



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Carson City District Office  
1535 Hot Springs Rd., Ste. 300  
Carson City, NV 89706-0638



IN REPLY REFER TO:  
4130  
(NV-03580)

February 11, 1994

Dear Interested Party:

The Walker Resource Area has been working on the evaluation of monitoring data for grazing allotments in the Pine Nut Herd Management Area (HMA). Enclosed for your review is the Sunrise Allotment Evaluation, which is the first to be completed. Please send all comments to the above address before March 14, 1994. Also include any additional information relating to the northern Pine Nut Mountains or the Pine Nut HMA.


During the development of earlier evaluations, a key question asked by the Walker Resource Area Staff was how to meet the requirements of the allotment evaluation process while still recognizing the mandate to manage wild horses within the HMA, not within each allotment. To avoid "mini management" of separate Appropriate Management Levels (AMLs) within unfenced portions of a HMA, it was decided that the evaluations should not set an "AML" for each allotment but should, instead, set forth a potential stocking level for each segment of the HMA based on monitoring data and then define an AML for the combined potential stocking levels of the allotments.

By defining a potential stocking level for each portion of the HMA in lieu of an "AML" for each allotment, provision is made for the movement of horses within the HMA since utilization by wild horses is based on the availability of forage, not on a predetermined number of horses for an allotment. For example, a potential stocking level of 159 AUMs in the Sunrise Allotment will provide for 13 wild horses for 12 months or 26 horses for 6 months or a number of combinations.

Since Sunrise Allotment contains only a portion of the Pine Nut HMA (refer to attached map), I have included three tables showing the preliminary analysis of monitoring data and estimated stocking levels in other allotments within the Pine Nut HMA. As my staff was collecting and reviewing this data, it became evident that individual bands of wild horses tended to establish their own individual ranges. To reflect this situation, some of the allotments are grouped on the enclosed tables.

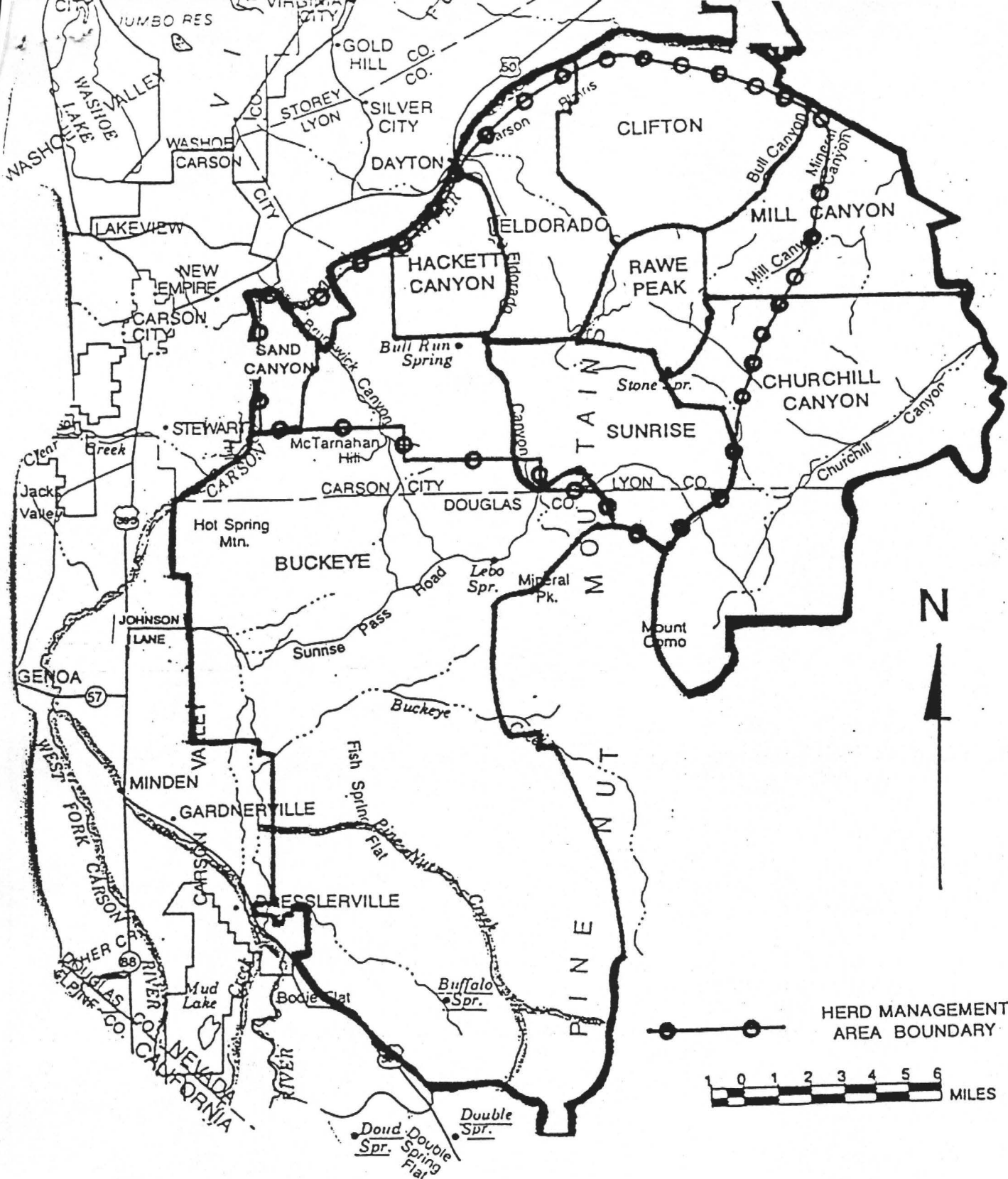
Please note that the information in these tables relating to allotments other than Sunrise is based on preliminary results and may change slightly as the other evaluations are finalized.

