M 7/24/92

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Ely District Office
HC 33 Box 33500
Ely, Nevada 89301-9408

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

4700 (NV-046)

JUL 2 4 1992

Commission for the Preservation
of Wild Horses & Burros
Cathie Barcomb
Executive Director
Stewart Facility
Capitol Complex
Carson City, NV 89710

Dear Reader:

Enclosed is a copy of the Draft Antelope Herd Management Area Plan (HMAP) and the associated Preliminary Environmental Assessment (EA) for your review. The HMAP is a rewrite of the 1987 plan due to changes in appropriate management levels (AMLs) based on analysis of monitoring data. The Antelope Herd Management Area has been selected as one of the sites for a pilot project to implement fertility control through immunocontraception. The HMAP was revised to reflect new population data and the methodology for fertility control.

Please review the documents and provide comments in writing to the Ely District Office, Schell Resource Area, at the above address, by August 27, 1992. All comments will be considered for inclusion in the final HMAP and EA. If you have questions, please call Sheree Kahle, Wild Horse and Burro Specialist at (702) 289-4865.

Sincerely,

Hal M. Bylee

acting for Kenneth G. Walker
District Manager

2 Enclosures
1. Draft Antelope HMAP
2. Preliminary EA

7/24/92

ANTELOPE WILD HORSE HERD MANAGEMENT AREA PLAN

SCHELL RESOURCE AREA

ELY DISTRICT

TABLE OF CONTENTS

ANTELOPE HERD MANAGEMENT AREA PLAN

I. INTRODUCTION

A. Location and Setting

The Antelope Herd Management Area (HMA) is located approximately 35 miles northeast of Ely, Nevada. Maps 1 and 2 in Appendix 1 show general location of the HMA and the HMA itself. The herd area boundary to the east is the Nevada/Utah State line. The boundary on the north is the Elko and White Pine County line which is also the Ely/Elko BLM District boundary. Steptoe Valley west of U.S. Highway 93 is the western boundary south from the Ely/Elko County line to Schellbourne Pass Rd. The boundary roughly follows the Schellbourne Pass Rd to the east through Tippett Pass. From Tippett Pass, the line goes north through Antelope Valley to Tunnel Canyon and then east to the Goshute Indian Reservation. The herd area encompasses a total of 400,335 acres, with 390,553 acres of public land and 9,782 acres of private land which is scattered in small parcels throughout the HMA. The Schell Resource Area (RA) has administrative responsibilities for the entire HMA although a portion of the HMA is within the Egan Resource Area. A total of 312,544 acres are in the Schell Resource Area and 87,791 acres are in the Egan Resource Area. Map 3 shows land status of the area (Appendix 1).

The Antelope HMA lies just south of the Antelope Valley HMA (Elko District, Wells Resource Area). Each resource area is responsible for the administration of its own herd area. Therefore, the Antelope Herd Management Area Plan (HMAP) will address only those issues and management objectives related to the wild horses within the Ely District. There is considerable movement of horses between the two herd areas due to seasonal differences in forage and water availability. Therefore, all management actions will be closely coordinated between the Districts.

B. Background Information

The Antelope Herd Management Area Plan is designed to manage the wild horse population inhabiting the Antelope HMA in accordance with Washington Office Instruction Memorandum No. 83-289, Title 43 Code of Federal Regulations (Part 4700), and Nevada State Office Manual Supplement 4730.6. The wild horse population will be managed as a component of the public lands in a manner that maintains or improves the rangeland ecosystem and promotes a thriving natural ecological balance with all other users and resources. The HMAP adheres to the multiple use policy specified in the Wild Free Roaming Horse and Burro Act of 1971 (P.L. 92-195) and the Federal Land Policy and Management Act of 1976 (P.L.

94-579), while maintaining the free roaming behavior of the wild horses within the HMA.

Preparation of a wild horse herd management plan designed to manage the wild horses within the Antelope HMA, with multiple use taken into consideration, was recommended by the Schell Management Framework Plan (MFP) and the Proposed Egan Resource Management Plan (RMP) and Final Environmental Impact Statement (Ely District, Bureau of Land Management, U.S. Department of the Interior, 1983 and 1984). An HMAP was developed for the Antelope HMA and was approved in 1987. Revision became necessary due to recent Final Multiple Use Decisions (FMUDs) resulting from the Land Use Plans (MFP and RMP). These decisions set Appropriate Management Levels (AMLs) for wild horses in that portion of the HMA within the Chin Creek, Tippett, Sampson Creek Allotments in the Schell RA and Becky Creek Allotment in the Egan RA. The FMUDs also set stocking rates for livestock. Based on the analysis of monitoring data, the decisions identified the need to make reductions in wild horse numbers and livestock stocking levels because of resource damage. Due to high rates of increase and the high cost of having to repeatedly remove the excess wild horses, population fertility control will now be implemented within the State of Nevada. The Antelope HMAP will direct the use of fertility control methods and will address specific objectives related to fertility control. Because the wild horses within the Ely District's Antelope HMA and the Elko District's Antelope Valley HMA intermix; all fertility control methods, census, removals, and other management actions will be closely coordinated between the districts.

C. Resource Information

1. Wild Horse Population Baseline Data

a. Wild Horse History

Horses have been a part of the range environment at least since contemporary livestock use began. Often, homesteaders, ranchers, and miners would turn horses out on the range during the winter when they were not needed for work animals. In the spring, horses were rounded up, sorted, and some were kept for use. Those not needed at the time were either released, destroyed or sent to slaughter houses. There were quite a few horses that were never captured because they had gone wild. These horses remained free and reproduced, providing a fairly stable source of horses. Numbers typically did not become excessive due to frequent roundups.

There is some evidence that the Army Remount Service was active in at least part of the area during the early 1900's through 1940. Remount stallions, mostly thoroughbreds and Morgans, were periodically released on the range as breeding stock for desired

offspring. A few draft horses were also introduced to provide sturdier horses for pulling supply wagons and heavy artillery. Existing, undesirable stallions were often shot to give the remount stallions breeding dominance.

In 1971, the Wild Free-Roaming Horse and Burro Act was passed protecting wild horses. Prior to the passage of the act, populations were kept under control by ranchers and others who would remove horses for use or to sell to slaughterhouses. As a result of protection, the population in the Antelope HMA has increased dramatically and conflicts with other users are intense. The BLM has removed horses to keep population levels in check but the Antelope HMA shows a high rate of increase as well as much movement between the Elko and Ely Districts. Management efforts have been and will continue to be coordinated between districts.

Wild horse population levels were not documented prior to the first aerial census conducted in 1975. Several censuses have been conducted since that time and numbers counted are shown in Table 1. The latest census map is located in Appendix 1, Map 4.

Table 1. Census Data for Antelope HMA (Ely) and Antelope Valley HMA (Elko).

Date	Antelope	Antelope Valley	Total
3/75	275	408	683
78	149	449	598[a]
3/79	425	122[b]	547
2/80	167	191	358[c]
5/81	288	164	452
5/83	303	249	552
6/85	451	267	718
2/87	782	366	1,148[c]
1/88	528	131	528[c]
3/90	753	418	1,171
11/90	574	-	574[c]
2/91	331	366	697[c]
2/92	468	545	1,013

a.) Claimed horses were removed between 1975 and 1978.
b.) Incomplete census in Elko District
c.) Post removal census

Periodic removals have occurred in the Antelope and Antelope Valley HMAs. Table 2 shows numbers of wild horses removed from each area.

Table 2. Wild Horse Removals in the Antelope HMA (Ely) and the Antelope Valley HMA (Elko).

Date	Antelope	Antelope Valley	Total
8/78	41		41
1/80	340	361	711
9/86	107		107
2/87	58	340	398
1/88	526	118	644
7/88		175	175
9/90	412		412
2/91	225		225

b. Present Situation

i. Wild Horse Habitat and Use Areas

Wild horse habitat in the Antelope HMA was analyzed using the 1986 Draft BLM Wild Horse and Burro Habitat Evaluation Procedures. Preliminary results from the analysis indicate that forage availability is the most limiting suitability factor in the Antelope HMA. Water, cover and space were determined to be less restrictive than forage availability in terms of supporting the wild horse population.

For detailed information of rangeland monitoring data within the HMA, refer to the Final Multiple Use Decisions for the Chin Creek, Tippett, Sampson Creek, and Becky Creek Allotments and also Appendix II.

Wild horse use areas and seasons of use are shown in Map 5, Appendix 1. There are five broad use areas in the HMA: the Schell Creek Range and west bench, Spring Valley, Antelope Range, Antelope Valley and the Black Hills. The mountain ranges are generally used in the summer months and the valleys are used more in the winter months, although, depending on weather conditions horses can be found year round in all areas. The Black Hills are used year round as they are low and rolling. Horses move into the Antelope Valley HMA in the Elko District during the winter months if snow is available. They return in dry months because there is very little water in the Antelope Valley HMA.

ii. Population Demographics

Demographic data on the wild horses of the Antelope HMA are derived from data gathered during removals. Age structure, age specific sex ratios, survival rates and rates of increase are all calculable from removal data. Figure 1 shows the general age structure of the Antelope Herd.

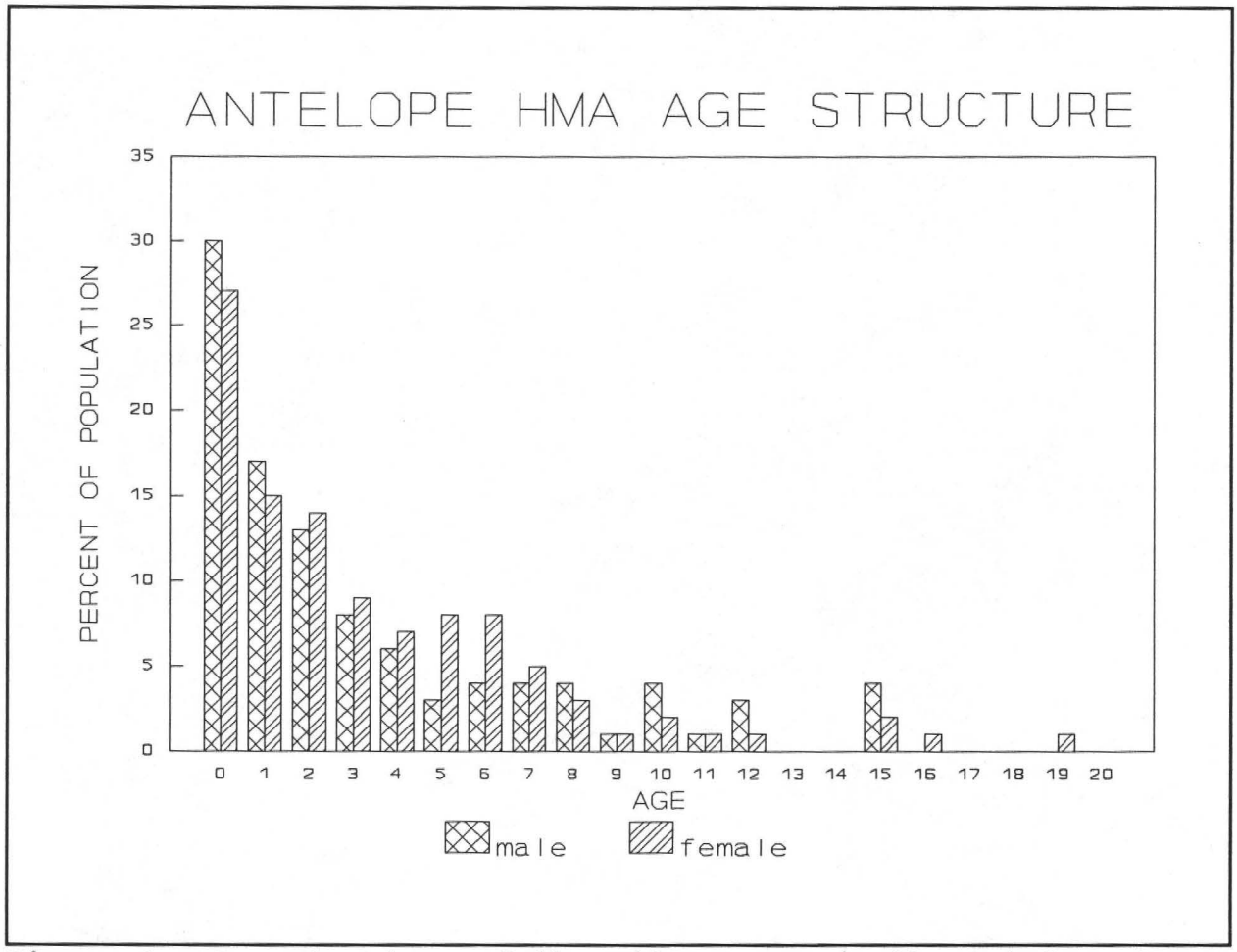

Figure 1. Age Structure of the Wild Horses in the Antelope HMA.

Age structure is useful in determining the direction a population is headed. For example, a population with many young animals is an increasing population and vice versa; a population with many older animals is usually decreasing. The wild horse population in the Antelope HMA is increasing fairly dramatically as shown by the fact that approximately 66% of the population is four years old and younger. The life-span of wild horses is believed to average 20-25 years, so that those horses that were being recruited to the population in 1971 (year the Act was passed), are just now reaching old age. One reason the older age classes are so small is because with the smaller population in the early 70's, the number of young born each year was smaller.

Survival rates and rates of reproduction are factors of population demographics which give insight into the health and vigor of a population. Several computer models exist which provide these data using representative samples of a population, in this case using data from removals. Dr. Walt Conley, from New Mexico State University has developed models which can be used for wild horse population analysis. The data on horses removed from The Antelope HMA was input to the models. Age specific survival rates (and inversely, mortality rates) and annual rate of increase were calculated. The annual rate of increase derived from the model was 21%. When reproductive rate is also calculated using the following formula, from the BLM Nevada Manual Supplement 4730, an annual reproductive rate of 21% is shown.

$$\text{REPRODUCTIVE RATE} = \frac{\text{NUMBER OF ANIMALS 0-1 YEAR OF AGE}}{\text{NUMBER OF ANIMALS 1 YEAR AND OLDER}}$$

Figure 2 shows calculated age specific survival rates for both males and females.

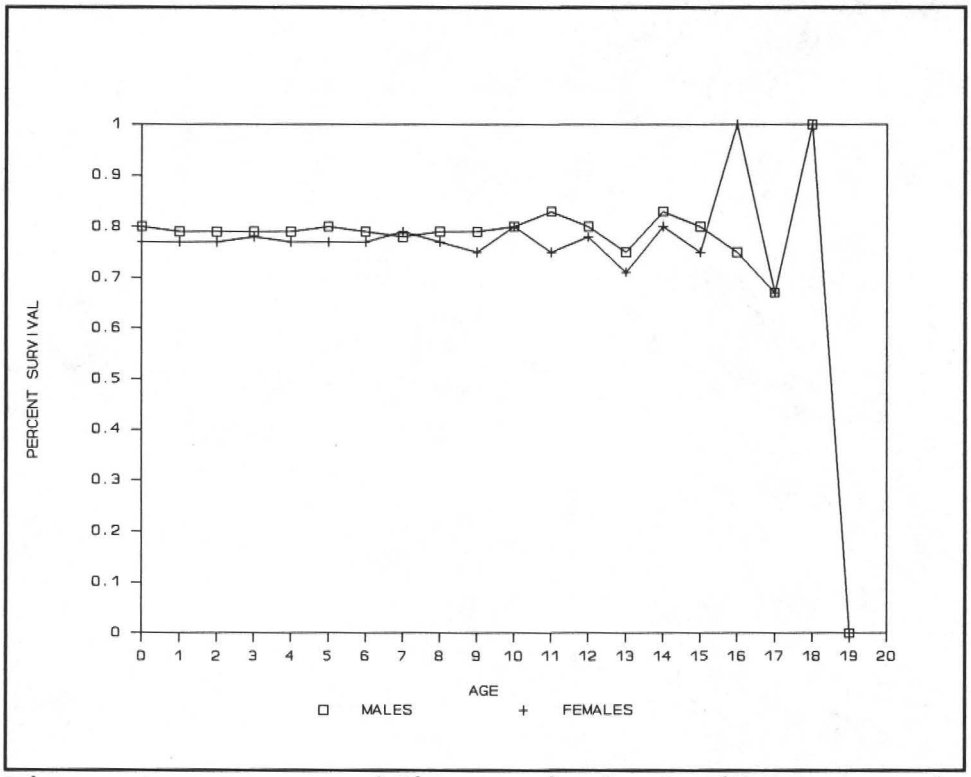

Figure 2. Age Specific Survival of Wild Horses in the Antelope HMA.

To date, there have been no genetic studies conducted on the horses in the Antelope HMA. Overt characteristics, such as coloration and conformation are evident from animals removed from the range. At least one partial albino was noted during the 1990 removal as well as some potentially primitive bloodlines. Table 3 shows percentages of each color variation found in the HMA.

Band structure within the HMA is derived from census data and field observations. Band size ranges from 1 to 50 animals but varies depending on the total population size. When the population is large, band sizes increase and conversely when the population is smaller, band sizes decrease.

Bands typically have one stallion and several mares. Data is sketchy on average numbers of each sex per band because it is not practical to sex the animals during aerial census. Sexing animals in the field is often not possible due to distance of the animals and the fact that animals are usually running from the observer.

Table 3. Percentage of Color Variations in the Antelope HMA.	
Color	Percentage
Sorrel	38
Bay	26
Brown	13
Black	8
Strawberry Roan	3
Buckskin	3
Dun	3
Red Roan	2
Palomino	1
Grulla	1
Blue Roan, Pinto, White, Gray, Appaloosa	2

A few horses, classified as duns, show the primitive color characteristics of the "Spanish Barb". These traits include a general buckskin color with a dark dorsal stripe down the back, black zebra stripes on the legs, and a black mane and tail with blonde mixed in. There is controversy over whether these characteristics are primitive or not and the purity of the bloodlines is questionable. However, any horses exhibiting these traits will be excluded from removals or fertility control measures.

Overall, the condition of the horses is fair at this point. However in the late 80's and early nineties, when population levels were excessive, many horses that were removed were in poor condition and exhibited stunted growth. The 1990 and 1991 removals eased competition for forage; condition of the range resources and the horses is expected to improve.

2. Reference to the Land Use Plan (LUP)

Four Final Multiple Use Decisions (FMUDs) have been issued resulting from the Schell Resource Area LUP and the Egan Resource Area LUP. These decisions were issued as the final step in the Allotment Evaluation process which is directed by Washington Office Instruction Memorandum No. 86-706 and Nevada State Office

Instruction Memorandum No. 87-270. Multiple use decisions are issued for individual grazing allotments in conformance with the LUPs. Wild horse herd management areas may cover several allotments but it would be impossible to allocate forage for all users on an HMA basis. Therefore, all allocations of forage are being made through the allotment evaluation and decision process.

The FMUDs for the Chin Creek, Tippett and Sampson Creek Allotments in the Schell RA were issued on July 16, 1990; July 17, 1990; and July 18, 1990, respectively. The FMUD for the Becky Creek Allotment in the Egan Resource Area was issued on April 19, 1991. The FMUDs are available upon request at the Ely District Office. A map of the four allotments in relation to the HMA is found in Appendix 1, Map 6. The four allotments make up approximately 57% of the entire HMA and contained over 82% of the population in the last census (2/92). The decisions made forage allocations for all users including setting AML for wild horses for that portion of the HMA that lies within the allotments. The remaining allotments within the HMA are in the process of being evaluated. Once AML has been established for all allotments, a total AML will be equal to the sum of the AMLs for each allotment. Wild horses will not be restricted to the exact number in each allotment but will be kept at or near the total AML for the HMA. For specifics of how the allocations were made, the rationale for the allocations, use areas, seasons of use for livestock, evaluation data, etc., refer to the FMUDs. Table 4 shows specific allocations by user for the four allotments.

Table 4. Forage Allocations From the FMUDs for the Chin Creek, Tippett, Sampson Creek and Becky Creek Allotments.

Allotment	User	AUMs[1] (#)
Chin Creek	Livestock	7,372[2]
	Wild Horses	1,824 (152)
Tippett	Livestock	5,393
	Wild Horses	408 (34)
Sampson Creek	Livestock	1.327
	Wild Horses	300 (25)
Becky Creek	Livestock	671
	Wild Horses	96 (8)

1 AUM = Animal Unit Month.
2 5,743 additional AUMs were placed in Mandatory Nonuse.

The forage allocations reflect reductions for all users which were necessary due to over-grazing and resource damage except in the Becky Creek Allotment where no changes were determined to be necessary. For each use area in the allotments evaluated, all reductions were made in proportion to the amount of use (and subsequent damage) each user was making. Livestock use will be authorized by use area but wild horses will be allowed to use the entire HMA as long as numbers do not exceed AML. For specific vegetation data and status at key areas within the HMA, refer to Appendix II.

3. Other Resources and Uses

Livestock grazing is the most important consumptive use within the HMA and conflicts with wild horses have been severe. However, the recent Multiple Use Decisions which direct grazing management have detailed plans to reduce competition and increase forage for all users. See Appendix III for more information on livestock, wildlife and other uses within the HMA. A complete description of the environment can be found in the Schell Resource Area Unit Resource Analysis and in the Egan Draft Resource Management Plan and Final Environmental Impact Statement.

II. OBJECTIVES

A. Land Use Plan Objectives

In 1982, the Schell Grazing EIS outlined five objectives for the resource area. The Antelope HMA is subject to those objectives which are as follows:

Manage the vegetation resource and its uses to attain utilization rates not to exceed those recommended by the Nevada Rangeland Monitoring Task Force for sustained yield (45 percent for shrubs, 55 percent for grasses and forbs).

Attain and maintain habitat for reasonable numbers of wildlife, reestablish bighorn, pronghorn antelope, and elk on historic ranges, and protect crucial wildlife habitat.

Upgrade and maintain all riparian and wetland areas in good or better condition.

Maximize livestock based on sustained yield of the forage resource.

Maximize wild horse numbers based on sustained yield of the forage resource.

The Schell Resource Area Decision Summary and Record of Decision (BLM, 1983) outlined three objectives for wild horse management in the resource area:

> Develop wild horse management plans for the six Herd Management Areas within the Schell Resource Area in the following priority order: Antelope Herd, Wilson Creek Herd, Dry Lake Herd, Seaman Herd, White River Herd, and the Moriah Herd.
>
> Increase the availability of water and forage for wild horses. Wherever possible, year long water will be made available at all water sources within Herd Use Areas. Further, reservoirs that are fenced will be improved so wild horses may obtain water.
>
> The initial stocking level for wild horses will be the number present in each herd area as determined by the 1983 inventory (303 for the Antelope Herd). In addition, the Record of Decision (ROD) accepted the proposed action, as modified, to establish the initial stocking rate for wild horses at the number present in each herd area as determined by the 1983 inventory, and to base future adjustments of the initial levels on adequate monitoring data or through agreement. The ROD also states that "Wild horse numbers to be managed for will be determined through consultation and coordination during preparation of the activity plans." *

* Note: IBLA decisions 88-591, 88-638, 88-648, and 88-679, dated June 7, 1989, stated that initial stocking levels stated in land use plans were not to be used as AMLs but that AMLs must be based on monitoring data. Through the allotment evaluation process, stocking level (AML) was determined based on the analysis of monitoring data.

The Egan Resource Area RMP states the following objectives:

The objective of this plan is to emphasize a balanced approach to land management, protecting fragile and unique resources, while not overly restricting the ability of other resources to provide economic goods and services.

Wild Horses

> Short-Term (0-5 years): Wild horses will be managed at a total of 1,451 animals according to the following populations within the herd use areas:
>
> Antelope 14 (refer to RMP for other HMAs)
>
> Continue existing rangeland monitoring studies and establish new studies as needed.

Monitoring studies will be used to determine if adjustments in wild horse numbers are necessary to meet management objectives.

Long-Term (6-20 years): Future adjustments in wild horse numbers will be based on data provided through the rangeland monitoring program.

The rangeland monitoring program will also provide data to determine the need for additional improvements for wild horses.

B. Habitat Objectives

The BLM Draft Strategic Plan for Management of Wild Horses and Burros on Public Lands (1992) states that there will be increased program emphasis on wild horse habitat management. Specific wild horse habitat objectives for the Antelope HMA include the following:

1. Vegetation.

Manage for the most appropriate seral stages to provide for desired quantity, quality, and density of forage in order to meet the requirements of the wild horses and other foraging animals. Refer to Appendix II for short and long term management objectives for each key area in the HMA. Utilization levels will be maintained at approximately 45% on shrubs and 55% on grasses in accordance with the recommended utilization levels in the Nevada Rangeland Monitoring Handbook (1984).

2. Water Distribution and Availability.

Improve distribution and provide water yearlong for wild horses throughout the HMA where possible.

C. Wild Horse Objectives

1. Multiple Use.

The objective in the Antelope HMA is to maintain a healthy, viable population of wild horses in a thriving natural ecological balance with all other resources and users.

2. Appropriate Management Level (AML).

The wild horses in the portions of the Antelope HMA that lie within the Chin Creek, Tippett, Sampson Creek and Becky Creek Allotments will be managed at a median level of 219 horses (see Table 4). When the remaining allotments are complete (prior to 1994), a total AML for the HMA will be determined. An estimate of total AML is 274 animals based on the AMLs already established

(219) and the numbers that were counted during the latest census on those allotments that do not have evaluations complete (55). The estimated AML of 274 may change once all evaluations are complete. The number of horses will be maintained within a range of ± 15% of AML.

AML will be maintained using one or more of the following options: periodic removals with no selectivity, selective removals targeting specific age groups, and/or fertility control. The objective of the selective removals and fertility control is to decrease the reproductive rate in the wild horse population so removals are not necessary more than once every four years. The reproductive rate is now 21% annually; the objective is to reduce the rate by at least 10%.

3. Free-Roaming Characteristics.

The wild horses within the Antelope HMA will be managed in a manner that maintains their wild free-roaming characteristics.

