), Wayne Elmore (BLM Riparian Specialist for Oregon), and Bernard Kovalchik (Riparian Ecologist, U.S. Forest Service, Washington) were contacted to get their input on whether cattle can be used to enhance willow growth and restore riparian areas, and whether riparian areas can recover under a well managed livestock grazing program at the same rate of recovery as would occur under complete rest, as claimed by Krueger and Buckhouse (1993, 1994). All agreed that restoration can proceed in riparian areas under well a managed livestock grazing program. Elmore felt that similar rates of recovery can be obtained under a well managed program compared to complete rest in some areas, but did not know of any definitive studies that demonstrate this. Chaney and Platts felt that restoration of riparian areas under a well managed livestock grazing program would not approach the restoration rate of completely rested areas. Kovalchik did not know of any information to suggest that cattle can be used to enhance willow growth. He did, however, point out that adverse impacts to willows could be reduced by early season grazing. Input of these professionals is consistent with information presented in the FEIS, and supports my decision to adopt Alternative D for implementation.

In a letter submitted by the Lakeview District Office of BLM, they recommended that noxious weed management be addressed in the EIS. Based on this and other comments, sections on noxious weed management were added to the FEIS. They also suggested using cattle as a vegetation manipulation tool, and stated that "it could become the most viable management method to obtain the desired vegetation conditions." Desired vegetation conditions are described in the long-

range objectives in Chapter 1, and the primary limitations to achieving these conditions are excessive shrub and juniper cover in uplands and eroded stream channels and deficient stream-side riparian vegetation in riparian areas. Information has not been obtained by the Service to demonstrate that cattle can be used to obtain desired vegetation conditions. Jim Yoakum (Wildlife Consultant), under contract to the Service, met with the BLM personnel at the Lakeview District Office to inquire as to how cattle could be used to enhance wildlife habitat on Hart Mountain NAR (Yoakum 1994). Four possibilities were discussed: (1) livestock can be used to increase cover of upland shrubs, (2) livestock can be used to disturb soil and aid in implanting seeds, (3) livestock can be used to decrease plant fuel in firebreaks for prescribed burning, and (4) livestock can be used to break up overgrown, thick, dense, vegetation in riparian areas. The first and fourth would not be desirable at this time, and would be in direct conflict with resolution of core problems and long-range objectives. In regard to the second potential application, there is no indication that cattle would contribute to the re-establishment of native grasses and forbs. During the meeting, it was decided that the third potential application would be most relevant in areas where cheatgrass is abundant, and thus would have limited application to the Refuge at this time. Please see Appendix I of the FEIS for further detail.

Chris Maser, co-editor of *Wildlife Habitats in Managed Rangelands: The Great Basin of Southeastern Oregon*, reviewed several areas of the DEIS under contract to the Service (Refuge files). Most of his review centered around the wildlife-habitat relationships model (Chapter 3, Section One, part II, B; and Appendix H), which was in large part based on models developed by Maser and others (Maser et al. 1984a, 1984b). His main concern regarding the DEIS, and specifically the presentation of information on the wildlife-habitat relationships model, was that the information could have been presented more simplistically. Refuge personnel revised the FEIS where possible, but major revisions were not considered desirable in some instances (because of reduced information content and excessive simplification) and was not possible given time constraints. Maser expressed his support for the concept of resolving core problems as the primary means to manage for healthy and balanced populations of native wildlife on the Refuge. Similarly, he agreed with the concept that, "in short, by providing a healthy environment, wildlife populations will respond accordingly." This, he maintained, is the best strategy for the Refuge. Maser questioned the ecological benefits of designating wilderness; he felt it would only attract more people. As explained previously, Service policy dictates that lands be studied for wilderness potential during management planning. Maser also recommended that herbicides be avoided. Again, herbicides will only be used as a last resort for reducing shrub cover.