Sincerely,

  
John Matthiessen  
Area Manager  
Walker Resource Area

3 Enclosures:

1. Map of HMA
2. Tables 1 to 3
3. Sunrise Allotment Evaluation



NORTHERN PINENUT HERD MANAGEMENT AREA  
AND ASSOCIATED LIVESTOCK ALLOTMENTS

TABLE 1  
FORAGE UTILIZATION BY THE HORSE GROUPS OF THE PINE NUT HORSES

		HORSE GROUP:				
		Buckeye / Sand Canyon	Eldorado / Hackett Canyon	Clifton	Churchill Canyon/ Mill Canyon/ Rawe Peak	Sunrise
Acres Within HMA By Utilization Class	Slight	8062	2171	4410	73	0
	Light	1239	2517	660	225	284
	Moderate	5555	2601	0	696	0
	Heavy	396	1619	6060	11347	1413
	Severe	0	49	1640	181	891
	TOTAL ACRES:	15252	8957	12770	12522	2588
Acres Outside HMA By Utilization Class	Slight	0	0	3390	0	0
	Light	0	0	0	2943	0
	Moderate	0	0	0	4163	0
	Heavy	0	0	0	2812	0
	Severe	0	0	0	41	0
	TOTAL ACRES:	0	0	3390	9959	0

TABLE 2

Computation: "PRESENT MULTIPLE" = Product of acres in utilization class, multiplied by the utilization midpoint by horse group:

	Utilization Class	Utilization Class Midpoint	Buckeye / Sand Canyon	Eldorado / Hackett Canyon	Clifton	Churchill Canyon/ Mill Canyon/ Rawe Peak	Sunrise
Within HMA	Slight	10	80620	21710	44100	730	0
	Light	30	37170	75510	19800	6750	8520
	Moderate	50	277750	130050	0	34800	0
	Heavy	70	27720	113330	424200	794290	98910
	Severe	90	0	4410	147600	16290	80190
	SUBTOTAL:		423260	345010	635700	852860	187620
Outside HMA	Slight	10	0	0	33900	0	0
	Light	30	0	0	0	88290	0
	Moderate	50	0	0	0	208150	0
	Heavy	70	0	0	0	196840	0
	Severe	90	0	0	0	3690	0
	SUBTOTAL:		0	0	33900	496970	0
	TOTAL ("PRESENT MULTIPLE"):		423260	345010	669600	1349830	187620

TABLE 3

CALCULATION OF HORSE POPULATION LEVEL (AML) AT THE DESIRED FORAGE UTILIZATION LEVELS

	HORSE GROUP				
	Buckeye / Sand Canyon	Eldorado / Hackett Canyon	Clifton	Churchill Canyon/ Mill Canyon/ Rawe Peak	Sunrise
PRESENT POPULATION (Number of horses):	49	43	68	164	35
PRESENT FORAGE REQUIRED (AUMs)	588	516	816	1968	420
PRESENT AVERAGE UTILIZATION:	27.8%	38.5%	49.8% *	68.1% *	72.5%
"PRESENT MULTIPLE" (from Table 2)	423260	345010	669600	1349830	187620
DESIRED UTILIZATION:	27.5%	27.5%	27.5%	27.5%	27.5%
ACRES GRAZED WITHIN HMA:	15252	8957	12770	12522	2588
CALCULATION OF "DESIRED MULTIPLE" (Acres grazed within HMA, multiplied by the 27.5% Desired Utilization)	419430	246318	351175	344355	71170
CALCULATION OF AUMS POTENTIALLY PRODUCED AT "DESIRED MULTIPLE" **	583	368	428	502	159
<b>ALLOWABLE MANAGEMENT LEVEL (AML) AT THE DESIRED UTILIZATION LEVEL</b>				<b>2040 AUMs</b>	
<b>(Sum of forage in AUMs for each horse group at desired level, divided by 12 months):</b>				<b>170 Horses</b>	

\* INSIDE THE HMA. THERE IS ADDITIONAL UTILIZATION OUTSIDE THE HMA FOR THESE HORSE GROUPS.

\*\* SOLVING FOR "ALLOWABLE USE" IN THE EQUATION: 
$$\frac{\text{PRESENT PRODUCTION}}{\text{"PRESENT MULTIPLE"}} = \frac{\text{"ALLOWABLE USE"}}{\text{"DESIRED MULTIPLE"}}$$