4. Coloration and Conformation.

The wild horses within the Antelope HMA which exhibit the "Spanish Barb" characteristics will be maintained within the population. Removals and or fertility control treatments will exclude those horses that obviously exhibit those traits. No other characteristics or conformations will be selected. Only those animals with gross deformities or disease will be eliminated from the herd.

III. MANAGEMENT METHODS

A. Attaining Land Use Plan Objectives

Land Use Plan Objectives are general. By conducting management actions to attain habitat and animal objectives, the LUP objectives should be met.

B. Habitat Management Methods

1. Vegetation.

Managing for the most appropriate seral stages to provide forage needed for grazing animals will be accomplished by maintaining the wild horse population at the appropriate management level as determined through monitoring (see Section III.(C.) Wild Horse Management Methods). Management of livestock through the allotment evaluation and decision process is also necessary to attain vegetation objectives. Refer to the appropriate allotment evaluations and FMUDs for details on livestock management. Removals and fertility control on the wild horses will have a

direct impact on seral stage condition by reducing the forage utilization in critical areas. By reducing the rate of increase, it will be easier to maintain population levels which will help achieve appropriate seral stages.

Utilization levels on key areas will be maintained through population control measures with adjustments to grazing level by all users being determined through monitoring data (see Section III.(C.) Wild Horse Management Methods).

Monitoring data to be collected in conjunction with the range and wildlife programs include the following:

a. Trend and Condition. Trend is defined as the direction of change in rangeland condition or ecological status. The Nevada Rangeland Monitoring Handbook (1984) and Technical Reference 4400-4 recommend the use of frequency sampling to determine trend. If frequency data show a significant change, condition (or ecological status) will be determined. Condition data will be used to evaluate whether seral stage objectives are being met at each key area. The frequency sampling method described by Tueller et al., (1972) will be used to determine trend.

b. Utilization. Utilization is defined as the proportion of current year's forage production that is consumed or destroyed by animals (including insects). The Key Forage Plant Utilization Method will be used to determine utilization levels as described in the Nevada Rangeland Monitoring Handbook as well as the BLM Technical Reference 4400-3, Section 5.23. Utilization levels will be determined at key management areas and through use pattern mapping when possible.

c. Precipitation. Precipitation data is collected four times per year from rain gauges located within the HMA and from weather data stations in Ely, Nevada and Ibapah, Utah.

Wild horse habitat studies will be established in areas where none exist to determine the impact of grazing animals on the HMA. Existing studies for wild horses, livestock and wildlife will continue to be read. These studies include utilization, trend, precipitation and wild horse population estimates and seasonal movement inventories. Many of the key areas in the HMA are set up to monitor utilization and trend for both livestock and wild horse use. All vegetative studies will be coordinated with the Wildlife Biologists, Range Conservationists in charge of each grazing allotment, and all other interested parties.

2. Water Distribution and Availability.

Yearlong water for wild horses will be provided and water distribution and availability will be improved through spring developments, pipeline construction, and development of catchment reservoirs. Many areas receive very little use due to the lack of water. Improved water distribution will relieve many areas of the heavy use they presently receive. Five water developments identified in the 1987 Antelope HMAP have been completed: a. Domingo Well Spring (redevelopment), b. Kingsley Spring and Pipeline, c. Cattail Spring, d. Black Hills Well Pipeline and e. North Spring. The first three of these water projects were developed with the assistance of the National Mustang Association. While improving the habitat, development of these waters and additional waters for livestock has also increased the movement of horses into the Ely District from the Elko District because water is much more scarce in Elko. This has created problems of over-population and over-utilization in the Antelope HMA (Ely). The horses return to Elko when snow or runoff is available in Elko because there is more forage available there.

The water developments identified below have been proposed by other resource activities but will have major benefits to wild horses. All projects are listed in descending priority for development and for consideration of joint funding with other resource activities, if funding is available:

Ayarbe Spring Redevelopment[1]
Grouse Spring[2]
Skull Spring[2]
Horse Spring[2]
Deep Creek Well and Pipeline
Goshute Reservoir
Antelope Well Pipeline
North Creek Pipeline
Cress Spring
Sampson Creek Pipeline
Camp Spring
Lookout Spring Pipeline
Tunnel Canyon Spring Redevelopment
Sharp Creek Pipeline
South Spring
Sand Spring
Water Canyon Pipeline

[1] The National Mustang Association has expressed an interest in entering into a Cooperative Agreement to assist the BLM in developing this water for wild horse use.

[2] The Nevada State Commission for the Preservation of Wild Horses has expressed an interest in entering into Cooperative Agreements to assist BLM in development of these waters for wild horse use.

Development of each of the above waters is dependent upon attaining water rights from the Nevada State Water Engineer prior to development and will be within the scope of the Schell MFP and the Egan RMP.

C. Wild Horse Management Methods

1. Multiple Use.

Wild horse forage allocations will be established and determined through the analysis of monitoring data in conjunction with both livestock and wildlife through the allotment evaluation process. Wild horse management activities will be coordinated with all other BLM programs.

2. Appropriate Management Level

a. AML

Once AML is established for all allotments within the HMA, monitoring will continue and AML will be revised if monitoring data shows a change is needed to meet LUP objectives.

If monitoring data shows reductions in animal numbers are necessary, reductions will be made in the following manner:

Where a kind of foraging animal can be identified as the primary cause of forage resource damage in a specific area, adjustments will be made from the base levels for that particular kind of animal (active use for livestock, AML for wild horses, and reasonable numbers for wildlife). This foraging animal will be determined from monitoring studies, utilization, actual use, sightings, counts, etc.

Where a single kind of foraging animal cannot be identified as the primary cause of forage resource damage, adjustments will be made proportionately between livestock and wild horses based on the percentage of use each is making at the time resource damage is occurring. Adjustments will be made to active use for livestock and AML for wild horses.

If additional forage is available after meeting AML for wild horses, livestock active use and reasonable numbers for wildlife, additional forage may be divided proportionately among all foraging animals.

b. Maintaining AML - Discussion of Options

Maintaining wild horse AML will be accomplished by one or a combination of the following: removals without selectivity, removals with selectivity based on age or sex, and/or fertility

control. All capture operations, whether for removal or treatment, will follow the Capture/Removal Plan for the Antelope HMA, in Appendix IV.

i. Removals With No Selectivity

Removals may be conducted with no selectivity other than removing only adoptable animals. Adoptable animals are generally any animal under 10 years of age. In the past the removals with no selectivity have been unsuccessful at keeping wild horse populations under control and have resulted in saturation of the adoption market. Unadopted horses have been placed in private sanctuaries which is not cost efficient.

ii. Selective Removals

Selective removals can target specific age groups or a specific sex to be removed. Altering the age structure of the herd is aimed at reducing the number of animals in the primary breeding age groups. The age structure of the wild horses in the Antelope HMA is weighted heavily toward younger animals. Data collected from removals indicate that approximately 66% of the population is from one to four years old. Wild horse mares are first able to conceive at age 2 and continue until death. Peak fertility is realized during ages three to nine. After that, mare cycling becomes less regular and more dependent on fluctuating environmental factors which serve to restrict reproduction. Males are able to first copulate at age 1 and will continue to do so until death or preclusion through social interactions within the herd. Peak reproductive years for males are between age 4 through 9. After that, physical decline and loss of social dominance reduce participation in reproduction.

An age specific removal program would target removing approximately 90% of the 1 to 4 year old animals with repeated removals every 3 to 4 years. Population modeling, using data from all removals from the State of Nevada, indicates that repeated treatments may be able to slow foal recruitment from 18% of the total population down to 10%. Normal age distribution would be achieved after approximately 12 years, following initial treatment. Altering the age structure of the population could impact herd behavior. As the population ages and fewer animals are available to fill dominant roles in the social structure, older animals would continue to dominate and reduced competition for dominance could result in bands containing larger numbers of animals.

Sex specific removals would target mares in order to decrease the number of breeding females. Removing males is not effective because one male would merely acquire larger harems due to a lack of competitive dominance. Population modeling has shown that a

ratio of 70 males to 30 females may be able to slow foal recruitment from 18% of the total population down to 12%. A program to alter sex ratios could target mares aged 1 through 6 with male populations remaining intact.

Each of the selective removal strategies would be reversible over time. The time required to re-establish a normal age structure or sex ratio would be dependent on the size of the population and number of treatments administered prior to termination. Selective removals would require little additional stress and handling to the animals over current removal procedures.

iii. Fertility Control - Immuno-Contraception

Immuno-contraception represents one of the most recent advances in fertility control methodology. One of the most successful applications of immuno-contraception involves vaccinating the animal with porcine zonae pellucidae (PZP) which prevents fertilization of the egg. The zona pellucida is a non-cellular protein membrane which surrounds all mammalian eggs. In order for fertilization to occur, sperm must first bind to this membrane before they can penetrate the egg. The intramuscular injection of PZP into mares causes them to produce antibodies against the protein. The anitbodies bind to the injected protein as well as the sperm attachment sites on the mare's eggs. This prevents sperm from attaching to the egg and prevents fertilization.

Pen and field studies have been conducted on wild horses using porcine zona pellucida (PZP). PZP immuno-contraception in wild horse mares was found to be successful in reducing pregnancy. However, the process requires that the initial inoculations be followed up with a booster shot 21 days after initial treatment. The contraceptive effectiveness only lasted one season. Studies are currently being conducted to develop a one shot vaccination which will have an effective life of two or more years.

Field studies on wild horses has shown over 90% success in preventing pregnancy. Population models indicate that the current one year duration of control would be ineffective in the long-term management of wild horse populations. Speculative modeling, using a drug with a three year effective life, indicates that immuno-contraception targeted at 4 to 9 year old mares would be feasible in controlling reproduction.

PZP has been shown to be reversible in only a short time frame. No side effects or environmental hazards have been identified. Some animals may experience allergic reactions to the agent, however, no problems have been identified in previous wild horse studies.

c. Maintaining AML in Antelope HMA

i. Selected Option for Antelope HMA

The Antelope HMA (Ely) and the adjacent Antelope Valley HMA (Elko) have been identified as herd areas where a pilot project for fertility control will be implemented in late 1992. The method to be used in the Antelope HMA will be a combination of a selective removal to attain AML, and the use of immuno-contraception to maintain AML over a longer period of time.

The selective removal is scheduled to begin in September 1992 and will target animals in the one-to-four year old age classes. In Feb., 1992, a total of 468 wild horses were counted in the Antelope HMA. An estimated colt crop of 20%, in the spring of 1992, would give a population size of approximately 562 animals. To attain an AML of 274 animals, a total of 288 animals will need to be removed. Based on removal data, 66% of the population is between the ages of one and four. Therefore, there will be approximately 371 horses available for capture, removal and subsequent adoption. It should be possible to capture and remove the necessary 288 animals. Table 5 shows the age class structure of the population before and after the selective removal based on percentages in each age class existing at the last removal (2/91).

Table 5. Age class structure before and after selective removal of 288 horses in age classes one to four.

	Male			Female		
Age Class	Present Number	Number to Remove	Number to Remain	Present Number	Number to Remove	Number to Remain
0	67	52	15	64	50	14
1	45	35	10	42	33	9
2	35	27	8	40	31	9
3	18	14	4	19	15	4
4	18	14	4	20	16	4
5 - 9	37	0	37	81	0	81*
10 +	48	0	48	29	0	29
		Total =	126		Total =	150

* Of these, approximately 40 will be treated with immuno-contraceptive agent and will be non-breeding.

The proposed action plan for the Antelope HMA is as follows: Immuno-contraceptive drugs will be injected into 50% of all five-to-nine year old females. Based on the data presented in Table 5, there will be a total of approximately 81 mares in the age classes 5 to 9. Fifty percent of those mares (i.e. approximately 40 mares) will be treated with the immuno-contraceptive agent.

Exact numbers of animals to be treated with immuno-contraception will be determined through the analysis of census data collected just prior to the implementation of the project. Due to the seasonal movements of the horses between the Ely and Elko Districts, the exact number in each area is hard to predict but will most likely be close to the numbers presented above.

If the available drug requires two injections approximately 40 mares will be treated and held in captivity for three weeks. After three weeks the mares will be given a booster shot and be released.

If an immuno-contraceptive drug is available which lasts one or more years with only one injection, it will be necessary to test that drug by comparing it to the 2-injection drug. In this case approximately half of the targeted mares will receive the one injection drug and the other half will receive the two injection drug. The group receiving two injections will be held in captivity for three weeks and then will receive the booster.

Grass hay will be provided for any animals held for a three week period to alleviate problems which can arise when wild horses switch from native vegetation to high protein alfalfa hay. All animals held will be injected with a broad spectrum antibiotic to help prevent illness. Also, dust control will be strictly enforced throughout the confinement period. If dust is a persistent problem, pea size gravel will be spread in the holding pens.

Under either treatment regime, there will be small control group which receives a placebo preparation. Refer to Appendix 5 for a full description of ingredients of each treatment.

Calculations using age class data, percentages of mares in the population, percentage of mares breeding each year, and numbers to remain, predict that the rate of increase will decrease to 11% after the selective removal and immuno-contraceptive program.

The advantages to this strategy are identified as, a) the basic gene pool of each herd will remain intact; b) younger more adoptable animals will be available for private placement; c) displacement of older animals will be minimized; d) capability for selection and upgrading herd through sterilization of animals with undesirable qualities, or physical debilitation; e) opportunities to reverse or continue contraception; f) reduced

rates of population growth; and g) mares continue to ovulate so that stallions will continue to tend them and maintain the harem structure.

In conjunction with the pilot fertility project, the University of Nevada, Reno (UNR) will be conducting studies on the wild horse population. The UNR study proposal is found in Appendix 5.

ii. Methodology

Methods which are common to all capture/removal/treatment operations are as follows:

Capture animals following current Nevada capture policies and procedures using either helicopter or bait/water trapping (see Appendix 4).

Animals will be sorted by sex and age with animals 1-4 years old being removed if they are in excess of AML.

Move animals to be released onsite into holding facilities with separate pens for males and females with foals. Holding facilities may or may not be required depending on the number of trap sites to be used, number of animals to be removed and the distribution of animals throughout the gather area.

Animals placed in holding facilities servicing more than one trap site should be marked according to capture site and if possible according to band so that band integrity can be maintained upon release. Animals should be released in the general area where they were captured with the horses they were captured with.

Excess animals should be shipped as soon as possible to avoid stress and the possibility of contracting diseases associated with confinement.

Release animals as each trap site operation is completed or upon completion of all gather operations. Holding time for all animals should be minimized.

Captures and treatments will not occur during the peak foaling season, March 1 through June 30.

Methodology for implementing immuno-contraception in mares will be as follows (see Appendix 5 also):

Mares determined to be the correct age for treatment will be placed in a squeeze chute; (i.e. healthy mares 5-9 years old).

Signalment characteristics including sex, age, color, special markings, etc., will be recorded for each animal.

A decision will be made if the animal is to be treated or to be part of the control group.

An identifying mark will be placed on the animal as described below in the tracking section.

If necessary, each animal will be injected with a long acting penicillin (Benzathine Penicillin) at a dosage of 50-75cc per horse. Injection will be deep intramuscular into the rear leg hamstring muscle with a needle and syringe or a jab pole syringe mechanism.

Inject PZP vaccine into mares selected to be in the treatment group. Injection will be a deep intramuscular injection in the opposite rear leg hamstring than the one injected with penicillin.

If necessary, a control group will be established consisting of untreated animals in the same age classes as the treated animals. Animals in the control group may be marked as described below in the Tracking section to determine whether marking affects the animal's behavior. Control group animals may also be injected with a placebo phosphate buffer solution in equal volume to the immuno-contraceptive agent to determine whether any affects are caused by injections.

Injected animals will be held in temporary facilities for thirty minutes to an hour to observe for possible allergic reactions.

If a drug is available which does not require a booster shot after three weeks, the animals receiving one injection will be released after the observation period.

When the two-injection vaccine is used (all targeted mares in the event the single dose vaccine is not ready for use and/or for the comparison group receiving the two injection vaccine), the horses must be held in captivity for three weeks between the injections and then can be released after the second injection.

iii. Tracking Animals

Selective Removals

Animals removed from the trap-site will be marked to ensure that they are returned back to the site where they were captured. This will be done through temporary marks (i.e. grease pencil,

paint etc.). Type of mark will depend on the anticipated length of stay in a holding facility.

Fertility Control

Temporary Marking. Animals that are to be returned to the HMA with no treatment will be marked to ensure that they are returned to the same site where they were captured. This will be done through temporary marking (i.e. grease pencil, paint etc.). Type of marking will depend on the anticipated length of stay in the holding facility.

Permanent Marking. Any animal that has been injected with immuno-contraceptive agent will be marked with a freezebrand. The freezebrand will consist of a mark identifying U.S. Government ownership as well as a two digit number representing the year of birth. The control group (if needed) will be freezebranded on the right hip and the treated animals will be branded on the left hip. All freezemarks will be 4 inches high and will be placed high on the animals hip to facilitate detection from the air.

iv. Monitoring Population

Population data, including total numbers, seasonal movements, home ranges, age structure, sex ratio, survival rates, mortality, and proportion of breeding females in each age class will continue to be collected and analyzed. Total number, seasonal movements and possibly home ranges will be determined through periodic censuses to be conducted at least once each season if possible. Population demographics will be determined through data collected during captures or removals. Collected data will be input to computer models which calculate rates of increase, survival rates, mortality rates, etc. Rates of increase will also be calculated using simple mathematics. Individual animal condition will be documented through observations during removals or captures as well as routine ground observations.

Baseline data elements are shown in Table 6. Page numbers reference the existing data in this document.

Table 6. Data Elements and Location in This Document.	
Data Element	Page Number(s)
Census	3
Recruitment (rate of increase)	6
Age Structure of Population	5 - 6
Foaling Rate	6
Survival Rate (and Death Rate)	6 - 7
Individual Animal Condition	8
Band Structure	7
Grazing Habits	4 - 5
Seasonal Movement Patterns	4 - 5

Short-Term Monitoring. For animals which are to be released back to the HMA, minimum standards will be to monitor the condition of the horses by ground and/or air within 24 hours of their release. A flight should be scheduled within 72 hours after release to assure no animals are trapped behind a fence or other obstacle which would keep them from food or water. Subsequent flights must be conducted once each week for three weeks with ground checks following up the aerial observations, if needed. Some of the data collected during these short-term monitoring flights will be used for a comparison to the baseline data elements.

Each district must conduct advance coordination with the appropriate military flight control centers when wild horse flights are to be conducted within military operating areas (MOA's) or restricted areas (RA's). Monitoring flights may be prohibited by military activity for a few hours or a few days but flights will resume as soon as the military clears the area. Ground observations will substitute for aerial observations if necessary.

Long-Term Monitoring. On a year long basis, monitoring data will be collected concerning the baseline data elements. At a minimum, one flight will be conducted after each foaling season to collect population recruitment data, proportions of adults to yearlings to foals, seasonal movement patterns, and grazing habits. Other data may be collected if determined to be necessary.

Evaluation of the effectiveness of the selective removals and/or the fertility control measures will be discussed under the Evaluation section of this document.

3. Free-Roaming Characteristics.

The wild free-roaming nature of the wild horses will be ensured through the following:

A. All projects proposed for the Antelope HMA will be analyzed in depth through an environmental analysis (EA) to determine if the project will impact the wild free-roaming characteristics of wild horses. Wild horse distribution, seasonal movements, daily movements, and home ranges will also be preserved in accordance with NSO Manual Supplement 4730, Release NV 4-6.

New fencing for livestock control and management will be minimized in the HMA. Use of herding and salting will be emphasized. If fences are necessary for livestock control, they will be designed with wild horses in mind, in accordance with NSO Manual Supplement 4730. Fencing will typically be open-end allotment boundary and pasture drift fences across the valley bottoms, and gap fences across narrow canyons. In either case, horses will have access around the fence ends. Gates will be opened by the livestock permittee, the Schell Wild Horse Specialist, or the Schell Range Technician when livestock are not authorized in the area, except on those fences designed to protect vegetation treatments and riparian areas. New fences will be flagged to increase visibility to wild horses.

B. Resource uses involving an increase in human activity in the HMA (eg. mining, recreation, etc.) will be evaluated closely. These types of activities may impact the free-roaming characteristics of the horses. Each activity or project will be handled on an individual basis. In analyzing the impacts, the overall and cumulative impact will also be analyzed.

At the present time, the fences proposed in the Antelope HMA, when constructed, will be designed to preserve the normal distribution and movement patterns for the majority of animals in accordance with NSO Manual Supplement 4730, Release NV 4-6.

4. Coloration and Conformation.

Coloration of the "Spanish Barb" traits will be preserved in the population by exclusion of those animals from removals and/or fertility treatments.

IV. EVALUATION AND REVISION

The effectiveness of the management actions in reaching the objectives stated in this plan will be evaluated as follows:

A. Effectiveness in Meeting Land Use Plan Objectives

Land Use Plan objectives are general and all other objectives conform to them. Reaching the habitat and wild horse objectives will help meet the land use plan objectives.

B. Effectiveness in Meeting Habitat Objectives

1. Vegetation.

Vegetation objective attainment will be evaluated through the multiple use rangeland monitoring program. Data will be collected, in conjunction with the range and wildlife programs, on utilization, condition, trend, and precipitation. The data will be analyzed to determine if utilization, condition and trend objectives are being met. If objectives are not met through the implementation of this plan and the livestock management program, numbers of all grazing animals will be re-evaluated.

2. Water Distribution and Availability.

The attainment of water distribution and availability objectives will be evaluated by periodic inventories of important water sources to determine if sufficient water is available to support the wild horse population.

C. Effectiveness in Meeting Wild Horse Management Objectives

1. Multiple Use.

Evaluation will consist of ongoing multiple use evaluations and decisions. All appropriate BLM programs will be involved in the evaluation and decision process.

2. Appropriate Management Levels.

a. AML.

AMLs will be calculated for the entire herd area by 1994. The multiple use evaluation process will continually re-examine AMLs and adjustments will be made if monitoring data suggests it is necessary.

b. Maintaining AML.

To evaluate the effectiveness of selective removals and/or fertility control in maintaining AML, comparisons will be made between all baseline data presented in Table 6 before and after implementation.

An attempt will be made to determine if environmental factors affected the results of the selective removals and/or fertility control measures. Comparisons will be made between vegetation data (utilization, condition, trend), precipitation data and general weather conditions, before and after implementation. If extreme weather conditions exist or there is severe competition for forage, reproductive rates may be affected. An attempt will be made to determine whether changes in reproductive rates are due to weather or habitat conditions or to the fertility control itself.

If fertility control and/or selective removals are ineffective in reducing reproductive rates, different percentages of animals to be treated will be considered. If necessary, other methods of controlling reproductive rates, such as hormone implants or sterilization, may be considered in the future.

3. Free-Roaming Characteristics.

Accomplishment of free-roaming objectives will be evaluated by conducting seasonal movement studies, both aerial and ground, to ensure that movement patterns are not disrupted by fences or other barriers to movement.

4. Coloration and Conformation.

Data concerning color and conformation will be collected and analyzed whenever a removal or capture is implemented. If "Spanish Barb" traits decrease or increase in the population, an attempt will be made to evaluate the causes and any required management actions.

V. COORDINATION

Vegetation monitoring, allotment evaluations, water developments, and all other management actions which may affect wildlife, livestock and wild horses will be closely coordinated with the respective BLM programs, permittees and affected interest groups.

A. Cooperation in Management

The Antelope HMA lies just south of the Elko District's Antelope Valley HMA. All management activities including fertility control, census, seasonal movement studies, etc. will be closely coordinated between the districts.