Because of concerns and scrutiny related to the treatment of livestock grazing in the DEIS, the Service requested several BLM Range Conservationist to review the DEIS specifically in regard to how we treated the issue of livestock grazing in the document. One Range Conservationist felt that the DEIS did not present a full

range of alternatives for livestock grazing. More specifically, he felt there was too large of a difference between Alternatives A and B in terms of livestock AUMs, and that an additional livestock grazing alternative should have been included between Alternatives A and B (e.g., 60 percent of historic livestock AUMs). After considering this concern, it was decided that a full range of alternatives has been considered and evaluated. Three of the 5 alternatives include a livestock grazing program. Refuge personnel met with Range Conservationists of the Lakeview District Office of BLM to obtain their assessment of Alternative B's livestock grazing program, from the standpoint of vegetation health. Their recommendations were incorporated into Alternative B of the FEIS.

Arnold Kruse, a Habitat Management Biologist for the Service in North Dakota, also reviewed portions of the DEIS dealing with livestock grazing. He had 3 specific comments: (1) wild horses should be removed from the Refuge, (2) cattle should only be used when they can be used to help reach and maintain Refuge goals and objectives, and (3) the DEIS was well written and documented. He added to the second point by stating that "cattle as they have been used in the past on the refuge are incompatible with [Refuge goals and objectives], due to adverse impacts on riparian areas, streams, etc." He also pointed out that, if cattle are used in the future, fences would be economically unfeasible and that herders would be the only practical solution for keeping cattle away from riparian areas.

D. INPUT FROM THE HART MOUNTAIN LIAISON COMMITTEE

Several meetings were held with the Lake County Chamber of Commerce's Hart Mountain Liaison Committee (Liaison Committee) during 1991 and 1992. In September of 1991, the Liaison Committee submitted recommendations to be considered in alternatives of the EIS, including the following: (1) continue livestock grazing on the Refuge; (2) continue traditional recreation uses; (3) limit road maintenance and reconstruction; (4) provide additional camping opportunities; (5) consider the use of fire, but only when livestock grazing would not serve the same purpose; (6) consider the use of predator control; (7) intensively manage water and habitat to maximize deer and pronghorn numbers; (8) intensively manage riparian areas, by rotating cattle, using portable fencing, planting willows, etc.; (9) respect private land ownership and water rights; and (10) assess the economic impact on Lake County; and (11) guarantee use of Blue Sky by the Order of the Antelope. Recommendations 2-6 are addressed in Alternative D of the FEIS, except that Alternative D does not provide for the use of livestock grazing. Recommendations 1-8 were included in Alternative B and recommendations 9-10 were common to all alternatives. Recommendation 11 is beyond the scope of the EIS.

In December of 1992, the Liaison Committee submitted a recommended cattle grazing program that expanded on their earlier recommendation (Refuge files). The report states that the program was designed to be compatible with wildlife and the needs of permittees. An evaluation of the recommended cattle grazing program,

however, reveals that implementation of the program would hamper the Service's ability to resolve core problems and thus would hinder the Service's ability to reach Refuge goals and long-range objectives (Chapter 4 and Appendix I of the FEIS).

E. OTHER PUBLIC INVOLVEMENT

Throughout the planning process, Planning Updates were periodically sent to interested parties. In early 1990, two public scoping meetings were held by the Service; input from these meetings was used to develop a list of issues. Two planning workshops, attended by 106 people, were held during the summer of 1991. On several occasions prior to releasing the DEIS, the Service briefed the Lake County Chamber of Commerce and Lake County Board of Commissioners on various aspects of the planning process. A summary of public involvement appears in Chapter 5 of the FEIS.

The DEIS was released on August 13, 1993 and this was followed by a 60-day public comment period. During the public comment period, 749 letters were received, 47 people commented during seven open house meetings held by the Service, and 28 people commented during two meetings held by the Lake County Board of Commissioners. Of the 914 people that presented their opinion regarding Alternative D (many letters had more than one signature), about 93 percent expressed their support for it. About 7 percent expressed their dissatisfaction with Alternative D and/or expressed their support for another alternative.

Aside from comments expressing support or dissatisfaction with the Service's Proposed Action (Alternative D), the most common issues addressed in comments were (1) the use of cattle grazing, (2) use of herbicides, (3) the proposed monitoring program, (4) potential wilderness, and (5) expansion of Refuge borders. The FEIS was revised where necessary to address concerns that people had regarding these and other issues. Detailed responses by the Service to representative public comments appear in Appendix O of the FEIS.