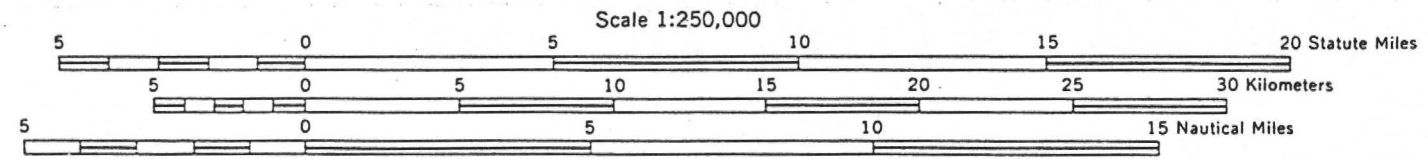
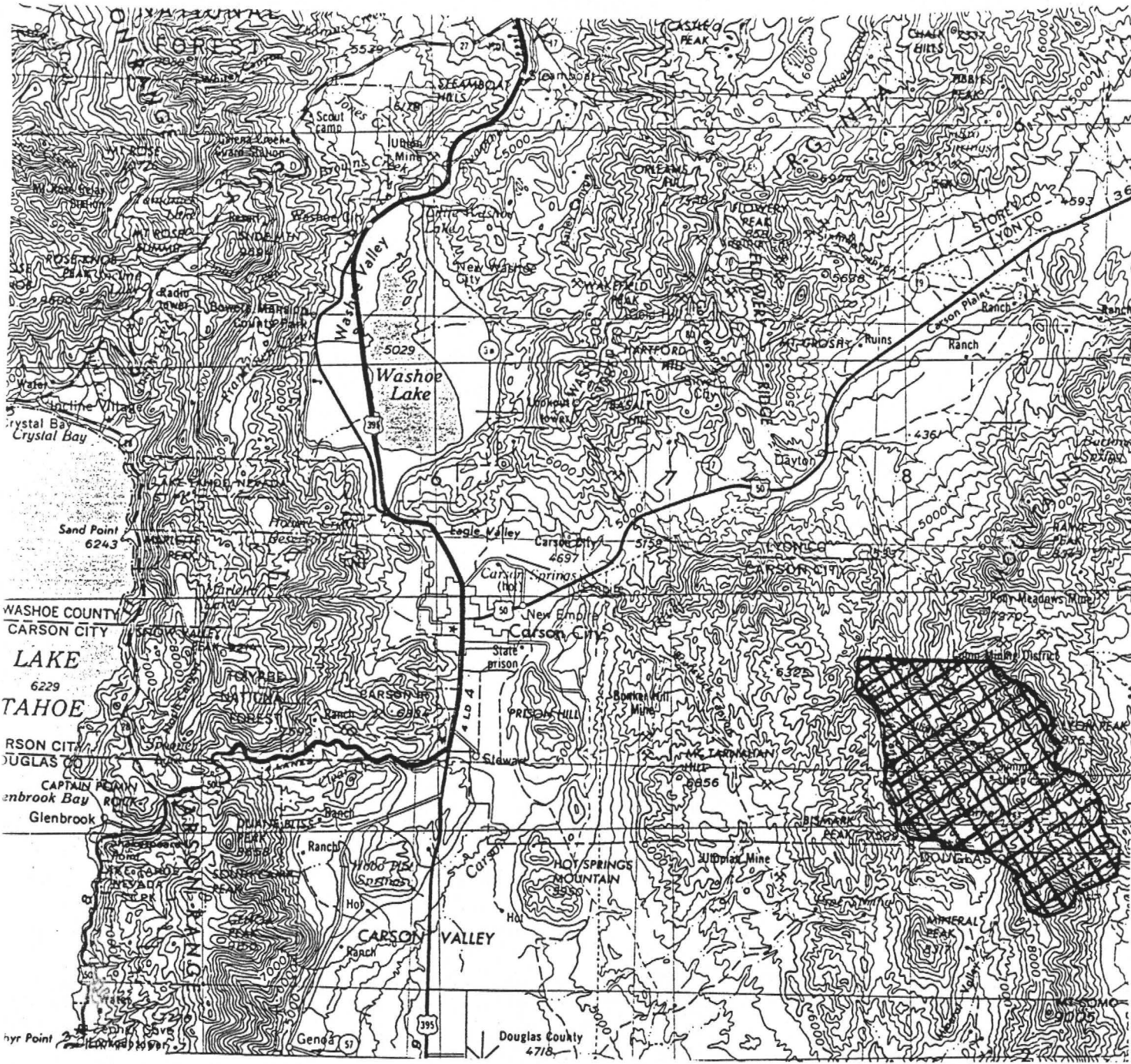
**UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

Carson City District Office  
1535 Hot Springs Road, Suite 300  
Carson City, Nevada 89706-0638

**SUNRISE  
ALLOTMENT EVALUATION**

February 10, 1994





CONTOUR INTERVAL 200 FEET  
 WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS

MAP NO. 1  
 Location of Sunrise Allotment

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Maps:

- 1. Location of Sunrise Allotment (page i)
- 2. Property Status and Range Improvement Projects
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- 4. 1992 Use Pattern Mapping
- 5. Ecological Sites and Pinyon - Juniper Cover



REVISION  
SUNRISE ALLOTMENT EVALUATION

I. Introduction

A. Purpose

On July 23, 1990, prior to the issuance of decisions on Category "I" allotments, the Sunrise Allotment Evaluation was submitted for public review. Technical recommendations included fencing one riparian area and then changing the category to "M" due to the elimination of major resource conflicts. A decision was to be rendered in 1991, however further monitoring showed that utilization levels by wild horses had increased dramatically over levels addressed during the evaluation process. Since additional monitoring was needed to establish a management level that would result in less than heavy utilization levels, the decision was delayed.

In June, 1992, the Bureau of Land Management issued its *Strategic Plan for Management of Wild Horses and Burros on Public Lands*. One of the objectives is to establish initial Appropriate Management Levels (AMLs) for all herd areas by 1995. In order to establish an AML for wild horses in the Pine Nut Herd Management Area (HMA), it is necessary to evaluate resource management within all the allotments included within the HMA. One of these is Sunrise Allotment.

Therefore, the Sunrise Allotment Evaluation is revised herein to include additional resource data acquired since 1990 and to determine if current management is consistent with attainment of the Walker Resource Management Plan (RMP) and allotment specific objectives for the Sunrise Allotment. If current management is not consistent with attainment of these objectives, then appropriate changes needed to meet these objectives will be identified, and appropriate changes in management implemented.

B. Allotment Name and Number: Sunrise (03590)

C. Permittees: Joe Ricci and F.M. Fulstone, Inc.

D. Evaluation Period: 1982 (issuance of Reno Record of Decision) to present.<sup>1</sup>

E. Selective Management Category: "I"<sup>2</sup>

II. Initial Stocking Rate

A. Livestock Use

1. Preference

Preference was adjudicated in 1962 based on the results of the 1961 Range Survey. Preference and period of use are identified below.

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<sup>1</sup> Some data discussed in this evaluation was collected prior to 1982.

<sup>2</sup> "Improve" current unsatisfactory condition (Final Grazing Management Policy, 1982).

Permittee	Preference (AUMs)			Kind of Live-stock	Period of Use	Percent Federal Range Use
	Active	Suspended	Total			
F.M. Fulstone, Inc.	750	0	750	Cattle	06/01 - 09/30	100%
Joe Ricci	342	0	342	Cattle	05/01 - 07/31	100%

2. Historical Use and Current Operations

a. F.M. Fulstone, Inc.

F.M. Fulstone, Inc. also has preference in the Artesia, Lincoln Flat, Hudson Hills and Central Allotments. These allotments are grazed in fall and winter while the Sunrise Allotment is grazed in spring and summer. All of F.M. Fulstone, Inc.'s allotments were originally included as a portion of Fred Fulstone's sheep and cattle operation until 1985. In 1985, Mr. Fulstone's preference was divided into two separate operations: F.M. Fulstone, Inc. (cattle) and FIM, Inc. (sheep).