VI. APPROVAL

Prepared By:

Sheree L. Kahle, Wild Horse Specialist — Date
Schell Resource Area

Reviewed By:

Robert E. Brown, Wild Horse Specialist — Date
Ely District

Thomas Pogacnik — Date
Wild Horse and Burro Specialist
Nevada State Office

Recommended By:

Gerald M. Smith, Area Manager — Date
Schell Resource Area

Gene L. Drais, Area Manager — Date
Egan Resource Area

Approved By:

Kenneth G. Walker, District Manager — Date
Ely District

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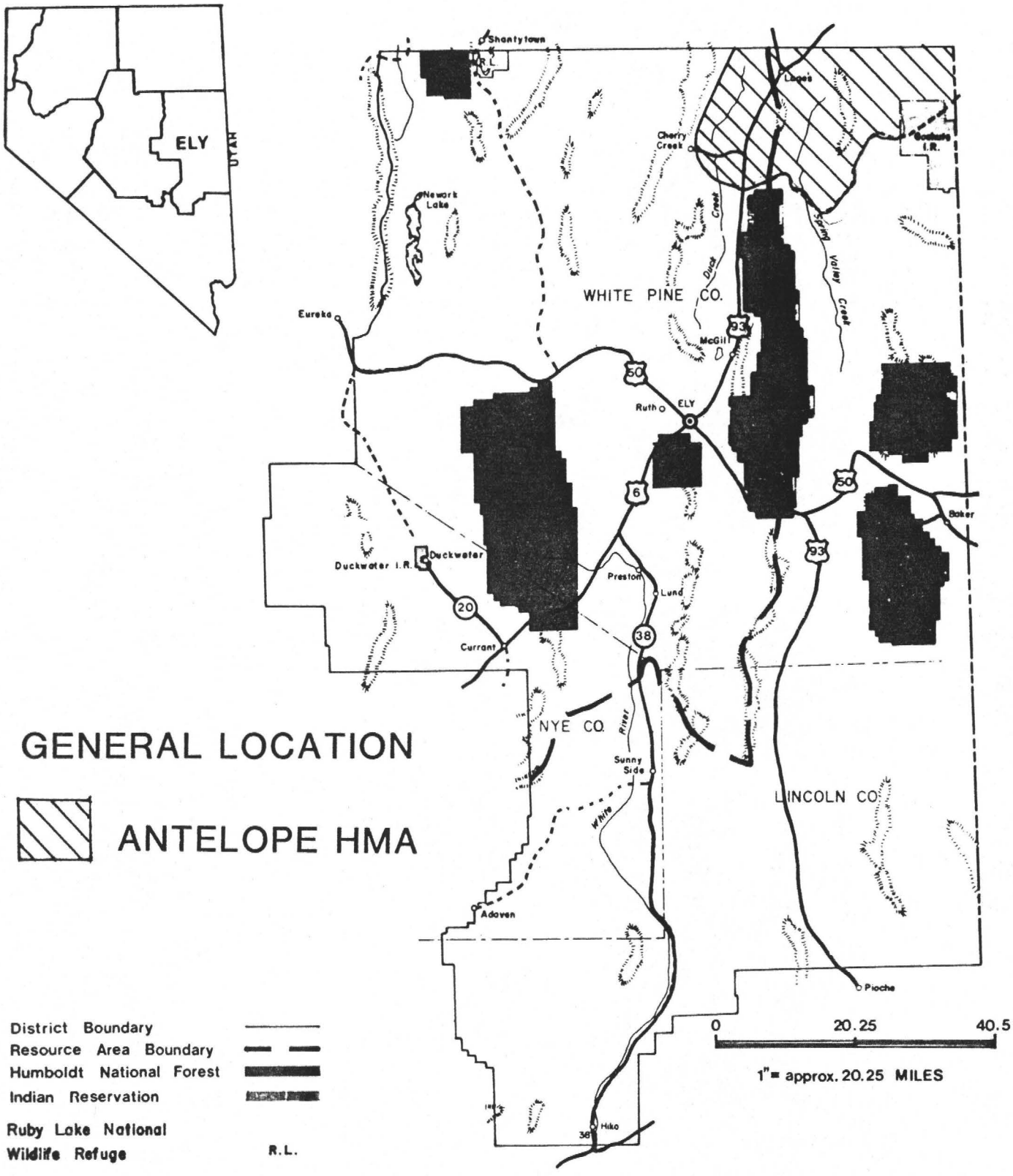
APPENDIX 1

MAPS

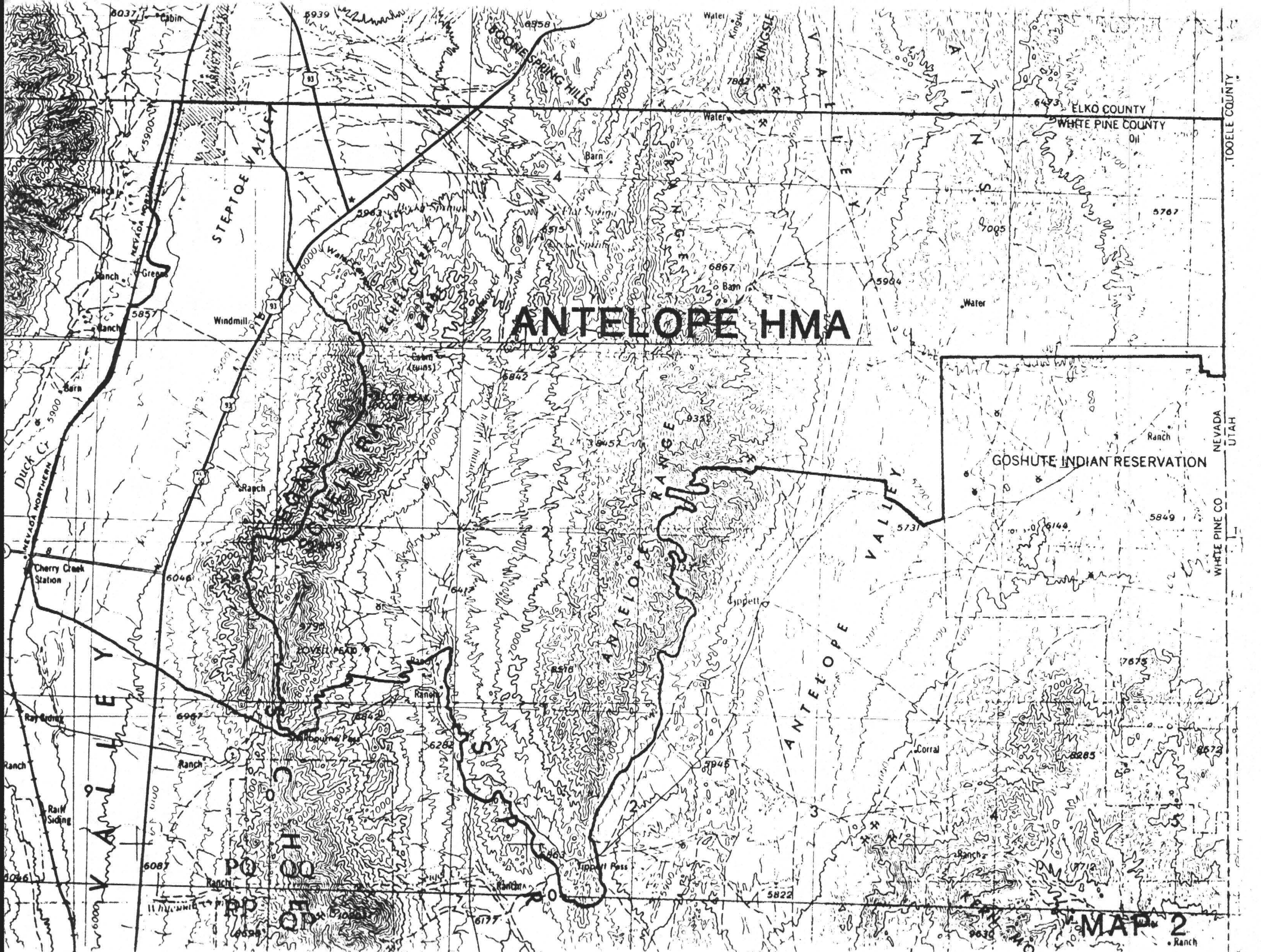
Map 1 - General Location
Map 2 - Antelope HMA
Map 3 - Land Status
Map 4 - Latest Census Map (2/92)
Map 5 - Use Areas and Seasonal Use
Map 6 - Allotments Within HMA
Map 7 - Existing Waters

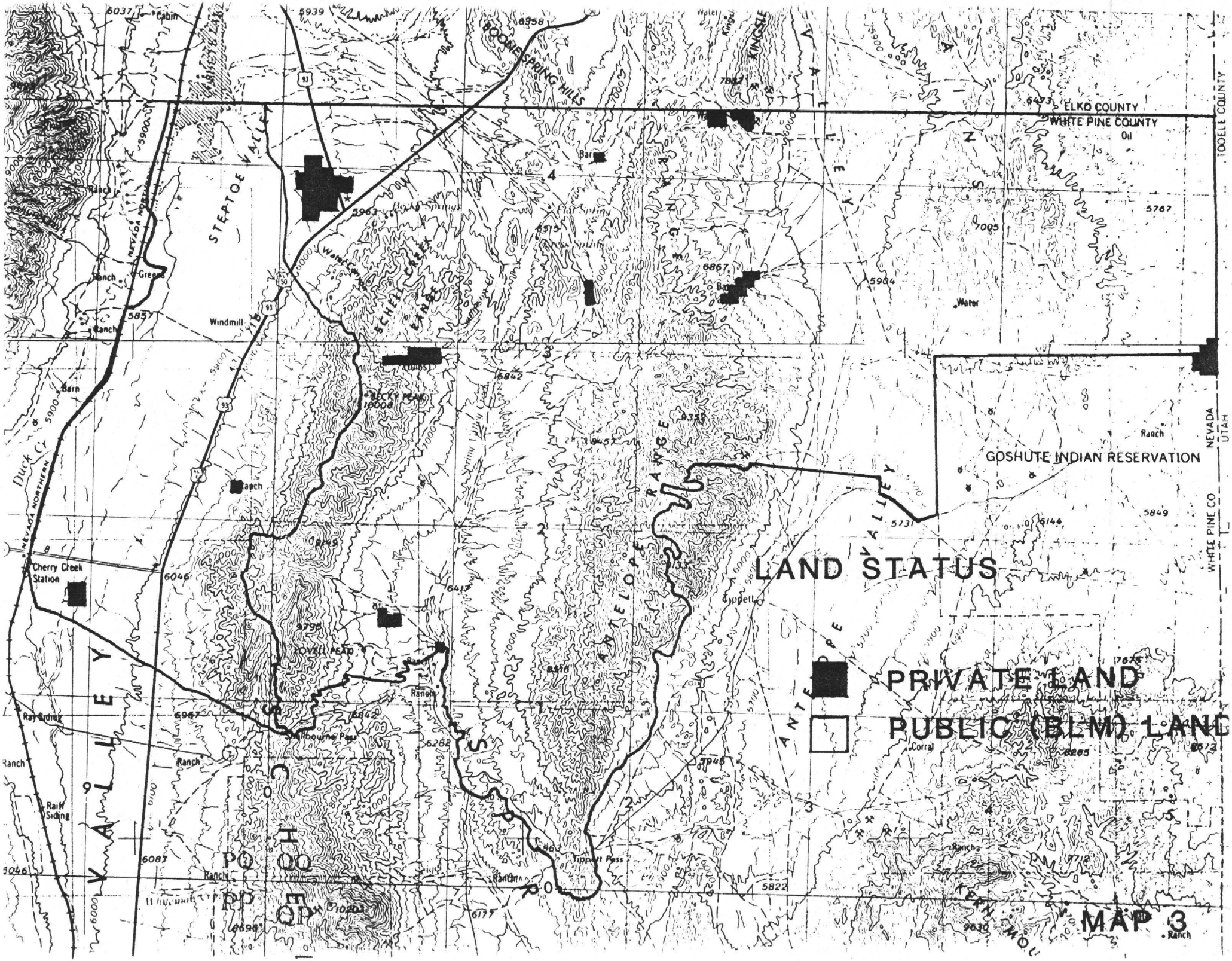


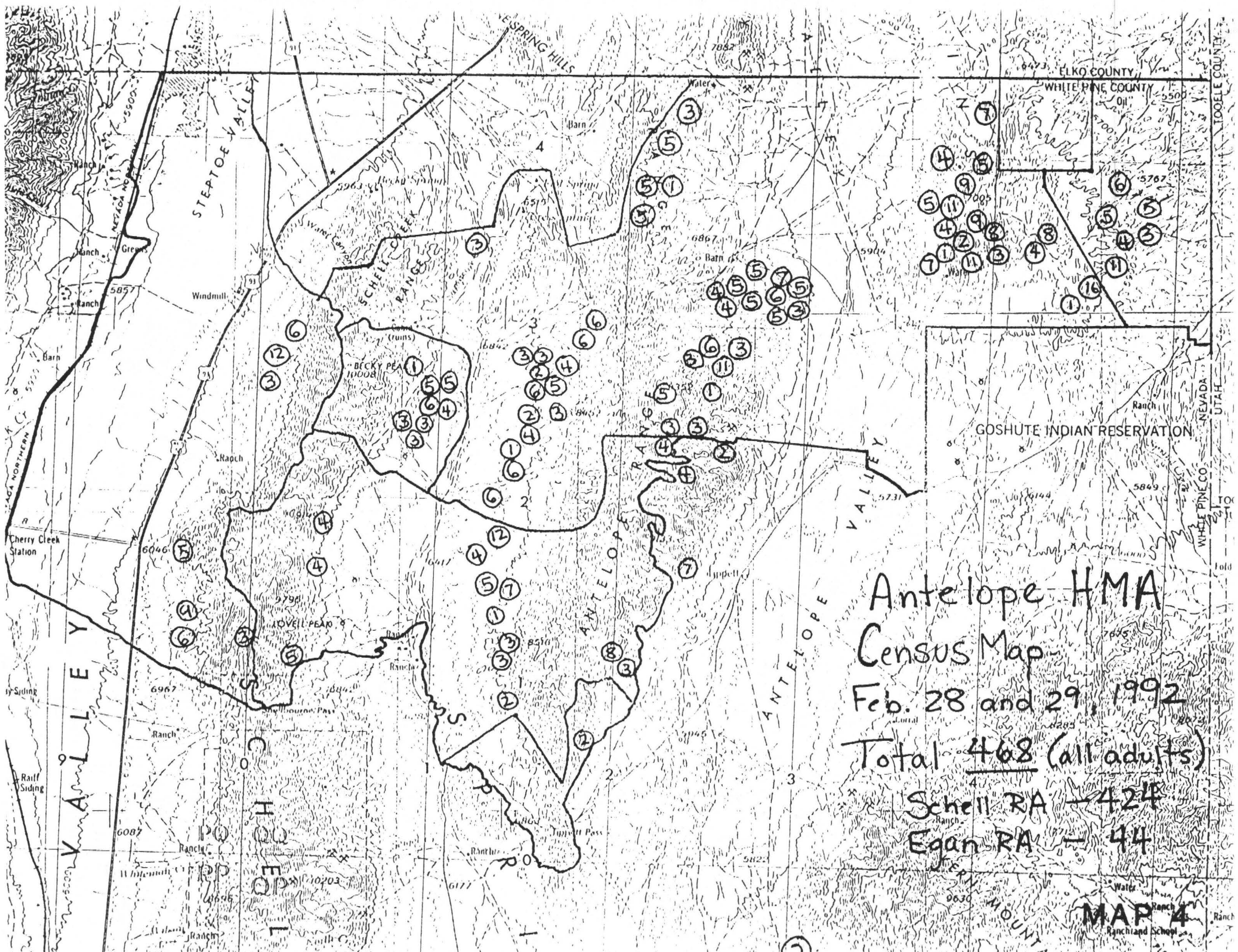
ELY DISTRICT

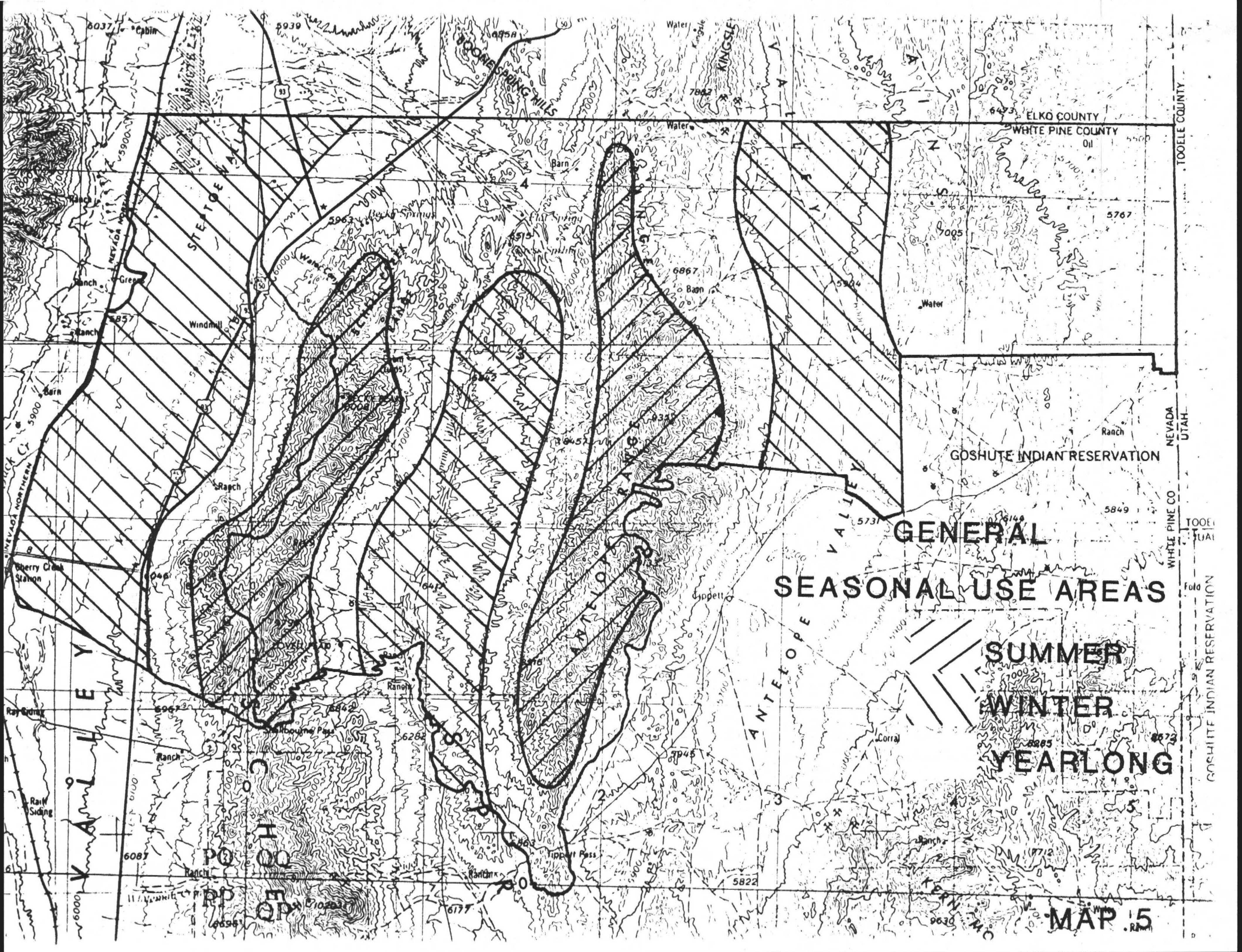
BUREAU OF LAND MANAGEMENT
U. S. DEPARTMENT OF THE INTERIOR

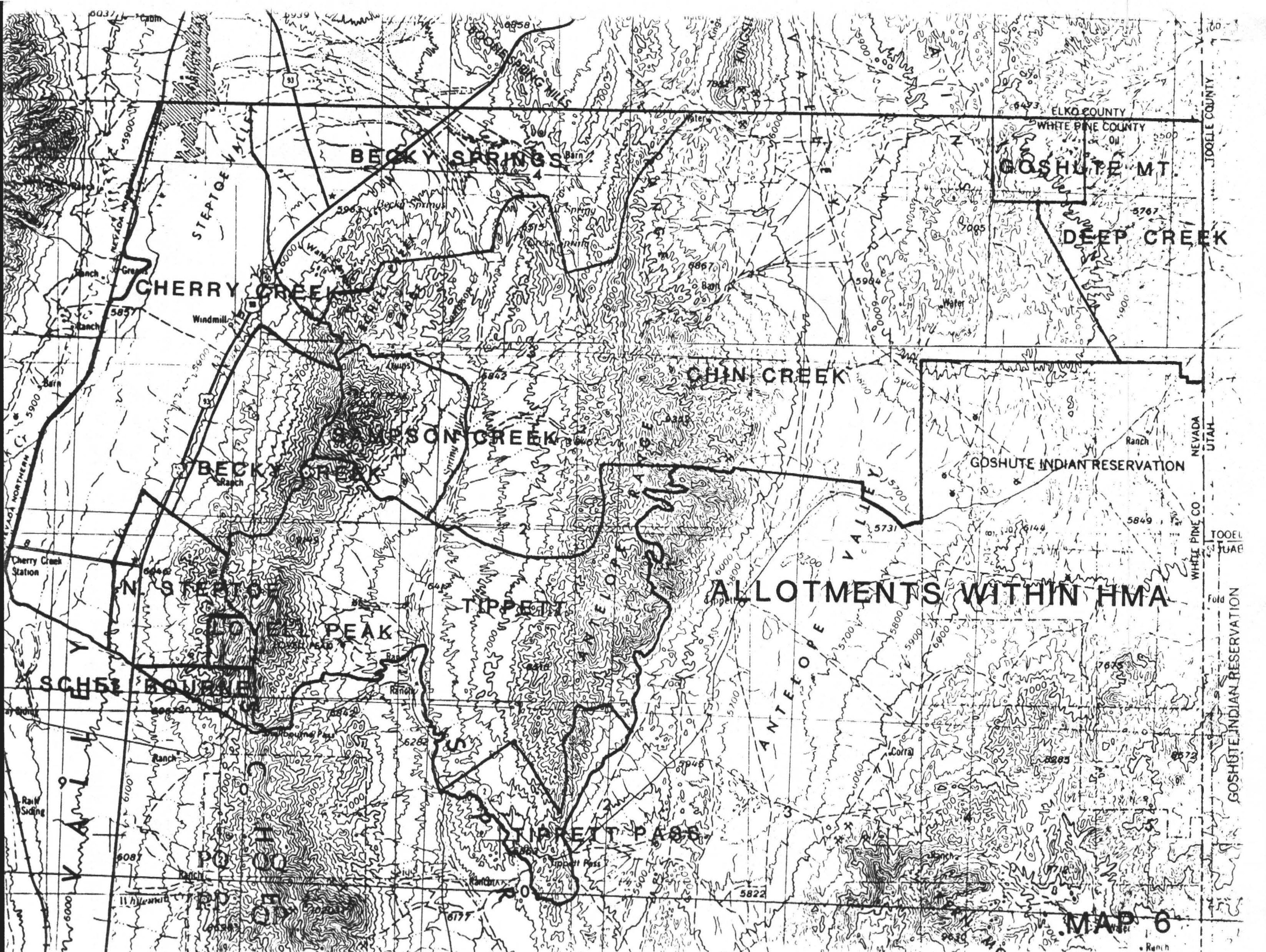
MAP 1


ANTELOPE HMA
MAP 2
ELKO COUNTY
WHITE PINE COUNTY
TOOELE COUNTY
NEVADA
UTAH
WHITE PINE CO
GOSHUTE INDIAN RESERVATION
STEPTOE VALLEY
ANTELOPE VALLEY
ANTELOPE RANGE
BOONE SPRING HILLS
Cherry Creek Station
Duck Cr
NEVADA NORTHERN
Lovell Peak
Tippett Pass
Currie Hills
Ranch
Windmill
Water
Barn
Corral

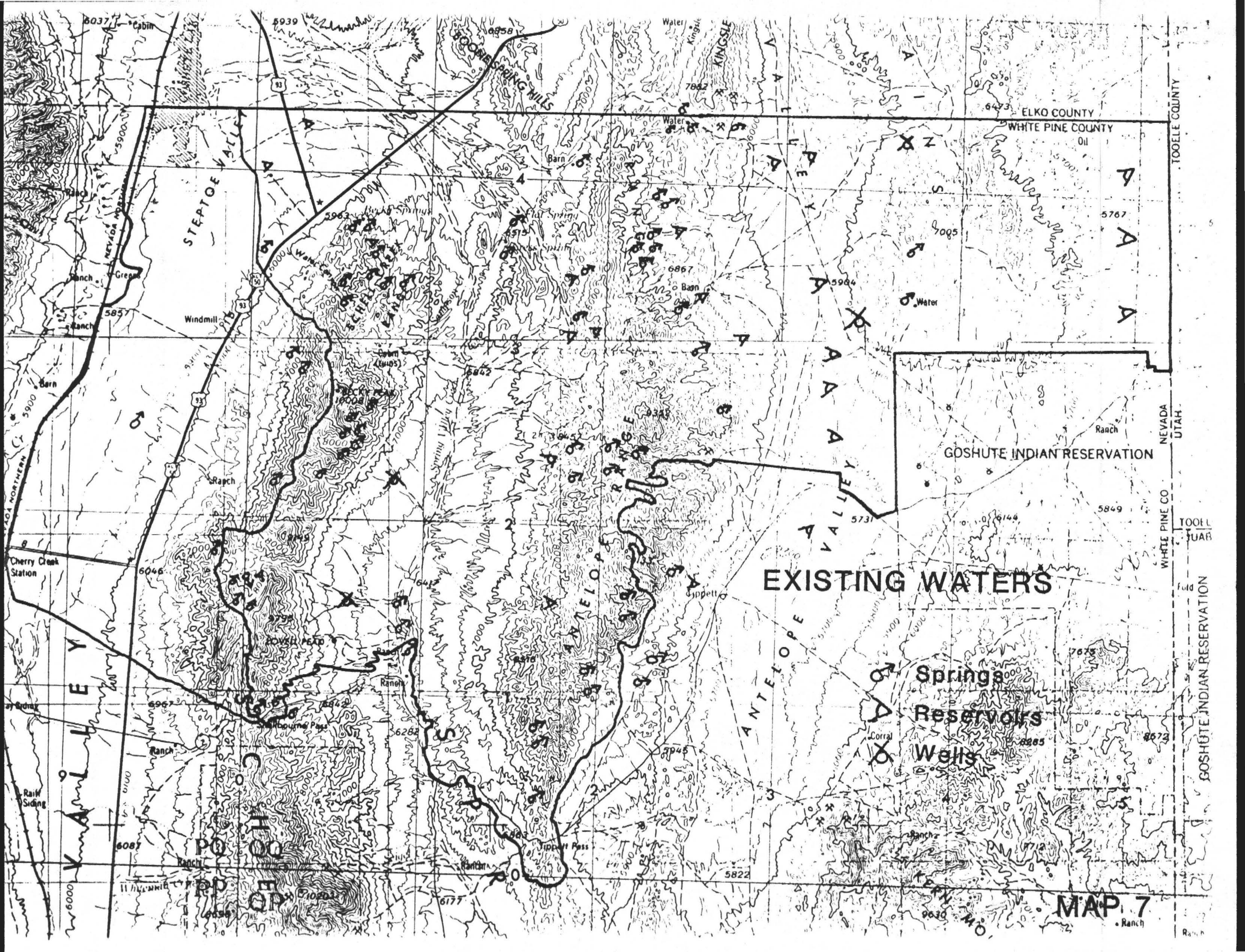

LAND STATUS
PRIVATE LAND
PUBLIC (BLM) LAND
MAP 3
ELKO COUNTY
WHITE PINE COUNTY
TOOELE COUNTY
GOSHUTE INDIAN RESERVATION
NEVADA
UTAH
WHITE PINE CO
STEPTOE VALLEY
ANTELOPE RANGE
ANTELOPE VALLEY
COOPER SPRING HILLS
SCHELL CREEK RANGE
Cherry Creek Station
Windmill
Ranch
Corral
Barn
Water
Tippett Pass
Melbourne Pass
Rail Siding
Duck Cr
NEVADA NORTHERN


Antelope HMA
Census Map
Feb. 28 and 29, 1992
Total 468 (all adults)
Schell RA - 424
Egan RA - 44
MAP 4
ELKO COUNTY
WHITE PINE COUNTY
TOOELE COUNTY
GOSHUTE INDIAN RESERVATION
STEPTOE VALLEY
SCHELL CREEK RANGE
ANTELOPE RANGE
ANTELOPE VALLEY
SPRING HILLS
BECKY PEAK
LOVELL PEAK
Cherry Creek Station
NEVADA
UTAH


GENERAL
SEASONAL USE AREAS
SUMMER
WINTER
YEARLONG
MAP 5
ELKO COUNTY
WHITE PINE COUNTY
TOOELE COUNTY
NEVADA
UTAH
WHITE PINE CO
GOSHUTE INDIAN RESERVATION
ANTELOPE VALLEY
STEPTOE VALLEY
BOONE SPRING HILLS
ANTELOPE RANGE
Cherry Creek Station
Tippett
Tippett Pass
Corral
Windmill
Ranch
Barn
Water
Cabin
Rail Siding
Ray Siding



BECKY SPRINGS
GOSHUTE MT.
DEEP CREEK
CHERRY CREEK
CHIN CREEK
SAMPSON CREEK
BECKY CREEK
GOSHUTE INDIAN RESERVATION
N. STEPTOE
TIPPETT
ALLOTMENTS WITHIN HMA
LOVELL PEAK
SCHELLBOURNE
TIPPETT PASS
ELKO COUNTY
WHITE PINE COUNTY
TOOELE COUNTY
NEVADA
UTAH
WHITE PINE CO
STEPTOE VALLEY
ANTELOPE VALLEY
Cherry Creek Station
MAP 6


EXISTING WATERS
Springs
Reservoirs
Wells
MAP 7
ELKO COUNTY
WHITE PINE COUNTY
TOOELE COUNTY
GOSHUTE INDIAN RESERVATION
NEVADA
UTAH
WHITE PINE CO
TOOELE
JUAB
STEPTOE VALLEY
ANTELOPE VALLEY
ANTELOPE RANGE
BOONE SPRING HILLS
Cherry Creek Station
Windmill
Ranch
Barn
Water
Cabin
Tippett
Tippett Pass
Corral

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APPENDIX 2

KEY MANAGEMENT AREA OBJECTIVES AND STATUS

APPENDIX 2. Key Management Area Objectives and Status

Management areas were chosen which could be used to address problems and measure effectiveness of solutions for each foraging animal group of the Antelope Plan Area. Many of these areas overlapped and could be combined so that livestock, wild horses and wildlife needs could be addressed in common. Each management area is (or will be) represented by one or more key use areas. The primary foraging animals were identified for each management area.

The Final Multiple Use Decisions for the Chin Creek, Tippett and Sampson Creek Allotments presented site specific allotment objectives by key management areas. For each management area, the following information was identified: the location, Soil Conservation Service (SCS) ecological site number, the district study number, key forage species, key species percent composition by weight, seral stage condition and objective, allowable use level and existing use level.

The specific resource objectives were developed using the SCS ecological site descriptions to obtain a realistic idea of potential natural community (PNC) for each key area. The percentage of PNC relates to response potential of each management area based on present species composition and whether or not vegetative treatment is to be proposed (realizing that certain communities cannot respond favorably to grazing treatments alone). In instances where production of undesirable species, particularly shrubs, exceeded potential levels for the site, it had to be recognized that the only way to decrease this level would be vegetative treatment. Where such treatments were proposed, the objective would be to decrease the density and production of that species. For those areas where shrubs would not be reduced without losing desirable species, the objective is to maintain production of undesirable shrubs at or below present levels, which equates to preventing any increase. If desired species are producing at or near the potential for that site, the objective for these species will be to maintain present production.

Objectives for an individual key species may vary between different areas because of site potential and proposed treatments. Monitoring studies will be used to measure the relative success of achieving these objectives. If the resources are responding favorably and moving toward desired levels or objectives on management areas, it is assumed that the overall area will be responding in a similar manner. Under this assumption, even those plant species for which no data was available should be expected to respond in the same manner as the listed species. Monitoring will pick up any increases in species diversity as well as production. Also portions of the planning area were not included in management areas because these portions were not critical to the development and implementation of the plan. These areas will not be intensively monitored, but will be affected by the plan and are expected to respond in a similar manner to the management areas.

Numbers of foraging animals from which monitoring will be based are as follows:

a. Present numbers of wildlife will be used.
b. Existing use and/or interim numbers of livestock as determined in each Final Multiple Use Decisions (FMUDs) and/or Allotment Management Plan will be used.
c. The Appropriate Management Levels (AMLs) for wild horses as identified in the FMUDs or existing numbers on those allotments where monitoring evaluations and decisions are incomplete.

Management Area - Water Canyon - Becky Springs Allotment

Foraging Animals - Antelope Yearlong, Sheep, Cattle, Wild Horses

Location	Ecological Site	Studies Number
T. 25 N., R. 65 E., sec. 22, SW^4	D28B011N	BSR 1

	Present Situation		Management Objective	
Key Species	Density (Plants/ac.)	Production* (Lbs./ac.)	Density	Production
Indian Ricegrass*	1,700	2	Increase	10
Forbs	580	7	Increase	14
Bud Sagebrush	67	(Trace)	Maintain	5
Winterfat	334	82	Maintain	Maintain Above 70

Ecological Status (% of Climax or PNC**)	Late Mid Seral (50% of PNC)	Mid to Late Seral (50-65% of PNC)
Relative Composition (all species)	Grasses - 33%	30-40%
	Forbs - 2%	2-5%
	Shrubs - 65%	60-70%

* Increase total production from 400 lbs/ac to 550 lbs/ac.

** PNC = Potential Natural Community.

Management Area - Lookout Springs - Becky Springs Allotment

Foraging Animals - Antelope Yearlong, Sheep, Wild Horses

Location	Ecological Site	Studies Number
T. 26 N., R. 66 E., sec. 25, SW^4	D28B011N	BSR 2

	Present Situation		Management Objective	
Key Species	Density (Plants/ac.)	Production* (Lbs./ac.)	Density	Production
Squirreltail	3,000	29	Maintain	Maintain
Forbs	-	3	Increase	5
Black Sagebrush	4,000	358	Maintain	Maintain

Ecological Status (% of Climax or PNC**)	Mid Seral Stage (43% of PNC)	Mid to Late Seral (45-60% of PNC)
Relative Composition (all species)	Grasses - 8%	10-15%
	Forbs - 1%	1-5%
	Shrubs - 91%	80-90%

** PNC = Potential Natural Community.

Location	Ecological Site	Studies Number
T. 26 N., R. 66 E., sec. 25, SW^4	D28B011N	BSR 3

	Present Situation		Management Objective	
Key Species	Density (Plants/ac.)	Production* (Lbs./ac.)	Density	Production
Squirreltail	5,000	6	Increase	10
Forbs	1,200	4	Increase	8
Black Sagebrush	3,000	112	Increase	120

Ecological Status (% of Climax or PNC**)	Mid Seral Stage (40% of PNC)	Mid to Late Seral (40-60% of PNC)
Relative Composition (all species)	Grasses - 2%	5-20%
	Forbs - 3%	3-10%
	Shrubs - 95%	70-90%

* Increase total production.

** PNC = Potential Natural Community.

Management Area - Goshute Mountain Allotment

Foraging Animals - Antelope Yearlong, Sheep, Horses

Location	Ecological Site	Studies Number
T. 26 N., R. 69 E., sec. 35, SE^4	D28AO13N	GMR 1

	Present Situation		Management Objective	
Key Species	Density (Plants/ac.)	Production (Lbs./ac.)	Density	Production
Indian Ricegrass	-	3	Increase	5
Shadscale	1,000	6	Increase	20
Black Sagebrush	15,000	314	Maintain	Maintain Above 200

Ecological Status (% of Climax or PNC**)	Mid Seral Stage (40% of PNC)	Mid to Late Seral (40-65% of PNC)

Relative Composition (all species)	Grasses	- 4%	5-15%
	Forbs	- -	0-5%
	Shrubs	- 96%	80-95%

** PNC = Potential Natural Community.

Management Area - Deep Creek Allotment

Foraging Animals - Antelope Yearlong, Cattle, Wild Horses

Location	Ecological Site	Studies Number
T. 26 N., R. 70 E., sec. 33, SW^4	D28A012N	DCR 1

	Present Situation		Management Objective	
Key Species	Density (Plants/ac.)	Production (Lbs./ac.)	Density	Production
Indian Ricegrass	16,000	13	Increase	25
Forbs	-	12	Increase	15
Bud Sagebrush	-	2	Increase	5
Shadscale	867	29	Increase	50
Winterfat	-	7	Increase	10

Ecological Status (% of Climax or PNC**)	Early Seral Stage (25% of PNC)	Mid Seral Stage (26-50% of PNC)
Relative Composition (all species)	Grasses - 26%	20-30%
	Forbs - 4%	5-10%
	Shrubs - 70%	65-75%

** PNC = Potential Natural Community.

APPENDIX II: Site Specific Allotment Objectives

ALLOTMENT: Chin Creek (Livestock & Wild Horses)

				PRESENT SITUATION		LONG TERM OBJECTIVE			SHORT TERM OBJECTIVE				
Study No.	Key Area Location	Ecological Site No.	Key Species	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Maintain or Improve	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Allowable Use Level	Season of Use	Met or Not Met		Rationale
CCR1	S. Antelope												AUL Exceeded
1)	Well	028BY047NV	EULA	85	30	Maintain	77	30-33	45	Yearlong	Not Met		1984=58%
	Sec. 27												85=64%
	T. 25 N.,												86=46%
	R. 68 E.,												87=60%
CCR2	N.E.												AUL exceeded
2)	Antelope	028BY075NV	EULA	25	55	Maintain	25	55-60	45	Yearlong	Not Met		1984=49%
3)	Valley												
	Sec 26		ORHY	38			38		55				84=69%
	T. 26 N.,												85=70%
	R. 68 E.												
CCR3	Baldy Peak	028BY034NV	AGSP	27	77	Maintain	25	77-80	50	Summer	Met		AUL not
2)	Sec 9												exceeded
	T. 24 N.,												
	R. 67 E.												
CCR4	E. Ayarbe	028BY11NV	ORHY	18	80	Maintain	18	80-85	55	Yearlong	Not Met		AUL exceeded
2)	Drift Fence												1985=70%
3)	Sec 28												
	T. 25 N.,												
	R. 69 E.												
CCR8	S.W. Ante-	028AY002NV	EULA	7	30	Improve	20	50-55	35	Yearlong	Not Met		AUL exceeded
1)	lope Valley												1982=66%
3)	Sec 8												85=68%
	T. 24 N.,												87=65%
	R. 68 E.		ORHY	7			15		40				1982=66%
													84=58%
													85=75%
													86=74%

1) Study area representing livestock and wild horse use.
2) Study area representing wild horse use.
3) Present Situation and Long Term Objective changed based on revised SCS Range Site Descriptions. Other key areas may be changed if Range Site Descriptions are revised.

APPENDIX II: Site Specific Allotment Objectives

ALLOTMENT: Chin Creek (Livestock & Wild Horses)

				PRESENT SITUATION		LONG TERM OBJECTIVE			SHORT TERM OBJECTIVE				
Study No.	Key Area Location	Ecological Site No.	Key Species	Key Spp % Comp By Weight	Livestock Forage Condition	Maintain or Improve	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Allowable Use Level	Season of Use	Met or Not Met		Rationale
CCR5 1)	N. Creek Seeding T. 24 N.R. 66 E., S.3	NA (seeding) 3)	AGCR	28	Fair	Improve	32	NA	40% 50%	Summer Fall	Not Met		AUL Exceeded 1982=66% 87=62%
CCR6 2)	Flat Sp. Seeding T. 25 N., R. 66 E., S. 12	NA (seeding) 3)	AGCR	26	Fair	Improve	28	NA	40% 50%	Summer Fall	Not Met		AUL Exceeded 1982=76% 85=36%
CCR7 1)	Robison Seeding T. 24 N., R. 66 E., S. 34	NA (seeding) 3)	AGCR	18	Fair	Improve	20	NA	40% 50%	Summer Fall	Not Met		AUL Exceeded 1982=78% 84=68%

1) Study area representing livestock and wild horse use.
2) Study area representing wild horse use.
3) Ecological Status does not apply to seedings.

APPENDIX II: Site Specific Allotment Objectives

ALLOTMENT: Chin Creek (Livestock & Wild Horses)

				PRESENT SITUATION		LONG TERM OBJECTIVE		SHORT TERM OBJECTIVE				
Study No.	Key Area Location	Ecological Site No.	Key Species	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Maintain or Improve	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Allowable Use Level	Season of Use	Met or Not Met	Rationale
CCR9	Central Antelope Valley T.25N, R.68E,S.16	028BY075NV	ORHY	ORHY - 7% Grass- 9% Forbs-17% Shrubs-74%	13	Improve	ORHY - 35% Grass-45-55% Forbs- 0- 5% Shrubs-30-40%	25	50	Yearlong	Not Met	AUL Exceeded 1989=63%
CCR10	Black Hills Well T. 26 N, R. 68 E. Sec 4	028BY075NV (general area)	EULA	(No Ecological Data)			EULA - 10% Grass-45-55% Forbs- 0- 5% Shrubs-30-40%		45	Yearlong	Not Met	AUL exceeded 1989=61%
CCR11	S.E. Antelope Valley T.24N, R.68E,S.13	028BY075NV	ORHY	ORHY- 22% Grass-25% Forbs- 2% Shrubs-73%	41	Maintain	ORHY - -35% Grass-45-55% Forbs- 0- 5% Shrubs-30-40%	41-55	55	Yearlong	Not Met	AUL Exceeded 1989=70%

1) Study area representing livestock and wild horse use.

3) Present situation and long term objective changed based on Revised SCS Range Site Description. Other key areas may be changed if Range Site Descriptions are revised.

APPENDIX IV: Site Specific Allotment Objectives

ALLOTMENT: Chin Creek (Wildlife)

			PRESENT SITUATION		LONG TERM OBJECTIVE		SHORT TERM OBJECTIVE			
Study No.	Key Area Location	Ecological Site No.	Key Species	Habitat Condition Rating 1/	Maintain or Improve	Habitat Condition Rating	Allowable Use Level	Season of Use	Met or Not Met	Rationale
PAW-1 AKG (Chin Creek)	T. 24 N., R. 68 E. Sec.8, NW§	D28A026N	Forbs CHVI ATCO ARARN	Fair	Improve	Good	30% 35% 35% 35%	Yearlong	Not met	Utilization exceeded Allowable Use Levels in: 1985 - 50% CHVI 48% ATCO 1984 - 40% CHVI 59% ATCO 1983 - 45% CHVI 46% ATCO 1982 - 77% CHVI 50% ATCO 40% ARARN
PAW-2 (Ayarbe Spring)	T. 25 N., R. 69 E., Sec. 31, NE§	D28A024N	ATCO ARARN ARSP	Fair	Improve	Good	35% 35% 35%	Yearlong	Not Met	Utilization exceeded Allowable Use Levels in: 1986 - 48% ATCO 55% ARSP 1985 - 58% ATCO 53% ARSP

1/ For pronghorn antelope, habitat condition is based on vegetation quality rating, diversity index, and vegetation quantity rating.

APPENDIX II

SITE SPECIFIC ALLOTMENT OBJECTIVES

ALLOTMENT: TIPPETT (LIVESTOCK & WILD HORSES)

				PRESENT SITUATION		LONG TERM OBJECTIVE			SHORT TERM OBJECTIVE			
Study No.	Key Area Location	Ecological Site No.	Key Species	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Maintain or Improve	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Allow-able Use Level	Season of Use	Met or Not Met	Rationale
TAR1**	Calcuta Burn T. 23 N., R. 65 E., Sec. 8 SW	N/A***	AGCR	AGCR 7% Grass 12% Forbs 8% Shrubs 80%	N/A***	Maintain	AGCR 7-25% Grass 36-45% Forbs 2-10% Shrubs 50-65%	N/A ***	50%	Summer	Not Met	AUL Exceeded 1986-90% 1988-90%
TAR2**	Dolan Trap Spring T. 24 N., R. 65 E., Sec. 27 SW	D28B037N	AGSP ARARN	AGSP 10% ARARN 63% Grass 10% Forbs 27% Shrubs 63%	Late 57%	Maintain	Grass 20-35% Forbs 17-20% Shrubs 63-65%	Late 57-65%	50% 50%	Summer	Not Met	AUL Exceeded 1986-70%
TAR3*	W. Sellas Well T. 23 N., R. 68 E., Sec. 2 NW	D28B071N	AGSM EULA	AGSM 39% Grass 65% Forbs 25% Shrubs 10%	Early Late 53%	Maintain	Grass 55-65% Forbs 15-25% Shrubs 15-30%	Late 53-70%	55% 45%	Fall Winter Spring	Met	AUL Not Exceeded
TAR4* ****	E. Sellas Well T. 23 N., R. 68 E. Sec. 1 NW	28BY084NV	ORHY EULA	ORHY 15% EULA 57% Grass 27% Forbs T Shrubs 73%	Late 58%	Maintain	ORHY 15-30% EULA 30% Grass 27-50% Forbs 0-5% Shrubs 50-73%	Late 58-65	55% 45%	Fall Winter Spring	Not Met	AUL Exceeded 1985-65% 1987-56%

*Study Area Representing livestock use
**Study Area Representing livestock and wild horse use
***Ecological Status does apply to seedings
****Present situation and Long Term Objective changed based on revised SCS Range Site Description. Other key areas may be changed if Range Site Descriptions are revised.

APPENDIX II

SITE SPECIFIC ALLOTMENT OBJECTIVES

ALLOTMENT: TIPPETT (LIVESTOCK & WILD HORSES)

				PRESENT SITUATION		LONG TERM OBJECTIVE			SHORT TERM OBJECTIVE				
Study No.	Key Area Location	Ecological Site No.	Key Species	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Maintain or Improve	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Allow-able Use Level	Season of Use	Met or Not Met	Rationale
TAW1	Cedar Springs T. 22 N., R. 68 E., Sec. 13 NWNE	028A013NV	ORHY ARARN EULA	Grass 4% Forbs - Shrubs 96%	Mid 46%	Improve	Grass 5-10% Forbs 0-5% Shrubs 85-95%	Mid to Late 47-75%	40% 35% 35%	Yearlong		
TAW2	Antelope Spring T. 22 N., R. 67 E., Sec. 2 NWNW	028A012NV	ORHY ATCO	Grass 18% Forbs - Shrubs 82%	Early 24%	Improve	Grass 20-30% Forbs 0-5% Shrubs 65-80%	Mid 26-50%	40% 35%	Yearlong		

APPENDIX II

SITE SPECIFIC ALLOTMENT OBJECTIVES

ALLOTMENT: TIPPETT (LIVESTOCK & WILD HORSES)

				PRESENT SITUATION		LONG TERM OBJECTIVE		SHORT TERM OBJECTIVE				
Study No.	Key Area Location	Ecological Site No.	Key Species	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Maintain or Improve	Key Spp % Comp By Weight	Seral Stage (% of PNC)	Allow-able Use Level	Season of Use	Met or Not Met	Rationale
TAR12 **	Henroid Seeding T. 23 N., R. 66 E., Sec. 6	N/A*** Seeding	AGCR	Grass 59% Forbs - Shrubs 41%	N/A***	Maintain	Grass 50-75% Forbs - Shrubs 25-50%	N/A ***	50%	Spring	Met	AUL Not Exceeded
TAR13*	Tungstonia Seeding Spring T. 20 N., R. 69 E., Sec. 33	N/A Seeding	AGCR PUTR	Grass 82% Forbs 5% Shrubs 13%	N/A	Maintain	Grass 75-85% Forbs 5-10% Shrubs 10-20%	N/A	50% 50%	Summer	Not Met	AUL Exceeded 1982-70% 1985-70%
TAR14 **	Sand Spring T. 23 N., R. 67 E., Sec. 17	D28B022N	AGSM ARTRV	Grass 45% Forbs 31% Shrubs 24%	Mid 42%	Maintain	Grass 45-50% Forbs 15-25% Shrubs 20-30%	Mid 42-65%	50% 50%	Summer	Not Met	AUL Exceeded 1985-70%
TAR15 **	E. Central Antelope Range T. 24 N., R. 67 E., Sec. 33	D28B030N	AGSM ARTRV	Grass 17% Forbs 6 Shrubs 77%	Mid 33%	Improve	Grass 20-50% Forbs 5-10% Shrubs 45-70%	Mid 34-50	40% 35%	Summer	Not Met	AUL Exceeded 1985-50% 1987-60%

*Study Area Representing livestock use
**Study Area Representing livestock and wild horse use
***Ecological Status does apply to seedings

APPENDIX II: Site Specific Allotment Objectives

ALLOTMENT: Sampson Creek (Livestock & Wild Horses)

				PRESENT SITUATION		LONG TERM OBJECTIVE		SHORT TERM OBJECTIVE				
STUDY NO.	KEY AREA LOCATION	ECOLOGICAL SITE #	KEY SPECIES	KEY SPP % COMP BY WEIGHT	SERAL STAGE (% OF PNC)	MAINTAIN OR IMPROVE	KEY SPP % COMP BY WEIGHT	SERAL STAGE (% OF PNC)	ALLOWABLE USE LEVEL	SEASON OF USE	MET OR NOT MET	Rationale
SCR1 1)	Becky Peak Bench Sec. 2, T. 24 N., R. 65 E.	028BY037NV	AGSP	2	66	Maintain	2	66-68	50%	Summer	Not Met	AUL Exceeded 1984=75%
SCR2 2)	W. Spring Valley Bench Sec. 30, T. 24 N., R. 66 E.	028BY011NV	ARARN	76	51	Maintain	76	51-52	45%	Year-long	Met	AUL Not Exceeded
SCR3 2)	Spring Valley Bottom Sec. 32, T. 24 N., R. 65 E.	028BY013NV	EULA	58	68	Maintain	58	68-72	45%	Year-long	Not Met	AUL Exceeded 1982=78% 1983=59% 1984=62% 1985=90% 1986=80% 1987=72%

1) Study area representing livestock and wild horse use.
2) Study area representing wild horse use.

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APPENDIX 3

OTHER RESOURCES AND USES WITHIN ANTELOPE HMA

Appendix 3. Other Resources and Uses Within the Antelope HMA

1. Vegetation

Major ecosystems in the plan area are the pinyon-juniper woodland and the cold desert ecosystem. At higher elevations, small isolated communities of coniferous forest occur. The cold desert ecosystem is composed of two major vegetative zones - the shadscale zone and the sagebrush zone.

The pinyon-juniper zone, scattered through-out the area, generally occurs at 6,000-8,000 feet elevation, between the shrub zone in the valleys and the conifer zone at higher elevations of the Schell Creek and Antelope Ranges. Stands of these trees vary in density from scattered to closed (solid) stands.

The shadscale zone is found mostly in the bottoms of the Antelope and North Spring Valleys. Plants in this zone must have a higher salinity tolerance than in other zones. Important plants in this zone are shadscale, winterfat, black sagebrush and black greasewood. This zone serves as important winter range for both wild horses and livestock, and year-round pronghorn antelope range. Despite the low productivity, the protein content of species within this zone is high. Continuous heavy utilization of the forage has occurred in Antelope Valley, Spring Valley and around waters. This can be readily seen by the heavy utilization on the winterfat (Ceratoides lanata) flats and riparian areas.

The sagebrush zone, which is scattered throughout the plan area, occurs between 5,500 feet and 7,000 feet elevation. Big sagebrush, desirable perennial grasses, and forbs occur in this zone. This zone is important to livestock as spring-fall range. Wild horses use this area for year-round forage. Mule deer use this zone year-round and it is especially important for winter forage. Sage grouse are dependent on this zone for nearly all aspects of the life cycle. Some stands of big sage can and have become very dense and closed.

The coniferous zone is generally located at 9,000 feet or higher. Large fir and pines characterize this zone; understory vegetation is sparse. Mule deer and wild horses use these areas in summer for forage and shading. Eagles, hawks, and blue grouse need this zone for nesting, wintering and roosting.

Throughout each of these zones, small riparian areas occur with seeps, springs and creeks. Vegetation found in these areas need wetter conditions than surrounding plants. Rushes, sedges, forbs and deciduous trees that rarely occur elsewhere are found on these sites. All large ungulates, small wildlife, wild horses and livestock, use these areas for water, shade, succulent forage and to pick up trace minerals from the different vegetation. Sage grouse chicks are especially dependent on these areas for insects and forbs until they are able to survive on a sagebrush diet.

Hawks, such as the Cooper's and Goshawk are dependent on these areas for nesting. Riparian areas are used by and are depended on by up to 97% of the non-game wildlife species that occur in the HMA. (See Schell URA-2 and the Draft Egan RMP/EIS for a complete list of species associated with each vegetation zone.)

Trend studies are located on key areas throughout the HMA and a detailed analysis of rangeland condition can be found in the allotment evaluations for the Chin Creek, Tippett, Sampson Creek and Becky Creek Allotments. Appendix 2 contains a summary of monitoring data for those key areas within the HMA. Use pattern mapping was completed in 1985 and 1986 within the Chin Creek, Tippett and Sampson Creek Allotments. Use pattern mapping was completed in 1989 and 1990 in the Becky Creek Allotment. Utilization is generally heavy to severe around water sources and in some locations in the valley. Utilization generally gets lighter with increases in elevation. Ecological site condition studies have been completed by management area throughout the HMA. Although some management areas are currently at the desired seral stage, most areas are not at the desired stage (see Appendix 2).

There are no known threatened or endangered plant species in the Antelope HMA.

Poisonous or noxious plants other than halogeton and larkspur are quite limited in the plan area.

2. Water

The Antelope HMA is well watered in the upper elevations of the Schell Creek Range and North Antelope Range. In other parts of the plan area water is not well distributed or is lacking. Available water is provided via streams, springs, seeps, reservoirs, and wells. Map 7, showing existing waters, can be found in Appendix 1.

Where water currently exists, there appears to be little conflict in consumption needs between foraging animals. Problems center around poor water distribution in Spring Valley, the Black Hills, and South Antelope Valley, competition for space near isolated waters, seasonal availability of well water and vegetation associated with the water.

Water is available throughout most of the HMA, but poor water distribution is a problem which results in uneven use of available forage. The availability of water needs to be increased, and yearlong water should be made available at all water sources for horse use, wherever possible.

3. Livestock

Livestock grazing is an important resource use within the HMA. Competition for existing forage in the past was extreme, but in recent years voluntary reductions in numbers by livestock permittees has helped to reduce this competition between horses and domestic livestock. In 1980, only 25 percent of livestock grazing preference was activated with five permittees taking total nonuse. Active use has remained below preference since then. The FMUDs for Chin Creek, Tippett, Sampson Creek and Becky Creek Allotment have reduced grazing pressures from livestock.

The herd area encompasses parts of seven allotments in the Schell Resource Area - Becky Springs, Chin Creek, Deep Creek, Goshute Mountain, Sampson Creek, Tippett and Tippett Pass. In addition, the HMA also falls within the boundaries of five allotments in the Egan Resource Area - Cherry Creek, Becky Creek, North Steptoe, Lovell Peak, and Schellbourne. Wild horse use is minimal on these allotments. Table 2a shows the livestock AUMs, season of use, and class of livestock for each allotment within the HMA.

Table 2a. Livestock Operations in the Antelope HMA.

Allotment	AUMs Active Preference	Season of Use	Class of Livestock
Becky Creek*	671	11/15 - 4/15	Sheep
Becky Springs*	3,842	11/1 - 5/30	Cattle/Sheep
Cherry Creek	7,040	Yearlong	Cattle
Chin Creek*	13,115[1]	Yearlong	Cattle/Sheep
Deep Creek*	2,083	Yearlong	Cattle
Goshute Mountain*	465	1/1 - 4/7	Sheep
Lovell Peak*	105	7/10 - 1/25	Sheep
North Steptoe*	700	3/1 - 3/31	Sheep
Sampson Creek*	1,327	5/1 - 9/30	Sheep
Schellbourne	799	5/1 - 3/1	Cattle/Sheep
Tippett	5,393	6/1 - 4/15	Cattle/Sheep
Tippett Pass	8,177	Yearlong	Cattle/Sheep

* The entire allotment is within the HMA.

1 5,743 AUMs are in Mandatory Nonuse unless monitoring data shows the AUMs are available. Wild Horses will receive a proportionate increase in AUMs if livestock do.

4. Wildlife

A Habitat Management Plan (HMP) was developed for wildlife in the Antelope Area. The management of wildlife, range and wild horses was closely coordinated and potential conflicts were analized and resolved at that time.

About 362 species of wildlife occur in the Antelope HMA. This includes 75 species of mammals, 247 species of birds, 11 amphibians, 28 reptiles and 1 species of fish (Steptoe Dace). (A complete listing of species can be found in Schell URA-2.)

Several species of wildlife occurring in the area are quite important. Mule deer, pronghorn antelope, mountain lions, coyotes, bobcats and kit foxes provide the main game and furbearer species. Blue grouse, sage grouse, chukar and cottontail rabbits constitute the major upland game species.

Two species of wildlife within this plan area are on the Federal Threatened and Endangered Species Listing. Bald eagles, endangered, commonly winter in North Spring and Antelope Valleys.

Peregrine falcons, endangered, have been known to migrate through this area. No nests are known to occur.

Three species in the area are on the Federal list of species which may be proposed for threatened and endangered status.

Spotted bats, category 2, may occur in the plan area which is well within its range of occurrence.

Steptoe Dace, category 2, which occur in Lookout Spring (T. 26 N., R. 67 E., sec. 30, SESE) are on the State of Nevada's and the federal sensitive list.

Ferruginous hawks which are now on a Federal special concern list, category 2, nest within the plan area.

5. Minerals

Mining activity began in portions of the plan area as early as 1859. Four mining districts have been established within the area with numerous isolated prospect pits scattered throughout the area. Little activity is presently occurring but could pick up as demand and technology change. (See Schell URA-3 and 4 for a detailed description of mining districts, ore bodies and production potential.)

6. Recreation

Recreation in the area is limited, with hunting and trapping being the major recreational activities. Very little sightseeing or recreational horse viewing has been noted. This is probably due to the remoteness of the area. Some post and woodcutting takes place,

particularly in the Antelope Range. An area on the north end of the Antelope Range has been designated as a commercial woodcut area. However, recreation and woodcutting presently cause no major disturbance to wild horses.

APPENDIX 4.

DRAFT

CAPTURE/REMOVAL PLAN FOR THE ANTELOPE HERD MANAGEMENT AREA

Ely District

Schell Resource Area

Purpose

The proposed action is to capture and/or remove wild horses from the Antelope Herd Management Area (HMA) for the purposes of maintaining the appropriate management level (AML) or to implement fertility control measures. Maintenance of AML will restore the range to a thriving natural ecological balance and prevent further deterioration of the range threatened by an overpopulation of wild horses in and around the Antelope Herd Management Area (HMA). Fertility control will help maintain AML without the necessity for as many removals in the future. Wild horses will be captured and/or removed using helicopters. Some roping from horseback will also be allowed.

This document outlines the procedures and methodology for capturing and/or removing wild horses from the Antelope HMA. Also outlined are the BLM personnel involved with the roundup, the Contracting Officer's Representative (COR) and Project Inspectors (PI's), the delegation of authority, the briefing of the contractor(s), and the precapture evaluation held prior to gathering operations.

Area of Concern

The Antelope HMA is located approximately 35 miles north of Ely in northern White Pine County, Nevada, in the Bureau of Land Management (BLM) Ely District, Schell and Egan Resource Areas. Removals may also occur in adjacent horse-free areas if it is determined that wild horses are residing outside the HMA yearlong. Maps of the HMA are located in Appendix 1 of the HMAP.

The proposed action is in conformance with the Schell Management Framework Plan (MFP), the Schell Grazing Environmental Impact Statement (EIS) and Record of Decision (ROD), the Draft Egan Resource Management Plan (RMP) and Final EIS, The Egan ROD, and the Final Multiple Use Decisions for the Chin Creek, Tippett, Sampson Creek, and Becky Creek allotments. This action is considered a part of long term management.

Any removals will be followed by a post-removal census to determine if the proper number of horses remains in the HMA. All fertility control measures will be monitored as outlined in the HMAP.

Method of Capture

Captures and/or removals will take place through issuance of removal contracts.

Under no circumstances will gathering be allowed during the foaling season (March 1 to July 1).

The method of capture to be used will be a helicopter to bring the horses to trap sites and horseback riders at the wings of

portable traps. The Horse Free Area may require a combination of helicopter trapping and roping from horseback, as determined by the COR, to eliminate all horses from the area. Roping will be allowed to complete the total removal as horses become widely scattered. The temporary traps and corrals will be constructed from portable pipe panels. A temporary holding corral will be constructed in the area to hold horses after capture. A loading chute at the holding corral will be equipped with plywood sides or similar material so horses' legs won't get caught in the panels. Trap wings will be constructed of portable panels, jute netting, or other materials determined to be non-harmful to the horses. Barbed wire or other harmful materials will not be allowed for wing construction. All trap, corral, and wing construction will be approved by the COR.

Other methods of capture are not being considered for various reasons. Water trapping wild horses, though easier on the animal, is not feasible due to the numerous water sources available to horses in the proposed gathering area. Water traps take time to construct and require time for horses to accept as part of their environment; the time allotted to each removal is limited. Trapping horses by running them on horseback is not feasible because it is too easy to lose the horses after starting them towards the trap; injuries to both people and horses are more likely and the cost factor shown from previous roundups using this method indicates that the costs are prohibitive.

Each trap site will be selected by the COR after determining the habits of the animals and observing the topography of the area. Specific locations may be selected by the contractor with the COR's approval within this general pre-selected area. Trap sites will be located to cause as little injury to horses and as little damage to the natural resources of the area as possible. Sites will be located on or near existing roads and will receive cultural and threatened/endangered plant and animal clearances prior to construction.

Due to the many variables such as weather, time of year, location of horses, and suitable trap sites, it is not possible to identify specific locations at this time. They will he determined at the time of each operation.

The terrain in the removal area varies from flat valley bottoms to mountainous, and the horses could be located at all elevations during the time that a gather is scheduled. There are few physical barriers and fences in the area and the contractor will be instructed to avoid them.

Administration of the Contract

BLM will be responsible, through a contract, for all capture, care, fertility treatments, temporary holding until release, and transportation of excess animals to the adoption preparation facility.

Within two weeks prior to the start of each operation, BLM will provide for a precapture evaluation of existing conditions in the gather area. The evaluation will include animal condition, prevailing temperatures, drought conditions, soil conditions, topography, road conditions, locations of fences and other physical barriers, and animal distribution. The evaluation will also arrive at a conclusion as to whether the level of activity is likely to cause undue stress to the animals, and whether such stress would be acceptable to the animals if veterinarian expertise were present, or whether a delay in the capture activity is warranted. If it is determined that the capture can proceed with a veterinarian present, the services of a veterinarian will be obtained before the capture will proceed.

At least one authorized BLM employee will be present at the site of captures/removals. Either a Contracting Officer's Representative (COR) or a Project Inspector (PI), preferably both, will be on site. The COR will be directly responsible for conducting the capture/removal and can appoint other BLM personnel to assist with the operation as necessary.

Other BLM personnel may be needed to help and include an archaeologist or a district archaeological technician to survey sites for cultural resources, Schell and/or Egan Resource Area personnel as the need arises, and a BLM law enforcement agent to protect BLM personnel and property from unlawful activities.

The COR is directly responsible for the conduct of the gathering operation and for reporting progress to the Ely District Manager, and the Nevada State Office.

The District Manager is responsible for maintaining and protecting the health and welfare of the wild horses. To ensure the contractor's compliance with the contract stipulations, the COR and/or Project Inspector will be on site. However, the Schell and Egan Resource Area Managers and the Ely District Manager are very involved with guidance and input into this removal plan and with contract monitoring. The health and welfare of the animals is the overriding concern of the District Manager, Area Managers, COR and PIs.

The COR and/or PIs will constantly, through observation, evaluate the contractor's ability to perform the required work in accordance with the contract stipulations. Compliance with the contract stipulations will be through issuance of written instructions to the contractor, stop work orders and default procedures should the contractor not perform work according to the stipulations.

To assist the COR in administering the contract, BLM will have a helicopter available at the capture site as needed. This helicopter will be used with discretion to minimize disturbance of horses that would make gathering more difficult. However, it will be used as needed to assure that the contractor is complying

with the specifications of the contract and to ensure the humane capture of animals.

If the contractor fails to perform in an appropriate manner at any time, the contract will not be allowed to continue until problems encountered are corrected to the satisfaction of the COR. All publicity, formal public contact, and inquiries will be handled through the Schell Resource Area Manager. He will also coordinate the contract with Palomino Valley Corrals, the adoption preparation facility. He will assure that there is space available in the corrals for the captured horses, that they can be handled humanely and efficiently, and that animals being transported from the capture site are arriving in good condition.

Contractor's Briefing

The contractor, after award of the contract, will be briefed on his duties and responsibilities before the notice to proceed is issued to him. There will also be an inspection of the contractor's equipment at this time to assure that it meets specifications and is adequate for the job. Any equipment that does not meet specifications must be replaced within 36 hours. The contractor will also be informed of the terrain involved, the condition of the animals, the condition of the roads, potential trap locations, and the presence of fences and other dangerous barriers.

Branded and Claimed Animals

A notice of intent to impound and a 28-day notice to gather wild horses will be issued concurrently by the BLM prior to any gathering operations in this area.

The Nevada Department of Agriculture and the District Brand Inspector will receive copies of these notices, as well as the Notice of Public Sale if issued.

The COR/PI will contact the District Brand Inspector and make arrangements for dates and times when brand inspections will be needed.

When horses are captured, the COR/PI and the District Brand Inspector will jointly inspect all animals at the holding facility in the gathering area. If determined necessary at that time by all parties involved, horses will be sorted into three categories:

a. Branded animals with offspring, including yearlings.

b. Unbranded or claimed animals with offspring, including yearlings with obvious evidence of existing or former private ownership (e.g., geldings, bobbed tails, photo documentation, saddle marks, etc.).

c. Unbranded animals and offspring without obvious evidence of former private ownership.

The COR/PI, after consultation with the District Brand Inspector, will determine if unbranded animals are wild and free-roaming horses. The District Brand Inspector will determine ownership of branded animals and their offspring and, if possible, the ownership of unbranded animals determined not to be wild and free-roaming horses.

Branded horses with offspring and claimed unbranded horses with offspring for which the owners have been identified by the District Brand Inspector will be retained in the custody of the BLM pending notification of the owner or claimant.

A separate holding corral will be set up near the temporary holding corral to house these horses until the owner/claimant or BLM can pick them up.

The animals will remain in the custody of the BLM until settlement in full is made for impoundment and trespass charges, as determined appropriate by the Schell or Egan Area Manager in accordance with 43 CFR Subpart 4710.6 and provisions in 43 CFR Subpart 4150. In the event settlement is not made, the horses will be sold at public auction by the BLM.

Branded horses with offspring whose owners cannot be determined, and unclaimed, unbranded horses with offspring having evidence of existing or former private ownership will be released to the Nevada Department of Agriculture (District Brand Inspector) as estrays.

The District Brand Inspector will provide the COR/PI a brand inspection certificate for the immediate shipment of excess wild horses to Palomino Valley (Reno), and for the branded or claimed horses where impoundment and trespass charges have not been offered or received, for shipment to public auction or another holding facility.

Destruction of Injured or Sick Animals

Any severely injured or seriously sick animal shall be destroyed in accordance with 43 CFR Subpart 4730.1. Animals shall be destroyed only when a definite act of mercy is needed to alleviate pain and suffering. The COR/PI will have the primary responsibility for determining when an animal will be destroyed and will perform the actual destruction. The contractor will be permitted to destroy an animal only in the event the COR/PI are not at the capture site or holding corrals, and there is an immediate need to alleviate pain and suffering of a severely injured animal. When the COR/PI is unsure as to the severity of an injury or sickness, a veterinarian will be called to make a final determination. Destruction shall be done in the most humane method available as per Washington Office Wild

Free-Roaming Horse and Burro Program Guidance dated January 1983. A veterinarian can be called from Ely if necessary to care for any injured horses.

The carcasses of wild horses which die or must be destroyed as a result of any infectious, contagious, or parasitic disease will be disposed of by burial to a depth of at least 3 feet.

The carcasses of wild horses which must be destroyed as a result of age, injury, lameness, or noncontagious disease or illness will be disposed of by removing them from the capture site or holding corral and placing them in an inconspicuous location to minimize the visual impacts. Carcasses will not be placed in drainages regardless of drainage size or downstream destination.

Temporary Holding Facility

The holding facility shall be on public land unless an agreement is made between the contractor and a private landowner for use of private facilities. When private land is used,the contractor must guarantee BLM, and the public, access to the facilities and accept all liability for use of such facilities.

The contractor shall provide all feed, water, labor, and equipment to care for captured horses at the holding facility. The contractor shall also provide transportation of captured excess horses from the temporary holding facility to the Nevada Distribution Center, Palomino Valley (Reno), Nevada. BLM will provide transportation of unclaimed and claimed branded horses to an approved facility for release to the claimant or for handling under Nevada State estray laws. All work shall be accomplished in a safe and humane manner and be in accordance with the provisions of 43 CFR Part 4700 and the following specifications and provisions.

All labor, vehicles, helicopters, traps, troughs, feed, temporary holding facilities, and other supplies and equipment including, but not limited to the aforementioned, shall be furnished by the contractor. BLM will furnish contract supervision.

Stipulations and Specifications

A. Motorized Equipment

1. All motorized equipment employed in the transportation of captured animals shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of animals.

2. Vehicles shall be in good repair, of adequate rated capacity, and operated so as to insure that captured animals are transported without undue risk or injury.

3. Only stocktrailers shall be allowed for transporting

animals from traps to temporary holding facilities. Only Bobtail trucks, stocktrailers, or single deck trucks shall be used to haul animals from temporary holding facilities to final destination. Sides or stockracks of transporting vehicles shall be a minimum height of 6 feet 6 inches from vehicle floor. Single deck trucks with trailers 40 feet or longer shall have two partition gates to separate animals. Trailers less than 40 feet shall have at least one partition gate to separate the animals. Each partition shall be a minimum of 6 feet high and shall have a minimum 5 foot wide swinging gate. The use of double deck trailers is unacceptable and shall not be allowed.

4. All vehicles used to transport animals to final destination shall be equipped with at least one door at the rear end of the vehicle which is capable of sliding either horizontally or vertically.

5. Floors of vehicles and the loading chute shall be covered and maintained with a non-skid surface such as sand, mineral soil or wood shavings, to prevent the animals from slipping. This will be confirmed by the COR/PI prior to loading (every load).

6. Animals to be loaded and transported in any vehicle shall be as directed by the COR and may include limitations on numbers according to age, size, sex, temperament, and animal condition. A minimum of 1.4 linear foot per adult animal and .75 linear foot per foal shall be allowed per standard 8 foot wide stocktrailer/truck.

   The BLM employee supervising the loading of the wild horses to be transported from the trap to the temporary holding corral will require separation of small foals and/or weak horses from the rest should he/she feel that they may be injured during the trip. He/She will consider the distance and condition of the road and animals in making this determination. Horses shipped from the temporary holding corral to the BLM facility will normally be separated by studs, mares and foals (including small yearlings). However, if the numbers of these classes of animals are too few in one compartment and too many in another, animals may be shifted between compartments to properly distribute the animals in the trailer. This may include placing a younger, lighter stud with the mares or a weak mare with the foals. Further separation may be required should condition of the animals warrant.

   The BLM employee supervising the loading will exercise his/her authority to off-load animals should he/she feel there are too many horses on the trailer/truck.

7. The COR shall consider the condition of the animals, weather conditions, type of vehicles, distance to be transported, or other factors when planning for the movement of captured animals. The COR shall provide for any brand and/or inspection services required for the captured animals.

   It is currently planned to ship all excess horses to the Palomino Valley facility. Communication lines have been established with the Palomino Valley personnel involved in off-loading the horses, to receive feedback on the condition of shipped horses. Should problems arise, shipping methods and/or separation of the horses will be changed in an attempt to alleviate the problems.

8. If the COR determines that dust conditions are such that the animals could be endangered during transportation, the contractor will be instructed to adjust speed. The maximum distance over which animals may have to be transported on dirt roads is approximately 25 miles per load.

   Periodic checks by BLM employees will be made as the horses are transported along dirt roads. If speed restrictions are placed in effect, then BLM employees will, at times, follow and/or time trips to ensure compliance.

B. Trapping and Care

1. All capture attempts shall be accomplished by the utilization of a helicopter. A minimum of one saddlehorse shall be immediately available at the trap-site to accomplish roping if necessary. Roping shall be done as determined by the COR. Under no circumstances shall animals be tied down for more than 1 hour.

   Roping will be allowed only to capture an orphaned foal or a suspected wet mare. However, since all wild horses have to be removed from the area outside of the HMA, roping will be allowed if certain individual horses continue to elude helicopter herding operations.

2. The helicopter shall be used in such a manner that bands or herds will remain together. Foals shall not be left behind.

   The Ely District will use an observation helicopter if needed as the primary means in which to supervise the use of the project helicopter. In the absence of an observation helicopter, the project helicopter or saddle horses may be used to place a BLM observer on a

point overlooking the area of the helicopter herding operations.

3. The rate of movement and distance the animals travel shall not exceed limitations set by the COR who will consider terrain, physical barriers, weather, condition of the animals, and other factors.

   BLM will not allow horses to be herded more than 10 miles nor faster than 20 miles per hour. The COR may decrease the rate of travel or distance moved should the route to the trap site pose a danger or cause avoidable stress (steep and/or rocky). Animal condition will also be considered in making distance and speed restrictions.

   Temperature limitations are 10 degrees F. as a minimum and 95 degrees F. as a maximum. Special attention will be given to avoiding physical hazards such as fences.

4. All trap locations and holding facilities must be approved by the COR prior to construction. The contractor may also be required to change or move trap locations as determined by the COR. All traps and holding facilities not located on public land must have prior written approval of the landowner.

   If tentative trap sites are not located near enough to the concentrations of horses, then the trap site will not be approved. The COR will move the general location of the trap closer to the horses. Trap sites will not be approved where barbed-wire fences are used as wings, wing extensions, or to turn the horses, during herding, toward the trap.

5. All traps, wings, and holding facilities shall be constructed, maintained and operated to handle the animals in a safe and humane manner and be in accordance with the following:

   a. Traps and holding facilities shall be constructed of portable panels, the top of which shall not be less than 72 inches high, and the bottom rail of which shall not be more than 12 inches from ground level. All traps and holding facilities shall be oval or round in design.

   b. All loading chute sides shall be fully covered with plywood or like material. The loading chute shall also be a minimum of 6 feet high.

   c. All runways shall be a minimum of 20 feet long and a minimum of 6 feet high and shall be covered with plywood or like material a minimum of 1 foot

to 5 feet above ground level.

d. Wings shall not be constructed out of barbed wire or other materials injurious to animals and must be approved by the COR.

e. All crowding pens including the gates leading to the runways shall be covered with a material which prevents the animals from seeing out (plywood, burlap, etc.) and shall be covered a minimum of 1 foot to 5 feet above ground level. Eight linear feet of this material shall be capable of being removed or let down to provide a viewing window.

f. All pens and runways used for the movement and handling of animals shall be connected with hinged self-locking gates.

6. No fence modification will be made without authorization from the COR. The contractor shall be responsible for restoration of any fence modification which he has made.

   If the route the contractor wishes to herd horses passes through a fence, the contractor will be required to roll up the fencing material and pull up the posts to provide at least one-eighth mile of gap. The standing fence on each side of the gap will be well-flagged for a distance of 300 yards from the gap on each side.

7. When dust conditions occur within or adjacent to the trap or holding facility, the contractor shall be required to wet down the ground with water.

8. Alternate pens, within the holding facility shall be furnished by the contractor to separate mares with small foals, sick and injured animals, and estray animals from the other horses. Animals shall be sorted as to age, number, size, temperament, sex, and condition when in the holding facility so as to minimize, to the extent possible, injury due to fighting and trampling.

   As minimum, studs will be separated from the nares and foals when the animals are held overnight.

9. Animals shall be transported to final destination from temporary holding facilities within 24 hours after capture unless prior approval is granted by the COR for unusual circumstances or for the treatment of animals with fertility control measures. Animals shall not be held in traps and/or temporary holding facilities on

days when there is no work being conducted except as specified by the COR. Holding may be necessary for three weeks if an immuno-contraceptive agent requires a booster shot. The Contractor shall schedule shipments of animals to arrive at final destination between 6:00 a.m. and 4:00 p.m. Every effort will be made to ensure that the time horses are standing on the trucks prior to off loading is minimized.

No shipments shall be scheduled to arrive at final destination on Sunday.

10. The Contractor shall provide animals held in the traps and/or holding facilities with a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day. Animals held for 10 hours or more in the traps or holding facilities shall be provided good quality grass hay at the rate of not less than 2 pounds of hay per 100 pounds of estimated body weight per day.

11. It is the responsibility of the contractor to provide security to prevent loss, injury or death of captured animals until delivery to final destination or until released back to the range.

12. The contractor shall restrain sick or injured animals if treatment by the Government is necessary. The COR will determine if injured animals must be destroyed and provide for destruction of such animals. The contractor may be required to dispose of the carcasses as directed by the COR.

C. Helicopter, Pilot, and Communications

1. The contractor must operate in compliance with Federal Aviation Regulations, part 91. Pilots provided by the contractor shall comply with the Contractors Federal Aviation Certificates, applicable regulations of the State of Nevada and shall follow what are recognized as safe flying practices.

2. When refueling, the helicopter shall remain a distance of at least a 1,000 feet or more from animals, vehicles (other than fuel truck), and personnel not involved in refueling.

3. The COR shall have the means to communicate with the Contractor's pilot and be able to direct the use of the gather helicopter at all times. If communications cannot be established, the Government will take steps as necessary to protect the welfare of the animals. The frequency(s) used for this contract will be assigned by the COR when the government furnished "slip-in" VHF/FM portable radio is used. When a VHF/AM

radio is used, the frequency will be 122.925 MHz.

4. The contractor shall obtain the necessary FCC licenses for the radio system.

5. The proper operation, service and maintenance of all contractor furnished helicopters is the responsibility of the contractor. The BLM reserves the right to remove from service pilots and helicopters which, in the opinion of the contracting officer or COR violate contract rules, are unsafe or otherwise unsatisfactory. In this event, the contractor will be notified in writing to furnish replacement pilots or helicopters within 48 hours of notification. All such replacements must be approved in advance of operation by the contracting officer or his/her representatives.

D. Contractor-Furnished Property

1. All hay, water, vehicles, saddle horses, helicopters and other equipment shall be provided by the contractor. Other equipment includes, but is not limited to, a minimum of 1,500 linear feet of 72-inch high (minimum height) panels for traps and holding facilities. Separate water troughs shall be provided at each pen where animals are being held.

2. The contractor shall furnish an avionics system that will allow communications between the contractor's helicopter and his fuel truck.

3. The contractor shall furnish a VHF/AM radio transceiver in the contractor's helicopter which has the capability to operate on a frequency of 122.925 MHz.

4. The contractor shall provide a programmable VHF/FM radio transceiver in the contractor's helicopter to accommodate the COR/PI in monitoring the gather operation.

APPENDIX 5

STUDY PROPOSAL FROM UNR

FERAL HORSE AND BURRO FERTILITY CONTROL IN NEVADA: CONTRACEPTIVE VACCINE PILOT PROJECT

A Proposal Submitted to the
United States Department of the Interior
Bureau of Land Management
Nevada State Office

by

Kenneth W. Hunter, Jr., Sc.D.
Professor of Biology
Associate Vice President for Research
and Dean of the Graduate School
University of Nevada, Reno
Reno, Nevada

July 1990

The University of Nevada, Reno (UNR) is pleased to submit this proposal for a pilot project to evaluate a novel, single-injection contraceptive vaccine for fertility control in feral horses. Wild horses and burros in Nevada represent a magnificent natural resourse, but a resource that requires better management. We feel that an immunologic approach to fertility control represents a humane and cost effective way to manage wild horse and burro populations on public lands in Nevada and elsewhere.

While a variety of potential population management approaches have been discussed in the scientific community, the use of a zona pellucida-based vaccine in mares is perhaps the approach with the greatest present potential. In this proposed project, UNR will subcontract with the Medical College of Ohio for the services of Dr. John W. Turner and his colleagues Drs. Jay G. Kirkpatrick and Irwin K.M. Liu, acknowledged experts in the preparation and use of zona pellucida-based vaccines for fertility control. UNR will serve an administrative role, and provide oversight on the project through the following faculty committee:

Kenneth W. Hunter, Jr., Sc. D., Professor of Biology, Associate Vice President for Research and Dean of the Graduate School (Committee Chair)

Donald R. Hanks, D.V.M., Professor and Chair, School of Veterinary Medicine

Richard C. Simmonds, D.V.M., M.S., Director, Laboratory Animal Medicine

William G. Kvasnicka, D.V.M., Associate Professor of Veterinary Medicine and Extension Veterinarian

Ronald S. Pardini, Ph. D., Professor of Biochemistry and Associate Director, Nevada Agricultural Experiment Station

Duane L. Garner, Ph. D., Professor of Animal Science

This committee will meet periodically with the research team from the Medical College of Ohio and the Nevada Bureau of Land Management to plan and discuss the progress of the pilot fertility project.

The following section of this proposal outlines the experimental approach for the pilot fertility control project.

INTRODUCTION

Feral horse management on western public lands is currently confined to the removal of excess horses. While we are not convinced that there is an actual overpopulation of horses in many areas, we recognize the need for improved, more effective management of feral horse populations. The removal of horses as the sole management effort, while seemingly effective at the time of removal, does not prevent the subsequent growth of the remaining population and insures that removal must continue year after year. Indeed, there is evidence that the removal of horses actually increases fecundity among those animals remaining behind and accelerates the growth of the population (Kirkpatrick and Turner 1991). In other words, removal alone addresses only the symptom of overpopulation (too many horses) and not the cause (reproduction).

An alternative approach is to limit reproduction, through some form of fertility control (see reviews by Kirkpatrick and Turner 1985, 1991; Turner and Kirkpatrick 1991). Toward that goal we have tested a contraceptive vaccine on feral horses which can limit the number of foals born to free-roaming mares. The major characteristics of this vaccine include (1) great effectiveness (> 95% effective), (2) remote delivery, which permits humane non-capture administration of the vaccine, (3) relative low cost, (4) no effects upon individual or social behavior of the target animals, (5) no effects upon pregnancies already in progress at the time of delivery, (6) reversible contraceptive action, and (7) no passage of the vaccine through the food chain or into the environment. These characteristics have been previously identified as required for successful feral horse contraception (Turner and Kirkpatrick 1986).

The vaccine, known as porcine (pig) zonae pellucidae, or PZP, satisfies these criteria. The zona pellucida is a non-cellular protein membrane which surrounds all mammalian eggs. In order for fertilization to occur, sperm must first bind to this membrane before they can penetrate the egg. The intramuscular injection of PZP into mares causes them to produce antibodies against the pig protein, but these antibodies also bind to the sperm attachment sites on the mares' eggs, thereby preventing sperm attachment and fertilization (for a review of the PZP vaccine see Paterson and Aitken 1990). Because only fertilization has been blocked, there are no hormonal manipulations which cause behavioral changes. Indeed, immunized mares remain together in their social groups, ovulate regularly during the breeding season, and permit mating behavior by the herd stallion, and in general reflect the social behavior of untreated feral horses (Kirkpatrick et al. 1990a).

This vaccine was originally tested on captive feral horses and prevented pregnancies in 13 of 14 treated mares (Liu et al. 1989). Following this, the vaccine was tested on free-roaming feral horses managed by the National Park Service (Kirkpatrick et al. 1990a).

The hallmarks of this first field test were successful remote delivery by means of barbless darts fired from a capture gun, a demonstration of the vaccine's effectiveness (no pregnancies among 26 treated mares vs. a 50% pregnancy rate among control mares), reversibility, and a demonstration of its safety for use in animals already pregnant at the time of inoculation. After four years of treatment over 60 "mare years" (i.e., the number of mares treated annually x the number of years treated) only a single foal has been born. This approach to fertility control in feral horses has been so effective that the National Park Service is already in the process of designing a management program built around this vaccine (personal communication, John Karish, Regional Scientist, Mid-Atlantic region, National Park Service). The effectiveness and safety of this contraceptive vaccine has been well documented and our own research group has tested the vaccine on a variety of other hoofstock, including white-tailed deer (Turner et al. 1992), sika, samabar, axis and muntjac deer and Himalayan tahr (Bronx Zoo), and West Caucasian tur (Toronto Zoo). Other investigators have demonstrated the effectiveness of the vaccine in a wide variety of non-human primates (Paterson and Aitken 1990) and even humans (Sacco 1987). Currently the vaccine is a candidate for development as a human contraceptive (Millar et al. 1989).

The vaccine has one major disadvantage at the present time. During the first year of administration of the vaccine, the mare must be inoculated twice, about three weeks apart. Contraceptive protection for subsequent years requires only a single booster inoculation (Kirkpatrick et al. 1992). Thus, the focus of current research efforts is to develop a one-inoculation vaccine which will permit one to two full years of contraception after a single administration. Basically, this will involve incorporating multiple doses of the PZP vaccine in a single inoculation in such a way that there is an initial release of some of the vaccine after injection and then a small but constant release of the remaining vaccine, similar to the way Contac® cold capsules work. A pilot study has already been carried out which has demonstrated the effectiveness of a continual release of the vaccine. This study, with domestic mares, employed a single injection followed by placement of an implant under the skin, which released the vaccine gradually over four weeks. Antibodies were produced in quantities which cause contraception and indicate that a one-inoculation sustained release system can be effective as a fertility inhibitor (see Figure 1).

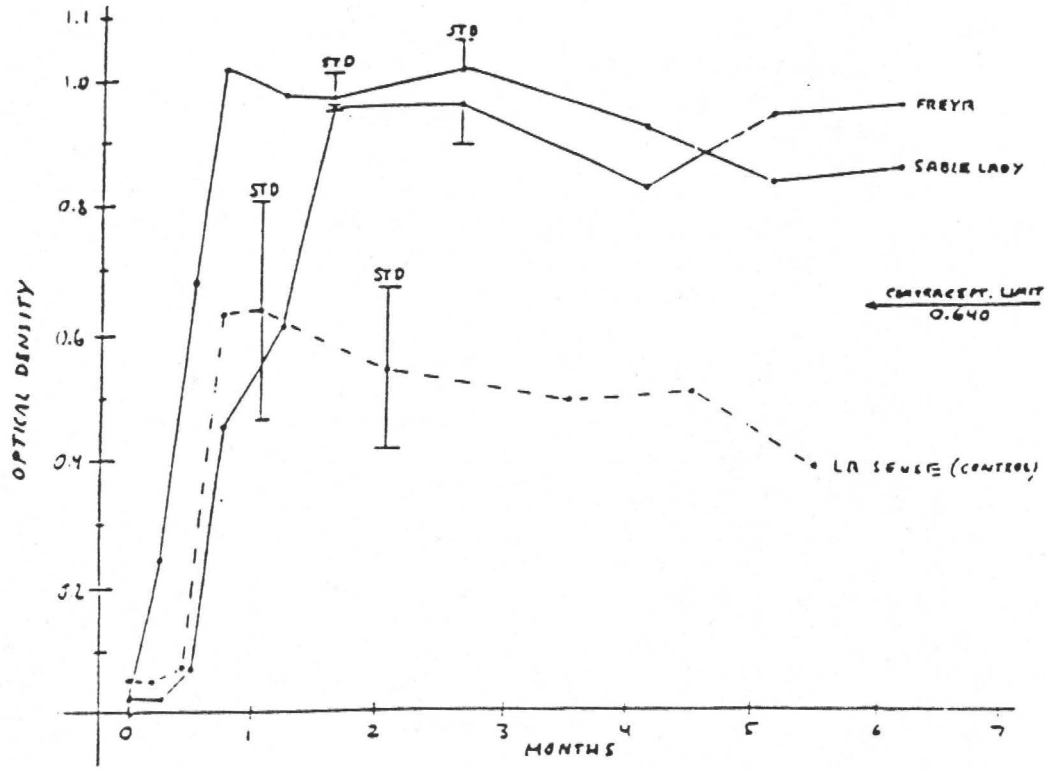

Fig. 1. Effect of sustained-release PZP vaccination in mares (Freya and Sable Lady) on anti-PZP antibody production. Vaccination consisted of bolus injection of 65 μg PZP and Freunds Complete Adjuvant (0.5 cc) followed by sustained PZP release (2.3 μg/day) over 28 days from a subcutaneously implanted osmotic minipump (Alzet, Inc.). Control (LaSense) received bolus PZP and Freund's Complete Adjuvant, but no pump. Plasma antibody titers are measured in optical density units. The lower limit of contraceptive efficiency determined from previous studies is 0.64 O.D.

With these encouraging data we have embarked upon the chemical engineering necessary to give us this same type of release pattern in a single injection. This is a collaborative effort between the Medical College of Ohio, Deaconess Research Institute, the University of California at Davis, and The Humane Society of the U.S.. The prototype timed-release preparation is already underway and we expect to have an initial testing of it in domestic mares completed by Fall of 1992. Additional funds are needed to complete this study, and this is the first of three studies for which we are requesting funding from your organization.

The second study for which we are requesting funding support is the development of a two-year contraceptive capability with a single injection. This will essentially involve an extension of the technology for the annual single-injection vaccine described above. It is obviously more time- and cost-efficient to deliver vaccine every other year instead of annually. The timed-release technology which is currently available must be evaluated for its specific application to the PZP vaccine. This approach involves formulating a single injection which contains the two-dose release sequence for the first year and a single dose released 9-12 months later for contraception during the second year. Long-term timed-release such as this, employing a process called microencapsulation, has been used for other applications (Eldridge et al. 1989). The high potency of the vaccine in small amounts makes it a very good candidate for permitting microencapsulation and still allowing remote delivery.

While the two studies described above will be primarily chemical engineering (with testing of antibody levels in domestic mares), the true test of the vaccine will require a field study. To accomplish this, the vaccine will be tested on free-roaming feral horses in Nevada. This third study, for which we are requesting funding, will be carried out in one or two herd areas mutually agreed upon by our research group and the agency or agencies appointed to make such decisions in Nevada. The field trials will evaluate effectiveness of the vaccine by pregnancy testing and foal counts. While remote delivery of vaccine in the field by darting from helicopter or at water holes is certainly a reasonable eventual goal, the proposed field trial will focus on injection in the chute following gathering. This will permit guarantee of scientific validity in terms of assured injection of vaccine and individual animal identification. Other field trial considerations such as cost, time, humaneness and safety will be monitored. While it is possible that the chemical engineering of the single-injection vaccine will be completed by Fall of 1992, we cannot guarantee this. Therefore, we propose two possible vaccination protocols for the 1992 gathering. If the single-shot vaccine is complete at that time, one half of the mares will be given a single injection and released while the remainder will be injected, retained for 3 weeks, reinjected and released. If the single-shot vaccine is not complete, then our current 2-injection procedure will be used on all mares. The proposed protocol will require maintaining horses in captivity for 3 weeks (without handling), but will permit successful vaccination and maintained flow of the project in the event that the single-injection engineering is delayed in completion. Because the second study (i.e., two-year capability) will probably not be complete by the time the initial field applications are needed the proposed first round of field testing will utilize only the prototype annual single-injection vaccine or current two-injection procedure.

While this proposal is brief and to the point, it is important in outlining crucial steps to enable large scale contraceptive vaccination of feral horses. We feel it is necessary to point out that the alternative available contraceptive technology - steroid

hormone implants - does not represent current technology nor does it satisfy basic criteria for humane treatment of animals. It is not cost-effective, safety for use in pregnant animals is still a question, behavioral effects are unknown, and steroid use is not likely to be permitted by the EPA because of possible environmental and food-chain contamination.

RESEARCH PLAN

Rationale

The purpose of this proposed research is three-fold and includes (1) development of a functional one-inoculation, one-year PZP contraceptive vaccine which can be delivered remotely for the regulation of free-roaming feral horses, (2) extension of that engineering technology to produce a one-inoculation PZP vaccine which will provide two-years of contraceptive protection, and (3) field test of the vaccine on free-roaming feral horses inhabiting public lands in Nevada.

Objectives

The specific objectives of this proposed research include the following:

I. Development of the one-inoculation, one-year vaccine (in the form of MICROSPHERES).

   1. to determine if the PZP protein, or antigen, retains immunological activity during preparation for incorporation into microspheres,

   2. to engineer a sustained-release formulation for a one-inoculation PZP vaccine that will impart a full year of contraceptive protection, i.e., microspheres,

   3. to test the effectiveness of this one-inoculation, one-year vaccine to produce antibodies in domestic horses.

II. Development of a one-inoculation PZP vaccine which imparts two years of contraceptive protection (in the form of MICROCAPSULES).

   1. to determine whether the PZP antigen retains immunological activity during preparation for incorporation into microcapsules,

   2. to engineer a timed-release, pulsed-release formulation for a one-inoculation vaccine which will impart two-years of contraception,

   3. to test the effectiveness of the one inoculation, multiple year PZP vaccine to produce antibodies in domestic horses.

III. Remote field testing of the PZP vaccine in its current 2-injection form or as a single-injection prototype on free-roaming horses in Nevada. Note that additional field trials will be needed to complete PZP vaccine testing, and these will be addressed in a subsequent proposal.

Considerations in the development of a one-inoculation PZP vaccine

At the present time a minimum of two inoculations of the PZP vaccine, given three weeks apart, are necessary for effective contraception in horses. Despite the > 95% contraceptive effectiveness of the vaccine, the need for two inoculations greatly limits the usefulness of this approach for use in free-roaming horses. Thus, the first goal of this proposed research is to develop a method for delivering a single inoculation of PZP vaccine which will result in an immediate release of some of the vaccine antigen, and then a second release of the vaccine, either continuously for a month or so or as a pulsed release about 3 weeks later. Ideally, the one inoculation would also contain a third dose of the vaccine which would be released about one year later, thus resulting in contraceptive protection for two or more years.

There are two existing technologies which can immediately be applied to the PZP vaccine to meet these goals. The first is to bind the PZP antigen within an inert non-toxic polymer which, upon injection, will release the antigen continuously but slowly over some period of time. The chemical particles which contain the antigen are referred to as microspheres. The second technology is microencapsulation of the PZP antigen. This involves coating the antigen with a non-toxic material which, after injection, erodes away and also releases the antigen. Microcapsules differ from microspheres in that they cause a sharp, timed, pulsed release of the antigen rather than a sustained release (Maulding 1987).

The first timed-release approach involves the continuous, controlled release of PZP antigen imbedded within a microsphere matrix of poly (L-lactide) or copolymers of lactide and glycolide. This approach has been used for the delivery of a large number of drugs, including intramuscular and subdermal contraceptive agents, cancer chemotherapeutics and vaccines (Cowsar et al. 1985; Linhardt 1989; Staas et al. 1991). This methodology initially appeared less promising than microencapsulation (see below) because the process causes a continuous release of the antigen rather than pulses, and continuous release might result in tolerance to the antigen rather than production of high concentrations (titers) of antibodies. However, our preliminary study of continuous release of PZP antigen in mares (see page 4, Figure 1) has demonstrated that high titers of antibody, well above the contraceptive threshold, can be obtained by continuous release. These results make this approach very attractive. Microsphere release of a common protein (bovine serum albumin, or BSA) indicates that this process can duplicate the release we achieved with the implant (see Figure 2). The two real critical questions are whether or not the PZP protein will withstand the chemical process required for incorporation into

microspheres and whether microsphered PZP vaccine will work *in vivo*.

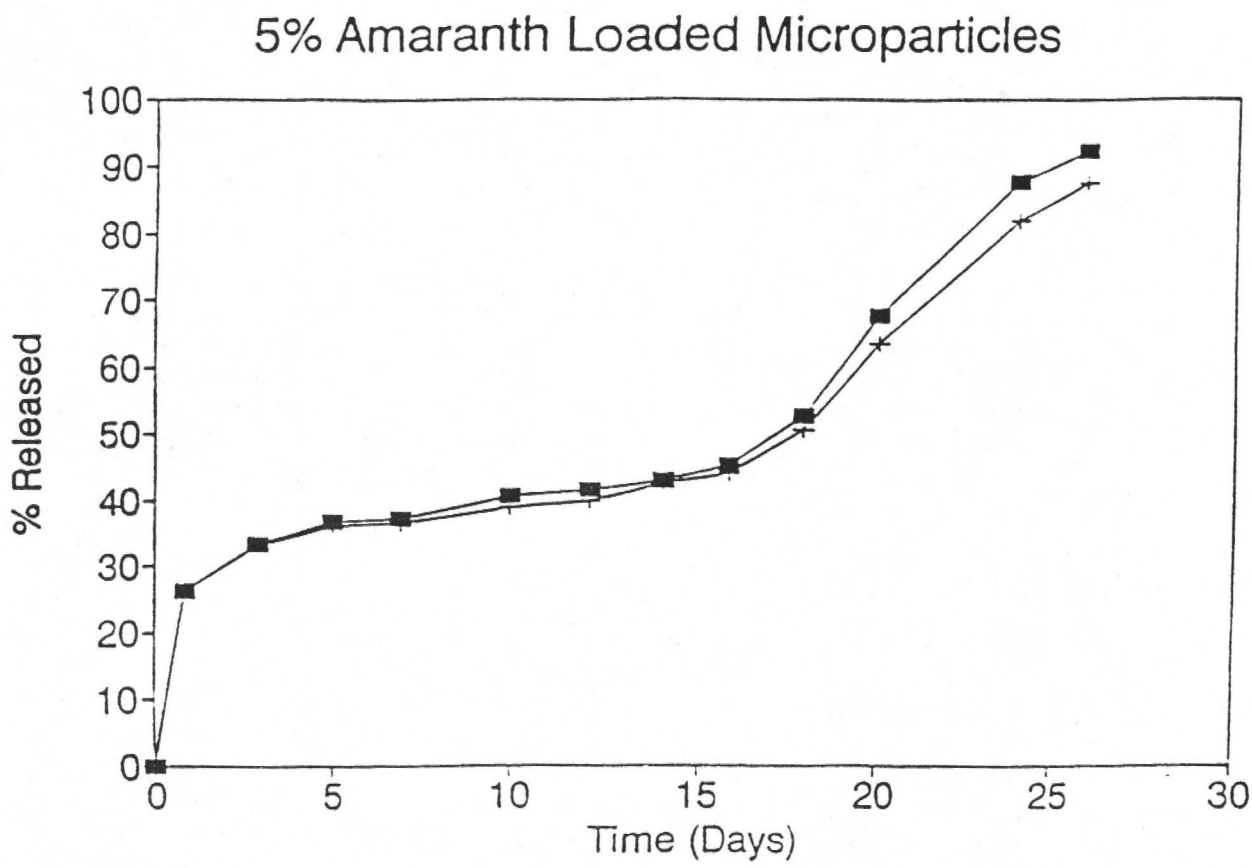

Figure 2. Release rates for bovine serum albumin from lactide pellets.

The technology to produce a one-inoculation PZP vaccine by microencapsulation also already exists. Several protein vaccines have been microencapsulated for oral delivery in humans (Eldridge et al. 1989), and there is a high probability that the same thing can be done for the intramuscular injection of PZP antigen. In the microencapsulation process the protein antigen, PZP in this case, is coated with a non-toxic polymer material, producing small capsules about the size of talcum powder grains. Upon injection into the animal the coating begins to erode. When erosion is complete, the PZP is released. We have previously used this very technique - microencapsulation - to deliver contraceptive steroid hormones to feral horses (see Kirkpatrick et al. 1982; Turner and Kirkpatrick 1982; Turner and Kirkpatrick, 1991). Long-term release rates for vaccines incorporated into microcapsules have been reported to be maintained for up to 2 years (Staas et al., 1991) and we expect that the same sort of sustained release can be achieved with the PZP antigen. Once again, the two critical questions are whether the antigen can withstand the chemical process required for incorporation into microcapsules and whether

the preparation works in vivo.

There are several laboratories which can microencapsulate protein molecules. The most established microencapsulation laboratories in the U.S. are Southern Research Institute (Birmingham, AL), and Medisorb Technologies (Cincinnati, OH). Their approach is to coat the protein antigen with a non-toxic biodegradable coating (D,L-lactide and D,L-lactide co-glycolide) which, on contact with tissue fluids breaks down into harmless products such as carbon dioxide and lactic acid (Redding et al. 1988). When the coating erodes, the protein antigen is released and stimulates the animal to produce antibodies which will bind to its own zonae pellucidae, on its own eggs, and thereby block fertilization.

Considerations for field tests of the one-inoculation vaccine:

Regardless of the success of the chemical engineering necessary to develop the one-inoculation vaccine, the ultimate measure of success in this project will be the effectiveness of inhibiting fertility in PZP-treated free-roaming feral horses in Nevada. Thus, the second major component of this project is to test the one-inoculation vaccine under field conditions. This will involve selection of an appropriate herd area in Nevada, gathering of horses at the appropriate time administration of PZP vaccine or placebo to identified mares in the field and monitoring of these mares for pregnancy and foaling.

METHODS

STUDY 1

PZP Microsphere Development: This work will be performed under subcontract, in the laboratory of R. Linhardt, at the University of Iowa. Approximately 3.0 mg of PZP will be obtained from I.M.K. Liu, at the University of California, Davis. The PZP will be tested for its ability to withstand concentrating, lyophilization, organic solvent exposure, desalting, and heat exposure. These tests are necessary to determine if the PZP antigen can withstand the actual chemical processes necessary for incorporation into microspheres. Retention of the PZP's ability to raise antibodies will be determined by a procedure known as western blot electrophoresis, using PZP anti-horse antibodies already prepared at U.C.-Davis, by M. Bernoco. If the PZP retains its ability to raise antibodies, the next step is to actually incorporate 65 µg doses of PZP, along with an appropriate adjuvant, into microspheres. These microspheres will then be injected into 3 domestic horses, at the Equine Reproduction Laboratory at U.C.-Davis. Periodic blood samples will be collected to determine if the horses are raising antibodies against the microspheres.

Microsphere preparation and in vivo testing: If antibody titers sufficient for contraception are obtained, the most promising formulation will be prepared for injection into a larger number of domestic horses. Preparation will be by R. Linhardt and associates using procedures previously described (Wang et al., 1990, 1991).

PZP release rates will be designed on the basis of previously effective doses in horses, such that 65 μg is released initially and 65-90 μg is released continuously thereafter over one month. Also, Freund's Complete Adjuvant (FCA) will be used based on previous success with this adjuvant in horses. Adjuvants are compounds which, when given with a vaccine, cause the target animals' immune systems to produce very high concentrations of antibodies against the vaccine. A study is already underway which is investigating the possible use of other adjuvants which have minimal side effects and maximum antibody responses. This adjuvant study, conducted by us and funded in part by the American Association of Zoological Parks and Aquariums (AAZPA) will run parallel to our research on a one-inoculation PZP vaccine and will provide valuable information for identifying sound adjuvants for use with the PZP vaccine in horses. The expanded horse study will utilize domestic horses at the Equine Reproduction Laboratory at U.C.-Davis, and will be supervised by Dr. I.K.M. Liu.

Study Design

Group 1 - Free PZP bolus and PZP microspheres + FCA (n=5)

Group 2 - PZP microspheres + FCA (n=5)

Group 3 - Empty (or BSA-loaded) microspheres + FCA (n=5)

Study Schedule

1. Immunization injection 6 weeks prior to onset of breeding is preferred.

2. Blood sample prior to inoculation and monthly post-inoculation for antibody titer measurement.

3. Fecal and/or urine samples prior to inoculation and monthly post-inoculation to determine pregnancy. This will be performed by J. F. Kirkpatrick, Deaconess Research Institute, Billings, MT and will provide information regarding contraceptive efficacy eight months prior to expected foaling time, thereby permitting maximum lead time for designing the next phase of the research.

4. All mares will be placed with fertile stallions and the above schedule of collections and tests will be carried out until antibody titers drop below the contraceptive threshold (previously determined by I.K.M. Liu et al. (1989); all animals will be monitored for general health and physical condition during the study.

Part of Study 1 is already underway as a collaborative effort between The Humane Society of the U.S., the Medical College of Ohio, Deaconess Research Institute, the University of California at Davis, and the University of Iowa.

STUDY 2

Two-year contraceptive vaccine with a single inoculation (microencapsulation): This is primarily a chemical engineering study and will involve subcontracting with one of several companies (Southern Research Institute, Birmingham, AL; Medisorb Technologies, Inc., Cincinnati, OH) to formulate the PZP preparation according to the timed-release schedule we request. Testing of antibody-stimulation characteristics will be performed by I.K.M. Liu. Basically this research will follow the same steps described above for the one-year microsphere inoculation, i.e., (1) testing of the antigen for its ability to withstand the process of microencapsulation, (2) incorporation of PZP antigen into microcapsules designed to give a release one-month, and 10 months after injection, and (3) *in vivo* testing of microcapsules in domestic horses. Depending upon the start-up date, this projected research will permit *in vivo* testing in domestic mares by Fall of 1992.

STUDY 3

Field study of one-inoculation PZP vaccine

Selection of field site: A feral horse herd in Nevada will be identified and agreed upon for field test of the PZP vaccine. Selection will require mutual agreement by our research group, the Bureau of Land Management and the State of Nevada. Selection criteria will include (1) topography suitable for testing, (2) herd size suitable for testing, (3) available background data regarding fertility rates, mortality rates, and population dynamics which will permit reasonable population modelling, and (4) available logistical support (housing, transportation, etc.). The site presently under most serious consideration is the combined herd management areas of Antelope and Antelope Valley in eastern Nevada. All agencies with regulatory authority over the test animals must agree, in writing, that only horse gathers or removals associated with the experimental design of this study will be conducted during the course of these studies.

For the selected feral horse population several population parameters must be established before treatment can begin. First, the desired population effect must be determined. This can be stated as a question; do we wish to achieve negative growth, zero growth, or some predetermined low growth rate? Second, once the desired population effect has been decided upon, we must determine what percentage of sexually mature mares must be treated in order to achieve the population effect, i.e., 60%, 70%, etc. Finally, we suspect that there are differential fecundity rates among mares with foals (yearlings at the time of treatment) and those without foals. Recent evidence from feral horses in California (J. W. Turner, unpublished data) and on a barrier island (Kirkpatrick and Turner 1991) indicate that mares without foals are more likely to be pregnant than those with foals and are less likely to become pregnant the next year. In the herd or herds to be treated in the proposed studies contraceptive treatment efforts will include as

many mares with foals as possible. The determination of the population goals, size of the target treatment population, and which individual animals provide the best opportunity for contraceptive success are the domain of population modelling (we suggest Dr. Walt Conley, New Mexico State University, for this input), and these parameters will be assessed before actual treatment begins. As a first estimate regarding the Antelope (n=468) and Antelope Valley (n=540) HMA's, based on discussion with informed BLM personnel, an "n" of 100-140 mars in the 5-9 year age group may be available for the study. Prior to beginning the field test it must be demonstrated that the herd is in reasonably good nutritional state, 2) the range is in fair to good forage condition with reliable water availability and that adequate gathering/holding capabilities exist to carry out the study.

Treatment Procedures: Gathering by bands is preferred to insure family integrity. However, our experience has been that gathered horses which have been separated from their bands and then released back into their home range area have good probability of relocating and rejoining their original band. Gathered females will be individually identified by freeze-brand marking. Pregnancy can be determined via urine sample testing on site (Roser and Lofstedt 1989) and injection of selected mares can be accomplished by jab-stick in chutes, or blowpipes in the corrals.

PZP antigen for these field tests will be produced by I.K.M. Liu, at U.C.-Davis. The PZP-loaded microspheres and/or microcapsules will be formulated and produced by the appropriate subcontractor (Linhardt, University of Iowa; Southern Research Institute; Medisorb Technologies, Inc.). Delivery of PZP vaccine to horses will be conducted/monitored by members of our research group.

Only healthy mares (as determined by our research team veterinarian) will be used in the study. Treatment of mares will be done in a blind study initiated in fall/winter based on the successful protocol developed in the course of the Assateague Island studies. Pending availability of single-injection vaccine and 140 mares for treatment, the following groups and numbers will be included: 2-injection PZP (55), 2-injection placebo (15), 1-injection PZP 956), 1-injection placebo (15). The 2-injection groups are essential in this study as a reference base with which to compare the 1-injection preparation. As stated in the Introduction section, Introduction section, if the 1-injection prep is not available by the time the treatments must be done, all mares will be given the 2-injection protocol. This will insure a viable field trial of PZP vaccine in 1992. Observations will be made of the horses during the ensuing breeding season in order to document that social structure is intact and to determine if there is any significant change in behavior. Essentially we are interested in whether or not harem groups are intact, whether mares are being attended by the stallions, and whether mares are displaying clinical signs of behavioral estrus. Additionally, a certain number of treated mares with unique identifying markings will be photographed for later identification. This will be important for

determining the duration of contraceptive effects.

Although the initial test will utilize gathered horses and direct injection of vaccine, an important consideration for vaccine delivery in the future is remote darting. Therefore, preliminary evaluation of this issue will be undertaken in the proposed studies. Capture gun technology is designed primarily for immobilizing animals, and not for remote delivery of drugs. Modifications of equipment and techniques of delivery are required to deliver drugs remotely to free-roaming animals and our experience with feral horses on Assateague Island has provided a great deal of experience in this area. There are currently several brands and models of capture guns and self-injecting darts which can be considered candidates for this work. These include the Pax-Arms rifle, Pneu-dart, Inc., and the Teleinject system. Additionally, Dr. Lee Simmons, of the Omaha Zoo, can provide custom capture rifles. Each of these instruments has advantages and disadvantages and it is our intention, in the course of this study, to evaluate all systems and seek appropriate modifications in order to achieve the greatest success. It is important to remember that, even when the one-inoculation vaccine is available, it will do little good if we can't get it into the horses.

Pregnancy diagnosis: At the time of the gather (1992) blood/fecal samples will be collected for pregnancy testing. Mares given 2-injections of PZP will also be blood sampled at the time of 2nd injection for antibody titer testing. Between August and November (1993) following the breeding season urine and/or fecal samples will be collected from a statistically valid sample of the treated and untreated populations. The urine and fecal samples will be collected as described by Kirkpatrick et al. (1988, 1991a), and measured for pregnancy-dependent estrone conjugates and non-specific progesterone metabolites as described by Kirkpatrick et al. (1988, 1990b, 1991b). The establishment of pregnancy rates is important because foaling rates do not always provide accurate pictures of contraceptive effectiveness. Fetal loss and early foal mortality (the latter witnessed by J. W. Turner among California feral horses where foals are subject to lion predation) can confound the measurement of contraceptive effectiveness; early pregnancy determination can provide a more accurate picture. And, while pregnancy detection is important, in keeping with our research group's concern for the safety and humane treatment of horses, remote pregnancy testing is an integral part of a complete hands-off approach to fertility control.

Experimental controls: Previous work with feral horses on Assateague Island national Seashore has documented the lack of contraceptive effects of placebo vaccination upon control animals. However, the validity of the proposed field test will be insured by including placebo controls for each type of treatment. The control preps will consist of an emulsion of phosphate buffer solution and Freund's adjuvant.

Treatment Evaluation: Field studies of contraception can be evaluated and measured for success or failure in different ways.

Our approach is to document the pharmacological success of contraception. This will be accomplished by comparing pregnancy and foaling rates among treated and untreated mares. This is a major focus of the present proposal and will be carried out by our research group. While it will ultimately be necessary to understand what the effects of contraception may be upon the population dynamics, this is beyond the scope of our proposed studies. Nonetheless, the proposed field trial can provide the beginning of a data base for population models to determine to what degree immunocontraception may alter the demographic dynamics and size of a feral horse herd.

Animal care: All research conducted in the course of this project will be subject to review by the appropriate animal research committees of the three institutions involved (Medical College of Ohio, Deaconess Research Institute, and the University of California at Davis), and will be conducted only after approval by these committees. The regulations surrounding animal care standards for wild or free-roaming species are not clear. However, our group will apply the standards for domestic animals to the treatment of all horses in this study, whether domestic or free-roaming.

Education and public relations: Our research group's experience with the highly visible and successful Assateague Island feral horse contraception study has made it extremely clear that a serious attempt must be made to keep the public informed and to provide open and honest dialogue with the media. The Assateague horses are the most visible - and perhaps most adored - feral horses in North America, and embarking upon the immunocontraceptive research project carried with it a certain amount of risk. In order to keep the public informed at each step of the project, the National Park Service conducted an extensive educational program. This involved the print media, local and national network TV, and on-site programs. After six years of research with this highly visible herd, which has some 700,000 visitors come to view it each year, there has been absolutely no public resistance and overwhelming public support, including animal protection groups. The key elements of this successful relationship with the public were careful documentation of each step of the research and willingness and efforts to share this information with the public. It is our intention to do the same thing with this proposed research. An experienced public relations expert will be retained by the research team on a consulting basis, to design an appropriate public relations program and to develop the necessary materials for disseminating information. Our research group has never killed or even seriously injured a horse in the course of 18 years of research; we are as proud of that as we are of our contraceptive success. We feel that the public must be able to view our work and the care we take if this approach to the control of feral animal populations is to become accepted. No information will be released without going through the consultant resource, who must have approval of the research team scientists for any information release.

INVESTIGATOR EXPERIENCE

The three investigators are Dr. John W. Turner, Jr., Department of Physiology and Biophysics, Medical College of Ohio, Toledo, Dr. Jay F. Kirkpatrick, Deaconess Research Institute, Billings, MT, and Dr. Irwin K. M. Liu, University of California, Davis, and the collaborating agency is the Humane Society of the U.S. Drs. Turner and Kirkpatrick have been involved in studies of the biology of feral horses for 18 years. These studies have focused on hormonal contraception and immunocontraception of both stallions and mares and culminated in the successful immunocontraception of the Assateague horses. Funding for these projects have come from a variety of source but primarily from the Department of the Interior, through the Bureau of Land Management (Contract YA-512-CT) and the National Park Service (Contract CA-1600-30005). In addition to contraceptive studies these two investigators have also pioneered non-capture methodologies for detecting pregnancy and monitoring ovarian function among free-roaming feral horses in order to develop a complete "hands-off" technology for the control of feral horse reproduction. Both investigators will personally devote a significant portion of their time to this project. Specifically, Dr. Turner will oversee the chemical engineering of the one-inoculation vaccine and play a significant role in designing and conducting the field testing of the vaccine. Dr. Kirkpatrick will be in charge of remote pregnancy detection, evaluation of vaccine delivery equipment, development of the public relations program and will participate in field tests. Together these investigators are responsible for 28 published scientific articles relating to feral horse biology and contraception, as well as numerous articles in the popular press. Dr. I.M.K. Liu is an equine immunologist in the School of Veterinary Medicine at U.C.-Davis. Dr. Liu was responsible for originally determining that the PZP vaccine is effective in horses and he has extensive experience testing this vaccine with feral horses living on sanctuaries. He will be in charge of vaccine production and antibody testing. All investigators will be present for the gathering and treatment of horses. Academic credentials and qualifications for the three co-investigators are provided in the appendix.

PROJECT EVALUATION

The project will be evaluated periodically at several check points, as well as at the conclusion. The check points, derived from the stated goals include (1) <u>in vivo</u> testing of the microsphere PZP vaccine (evaluation criteria = antibody concentrations and pregnancy rates), (2) <u>in vivo</u> testing of the microcapsule PZP vaccine (evaluation criteria = antibody concentrations and pregnancy rates), (3) effectiveness in the field of the vaccine delivered to feral horses percent of treated vs. control mares which produce foals. All endpoint evaluations are measurable and will result in data which can be tested for significance.

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PROPOSED PROJECT BUDGET

SECTION I. UNIVERSITY OF NEVADA, RENO (UNR) BUDGET

A. Personnel

Principal Investigator (K. Hunter) $5,831
(P.I. commitment to project is 5% of total time, plus 19% fringe benefits)

B. Travel

Travel from university to study site via university vehicle for P.I. and members of oversight committee $500

DIRECT COST TOTAL	$6,331
INDIRECT COST TOTAL*	$11,075
TOTAL UNR COSTS	$17,406

* includes indirect costs on first $25,000 of subcontract to Medical College of Ohio

SECTION II. PROPOSED SUBCONTRACT BUDGET (MEDICAL COLLEGE OF OHIO)

PART I. Chemical Engineering (Microsphere/Microencapsulation) Study

A. Personnel

Principal Investigator (J. Turner) $14,523.00
(P.I. commitment to this project is 20% of full-time effort. Plus 34% fringe benefits)

Co-Principal Investigator (J. Kirkpatrick) $ 6,100.00
(Co-P.I. commitment to this project is 10% of full-time effort. Plus 22% fringe benefits)

Research Associate $18,000.00
(Salary for preparation of PZP. 30% of full-time effort. Plus 34% fringe benefits)

Laboratory/Secretarial Assistance $14,472.00
(Part-time, $9/hr. X 24 hrs/wk (Medical College of Ohio) x 40 wks, plus 34% fringe benefits)

Laboratory Technician $16,080.00
(Part-time, $10/hr. X 30 hrs/wk X 40 wks, plus 34% fringe benefits)

SUBTOTAL $69,175.00

B. **Microsphere and Microcapsule Formulation and Testing**

Viability testing of vaccine for the formulations	$ 5,000.00
Timed-release vaccine preparation	$16,000.00
Vaccine release characteristics testing	$14,000.00
In vivo testing of the timed-release vaccine	$15,000.00
SUBTOTAL	$50,000.00

C. **Equipment**

Dionex Pulsed Electrochemical Detector and electrode for HPLC analysis of urine/feces	$ 7,900.00
Reciprocal shaker for urine/fecal extractions	$ 2,000.00
SUBTOTAL	$ 9,900.00

D. **Supplies**

Supplies for PZP preparation, antibody monitoring, blood collection, horse maintenance	$ 5,800.00

E. **Communications**

Phone, fax, mailing, copying	$ 1,600.00

F. **Consultants**

Public Relations Costs	$ 6,000.00

G. **Travel**

Principal Investigator (J. Turner):	
Toledo to site for microsphere preparation	$ 900.00
Toledo to site for microencapsulation preparation (2 trips)	$ 1,800.00
Toledo to site for timed-release vaccine testing in vivo	$ 900.00
SUBTOTAL	$ 17,000.00

DIRECT SUBCONTRACT COST SUM (PART I)	$146,075.00
MCO Indirect Costs (20% of above)	$ 29,215.00
TOTAL SUBCONTRACT COSTS (PART I)	**$175,290.00**

Part II. Field Trials Study

The costs of field trials will depend on the range site selected. Since conditions and tactical support elements vary

considerable from range to range, it is not possible to make a reliable cost projection. However, there are some aspects of the field trial costs which are fixed and an overall cost estimate can be made, assuming up to 140 mares will be treated.

The following budget is divided into 2 parts. Section A shows costs which will be provided to the Medical College of Ohio, and Section B shows costs which will be covered within the operating budget of the BLM.

Section A. (Costs Provided to MCO)

1. Personnel costs for 2 field technicians (students) to carry out the field monitoring of the PZP-treated and placebo horses, including urine/fecal sample collections for pregnancy testing and behavioral monitoring. Vehicles, fuel, and housing to be provided by BLM.

$8.00/hr X 8 hr/day X 100 days X 2 persons (plus 34% fringe benefits)	$	17,152.00
$15.00/person per diem X 100 days	$	3,000.00
SUBTOTAL	$	20,152.00

2. Equipment

a. Horse identification by videotape has proven superior in our studies, and we recommend that each monitoring person have such capability. Cost for freeze-frame videocamera is about $1,500. Sony TR-101 handycam $1,500 X 2	$	3,000.00
b. Binoculars $200 X 2	$	400.00
c. Spotting scope $300 X 2	$	600.00
SUBTOTAL	$	4,000.00

3. Supplies and communications, i.e., for sample collection and storage, horse monitoring, phone and mailing — $ 2,500.00

4. The cost of vaccine will depend on the results of the Microsphere-Microencapsulation study and on the number of horses to be treated. A conservative estimate is $35/horse. If the experimental phase is successful a larger scale PZP preparation system will greatly reduce the cost per horse.
Based on 110 mares treated plus 35 reserve doses.

Estimated Subtotal	$ 5,075.00
5. Cost of pregnancy testing will be approximately $15.00 per sample including shipping and assay and will be based on 140 mares (30 control and 110 experimental) Estimated Subtotal	$ 2,100.00
SUBTOTAL	$ 9,675.00

6. Travel

Travel by Turner, Kirkpatrick, Liu and assistant to range site to perform vaccinations.	$ 3,000.00
Travel by Dr. Turner or Kirkpatrick to verify foal counts and evaluate horse population in study range.	$ 2,000.00
Travel by 2 field technicians to range site.	$ 2,000.00
SUBTOTAL	$ 7,000.00

Total Direct Costs for Section A.	$40,827.00
MCO Indirect Costs (20%)	$ 8,165.00
Total Costs for Section A.	**$48,992.00**

Section B. (Costs Covered Directly by BLM)

1. All helicopter costs: for initial observations of range, gathers of horses for PZP treatment and post-treatment monitoring (including flyovers for horses identifications and foal counts).

2. All equipment, supplies and personnel costs for gathering of horses and maintenance of captive horses, including corrals, freeze-branding, disease testing, veterinary care, feed, water/feed transport.

3. Provision of 4 X 4 vehicles and fuel for all research activities during the field trial.

PROJECT BUDGET SUMMARY

University of Nevada, Reno Costs	**$17,406**
Subcontract Costs (Medical College of Ohio)	**$224,282**
Total Project Costs	**$241,688**

ADDENDUM TO DRAFT ANTELOPE HMAP (Latest Census)

The latest census in the Antelope HMA (Ely) was conducted on May 31, and June 1, 1992. The Draft HMAP was already being routed through the Nevada State Office so the census data was not included in the HMAP.

The data provided by the census shows seasonal movements between the Ely and Elko herd areas. The horses are expected to move back to Elko by the time the Fertility Project is implemented in November so numbers predicted in the HMAP should be fairly accurate.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Ely District Office
HC33 Box 33500
Ely, Nevada 89301-9408

In reply refer to :
4700 (NV-040)

JUN 1 1 1992

Memorandum

To: Antelope Herd Management Area File

From: Schell Resource Area Wild Horse Specialist

Subject: Aerial Census of Antelope HMA

On May 31, and June 1, 1992, Joe Stratton (Wild Horse Specialist, Egan RA) and I flew with Cliff Heaverne of High Desert Helicopters to conduct a wild horse census in the Antelope HMA. The helicopter used was a Bell B1, Soloy.

The weather was sunny and warm both days with excellent visibility. There was no snow cover at all and conditions were dry and dusty.

The intent of this flight was to collect data on seasonal use areas in the spring. Conditions were more like summer and the majority of horses were located high in the mountain ranges.

The portion of the HMA east of the middle of Spring Valley was covered on the first day and the remainder was covered the next day. A total of 741 horses were counted. Numbers counted by Use Area and by Allotment were as follows:

Use Area	Adults	Foals
Antelope Range	224	40
Spring Valley	130	35
Black Hills	111	19
Antelope Valley	81	19
Schell Creek Range	42	6
Steptoe Valley	25	5
Horse-free area	3	1
Subtotal	616	125
Total	741	

Allotment	Adults	Foals
Chin Creek	409	91
Tippett	118	20
Deep Creek	48	5
Becky Creek*	12	2
Schellbourne*	8	3
Lovell Peak*	6	2
Becky Spring	7	1
North Steptoe*	5	0
Horse-free area	3	1
Subtotal	616	125
Total	741	

*Within Egan Resource Area

See attached map for locations by band with adults over foals.

Seasonal movement between the Antelope HMA (Ely) and the Antelope Valley HMA (Elko) has occurred based on a comparison of consecutive seasonal censuses. The number of horses counted in each HMA and combined totals were as follows:

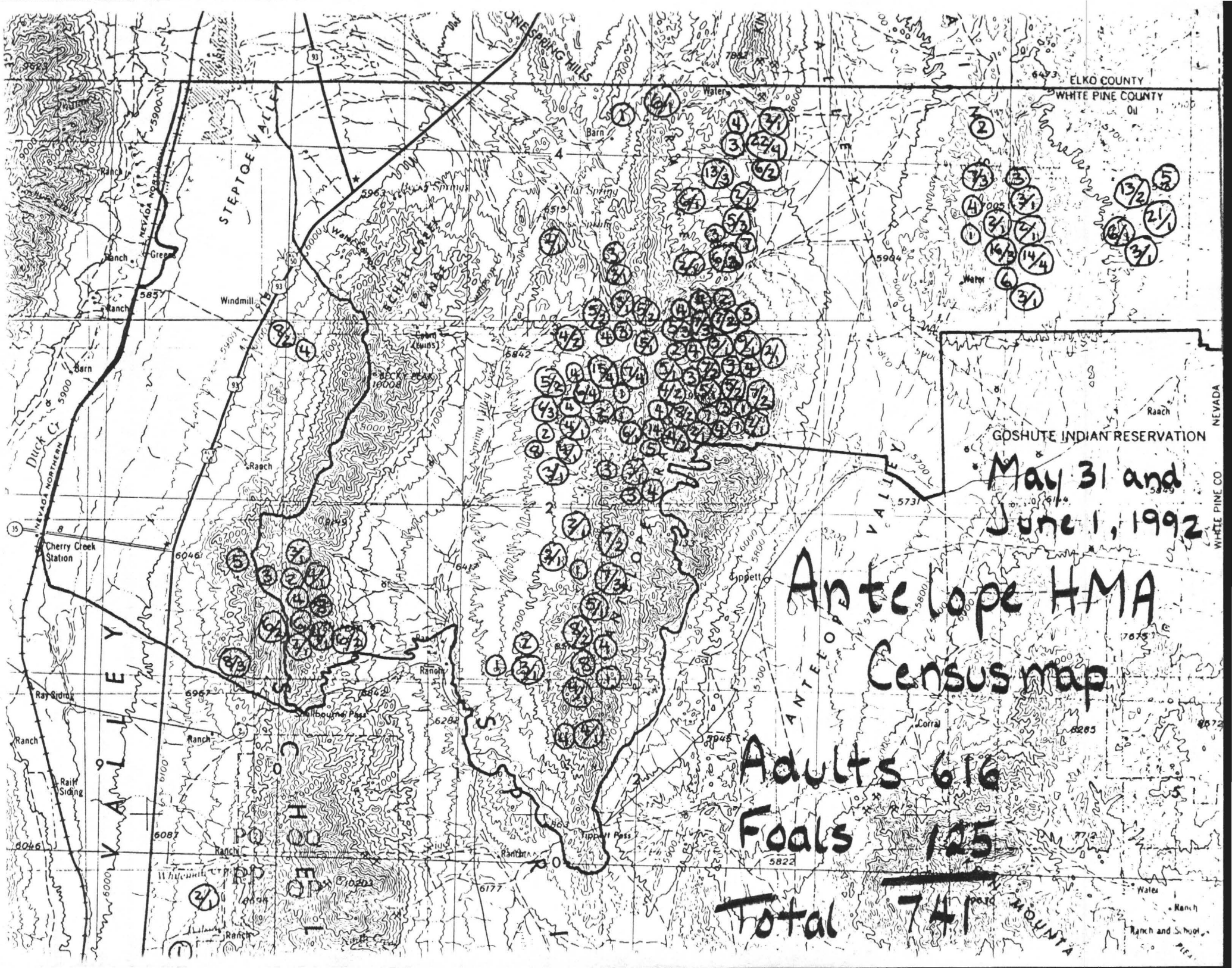
Date	Antelope HMA (Ely)	Antelope Valley HMA (Elko)	Total
2/92	468	545	1,013
5/92	741	446	1,187

The population increase in the Antelope HMA is equal to 37%. The population in the Antelope Valley HMA decreased by 18%. When numbers in both herd area were combined, an overall increase of 15% occurred between the end of February and the end of May.

The observed movements between districts are typical of movement patterns when there has been little rain or snow. The reservoirs in the Elko district dry up and water becomes scarce. Many of the horses move to the Ely District because water is readily available.

The horses have also moved to different elevations since the count in February. At that time, the mountains were almost entirely snow covered and the majority of horses were found in the valleys. The opposite was found on this count. Most of the horses were found high on the benches all the way to the tops of the peaks. In February, there were 149 adult horses in the Black Hills. The only water available in the hills are two developments which have very low flows at this time. Both of these water sources consist of a small puddle next to the troughs. A band of horses usually drinks all the water down to the mud. It takes an hour or two for the puddle to refill and bands are repeatedly seen waiting near the source for it to refill. Fights have occurred when more than one band moves in to drink. Some horses have been forced to move, leaving only 111 adults and 38 foals. The horses may have moved to the Antelope Range given the large numbers counted there.

Sheree Kahle


ELKO COUNTY
WHITE PINE COUNTY
GOSHUTE INDIAN RESERVATION
NEVADA
WHITE PINE CO
May 31 and
June 1, 1992
Antelope HMA
Census Map
Adults 616
Foals 125
Total 741
STEPTOE VALLEY
ANTELOPE VALLEY
DUCK CREEK RANGE
BECKY PEAK
Cherry Creek Station
Ranch
Windmill
Barn
Water
Corral
Ranch and School
MOUNTAIN

PRELIMINARY
ENVIRONMENTAL ANALYSIS
for
ANTELOPE
HERD MANAGEMENT AREA PLAN

EA No. NV-040-2-19

Prepared by Sheree L. Kahle
Wild Horse and Burro Specialist

Ely District
Bureau of Land Management
Ely, Nevada

BACKGROUND INFORMATION

Introduction

The Bureau of Land Management (BLM), Ely District, proposes to implement the Antelope Herd Management Area Plan (HMAP).

The Antelope Herd Management Area (HMA) encompasses 400,335 acres within the Egan and Schell Resource Areas of the Ely district. The HMA is located approximately 35 miles northeast of Ely, Nevada in White Pine County. For a complete description of the location and setting, refer to the HMAP.

This Environmental Analysis (EA) analyzes only those management actions which are new, ie. fertility control and selective removals. All other activities in the HMAP have undergone an environmental analysis through the Schell and Egan Resource Area Land Use Plans, the EA prepared for the 1987 HMAP (EA-NV-040-4-40) and the EA prepared for the last removal in the Antelope HMA (EA-NV-040-0-23).

Purpose and Need

In 1987, an HMAP was developed and approved for the Antelope HMA. Recent changes in the direction and policy in the wild horse and burro program necessitated a revision of the HMAP. The 1992 HMAP is designed to effectively manage the Antelope wild horse population to achieve a thriving natural ecological balance with all other resources and users.

Relationship to Planning

This EA is tiered to the Schell Grazing Environmental Impact Statement (EIS) which analyzed the ecological impacts of managing the rangelands in the Schell Resource Area under a program of monitoring and adjustment of wild horse and livestock numbers. This EA is also tiered to the Egan Resource Management Plan (RMP) and EIS, the EA for the 1987 Antelope HMAP (EA-NV-040-4-40), the EA for the last removal in the Antelope HMA (EA-NV-040-0-23), and the Final Multiple Use Decisions for the Chin Creek, Sampson Creek, Tippett and Becky Creek Allotments. These EAs and EISs are hereby incorporated by reference: The Schell Grazing EIS, the Egan RMP EIS, EA-NV-040-4-40, and EA-NV-040-0-23.

The proposal is in conformance with all applicable regulations and policies; The Wild Free-Roaming Horse and Burro Act (Public Law 92-195), as amended by the Federal Land Policy and Management Act (Public Law 94-579); Title 43 Code of Federal Regulations, Part 4700; BLM Manual 4710, Rel. 4-90; the BLM Strategic Plan for Management of Wild Horses and Burros on Public Lands (1992); and the Draft Nevada State Office Manual Supplement (Jan. 1989). The proposed HMAP is also consistent with all county and state land use and zoning decisions and recommendations including the White Pine County Policy Plan for Public Lands (1985).

Major Issues

The major issue involved with the HMAP, that has not been previously analyzed is the use of selective removals and fertility control to reduce reproductive rates of the wild horses in the Antelope HMA. These management strategies are necessary due to the high rates of increase in the Antelope wild horse population and the subsequent need to remove excess animals almost every year.

PROPOSED ACTION

The proposed actions which require analysis are to implement the portions of the Antelope Herd Management Area Plan which deal with selective removals and fertility control for the wild horse population within the Antelope HMA.

The proposed action involves an initial selective removal to attain the Appropriate Management Levels identified in the Antelope HMAP. The selective removal will target animals age one to four years. The removal is scheduled to occur in November of 1992 and will entail removing approximately 288 animals. Once AML is attained, 50% of the remaining mares in the age classes from 5 to 9 (approximately 40 animals) will be treated with an immuno-contraceptive agent which will inhibit reproduction in the following breeding season.

Standard operating procedures (SOPs) include all methodologies for captures and/or removals which are defined in the Capture/Removal Plan (Appendix 4 in the Antelope HMAP).

Standard operating procedures for implementing the immuno-contraception are all methodologies found The Wild Horse and Burro Fertility Management Policy and Procedures Task Group - Final Report (June 1992).

Alternatives Considered but Eliminated from Detailed Analysis

Other forms of fertility control that were considered by the State of Nevada Wild Horse Pilot Fertility Project Task Force were selective removals targeting one or the other sex, sterilization, and hormone implants. Selective removals targeting sex was not recommended at this time due to doubts about effectiveness. Sterilization was not recommended because of the invasive nature of the surgery required, lengthy recovery times would be required, risks of death loss would be too high, and the fact that it is permanent and non-reversible. The use of hormone implants was not recommended because of the invasive procedures required for the implanting and the lengthy recovery time required prior to release.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

A complete description of the affected environment is found in several documents; The Schell and Egan Land Use Plans and associated EISs, as well as the Antelope HMAP.

ENVIRONMENTAL CONSEQUENCES

The consequences of removing wild horses and maintaining AML in the Antelope HMA have been analyzed in the EA for the latest Wild Horse Removal Plan (EA-NV-040-0-23) and the EA for the 1987 Antelope HMAP (EA-NV-040-4-40). The proposed actions, selective removals and fertility control, would have no impact on the physical environment beyond what was already analyzed. There would be no impacts from the proposed action to threatened or endangered species (plant or animal); riparian areas; wilderness or wilderness study areas; social and economic values; water (drinking/ground/quality); air quality; Native American Religious concerns, wastes (hazardous and solid); floodplains; wetlands; areas of critical environmental concern; wild and scenic rivers; visual resource management; prime or unique farmlands; or cultural, paleontological, and historical resources.

All trap-sites and holding facilities used in captures or removals will be inventoried for threatened or endangered plant or animals as well as cultural resources. Traps will be relocated if these resources are found in the area.

Wild Horses

The use of fertility control and or selective removals would affect the wild horse population in the Antelope HMA by reducing reproductive rates. The reduced reproductive rates will have a positive impact on individual wild horses by causing slower population growth which in turn will make removals necessary less often. Fewer removals will mean that individual horses will experience less stress from removal actions. Initial removal of wild horses aged one to four to attain AML and the injection of an immuno-contraceptive drug will cause increased stress levels and potentially will increase mortality on a temporary basis. Increased mortality may be caused by a slight increase in handling to mark and inject animals.

If a drug requires a booster after a 2-3 week interval, mortality may increase due to the need to hold animals in corrals. If a booster is not necessary, holding times and subsequent effects of holding will be minimal. The immuno-contraceptive treatment may cause temporary disruption of band units. When horses are captured and then released back to the same area, it appears that they reorganize into bands which closely resemble the former structure. The pilot project is designed to assess the influences on social structure as well as potential impacts to individual horses.

PROPOSED MITIGATING MEASURES

No mitigating measures are proposed for the identified impacts to the wild horses from implementing the Antelope HMAP. The identified SOPs will minimize impacts.

SUGGESTED MONITORING

The Schell Resource Area Wild Horse and Burro Specialist, the Schell Resource Area Manager and the Schell Resource Area Range Conservationists will ensure that all monitoring identified in the Antelope HMAP will occur.

CONSULTATION AND COORDINATION

Intensity of Public Interest and Record of Contacts

The issue of wild horses and their management has created intense public interest for many years. Concerns include forage allocation for wild horses, livestock and wildlife; maintaining levels of wild horses; and removals of wild horses.

Since the public interest is high and the wild horse program is often controversial, public notification of the HMAP and this EA will be given and public comments will be solicited for a period of 30 days. Comments received will be considered in finalizing the HMAP and associated EA.

The following individuals or groups were contacted:

- American Horse Protection Association
- American Mustang and Burro Registry
- Animal Protection Institute of America
- Commission for the Preservation of Wild Horses and Burros
- Craig C. Downer
- Fund for Animals
- Humane Equine Rescue and Development Society
- Humane society of Southern Nevada
- International Society for the Protection of Wild Horses and Burros
- National Mustang Association
- National Wild Horse Association
- Nevada Department of wildlife - Region II
- Nevada Farm Bureau Federation
- Nevada Federation of Animal Protection Organizations
- Nevada Humane Society
- Nevada Outdoor Recreation Association
- Nevada State Department of Agriculture
- Save the Mustangs
- Sierra Club - Toiyabe Chapter
- U.S. Humane Society
- United States Wild Horse and Burro Foundation
- Nevada State Clearing House
- Wild Horse Organized Assistance
- Bureau of Land Management - Elko District Manager
- Bureau of Land Management - Pony Express Resource Area Manager
- Bureau of Land Management - Nevada State Director
- Dr. J.W. Turner
- Jack Blonquist

- Ralph E. Vance
- Warren P. Robison
- Metta Richins
- Reed B. Robison
- Hank Vogler
- George Swallow
- Lyman J. Rosenlund
- Kyle W. Bateman
- Mabel Bates
- Gail Parker
- John Phillips
- Albert Means
- Marvin Jessen

Many other individuals and groups will be notified that the HMAP and EA are available for their review if they request a copy.

Internal District Review

Chris Mayer	Range/Livestock/Threatened and Endangered Plants
Robert Brown, Joe Stratton	Wild Horses
Jake Rajala	Environmental Coordination/Land Use Planning
Mark Barber	Wildlife/Threatened and Endangered Animals
Gene L. Drais	Egan Resource Area Manager
Gerald M. Smith	Schell Resource Area Manager
Timothy B. Reuwsaat	ADM Resources

SIGNATURES

Prepared by:

Sheree L. Kahle — Date
Wild Horse and Burro Specialist
Schell Resource Area
Ely District

Reviewed by:

Robert E. Brown — Date
Wild Horse and Burro Specialist
Ely District

Jake A. Rajala — Date
Environmental Coordinator
Ely District

Gene L. Drais — Date
Egan Resource Area Manager
Ely District

Timothy B. Reuwsaat — Date
ADM Resources
Ely District

Thomas Pogacnik — Date
Wild Horse and Burro Specialist
Nevada State Office

DR/FONSI
for
Antelope Wild Horse Gather
EA No. NV-040-0-23

Decision: I have reviewed the Environmental Assessment for the Antelope Wild Horse Gather and concur with my staff's assessment. I approve of the proposed action to conduct a helicopter removal of approximately 390 excess wild horses in full force and effect from the proposed gather area with the mitigation as proposed:

1. Wherever possible, gathering will avoid areas of high concentrations of deer and antelope to avoid stressing these animals.

2. Livestock concentrations will be avoided whenever possible to reduce the disturbances to them during the gather.

3. Horses will not be kept within the traps or corrals for more than 1 day to minimize stress to the animals, trampling effects and soil compaction unless approved by the Authorized Officer. Number of horses to be held may vary depending on how many are caught in any one area. Horses may be held longer than 1 day, dependent on shipping schedules, number of horses captured, or other unforeseen circumstances.

The removal of wild horses will leave a minimum population of 369 animals on the HMA, which is based on an analysis of the most current monitoring studies data and the Final Multiple Use Decisions for the Chin Creek, Tippett, and Sampson Creek Allotments. The non-selected alternatives consist of water trapping the same number of horses, trapping them by running them on horseback and no action.

Rationale: The proposed action should be undertaken to manage the portion of the HMA within the gather area for a thriving natural ecological balance. The final multiple use decisions for Chin Creek, Tippett and Sampson Creek Allotments identified wild horses as being the primary contributor to the severe resource deterioration taking place within portions of the HMA.

The removal of wild horses from the horse free area (outside HMA boundaries) should be undertaken to comply with Title 43 CFR 4710.4. The identified stipulations will ensure humane treatment of the captured horses. The proposal is in conformance with the Wild Free-Roaming Horse and Burro Act of 1971 (P.L. 92-195), as amended. It also conforms with the Schell MFP, ROD, and the Final Multiple Use Decisions for the Chin Creek, Tippett, and Sampson Creek Allotments.

FONSI: There will not be a significant impact to the quality of the human environment resulting from the implementation of the proposed action. Therefore, an environmental impact statement is not required for this action.

Rationale: Analysis of impacts did not identify any unique or unknown risks. The standard operating procedures and mitigating measures will minimize the negative impacts. Direct and indirect environmental benefits are anticipated for wild horses, livestock, and wildlife with the adoption of the proposed action. The removal will help slow the degradation and deterioration of the vegetative resources and the irreparable damage occurring in portions of the HMA.

Gerald M. Smith
Gerald M. Smith
Schell Resource Area Manager

8/7/90
Date

8/29/92

BOB MILLER
Governor

STATE OF NEVADA

CATHERINE BARCOMB
Executive Director

COMMISSIONERS

Dan Keiserman,
Las Vegas, Nevada

Michael Kirk, D.V.M., *Chairman*
Reno, Nevada

Paula S. Askew
Carson City, Nevada

Steven Fulstone
Smith Valley, Nevada

Dawn Lappin
Reno, Nevada

COMMISSION FOR THE PRESERVATION OF WILD HORSES
Stewart Facility
Capitol Complex
Carson City, Nevada 89710
(702) 687-5589

August 29, 1992

Kenneth G. Walker, District Manager
BLM-Ely District Office
HC 33 Box 33500
Ely, Nevada 89301-9408

Dear Mr. Walker,

Thank you for the opportunity to review and comment on the Draft Antelope Herd Management Area Plan (HMAP) and associated Preliminary Environmental Assessment (EA).

I must first commend Sheree Kahle, your Wild Horse and Burro Specialist and your District for an excellent HMAP. Before I started reviewing the document I had many questions that I knew I would be asking. Initially, as I started reading, I was formulating more questions...by the time I was finished all of my questions were answered and then some! We realize there was much additional work in having to include a new fertility control program in the HMAP as well as other issues.

One of my Commissioners, Dawn Lappin, who has been involved in the land use planning process and the horse program much longer than I have has commented to me that she has not seen such a complete HMAP in all of her years in the horse program.

We feel you have done an excellent job with your planning and look forward to working with you in the future on this fertility control program.

If there is anything the Commission can do, please feel free to call us.

Sincerely,

Catherine Barcomb

CATHERINE BARCOMB
Executive Director

8/28/92

American Horse Protection Association, Inc.
1000 29th Street, NW, Washington, DC 20007
(202) 965-0500

The Humane Society of the United States
2100 "L" Street, NW, Washington, DC 20037
(202) 452-1100

August 28, 1992

Mr. Kenneth G. Walker
District Manager
U.S. Department of the Interior
Bureau of Land Management
Ely District Office
HC 33 Box 33500
Ely, NV 89301-9408

BY FACSIMILE TRANSMISSION TO: (702) 289-8465

Dear Mr. Walker:

On behalf of the nearly 1.7 million members and constituents of The Humane Society of the United States (HSUS) and the American Horse Protection Association (AHPA), we are writing today regarding the Draft Antelope Herd Management Area Plan (HMAP) and the associated Preliminary Environmental Analysis (EA).

We would like to begin by expressing our strong concerns about inclusion of the pilot fertility control study (immunocontraception) with the management scheme described in these documents. At several points, the HMAP describes immunocontraception as one of the management tools to be used to achieve wild horse Appropriate Management Levels (AML) (e.g. p. 2, para. 2; p. 13, para. 2). However, the HMAP acknowledges later (p.18, para. 5) that the immunocontraception technology being tested cannot, at this time, effectively manage wild horse populations. Until it has been shown that immunocontraception is effective at blocking conceptions, can be applied humanely, and is incorporated into a well-constructed, data-based management plan, we feel strongly that it is premature to propose immunocontraception as a management tool for the control of Nevada's wild horse populations.

Moreover, we believe that the success of the proposed immunocontraception pilot project should be judged strictly by the objectives stated in the research proposal itself (Appendix 5). The research proposal makes it clear that "the ultimate measure of success in this project will be the effectiveness of inhibiting fertility in PZP-treated free roaming feral horses." The goal of the immunocontraception pilot project is not to test the effectiveness of immunocontraception as a management tool, but rather to simply demonstrate that wild horses can be successfully contracepted under Nevada field conditions.

We are also very disturbed by important technical inconsistencies between the research proposal (Appendix 5) and the main text of the HMAP. Of greatest concern is the intent to conduct the immunocontraception pilot project in a population that is simultaneously being subjected to major removals. We feel that this protocol is scientifically indefensible, as well as being clearly at odds with the research proposal, which states as a condition for the performance of the study that "only horse gathers or removals associated with the experimental design of this study will be conducted during the course of these studies" (p. 11, para. 3). According to the HMAP (Table 5), 78% of horses between 0 and 4 years of age would be removed from the study population. We believe that a removal of this magnitude risks severe social and reproductive disruption. Social disruption and removal of dependent offspring have already been shown to influence foaling rates in wild horses (Kirkpatrick J.F. & Turner, J.W., J. Wildl. Manage. 55:649-652, 1991; Berger, J., Wild Horses of the Great Basin, Chicago: Univ. Chicago Press, 1986). Thus, the removals would constitute an important confounding variable that would obstruct the interpretation and severely undermine the credibility of the immunocontraception pilot project.

Fundamentally, we question the need to reduce the numbers of wild horses in this area. The introduction to the HMAP states that as a result of the Wild Free-Roaming Horses and Burro Act of 1971, wild horse and burro populations have increased dramatically and conflicts with other users have intensified, (page 3, para. 2). Throughout the HMAP there is much data regarding wild horse numbers but there is little or no discussion of data concerning livestock use in the HMA between 1971 and 1989. Further, according to the HMAP, wild horse population levels were not even documented prior to the first aerial census conducted in 1975 (page 3, para. 3). Therefore, it is misleading to conclude that wild horse populations alone have intensified multiple use. Bias against wild horse use is nowhere more evident than on page 10 (para. 2.) of the draft HMAP, which states, "Livestock grazing is the most important consumptive use within the HMA and conflicts with wild horses have been severe."

We also understand that all management actions for both the Antelope and Antelope Valley HMAs are to be closely coordinated between the Ely and Elko Districts. However, after reviewing both draft HMAPs, we have noted several inconsistencies in data, i.e., Table 4 of the proposed draft Antelope HMAP is not consistent with comparable data in the proposed draft Antelope Valley HMAP. To

what extent are the two Districts coordinating their efforts?

We also question the natural historical information about wild horse social organization. For example, the Draft states that males can mate at age one, and that the stallion's reproductive prime is between 4-9 years of age. However, as we understand it, males (regardless of their physiological capacities) do no reproducing until they obtain bands, usually between the ages of 5-7 years . When males establish bands, they may lose them within a year or two; however, many stallions hold on to their bands until 12-20 years of age (Berger, op. cit., pp. 140-142; Rutberg, A. T., Anim. Behav. 40:945-952, 1990).

Further, on page 3 of the draft HMA, it is stated that there is much movement between the Ely and Elko Districts. What evidence is there that this high rate is due to an increase in the actual number of animals as opposed to migration between the two areas? For example, do the numbers from the February '92 and June '92 censuses take into consideration seasonal migration? If so, what is the impact on the current population data as documented by the addendum to the HMAP?

Effective wild horse population management relies on a good understanding of wild horse behavior and on the availability of sound, interpretable data on wild horse population dynamics and life history. We believe that the HMAP does not adequately display these elements. This is especially apparent, and distressing, in the HMAP's discussion of reproductive rates. The HMAP asserts that removal data yield an annual reproductive rate of 21% for the Antelope herd. However, since no details of methodology are furnished, we find the number difficult to interpret, or accept. It is not clear whether 21% is an average reproductive rate or a maximum reproductive rate; nor is it clear how much the reproductive rate varies from year to year, and whether it has historically varied with horse population size, range condition, weather, or livestock use. These questions should be answered in the final HMAP, since management decisions will be based on understanding of such population characteristics.

With regard to the discussion of color variations within the HMA population, (page 20, para. 8) we question the reasons for inclusion of such information in the HMAP since removal decisions are not to be dictated or influenced by such factors. In addition, we are alarmed by the discussion on page 20 of the draft HMAP concerning the advantages of a selective removal strategy which

implies that the genetic diversity of a herd can be manipulated by selective removals, i.e. removing animals with "undesirable qualities, or physical debilitation." In the absence of managing to preserve specific genetic characteristics within a particular HMA (such as the Pryor Mountain HMA), the manipulation of a herd's genetic integrity is inappropriate. Determining "undesirable qualities" are at best subjective, and at worst, arbitrary, and should not be part of wild horse and burro management decisions.

The BLM claims that one advantage fo selective removals is that younger, more adoptable animals will be made available for private placement. AHPA and The HSUS firmly believe that wild horses are to be managed as a component of the public lands in a manner that promotes " a thriving natural ecological balance with all other users." Removal decisions should not be based on how "adoptable" a particular animal may be.

In addition, we strongly oppose the use of female-biased selective removals to reduce population growth rates. The intensity of aggressive competition for mates will increase sharply as the ratio of adult males to adult females increases. The proposed 70:30 male:female ratio would create a large surplus of "bachelor males," which could be expected to harass both the band stallions and adult mares, interfere with normal feeding, nursing, and group movements, and increase energy expenditure as bands attempted to escape the attentions of unmated males (Berger, op. cit., p. 142; Rubenstein, D. I., pp. 282-302 in Rubenstein, D. I., & R. W. Wrangham, Ecological Aspects of Social Evolution, Princeton: Princeton University Press, 1986; Rutberg, op. cit.). Band size would decrease, fighting-related injuries among males would increase, and energy and water stress on all animals would be exacerbated. Thus, the proposed sex-selective removals would cause what is, to us, an intolerable disruption of normal horse behavior.

With regard to the land use objectives discussed on page 11 of the draft HMAP, we do not believe it is valid to incorporate the 1983 inventory (303 for the Antelope Herd) factors into the present draft HMAP. Concerning the Interior Board Land Appeals ("IBLA") decisions, we understand that monitoring for adjustments in forage allocation is generally done in five year increments. Hence, it is not clear as to how BLM completed the entire allotment evaluation process (which analyzes monitoring data) for all four allotments within the Antelope HMA between June 7, 1990, (the date of the IBLA decisions) and July 1990/April 1991, (the dates when the Final Multiple Use Decisions ("FMUDs") were issued). We request further

clarification as to how the monitoring data in these four allotments were accessed in such a short time period.

Although one of the stated objectives of the Egan Resource Area RMP is to "...not overly restric[t] the ability of the other resources to provide economic goods and services, we remind the BLM that the protection of "goods and services" should not be at the expense of wild horses (page 11, para. 7). Also relating to the Egan Resource Area RMP, the draft HMAP is confusing as to the actual numbers of animals to be managed within the Antelope HMA. What does the "14" refer to? Is there information missing here?

Finally, throughout the draft Antelope HMAP, there are frequent references to established and estimated AMLs. Table 4 lists the forage allocations from the FMUDs for the four allotment areas in which a total of 2,628 AUMs (219 animals) have been established for wild horses. In addition, based on the AMLs already established (219) and the numbers counted during the June 1992 census in those allotments in which evaluations have not yet been completed, the HMAP states the total estimated AML to be 274 animals. It is from this total estimated AML that the draft HMAP appears to be basing its recommendation to remove 288 animals from the HMA in November 1992. We do not believe it is appropriate to reduce wild horse numbers based on a total estimated AML which may or may not be supported through the allotment evaluation process.

Since it is well established that AMLs must be the product of monitoring data, we remind the Bureau that any AMLs mentioned in this HMAP are to serve only as preliminary and tentative guidelines, subject to adjustment through the multiple use evaluation process.

Our review of the Preliminary Environmental Analysis supports our concerns about the Draft HMAP. Although we agree with BLM's conclusion that immunocontraception is the most promising of the technologies available for wild horse fertility control, we feel that the final environmental document should include a more detailed analysis of the expected environmental effects of immunocontraception and alternative technologies. The section on "Alternatives Considered" should be expanded to document and analyze the effectiveness, costs, and health risks of surgery and implants, as well as the potential behavioral, physiological, and ecological consequences of using synthetic hormone implants. The HSUS and AHPA object to the permanent sterilization and return to original habitat of wild horses. We believe that such action would

be unacceptable because the techniques are permanent, extremely invasive and potentially dangerous. However, there is no discussion of any of the potential problems associated with such a proposal. Similarly, the section on "Environmental Consequences" should summarize the available literature on the effectiveness, costs, and potential behavioral, physiological, and ecological consequences of the proposed immunocontraception pilot project.

As stated previously, The HSUS and AHPA strongly oppose this Plan's incorporation of fertility control as part of an overall wild horse management scheme. At this juncture, it is only appropriate to conduct field tests of the immunocontraception technology, not incorporate it as part of a management package.

We are also distressed that the BLM is planning to use helicopters to round up horses. We believe that wild horses endure considerable stress and danger from helicopter round-ups, especially in the type of terrain found in the Ely District. Although we appreciate the Bureau's efforts to mitigate problems associated with helicopter round-ups, we are still concerned that horses may panic and stampede, causing separation of bands, serious injury and even mortality. Foals will still be fairly young and may be injured or perish while trying to keep up with their mothers. We question why the use of water traps was dismissed for this round-up and urge the BLM to reconsider this important matter. We understand that it can take more time to utilize water traps; however, this deficit is surely compensated by the increased safety and reduced stress to horses. Perhaps if this District is not to be the site of the pilot fertility control study, the timing of the round up is not as critical and water traps can be successfully utilized.

We are also concerned about the proposed roping of horses during the round-up. Such activities should be utilized only in an emergency situation and as briefly as possible. The HSUS and AHPA believe that tying horses down for up to an hour is completely unacceptable, and urge the BLM to adopt both a maximum time of only ten minutes and guidelines strictly limiting the use of tying down.

We commend the BLM for excluding the use of barbed wire or other harmful materials for wing construction, and urge the adoption of this standard for all fencing and fence-like construction. However, we are concerned that the issue of fence obstructions during the round-up has not been fully addressed.

Additionally, we urge the BLM to carefully and completely conduct the recapture evaluation of existing conditions in the gather area, focusing special attention on the issues of prevailing temperatures and locations of fences and other physical barriers. We are very concerned that these two factors could present serious animal welfare crises. We therefore urge the BLM to reduce the maximum temperature parameter to 85° F, and to eliminate hazards to the fullest extent possible. We believe that such obstructions could prove very dangerous, if not fatal, if encountered by a herd of chased horses.

Regarding the discussion of *Administration of the Contract*, we recommend that any fertility control program developed in the future should be handled in a separate contract.

In the discussion regarding *Destruction of Injured or Sick Animals*, we are concerned that standardized criteria are not referenced and recommend, to prevent subjective decision-making, that such criteria be developed and incorporated into this plan. Additionally, we recommend that a veterinarian with equine experience be available on-site during the entire operation.

We commend your exclusion of double deck trailers to transport horses, and encourage the BLM to continue to explore and adopt other measures to ensure humane shipment of horses, such as conservative response to high ambient temperature and excessive dust conditions.

Finally, we would like to express our dismay regarding Appendices 2 and 3. The *Key Management Area Objectives and Status* discussed in Appendix 2 makes no connection between the plant studies and animal use of these plants; the data contained in the Appendix is not particularly useful in evaluating the HMAP/EA/Capture Plan.

Similarly, the discussion of *Other Resources and Uses Within the Antelope HMA* in Appendix 3 is somewhat difficult to interpret. The discussion of water seems to contradict itself and leaves the reader wondering whether water was indeed a limiting factor, and if so, why efforts to develop more reliable water sources are not more energetically pursued. Similarly, the discussion of livestock indicates that competition for existing forage has been extreme; but, other discussions in the documents do not support this contention. Further, this discussion states that in recent years voluntary reductions in numbers by livestock permittees has helped to reduce this competition between horses and domestic livestock;

however, in the footnote for Table 2a, the AUM's are clearly in Mandatory Nonuse. This contradiction supports our previously stated contention that these removal decisions are based on political pressure, not competing pressures for forage and water.

Thank you for this opportunity to present our views. We remain available to provide any additional information or assistance.

Sincerely,

Paula R. Jewell
Program Coordinator
The Humane Society of
the United States

Robin C. Lohnes
Executive Director
The American Horse
Protection Association