Some commenters expressed concern that the Service ignored or disregarded input submitted by local residents, particularly information on cattle grazing. Because of this concern, a more extensive evaluation of submitted information was provided in the FEIS (Chapter 4 and Appendices I, J, and M). A more detailed response to the concern is provided in Appendix O of the FEIS (pages 30-42 and 110-134).

The possible use of herbicides was maintained in Alternative D in case there are areas in need of sagebrush reduction that cannot logistically be burned or mechanically treated. Herbicides would be used as a last resort. A more thorough evaluation of the use of herbicides is presented in the FEIS in Chapter 4 and Appendix J. Also based on public comments, a Noxious Weed Management section was added to Alternative D, as well as to the other alternatives.

Many people raised the concern that the monitoring program outlined in the DEIS for Alternative D was inadequate. In response to this concern, further details of the monitoring program were added to the FEIS (Appendix N).

After reviewing public comments on proposed camping areas, several changes were made to Alternative D in the FEIS. The camping areas on lower Guano Creek and near Stockade Creek were taken out of Alternative D. The Stockade Creek camping area was replaced with one near Barry Spring. The proposed Flook Meadow camping area was moved to the east to an upland site about one mile from Flook Lake. After considering comments on the areas to be studied for wilderness potential, changes were made to the borders of the areas. Expanding Refuge boundaries is beyond the scope of this EIS. Other changes to the FEIS based on public comments are identified in Appendix O of the FEIS.

In November of 1993, the Service's Regional Director and Assistant Regional Director, Refuges and Wildlife met with the Lake County Commissioners to allow the Commissioners additional opportunity to present their concerns regarding the DEIS. Concerns raised by the Lake County Commissioners, detailed in a letter received during the public comment period, are addressed in Appendix O of the FEIS. The Lake County Commissioners expressed concern that the process used by the Service in developing the EIS was inadequate. A reevaluation of procedures that were followed in developing the EIS revealed that the Service complied with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations.

The Lake County Board of Commissioners also expressed a concern that the Service failed to use "the considerable body of scientific evidence" regarding the use of cattle to manage wildlife. As noted above, a more thorough evaluation of this information was included in the FEIS. The evaluation reveals that cattle grazing would not contribute to achieving Refuge goals and long-range objectives. Furthermore, cattle would hamper efforts to restore habitat for native wildlife communities.

F. ECOLOGICAL CONSIDERATIONS

This discussion summarizes some of the ecological considerations presented in the previous sections. The primary ecological factor that influenced my decision was the relative importance of processes that created habitat conditions under which native wildlife communities of the Hart Mountain area evolved. As pointed out by Maser and Thomas (1983), wildlife are a product of habitat management, and habitat management can be equated to process management. In short, by restoring and maintaining the structure, species composition, and processes of native ecological communities and systems (Refuge goal 3), healthy and balanced populations of pronghorn and other native wildlife will be maintained to the extent that wildlife populations can be influenced on Refuge lands (Refuge goal 1).

Of the processes that have significantly influenced Refuge wildlife, fire and livestock grazing are the two that Refuge managers have direct control over. By managing these processes (including rest from either), managers influence vegetation succession, habitat interspersion, soil formation and erosion, plant species composition and structure along streambanks, stream channel structure and stability, and other processes and components of ecological systems.

While periodic fire historically had a major influence on the landscape of the northern Great Basin, grazing by large herbivores did not. The subsequent introduction of domestic livestock and suppression of fires probably altered habitat within what is now Hart Mountain NAR more than any other human activity.

Native wildlife communities of the area evolved under the influence of periodic fire and depend on conditions created by it. On the other hand, we have no reason to believe that native wildlife communities require a level of grazing that is above and beyond that which occurs under the existing populations of native ungulates. Additionally, a level of grazing above that which occurs with native ungulates can be detrimental to some species/communities of wildlife and plants, and ecological systems (e.g., low gradient streams).

Therefore, while it is of utmost importance that the Service reintroduce periodic fire through prescription in order to accomplish Refuge purposes, there are no compelling reasons to suggest that livestock grazing is necessary for accomplishing them. In fact, the National Wildlife Refuge System Administration Act and Service policy require that livestock grazing not be used or permitted until it can be demonstrated that it would not hinder progress toward accomplishing the purpose of the Refuge set forth in Executive Order 7523. The evaluations provided in Chapter 4 of the FEIS reveal that livestock grazing, under the strategies outlined in Alternatives A-C, would hinder progress toward accomplishing Refuge purposes.

There are several assumptions involved with the habitat management strategy prescribed by Alternative D. The major ones are (1) native wildlife communities evolved under habitat conditions created by periodic fire; (2) we have sufficient understanding of the range of habitat conditions under which native wildlife communities evolved; (3) we can adequately mimic or foster processes that will produce the desired range of conditions in desired proportions; (4) ecological systems have the potential to recover in the long-term; (5) shrub reduction measures will not push plant communities beyond an undesirable threshold from which they cannot be restored with a reasonable amount of funds; (6) shrub reduction in uplands in the absence of cattle grazing eventually will result in late succession plant communities with lower shrub cover and higher cover of grasses, forbs, and litter compared to present conditions; and (7) rest from cattle grazing will result in streambank stabilization, narrowing of stream channels, rising of streambanks, and ultimately, an increased distribution and abundance of riparian vegetation.

A strong monitoring program (Appendix N of the FEIS) will provide important information that will be used to determine the extent to which assumptions are accurate. Specific to the first assumption, a fire ecologist has been contracted by the Service to determine the ranges of historic fire return intervals of the major vegetation types on the Refuge.

ALTERNATIVES CONSIDERED

Description of the Alternatives

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

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

Feature	Alternatives	
	Baseline Management (No Action) (A)	Featured Species Management (B)
HABITAT MANAGEMENT		
Shrub Cover Reduction Prescribed Burning Mechanical Treatment Herbicide Treatment	2,000-2,700 acres/15 years ≥90% 0% 0-10%	6,000-9,000 acres/15 years 50-75% 0% 25-50%
Livestock Grazing	11,000-17,000 AUMs/year	3,9000-4,300 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)
WILDLIFE POPULATION MANAGEMENT		
Reintroductions	none	none
Predator Control	limited	moderate
RECREATION MANAGEMENT		
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
SPECIAL AREA MANAGEMENT		
lands to be evaluated for wilderness or RNA potential	none	none

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

Table 1. Continued

Alternatives		
Habitat Restoration (C)	Native Community Restoration (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 campground closed; three additional camping areas developed, (one for horseback riders); backcountry camping maintained	Hot Springs campground redesigned; Guano Creek campground 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

vigor, and forage quality for key wildlife species and watershed values with the premise that increasing interspersion of 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 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

This alternative will 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 will not be used as a management option during this planning period on Hart Mountain NAR. It will however, be revaluated 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 will be used to maintain them.

Recreational use associated with the uniqueness of the area will be emphasized. Backcountry camping will continue under a permit system. Camping also will be available at the Hot Springs Campground, and at several dispersed sites. Camp sites at campgrounds will be improved. Hunting opportunities will 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 will be rerouted or closed. Use of roads on North and South Hart Mountain by Refuge personnel will 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.

Summary of Impacts of the Alternatives

Effects on Wildlife

Alternative D will provide the most benefits to wildlife, during the 15-year planning horizon and over the long term. All featured species of wildlife will benefit over the long term, except possibly mule deer, as will wildlife diversity. Benefits to wildlife will increase 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.

Effects on Habitat

In line with effects on wildlife, Alternative D will make the most progress in resolving core habitat problems; benefits to wildlife will increase to the extent that these problems are resolved. Alternative D will result in the highest amount of habitat diversity in upland habitats, will reduce shrub cover to the greatest extent, and will allow riparian areas to recover at the fastest rate of any alternative. Prescribed burning will 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. 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 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 will 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 will occur in management of special areas within the 15-year planning horizon. Determinations as to whether or not wilderness or Research Natural Areas (RNAs) will 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 does not guarantees that these lands will be designated as wilderness or RNA.

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, followed by Alternatives B and C would maximize gains when all interests are considered (note that Table 2, 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.