When F.M. Fulstone, Inc. began grazing in 1985, it intended to gradually increase the herd based on livestock performance and distribution within the allotments, initially concentrating its efforts on the fall and winter allotments. Although there are still a few problems due to winter conditions in the higher elevation allotment, a basic grazing system has been developed. F.M. Fulstone, Inc., wishes to expand its cattle operation to include the Sunrise Allotment. However, it has applied for nonuse since 1991 due to "wild horse use so heavy no feed for cattle [sic]". Since this concurs with use pattern mapping in the allotment (refer to page 9), the nonuse has been approved.

b. Joe Ricci

The Ricci family has grazed in the vicinity of Carson City since before the 1930s. The Joe Ricci Estate currently has preference in the Sunrise, Stockton Flat and Hackett Canyon Allotments. Since 1986, the Riccis have applied for total nonuse on all their allotments due to "annual fluctuation of operation".

c. Borda Brothers

Although the Borda Brothers do not have a permit in the Sunrise Allotment, they own land in the southern portion of the allotment. They are allowed to trail sheep to their private lands and then to the Pine Nut Allotment, which lies immediately southwest of Sunrise.

B. Wild Horse and Burro Use

1. Herd Management Areas (HMAs) in Allotment

All of the Sunrise Allotment is included as a portion of the Pine Nut Herd Management Area.

## 2. Management Levels

The appropriate management level (AML) for the Pine Nut HMA will be based on stocking levels for wild horses determined for all the allotments within the HMA. The stocking level for the Sunrise Allotment will be determined through the analysis of monitoring data contained within this document.

## C. Wildlife Use

### 1. Mule Deer (*Odocoileus hemionus*)

#### a. Existing Numbers

Based on 1991 population estimates from the Nevada Division of Wildlife (NDOW) and predicted distribution data, 90 head of deer use the Sunrise Allotment yearlong with an additional 125 in winter. In order to compare with the objectives in Section III C, these numbers are converted to AUMs below.

Number of Deer	Period of Use (Months)	Percent Public Land	AUMs
90	Year-round (12)	96	259
125	Winter (6)	96	180
Total AUMs =			439

#### b. Key and Crucial Areas

6,531 public acres of mule deer summer range exist in the western portion of the Sunrise allotment. 9,898 public acres of key deer summer range exist along the full length of the allotment above 6500 feet elevation (refer to Map No. 3). 1,375 public acres of winter range exists in the vicinity of Sunrise Chaining.

### 2. Other Species (refer also to Threatened and Endangered Species, page 6)

Sage grouse (*Centrocercus urophasianus*) use the southern portion of the allotment, however strutting grounds have not been located. Other wildlife species include California quail (*Callipepla californicus*), mountain lion (*Felis concolor*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), western gray squirrel (*Sciurus griseus*), cottontail (*Sylvilagus nuttallii*), jack rabbit (*Lepus californicus*), and numerous species of raptors, small birds, small mammals, and reptiles.

## III. Allotment Profile

### A. Description

The Sunrise Allotment is located approximately 10 miles southeast to Carson City, Nevada, in the Pine Nut Mountain Range. Approximately 88% of the allotment lies in Lyon County and 12% in Douglas County (refer to Map Nos. 1 and 2). The area is mountainous, characterized by many dense stands of pinyon pine (*Pinus monophylla*) and mixed stands of pinyon and Utah juniper (*Juniperus osteosperma*). Elevation varies from approximately 5,200 feet in Eldorado Canyon to over 8,700 feet at Lyon Peak.

The area receives heavy human traffic due to its proximity to Carson City, Carson Valley, Smith Valley, and Mason Valley, and because a major route across the Pine Nut Mountains (Sunrise Pass Road) runs through the allotment. People are also attracted to the area for pine nut harvesting, hunting, trapping, wood cutting, bird watching and other recreational activities.

Sunrise allotment was categorized as "I" in the Reno Planning Area Record of Decision (1982) based on the following criteria.

- 1) Fair to poor range or ecological condition; downward trend.
- 2) Grazing management practices inadequate to meet long-term resource objectives.
- 3) Resource conflicts evident.

Approximately 33% of the allotment boundary is fenced. Range Improvement Projects are shown below. Refer to Map No. 2 for locations.

Project Name	Project No.	Year *1	Type of Agreement	Maintenance Responsibility
Lowney Spring	540044	1944	Cooperative	F.M. Fulstone, Inc.
Martin Spring	540195	1955	Cooperative	F.M. Fulstone, Inc.
Big Basin Spring Development	540217	1955	Cooperative	F.M. Fulstone, Inc.
Illinois Canyon Seeding	543501	1969	None	BLM
Sunrise Chaining & Seeding	543502	1969	None	BLM
Lowney Spring Holding Corral	544080	1944	Cooperative	F.M. Fulstone, Inc.
Sunrise Basin Pinyon Thinning	544310	1973	None	BLM
Quail Spring	544341	1973	None	BLM
Sunrise Cattleguard #1	544497	1976	None	BLM
Pine Nut Mountain Fence	545001	1941	Cooperative	F.M. Fulstone, Inc.
Sunrise Drift Fence	545002	1941	Cooperative	F.M. Fulstone, Inc.
Phenology Study Plot #7	545122	1977	None	BLM
Powerline Spring Development	546075	1978	None	BLM
Sunrise Cattleguard #2	546119	1976	None	BLM
Chaining Springs Protection Fence	546394	1988	None	BLM
Eldorado Canyon Stabilization	546667	1992	SCA *2	BLM

\*1 This is the year the project was constructed or last reconstructed  
 \*2 Student Conservation Association volunteers

## B. Acreage

Sunrise Allotment contains approximately 17,804 acres of public land and approximately 773 acres of deeded land. None of the deeded land is owned by either permittee in Sunrise Allotment. However, 160 acres in the southern portion of the allotment is owned by the Borda Brothers, who grazes the adjacent Pine Nut Allotment (refer to Historical Use and Current Operations, page 2).

## C. Allotment Specific Objectives

### 1. Land Use Plan Objectives

All objectives below are from the Reno Planning Area Record of Decision (Reno ROD), issued in 1982.

- a. Short Term
    - 1) Bitterbrush will be used as a key species within mule deer habitat on all Category I allotments.
  - b. Long Term
    - 1) All category I allotments will have intensive grazing systems developed or existing systems revised.
2. Reno Rangeland Program Summary (RPS) - released May, 1984
- a. Short Term
    - 1) Provide 1,092 AUMs of livestock use.
    - 2) Protect and improve condition on riparian areas.
  - b. Long Term
    - 1) Improve ecological condition on non-woodland sites and improve condition of seeding and chainings.
    - 2) Provide 471 AUMs for mule deer to reach reasonable numbers.
3. Pine Nut Habitat Management Plan (HMP) - revised in 1987
- a. Short Term
    - 1) Protect and improve riparian areas to a good or better condition class by May, 1989.
    - 2) Improve bitterbrush production and seedling establishment.
    - 3) Reduce habitat loss and harassment of wildlife caused by off road vehicle (ORV) use along the Pine Nut crest by May 1994.
  - b. Long Term
    - None that relate to Sunrise Allotment.

#### 4. Threatened and Endangered Species

No threatened or endangered species have been identified in the Sunrise Allotment. No candidate plants<sup>3</sup> have been observed in the allotment. Candidate animal species that may occur in the allotment include the loggerhead shrike (*Lanius ludovicianus*) and mountain quail (*Oreortyx pictus*).

Since the loggerhead shrike is common throughout the Resource Area and occurs in a variety of habitats, the possibility that it may occur in the Sunrise Allotment is high. The shrike generally prefers open areas for hunting insects, and occasionally small vertebrates. They generally will select nesting sites, which includes tall shrubs and trees, near their hunting areas. Based on this description, foraging habitat in the Sunrise Allotment would include the chainings, areas above the pinyon - juniper tree-line, and meadows. Since these birds store their food on thorns, the presence of thorny shrubs would be an advantage. Anderson peach-brush (*Prunus andersonii*) is one such plant species found in the chainings.

Mountain quail have been observed in the vicinity of the Sunrise chaining, and on private lands in the southern portion of the allotment. Mountain quail generally prefer brushy slopes and mixed woodlands for nesting, which is similar to loggerhead shrike foraging habitat. Important areas for chick rearing include meadows and the associated stands of shrubby riparian vegetation.

#### D. Key Species Identification

##### 1. Uplands

Antelope bitterbrush (*Purshia tridentata*) and Sandberg bluegrass (*Poa secunda*) were selected as key species because of their importance as forage for mule deer.<sup>4</sup> Although crested wheatgrass (*Agropyron cristatum*, *A. desertorum*, or crosses) is an exotic plant species, it is the most important forage grass for wild horses and livestock common enough in the seedings to be used as a key species. It also has a high rating as mule deer winter and spring forage.

##### 2. Riparian

Riparian vegetation is important for wildlife forage and cover. Woody species include quaking aspen (*Populus tremula tremuloides*), Fremont cottonwood (*Populus fremontii*), coyote willow (*Salix exigua*), Pacific tree-willow (*Salix lasiandra*), and wild rose (*Rosa woodsii*). Meadow species including Nevada bluegrass (*Poa nevadensis*), Nebraska sedge (*Carex nebrascensis*), silver sedge (*Carex praegracilis*), Baltic rush (*Juncus balticus*), tufted hairgrass (*Deschampsia caespitosa*), spikerush (*Eleocharis palustris*), Kentucky bluegrass (*Poa pratensis*), and creeping wildrye (*Elymus triticoides*).

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<sup>3</sup>Candidate species include plants and animals on which the currently existing information indicates that listing may be warranted, but for which substantial biological information to support a listing is lacking. BLM Manual 6840 requires that management be such as not to require listing of these species.

<sup>4</sup>Based on forage ratings in BLM 6630 Manual, Appendix 5.

IV. Management Evaluation

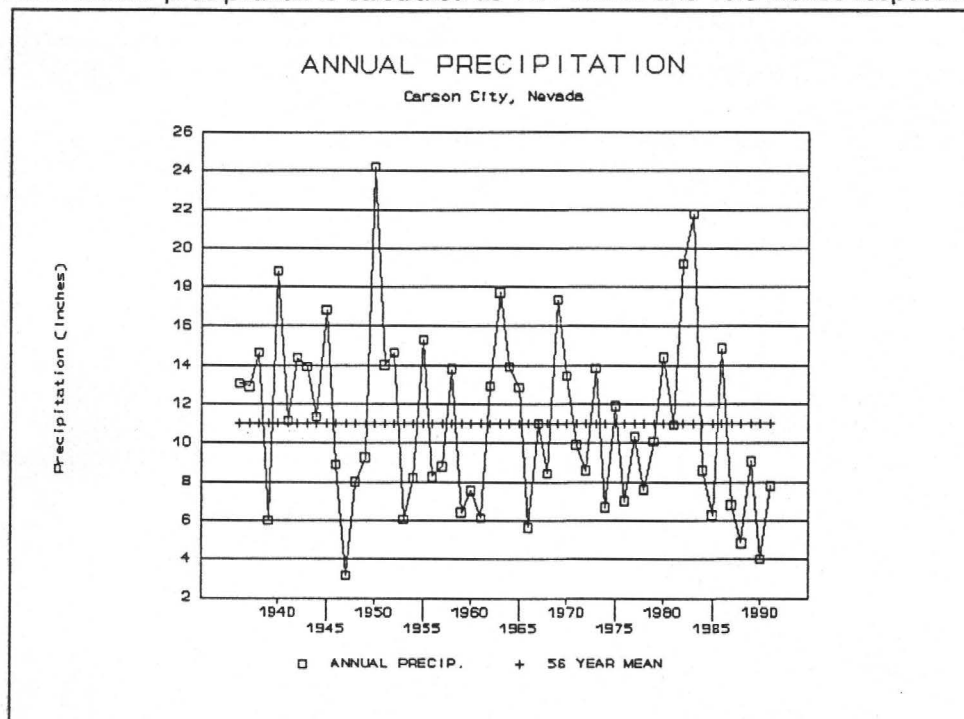
A. Actual Use

Authorized livestock use is shown below. Wild horse numbers are shown in Section IV (page 13).

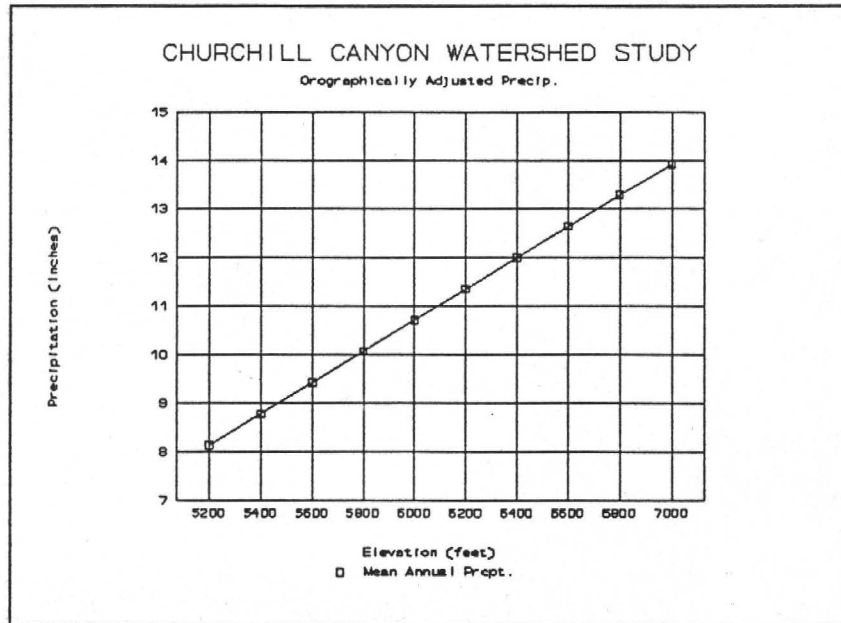
Grazing Season	Permittee(s)	AUMs	Use Period
1982	Joe Ricci	98	05/10/82 - 07/15/82
1983	Joe Ricci	286	05/20/83 - 08/15/83
1984	Joe Ricci	152	05/30/84 - 07/28/84
1985	Joe Ricci	226	05/30/85 - 08/31/85
1986	Joe Ricci	119	05/21/86 - 07/31/86
1987		0	N/A
1988		0	N/A
1989		0	N/A
1990		0	N/A
1991		0	N/A
1992		0	N/A

B. Precipitation

The annual precipitation shown below is from Carson City, Nevada, which is the closest station with consistent and reliable data. It is located at 4650 feet elevation. The fifty-six year mean and median annual precipitation is calculated as 11.1 inches and 10.9 inches respectively.



Note that the Carson City recording station is at a lower elevation than the major ecological sites in the allotment (refer to Appendix I). Due to the effects of orographic lifting<sup>5</sup>, the Sunrise Allotment will have a higher annual precipitation than Carson City. This effect was documented throughout the state in the *Nevada Watershed Studies (1963 to 1980)*<sup>6</sup>. Some of the data from the Churchill Canyon site was recorded in the Sunrise Allotment. The graph shown below is an estimate based on linear regression calculations for all of the Churchill Canyon data. As an example, the long term average precipitation at 6,400 feet elevation will be approximately 12 inches per year. Therefore, vegetation found in a 12 inch precipitation zone should be present at that elevation.



### C. Utilization

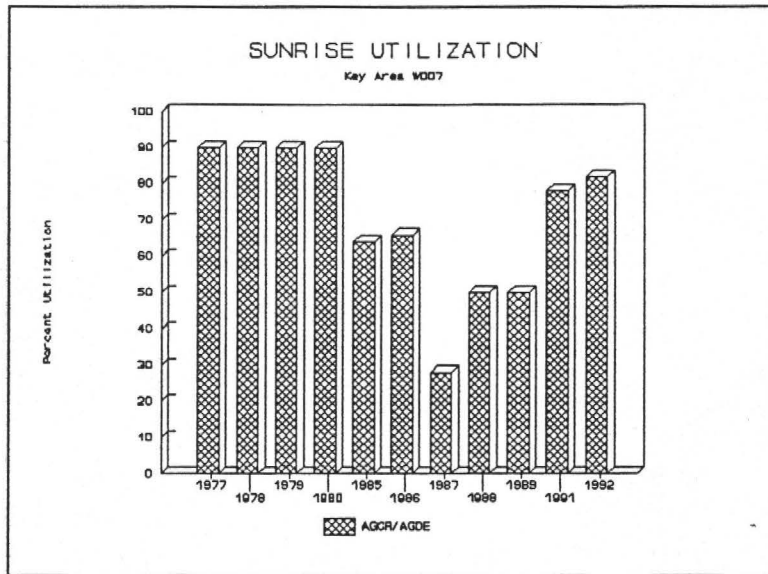
#### 1. Key Area

Utilization data for Key Area W007 (refer to map No. 2) is shown below. All use was from wild horses except 1985, which was from both horses and cattle. Note that only crested wheatgrass is shown. Bitterbrush was recorded at the no-use level every year except in 1979 (56% recorded in 1979).

<sup>5</sup>Orographic lifting: changes associated with the increase in elevation due to the presence of mountains.

<sup>6</sup>Houng-Ming Joung, John H. Trimmer, Richard Jewell (1983). BLM Nevada State Office Technical Publication BLMNVPT830014340.





## 2. Use Pattern Mapping

Use pattern mapping was completed in 1980 and all years since 1985. The 1980, 1987, 1989, and 1992 data shown below illustrates the major fluctuations in use patterns. The 1980 data was recorded when wild horse populations were near their peak. In 1987, after major wild horse removals during the mid-1980s, use levels were being recorded at or below the moderate level. The 1989 data was recorded during the initial allotment evaluation and shows that there was still very little heavy and severe use. 1992 illustrates the increase in use levels since the allotment evaluation. Note that all the use on public land is from wild horses (i.e. no cattle were authorized in 1980 or since 1986). "%" refers to percentage of allotment in the specific utilization class. The 1992 use mapping is shown on Map No. 4.

Year	Utilization Classes					
	No Use, Slight & Light		Moderate		Heavy and Severe	
	Acres	%	Acres	%	Acres	%
1980	10,010	53	3,043	18	5,407	29
1987	18,480	99	97	<1	0	
1989	18,197	98	312	2	68	<1
1992	16,273	88	0		2,304	12

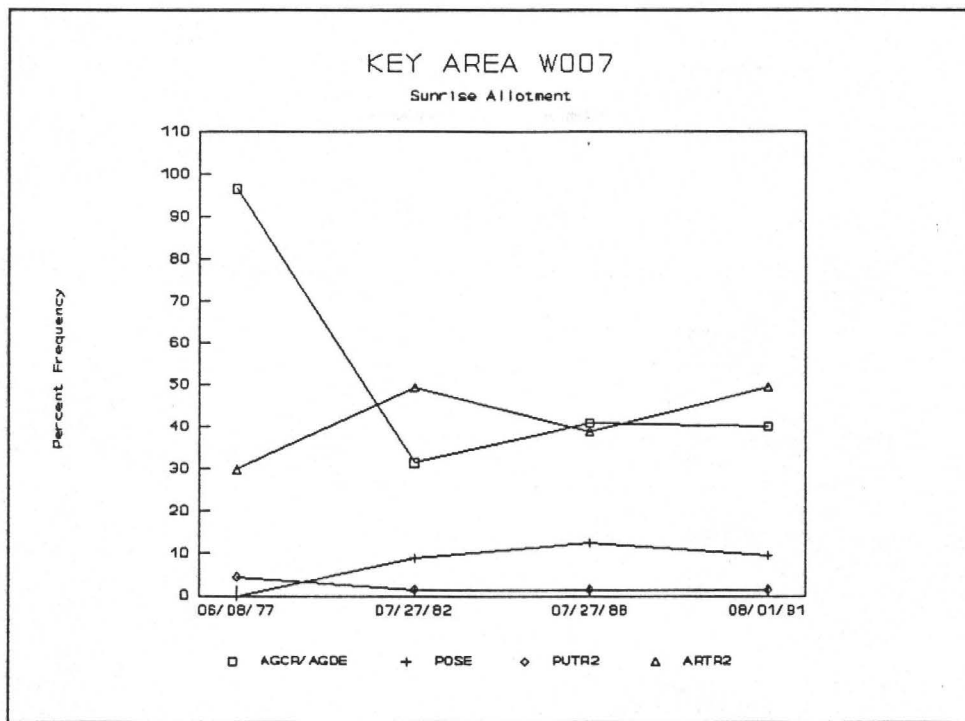
Additional observations from the 1992 mapping are presented below.

- a. Much of the allotment was classified as "no-use" due to an absence of key forage species (i.e., too small a sample size to determine the weighted average percent). This includes dense stands of pinyon and juniper as well as portions of old chainings that have been invaded by dense stands on mountain big sagebrush (*Artemisia vaseyana*).
- b. No use was observed on bitterbrush.
- c. Although heavy use was recorded on the upland habitat in Eldorado Canyon, severe use was occurring along the creek. One area had been stripped of vegetation where off highway vehicles (OHVs) had driven down the creek bed.
- d. Pinyon Springs (refer to Map No. 3) showed severe punching of wet areas on the meadow. Vegetation on the drier areas had been removed to such an extent that soil was exposed in several locations.
- e. Although Sunrise Cabin Meadow showed heavy use, very little hoof damage was observed. More physical damage was occurring due to vehicles driving on the meadow.
- f. Trail Spring showed heavy use of meadow species, but no use was recorded on aspen.
- g. Severe use in Illinois Canyon was on meadow species. No use was recorded on coyote willow. Heavy use occurred on the bench above the creek.

#### D. Trend

One key area (W007) has been established in the allotment. Results are shown below. "\*" indicates that species is a key species. Plant codes are identified as follows:

- \*AGCR / AGDE - Crested wheatgrass and hybrids (*Agropyron cristata* and/or *Agropyron desetorum*)
- \*POSE - Sandberg bluegrass (*Poa secunda*)
- \*PUTR2 - antelope bitterbrush (*Purshia tridentata*)
- ARTR2 - big sagebrush (*Artemisia tridentata*)



#### E. Ecological Status

Ecological status (i.e. range condition)<sup>7</sup> was determined during the vegetation survey in 1979. This data is presented in Appendix I and on Map No. 5. Note that areas in early seral stage dominated by pinyon and/or juniper overstory accounts for 14,442 acres (81.1% of the allotment). These areas are also depicted on Map No. 5.

The 1979 survey identified all plant communities as potentially grass or shrub-grass dominated ecological sites. This designation included those sites that were completely dominated by pinyon and juniper at the time of the survey. However, Soil Surveys for Lyon and Douglas Counties, issued in 1984, more correctly recognized that some soils will support a potential natural community (PNC)<sup>8</sup> dominated by pinyon-juniper. Current research (Appendix III) recognizes that ecosystems currently dominated by pinyon and juniper evolved under episodes of periodic burning. These fires restricted the trees to shallow, rocky soils in rough terrain where fine fuels were naturally limited.

Based on an analysis of soil data, 36.9% of public land in the Sunrise Allotment should support a PNC dominated by pinyon - juniper woodland (see table below) while 52% of the allotment should support a PNC dominated by grasses, shrubs or other tree species. This is significantly different from the 81.1% of sites dominated by pinyon and juniper in 1979. The "barren areas" category

<sup>7</sup>This evaluation uses terminology prescribed in the BLM Manual Handbook H-4410-1, National Range Handbook (NRH), released on 7/12/84. The manual adopted sections 200 to 700 of the Soil Conservation Service's NRH as the basic procedural guidance on ecological status inventory.

<sup>8</sup>BLM Manual Handbook H-4410-1 definition of Potential Natural Community (PNC): The biotic community (potential natural plant community and wild animal community) that would become established if all successional sequences were completed without interferences by man under the present environmental conditions.

identified below includes areas such as rock outcrops that have the potential of supporting very sparse stands of vegetation. This category was identified as early seral stage range sites in the 1979 survey.

Vegetation Status	Acres Public Land	Percent of the Public Land
Pinyon-Juniper Woodland	6,564	36.9%
Ecological Sites with PNC dominated by Other Species than P-J Woodland	9,261	52%
Barren areas (eg., rock outcrops)	1,979	11.1%

Major soil types that should naturally support pinyon-juniper woodland in the Sunrise Allotment are identified below.

Berit extremely stony loam, 30 to 50 % slopes. On south-facing mountainsides in Lyon County SMUs (soil mapping units) 871 and 972, and in Douglas County SMU 811.

Cagle very stony loam, 15 to 50% slopes. On south facing slopes in Lyon County SMU 171.

Hyloc very cobbly sandy loam, 15 to 30% slopes. On south- and west- facing slopes in Lyon County SMUs 171, 371, 372, and 831.

Minneha extremely stony sandy loam, 30 to 50% slopes. North and east-facing mountainsides in Lyon County SMU 972 and Douglas County SMU 811.

Nall gravelly sandy loam, 8 to 15% slopes. On dissected pediments in Lyon County SMU 871.

Wile gravelly sandy loam, 15 to 30% slopes. On ridges and upper south-facing mountainsides in Lyon County SMU 972 and Douglas County SMU 811.

#### F. Wildlife Habitat

In 1993, mule deer winter and key summer ranges were rated based on procedures from the Bureau's 6630 Manual. The Sunrise chaining and seeding, which comprises most of the winter range within the allotment, had a habitat condition rating of 67.2 (good). Key summer range, generally located above the pinyon - juniper tree line, rated as 69.9 (good). The tree dominated areas in the remainder of the allotment lacked adequate key species to reasonably conduct a rating. This would indicate that though the dense stands of pinyon and juniper covering approximately 81% of the Sunrise Allotment (refer to previous section on ecological status) provide optimal thermal and hiding cover, they do not provided adequate amounts and diversity of forage for mule deer. The herbaceous vegetation and associated woody plants provided by riparian areas have the best habitat values. These areas are important for season-long forage, spring and summer fawn rearing, and winter thermal cover<sup>9</sup>.

<sup>9</sup>Lackenby, Donavin A., Dennis P. Sheehy, Carl H. Nellis, Richard J. Scherzinger, Ira D. Luman, Wayne Elmore, James C. Lemos, Larry Doughty, and Charles E. Trainer. Wildlife habitats in managed rangelands - the Great Basin of Southeastern Oregon. 1986. USDA Forest Service and USDI-BLM General Technical Report PNW-139.

G. Riparian Habitat

Riparian areas shown on Map No. 3 were visited in 1992 during the use pattern mapping. Heavy and severe use of meadow herbaceous plant species by wild horses was observed on all riparian areas except Phenology Study No. 7. Very little use was observed on woody species (eg., willows and aspen) on any of the riparian areas. Soil stability was being threatened on the following areas:

Eldorado Canyon - Bare areas along creek due to severe use by wild horses. One area had been stripped of vegetation where OHVs had driven down the creek bed.

Pinyon Springs (SR7) - Severe punching of wet areas on the meadow. Vegetation on the drier areas had been removed to such an extent that soil was exposed in several locations.

Sunrise Cabin Meadow (SR4) - Physical damage was occurring due to vehicles driving on the meadow.

H. Wild Horse Numbers and Habitat

The considerable density of trees and the associated decline in the understory vegetation are limiting factors for wild horses. This is addressed in previous sections. Shown below is census data specific to the Sunrise Allotment.

Year	Wild Horse Numbers	AUMs
1989	1	12
1990	16	192
1992	35	420

Census and removal data available for the entire HMA is shown below (i.e., some data was not stored in a form where numbers could be tabulated for individual allotments).

Year	Numbers Counted during Census	Numbers removed during major Gathers
1981	820*	
1984	664	235
1985		335
1986	273	233
1989	279	
1990	351	
1992	467	

\* Estimate based on census data adjusted using a Lincoln- Peterson Index

## V. Conclusions

The accomplishment of the objectives shown in Section III C (Page 4) are discussed below. Objectives have been grouped due to similarities.

### A. Utilization Trend, and Condition

Improve ecological condition on non-woodland sites and improve condition of seeding and chainings. Reno RPS

Bitterbrush will be used as a key species within mule deer habitat on all Category I allotments. Reno ROD

Improve bitterbrush production and seedling establishment. Pine Nut HMP

Between 1985 and 1988, the trend of crested wheatgrass and bluegrass were slightly upward. This was probably due to the lower key area utilization levels recorded during that time period. However a slight downward trend was recorded between 1988 and 1991, during which time the utilization levels due to wild horses had increased. Therefore the RPS and ROD objectives have not been met.

The downward trend would again be reversed by decreasing the utilization levels on crested wheatgrass and bluegrass. The stocking rate necessary to achieve the desired utilization is calculated in Appendix II. Based on an even division of forage between wild horses and cattle, the desired stocking rate is 159 AUMs each for wild horses and cattle.

A browse transect completed within the winter range in 1993 indicated that past utilization was less than 5% on bitterbrush plants. This transect showed that 2% of the plants were seedlings and 10% of the plants were young. Another transect on key deer summer range indicated 10% of the bitterbrush plants had moderate past use. Five percent of plants were young. Based on the results from these transects, the above HMP objective has been met.

### B. Authorizing Livestock Use.

Provide 1,092 AUMs of livestock use. Reno RPS

All category I allotments will have intensive grazing systems developed or existing systems revised. Reno ROD.

The livestock operators have applied for nonuse since 1986, therefore the first objective has not been met. In the case of Joe Ricci, who applied for nonuse on all the allotments administered by the Carson City District, the reason for nonuse has been a fluctuation of the permittee's operation. In the case of the F.M. Fulstone, Inc., this has been due to its gradual buildup of a grazing system on the winter allotments. By the time it intended to expand the operation to include Sunrise Allotment, there was insufficient forage available to provide 750 AUMs for livestock due to overuse by wild horses.

Seasonlong grazing from 05/01 to 09/30 may not be appropriate for the Sunrise Allotment. Cattle grazing during this five month period would continually be returning to previously grazed plants. Upland plants would never be allowed to recover during their active growing season (spring and summer). Since late summer is during the warmest period of the year, livestock will have a greater tendency to concentrate on riparian areas than in spring. Fall grazing would not allow for the regrowth of riparian plant species and winter mule deer forage.

Based on the goal to protect riparian areas and provide winter forage for mule deer, an earlier season of use would be more appropriate. In this situation, grazing would be allowed during the active growing season of key plant species (03/15 to 06/15<sup>10</sup>). In order to allow for regrowth, specific areas should be grazed two weeks or less each year (i.e., short duration grazing).

On the other hand, short duration grazing occurring after the seed-ripe growth stage of key species (06/30) would enhance seedling production of upland plant species. Therefore occasional grazing after 06/30 may be necessary to improve upland sites.

#### C. Wildlife and Riparian Habitat

Protect and improve condition on riparian areas. Reno RPS

Provide 471 AUMs for mule deer to reach reasonable numbers. