



United States
Department of
Agriculture

Forest
Service

Region 4

Toiyabe National Forest
Las Vegas Ranger District
550 E. Charleston
Las Vegas, NV 89104

FS. Las Vegas m 10/1/91

Reply To: 2260

Date: October 1, 1991

State of Nevada
Commission for the Preservation of Wild Horses
ATTN: Kathy Barcomb
Stewart Facility
Capital Complex
Carson City, NV 89710

Dear Ms. Barcomb:

Enclosed is a proposal to determine optimum stocking rate between elk and wild horses on the Las Vegas Ranger District. At this time, we are contacting several interest groups that may wish to contribute funds to this project. The total contributed funds to complete the wild horse portion of this study is \$76,452 over the next three years. It is understood that this is a large amount for any one group to contribute, therefore, we are contacting several interest groups to jointly fund the project.

Please contact George Perkins at the above address or at (702) 477-7782 if your organization is interested in contributing funds.

Sincerely,

KIM E. MARSHALL
District Ranger

Enclosures



Caring for the Land and Serving People

PROPOSAL

OPTIMUM STOCKING RATE BETWEEN ELK AND WILD HORSES SPRING MOUNTAINS

LAS VEGAS RANGER DISTRICT TOIYABE NATIONAL FOREST

Introduction

The Spring Mountains are located North and West of Las Vegas, Nevada. Within this area there are significant populations of elk and wild horses. These same areas have significant range deterioration. The Las Vegas Ranger District Toiyabe National Forest, Stateline Resource Area, Bureau of Land Management and the Nevada Department of Wildlife are proposing a study be conducted that will provide information enabling the range to recover to a desired condition while maintaining viable populations of elk and wild horses.

Problem Statement

The goal of this project is to allow the range to recover to the desired future condition within a reasonable time while maintaining viable populations of both elk and wild horses. The objective is to determine the optimum stocking rate for elk and wild horses that will allow the range to recover at the desired rate. There is a significant mule deer population in the Spring Mountains. Through a literature search, it has been determined little competition exists for forage resources among deer, elk and wild horses, therefore, deer will not be considered in this study.

In order to determine the optimum stocking rate between elk and wild horses, it is necessary to determine Animal Unit Equivalents (AUE's), have an accurate population census, and have current range condition, trend and utilization measurements. It is necessary to determine the dietary overlap that exists between the elk and wild horses in order to calculate the AUE's. With all this information, an accurate estimate of optimum stocking rate can be determined.

The topic of dietary partitioning of rangeland forage between herbivores has economic and political, as well as, ecological importance (Flinders 1988). The principal goal of resource management on multiple use lands is to provide sustained yield of a variety of plant and animal products. We are mandated to manage wild free-roaming horses for their preservation and protection "in a thriving ecological balance with other legitimate uses of public lands". To achieve ecological balance among communities of sympatric organisms, management must be based on knowledge of how species use and partition resources available to them (Hudson 1976). To estimate combined populations of wildlife, livestock and wild horses that can be supported on a given range, it is necessary to know the diets of the animals, and the kinds and amounts and distribution of forage plants and the relation of the plants and animals to

other environmental and land use factors (Hubbard and Hansen 1976; Olsen and Hansen 1977). It would also be desirable to quantify food habits, food distribution, herbage production and herbivore populations by seasons (Hubbard and Hansen 1976).

Method

At this time, we are looking for interested groups to help fund this project. These contributed funds will be used in the wild horse portion of this study: to conduct fecal analysis on the wild horses and to census the wild horse population. Groups that will be contacted include:

Animal Protection Institute

Nevada Commission for the Preservation of Wild Horses

Wild Horse Organized Assistance

Humane Society of the United States

American Horse Protection Association

United States Wild Horse and Burro Foundation

International Society for the Protection of Mustangs and Burros

Whole Horse Institute

University Nevada, Reno

National Academy of Science

The Toiyabe National Forest has submitted this proposal to Rocky Mountain Elk Foundation to fund the elk portion of this study: purchase materials and construct enclosures, conduct fecal analysis for the elk, and a census of the elk population.

The desired future condition will be determined for each area on the Spring Mountains based on the ecological stage that will provide the optimum benefit to the soil and water while providing forage and other necessary resources (e.g. cover, water) for wildlife and wild horse populations. The Toiyabe National Forest personnel along with personnel from the Nevada Department of Wildlife and Bureau of Land Management will determine the optimum future condition. This condition will not necessarily reflect the climax condition of the plant communities, as the climax may not provide any forage resource. Other factors, such as biological diversity, threatened, endangered and sensitive species, recreational needs and current and projected human impacts will be considered when determining desired future condition.

The microhistological method was chosen to determine dietary overlap. The advantages of this method include dietary material from a number of different herbivores may be compared on an equal basis using a significant sample size and nondestructive sampling is possible (Flinders 1988). Botanical composition of diets can be determined by microscopic analysis of samples of fecal

material. Similarity of diets is calculated by Kulczynski's formula. The similarity index represents the percentage of the forage shared by two herbivores that are identical. A high dietary overlap between ungulates suggests competitive potential food relationship could develop if the stocking rates of the populations are not balanced with the production of the vegetative resource (Hubbard and Hansen 1976).

$$\text{Kulczynski's formula} = \text{SI} = \frac{2C(100)}{A+B}$$

Where C = least amount of plant species in both diets

A = total amount of plant species in diet A

B = total amount of plant species in diet B

A study unit will be identified within each area that has significant populations of elk and wild horses, plus one control area. Each study unit will have a homogeneous habitat. The areas will be no smaller than 5000 acres. The study unit will consist of a 400'x400' wild horse enclosure constructed to USFS fence standards. Elk will be able to enter into the enclosure. Utilization cages will be placed within the enclosure to monitor elk utilization. Utilization cages will be placed outside the enclosure within the same habitat in order to measure the combined utilization of elk and wild horses. From this information, utilization for both elk and wild horses can be extracted.

Fecal analysis will be conducted in the same area as, but not within, the enclosure. Collection of the fecal material will be made in areas that are not associated with travel paths, resting or bedding areas. This will reduce the chance of collecting fecal material from animals that have foraged in areas outside the study unit.

The term Animal Unit (AU) refers to a mature 1,000 lb dry cow in maintenance or gestation or its equivalent in other livestock or wildlife (Vallentine 1965). The AU concept is used to account for units of forage use on rangeland and is the basis for determining carrying capacity and stocking rates.

The basic assumption for calculation of animal unit equivalents is to take into account the amount of forage consumed by each herbivore that is the same as another herbivore, dietary overlap. Animal Unit Equivalents incorporates metabolic liveweights and proportion of dietary overlap:

$$\text{AUE} = \frac{\text{Cow weight} \cdot .75}{\text{Other herbivore weight(kg)} \cdot \text{Proportion of dietary overlap}}$$

This revised method of calculating AUE's fits the current integrated concept of management for wildlife, livestock and wild horses on public rangelands (Flinders 1988).

An accurate population census is needed seasonally in order to estimate the number of animals within the study unit. This information will be used in combination with the range monitoring data and dietary overlap data (Animal Unit Equivalents) to determine the optimum stocking rates of each population.

Cost for this study are projected to 1995 costs. This will facilitate the completion of this project. Projected increase is 5% per year.

Area Description

Areas With Significant Populations of Elk and Wild Horses:

Cold Creek
Wheeler Pass
Mt Stirling

Johnny Mine is included in this proposal as the fourth area. This area has a significant population of wild horses and no reported elk sightings. This area will act as our control situation to this study. All of these areas, but the Johnny Mine area, have been burned. Wheeler pass was burned and seeded 30 years ago. Cold Creek was burned and seeded 8 years ago. Mt Stirling burned 4 years ago and was not seeded. All of these burn areas are larger than 5000 acres. Lovell Summit will act as the control for the elk portion of this study. There is a small population of elk and no reported wild horse sightings in this area.

Implementation Schedule:

	FALL '93	FALL '94	FALL '95
WINTER 92	WINTER	WINTER	
SPRING	SPRING	SPRING	
SUMMER	SUMMER	SUMMER	

WINTER '92 - SPRING '92 Identify Study Areas
SUMMER '92 Construct Exclosures
WINTER '92 - FALL '94 Conduct Fecal Collection and Analysis
WINTER '92 - SUMMER '94 Conduct Range Monitoring
WINTER '92 - SUMMER '94 Conduct Seasonal Population Census
WINTER '94 - SUMMER '94 Determine AUE'S and Stocking Rates
FALL '95 Develop Management Plans

Objective

The objective is to determine the optimum stocking rate for elk and wild horses that will allow the range to recover at a desirable rate. The information gathered will also provide data for the development of habitat management plans that will help maintain the desired range condition once it is reached.

Evaluation

This project will be a success if optimum stocking rates are determined, the stocking rates are implemented on the ground and these stocking rates allow for the range to recover to the desired future condition within a reasonable time.

Additional Comments:

It is necessary for each portion of this study to be conducted, in order to achieve the goal of optimum stocking rate. All information needs to be gathered according to the implementation schedule in order for the information

to be valid. It may be necessary to extend the implementation schedule so that one unit is started each year instead of starting all units on the same year due to funding problems. We intend to submit this project through our Regional Office for Challenge Cost Share Funding. But this is not possible until Fiscal Year '93. Therefore, the Forest Service salaries may not be available for this project in full until 1993. This may be the same for the other agencies participating. Their commitment is based on available funding. The success of this project is also contingent upon funding the entire wild horse and elk portions requested for this study.

ATTACHED:

Map of Proposed Study Areas

Budget Justification

Budget Justification
In-Kind

Costs are based on Implementation Schedule.

US Forest Service Costs

Costs	FY 92	FY 93	FY 94
GS-12 Range Staff	@ \$200/Day		
Per Diem for Range Staff	@ \$103/Day		
GS-11 Resource Officer	@ \$170/Day	@ \$178.50/Day	@ \$187.43/Day
GS-9 Range Con Vehicle	@ \$125/day	@ \$130.25/Day	@ \$136.76/Day
Mileage	@ \$6.33/day	@ \$6.65/Day	@ \$6.98/Day
	@ \$0.23/mile	@ \$0.24/mile	@ \$0.25/mile

USFS Costs

Project Description	FY 92	FY 93	FY 94
Enclosure			
1 Enclosure /Unit			
Location (3 Days/Unit)			
GS-12 Range Staff	\$600		
Per Diem for Range Staff	\$360		
GS-11 Resource Officer	\$510		
GS-9 Range Con Vehicle	\$375		
Mileage	\$ 19		
Total	\$ 69		
	\$1933		
Construction			
Flagging Fence line (2 Days)			
GS-9	\$250		
GS-5	\$140		
Vehicle	\$ 12		
Mileage	\$ 46		
Total	\$448		

USFS Costs

Project Description	FY 92	FY 93	FY 94
Construction per Unit (2 Days)			
GS-9	\$250		
Total	\$250		
Fecal Analysis			
Data Collection (4 Days/Unit)			
GS-9	\$500	\$521	
GS-5	\$280	\$294	
Vehicle	\$25	\$27	
Mileage	\$46	\$48	
Total	\$851	\$890	
Range Condition, Trend And Utilization per Unit (2 Days/Unit)			
GS-9	\$250	\$260	\$274
GS-5	\$140	\$147	\$154
Vehicle	\$13	\$13	\$14
Mileage	\$23	\$24	\$25
Total	\$426	\$444	\$467
Population Census (4 Days per year)			
GS-9	\$500	\$520	\$548
Total	\$500	\$520	\$548
Determination of AUE's and Stocking Rate (5 Days)			
GS-9			\$684
GS-11			\$937
Total			\$1621

USFS Costs

Project Description	FY 92	FY 93	FY 94
Development of Management Plans (20 Days)			
GS-9			\$2736
GS-11			\$3748
Total			\$6484

Total Project Costs All 4 Units	FY 92	FY 93	FY 94
Exclosure	\$10524		
Fecal Analysis	\$ 3444	\$ 3560	
Range Monitoring	\$ 1704	\$ 1776	\$ 1868
Population Census	\$ 500	\$ 525	\$ 551
Determination of AUE's and Stocking Rate			\$ 1621
Development of Management Plans			\$ 6484
Total USFS Costs	\$16172	\$ 5861	\$10524
Total USFS Contribution		\$32557	

Nevada Dept of Wildlife Description	FY 92	FY 93	FY 94
Ron Lee Vehicle	@ \$203.44/Day @ \$0.18/mile	@ \$213.61/Day @ \$0.19/mile	@ \$224.29/Day @ \$0.20/mile

NDOW Costs Project Description	FY 92	FY 93	FY 94
Exclosures			
Location (3 Days per Unit)			
Ron Lee	\$610		
Vehicle	\$ 54		
Total	\$664		
Flagging (2 Days per Unit)			
Ron Lee	\$407		
Vehicle	\$ 36		
Total	\$443		
Fecal Analysis			
Fecal Collection (4 Days per Unit)			
Ron Lee	\$814	\$854	
Vehicle	\$ 72	\$ 76	
Total	\$886	\$930	
Range Condition, Trend, Utilization Measurements (2 Days per Unit)			
Ron Lee	\$407	\$427	\$449
Vehicle	\$ 36	\$ 38	\$ 40
Total	\$443	\$465	\$489
Population Census (4 Days per Year)			
Ron Lee	\$814	\$854	\$897
Total	\$814	\$854	\$897

NDOW Costs Project Description	FY 92	FY 93	FY 94
Determination of Carrying Capacity and AUE's (5 Days)			
Ron Lee			\$1121
Vehicle			<u>\$ 100</u>
Total			\$1221
Development of Management Plan (20 Days)			
Ron Lee			<u>\$4486</u>
Total			\$4486

Total Project Costs All 4 Units	FY 92	FY 93	FY 94
Exclosure	\$4348		
Fecal Analysis	\$3544	\$3720	
Range Monitoring	\$2658	\$1860	\$1956
Population Census	\$ 814	\$ 854	\$ 897
Determination of AUE's and Stocking Rate			\$1221
Development of Management Plans			\$4486
Total NDOW Costs	\$11364	\$6434	\$8560
Total NDOW Contribution		\$26358	

Bureau of Land Management Costs

Cost Description	FY 92	FY 93	FY 94
GS-11	@ \$170/Day	@ \$178.25/Day	@ \$187.43/Day
GS-7/9	@ \$125/Day	@ \$130.25/Day	@ \$136.76/Day
Vehicle	@ \$6.33/Day	@ \$ 6.65/Day	@ \$ 6.98/Day
Mileage	@ \$0.23/mile	@ \$0.24/mile	@ \$0.25/mile

BLM Costs

Project Description	FY 92	FY 93	FY 94
Exclosures			
Location (3 Days per Unit)			
GS-11	\$510		
GS-7/9	\$375		
Vehicle	\$ 19		
Mileage	<u>\$ 23</u>		
Total	\$927		
Fecal Analysis			
Data Collection (4 Days per Unit)			
GS-7/9	\$500	\$521	
Vehicle	<u>\$ 25</u>	<u>\$ 27</u>	
Total	\$525	\$548	
Range Condition, Trend Utilization Measurements (2 Days per Unit)			
GS-7/9	\$250	\$260	\$274
Vehicle	\$ 13	\$ 13	\$ 14
Mileage	<u>\$ 26</u>	<u>\$ 26</u>	<u>\$ 28</u>
Total	\$289	\$299	\$316
Population Census (4 Days per year)			
GS-7/9	<u>\$500</u>	<u>\$521</u>	<u>\$547</u>
Total	\$500	\$521	\$547

BLM Costs

Project Description	FY 92	FY 93	FY 94
Determination of Carrying Capacity and AUE's (5 Days)			
GS-7/9			\$684
Vehicle			\$ 35
Mileage			<u>\$125</u>
Total			<u>\$844</u>
Development of Management Plans (20 Days)			
GS-7/9			<u>\$2735</u>
Total			<u>\$2735</u>

Total Project Costs All 4 Units	FY 92	FY 93	FY 94
Exclosure	\$3708		
Fecal Analysis	\$2100	\$2192	
Range Monitoring	\$1156	\$1196	\$1264
Population Census	\$ 500	\$ 521	\$ 547
Determination of AUE's and Stocking Rate			\$ 844
Development of Management Plans			\$2735
Total BLM Costs	\$7464	\$3909	\$5390
Total BLM Contribution		\$16763	

Budget Justification
Requested

Requested Funds Rocky Mountain Elk Foundation

Project Description	FY 92	FY 93	FY 94
Exclosure			Construction Material Unit Costs 1991
Materials			
Wire	\$140		Wire - \$35/roll
Wood Posts	\$238		Wooden Posts - \$6.60 ea
Steel Posts	\$216		Steel Posts - \$2.572 ea
Stays	\$189		Stays - \$.631 ea
Fasteners	<u>\$ 13</u>		Fasteners - \$0.042 ea
Total per Unit	<u>\$796</u>		
Cost For 4 Units	\$3184		
Construction			
Conservation Crew, NDF			
Supervisor	\$300		
12 Man Crew	\$336		
Bus	\$ 30		
Toilet Trailer	\$ 28		
Chainsaw	\$ 14		
Total per Unit	<u>\$708</u>		
Cost For 4 Units	\$2832		
Fecal Analysis			
Laboratory per Unit	<u>\$104</u>	\$109	
Cost For 4 Units	\$416	436	
Population Census (Elk) 4 Days (6 Hours/Day) Flight Time	\$10800	\$11340	\$11880
Totals per Unit	\$12408	\$11449	\$11880
Totals for 4 Units	\$17232	\$11776	\$11880
Total Requested From RMEF	\$40888		

Budget Justification
Requested

Requested Funds Wild Horse and Burro Interest Group

Project Description	FY 92	FY 93	FY 94
Fecal Analysis			
Laboratory per Unit	<u>\$104</u>	\$109	
Cost For 4 Units	\$416	\$436	
Population Census (Wild Horses) 4 Days (6 Hours/Day) Flight Time	\$24000	\$25200	\$26400
Totals	\$24416	\$25636	\$26400

Total Requested from Wild Horse Interest Groups \$76452

Project Totals:

USFS - \$32557
 NDOW - \$26358
 BLM - \$16763
 \$75678

REQUESTED:

ELK - \$40888
 WH&B - \$76452
 \$117340