Table 2. Total market and non-market economic benefits for each alternative, relative to the Baseline Management Alternative (Alternative A).

Basic Assumption(s)	Alternative B	C	D	E
	----- 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

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 years, 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 2.

IDENTIFICATION OF THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

Alternative D, the selected alternative, is the environmentally preferred alternative. Implementation of this alternative will result in the greatest amount of restoration of uplands and riparian areas. It will result in the largest improvement in watershed functioning, and will benefit native wildlife communities to the greatest extent of the alternatives evaluated.

MITIGATION AND MONITORING

Summary of Mitigation Measures

The following sections summarize the primary mitigation measures that will be imposed to minimize or prevent adverse impacts to the natural environment and associated wildlife on the Refuge. Adverse impacts to surrounding lands are not expected with the implementation of the selected alternative. Please refer to Chapters 2 and 4, Alternative D of the FEIS for additional information on mitigation measures.

A. PRESCRIBED BURNING

Adverse smoke impacts from prescribed burning will be mitigated through firing technique and timing. Direct impacts to wildlife will be mitigated by not burning during the breeding season of most species. Indirect impacts will be mitigated by burning in a patchy mosaic, minimizing adverse impacts to soil, and re-seeding with native grasses and forbs where necessary. To mitigate impacts to sage grouse in particular, prescribed burns will be carried out in a way that will ensure continued existence of sage grouse nesting habitat in areas adjacent to burns.

B. MECHANICAL TREATMENT

Reduction of shrub cover through mechanical treatments will only be used in Wyoming big sagebrush and possibly low sagebrush on level tableland areas. It will only be used if prescribed burning would not be feasible or effective. Use of equipment, such as the Schmeiser Till an' Pak® pulled by a tractor, will result in the death of sagebrush with the least amount of disturbance to soil. Other measures to mitigate adverse impacts to soil include avoiding areas with slopes over 15 percent, treating vegetation during the winter (when soils are frozen) when soils are least vulnerable to disturbance from churning and compression, and re-seeding with certified weed-free seeds of native grasses and forbs where seed-source of native vegetation is scarce. Winter treatments would mitigate adverse impacts to wildlife by avoiding the breeding season. Another mitigation relative to wildlife is that project areas will be no larger than 2,000 acres, and treatment patterns will be mosaics in nature within project areas.

C. HERBICIDE APPLICATION

Mitigation measures to minimize potential impacts on water quality and nontarget plants and animals will include limiting the use of herbicides to applications for which prescribed burning and mechanical treatment would not be feasible or effective, minimizing chemical applications prior to an anticipated heavy rainfall period, scheduling pesticide applications so that they have more time to be taken up by growing sagebrush, non-use of herbicides during late fall or winter, and use of a 100-foot buffer zone around open water. Targeted herbicides for use on

sagebrush are 2,4-D and tebuthiuron. Additionally, re-seeding with certified weed-free seeds of native grasses and forbs would be conducted where seed-source of native vegetation is scarce.

D. NOXIOUS WEED MANAGEMENT

Emphasis will be placed on implementing the least toxic technique. Adverse impacts that can result from prescribed burning will be mitigated by reseeding of certified weed-free seeds of native vegetation. Adverse impacts that potentially can occur through the use of herbicides will be mitigated by following EPA regulations and Service Integrated Pest Management policies, and by using a wiping or wicking device for applying herbicides.

E. CAMPGROUNDS AND CAMPING AREAS

Closing the Guano Creek Campground, an existing campground in a key riparian area, and replacing it with smaller camping areas in less sensitive areas will mitigate adverse impacts of public camping on the Refuge. Adverse impacts associated with the Hot Springs Campground will be mitigated by delineating camping sites for visitors, locating these sites out of riparian areas, relocating parking areas and roads away from riparian areas, and limiting the number of campers that can camp in the campground. People currently camp wherever they choose in the campground, and a capacity limit has not been established until now.

Adverse impacts associated with the creation of a camping area adjacent to Post Meadow will be mitigated by providing parking areas in adjacent uplands, minimizing the development of camping sites in meadow habitat, delineating areas in which people can camp, limiting the number of people that can camp, and limiting use of the area to people with horses. Use of the camping area is expected to be limited.

Adverse impacts associated with the creation of a camping area at the Barry Spring site will be mitigated by reestablishing native vegetation after establishment of the camping area, delineating areas in which people can camp, limiting the number of people that can camp, and developing the camping area at least 50 meters from the adjacent riparian area. Locating the new campground next to a main road also will serve to minimize adverse impacts associated with the development of a new camping area.

Establishing the Flook Lake camping area is expected to have limited adverse impacts to wildlife because ecological conditions in the area are relatively poor. Mitigation of adverse impacts associated with establishing a camping area near Flook Lake will consist of locating sites on level terrain and establishing native vegetation in the camping area.

F. ROADS

Adverse impacts associated with roads and associated vehicle-use on the Refuge will be mitigated by closing an additional 103 miles of roads, and by closing most of the Refuge to vehicle access from December 1 to June 15. Closing one road in particular, the Barnhardi Road from near the Hot Springs Campground to Blue Sky, along with closing the Guano Creek Campground, is expected to have tremendous benefits to the riparian area and associated wildlife. To mitigate the adverse impacts of closing this road to the visiting public (the Barnhardi has been a popular road for late summer and fall visitors), the Guano Creek section of the road will be rerouted to an upland site (Appendix N). Additionally, a short section of the road between the Hot Springs Campground and the turn-off to North Mountain also will be rerouted to an upland site.

Another measure to mitigate adverse impacts of roads and associated vehicle-use is to limit the use of roads accessing North and South Hart Mountain by Refuge personnel. Use will be limited to prescribed burning efforts, accessing the radio repeater, and emergencies. This will substantially reduce the amount of traffic these roads receive; they currently are closed to the public.

G. HIKING AND HORSEBACK RIDING

To mitigate adverse impacts associated with hiking and horseback riding, areas that are beginning to be impacted by increased use will be closed to prevent habitat deterioration. Additionally, if use of an area threatens to create significant disturbance to wildlife, regulations will be imposed (e.g., closure during critical periods) to curb the potential problem. Hiking trails will not be developed on the Refuge.

H. HUNTING AND FISHING

Adverse impacts associated with hunting will be mitigated by continuing to work with ODFW to ensure that hunting levels will not adversely impact populations of hunted species. Tag numbers will continue to be determined based on population levels. At present, hunting levels are far below that which could be considered detrimental to populations.

Closing the Refuge to fishing during droughts and other times when fish populations cannot withstand fishing pressure, and maintaining harvest limits will mitigate adverse impacts associated with fishing. Non-native fish will not be stocked in Rock Creek, Guano Creek, or other stream-systems.

Summary of Monitoring

Monitoring the effects of the selected alternative is one of the most crucial components of the alternative, and it will receive high priority in future budgeting and scheduling. Without a strong monitoring program, Refuge managers that carry out the selected alternative cannot be certain that their management actions are contributing to the resolution of core problems and achievement of long-range objectives. Periodic assessment of the results of monitoring efforts also will provide managers opportunity to evaluate whether adjustments should be made to management strategies prescribed in Alternative D and future operation plans. This is imperative for successful management.

A. WILDLIFE AND HABITAT MONITORING

Wildlife monitoring activities are outlined in Table 3. The habitat monitoring program will consist of two primary strategies. Strategy I will consist of monitoring landscape-level changes in succession stages of upland vegetation types and progression stages of wetland vegetation types. As part of this strategy, routine mapping will be done of sites that have been prescribed burned, mechanically treated, or sprayed with herbicides. Periodic assessment and reclassification of succession and progression stages will be used to evaluate the extent to which long-range objectives are being achieved. Another part of Strategy I will be a single sample survey of habitat conditions at the end of the 15-year planning horizon (please see Appendix N for further detail).

Strategy II will consist of monitoring change in habitat characteristics on a site-by-site and project-by-project basis. The primary objective of this strategy will be to evaluate the success of habitat management actions (e.g., prescribed burning, rest from livestock grazing). Specifically, Strategy II will focus on 1) monitoring of streambank stability, stream channel morphology, distribution of riparian plant communities on 40 permanent plots in riparian areas (5 year intervals); 2) full-length stream-habitat surveys of Rock and Guano creeks by ODFW (5 year intervals); and 3) monitoring vegetation on and adjacent to sites subject to prescribed burning, mechanical treatment, and herbicide application (please see Appendix N for further detail).

The minimum standard for the third component of Strategy II for prescribed burns will consist of the establishment and monitoring of permanent photo-points. Where necessary (including all mechanical treatment and herbicide application projects), vegetation cover, frequency, or density will be quantified before and after treatment. Data also will be collected on adjacent, non-treated areas. The level of monitoring that will accompany a particular prescribed burn will be determined using several criteria including site accessibility, technical knowledge of fire response, probability that the site may be invaded by introduced plant species, and certainty of vegetation response.

Table 3. List of standard wildlife inventory and monitoring procedures, Hart Mountain NAR.

Species	Frequency	Time of year	Method	Objectives
Bighorn sheep[a]	Annual	March	Aerial survey	Population size
	Annual	June	Aerial survey	Lambs/100 ewes; rams/100 ewes
	Annual	October	Aerial survey	Population size
Mule deer	Annual	November	Ground survey	Fawns/100 adults; distribution
	Annual	March	Aerial survey	Fawns/100 does; bucks/100 does; distribution
Predators	Annual	April-July	Ground survey	Number/100 observation hours
Pronghorn	Annual	July	Aerial survey	Fawns/100 does; bucks/100 does; population size
	Annual[a]	February	Aerial survey	Population size
	Periodic[b]	Monthly	Aerial survey	Distribution & habitat use
	Periodic	May	Aerial survey	Distribution of fawning does
Sage grouse	Annual	April	Ground census	Males/lek
	Annual	June-July	Ground survey	% hens with broods; chicks/hen; chicks/brood
	Periodic	April	Aerial survey	Lek distribution; leks/area abundance
Small mammals	Annual	Quarterly	Ground survey	Number/100 km
Songbirds	Annual	June	Ground survey	Species no./area
	Annual	August-October	Ground survey	Species/100 net hours (riparian)
	Periodic	April-June	Ground census	Species no./area; total birds/area; total species/area (upland)
	Periodic	April-June	Ground census	Species no./area; total birds/area; total species/area (riparian)
Trout[a]	Periodic	June-July	Ground survey	Distribution; age structure
Waterbirds	Annual	April-July	Ground survey	Breeding pairs/area; fledging young/area; total birds/area

[a] Cooperative project with Oregon Department of Fish and Wildlife.
[b] Periodic surveys occur every 5-10 years.

B. PUBLIC USE MONITORING

Monitoring of campgrounds will receive highest priority under public use monitoring. Campgrounds will be checked regularly to assess impacts on soils, vegetation, and wildlife. New campgrounds will be monitored to assess amount of use.

Hiking areas will be monitored to make sure that damage to the environment, especially riparian areas, is not occurring. Communication with Refuge biologists will be conducted throughout the high-use season (May-October) to assess whether wildlife disturbance is occurring.

ROS (Recreation Opportunity Spectrum) areas (Map 2-13 of the FEIS) will be monitored to make sure that they continue to meet the criteria of the settings identified for them in Appendix K of the FEIS, and according to long-range public use objectives (Chapter 1, Section Two). Visitor use will be monitored to identify

which uses are increasing and which may not be compatible. Based on findings of monitoring efforts, adjustments may be made to maintain compliance with long-range objectives and to ensure continued compatibility of the public use program. Additional information on public use monitoring is provided in the Refuge Recreation Plan.

IMPLEMENTATION OF THE DECISION

Implementation of Alternative D, as described in Chapter 2 of the FEIS, and adoption of the Refuge goals and objectives, as outlined in Chapter 1 of the FEIS, takes effect immediately upon my signing of this ROD. For additional information concerning this decision, contact Barry Reiswig, Project Leader, Sheldon-Hart Mountain Refuge Complex, P.O. Box 111, Lakeview, Oregon 97630, or call (503) 947-3315.

Deciding Officer:

MICHAEL J. SPEAR
Regional Director
Portland, Oregon

August 3, 1994

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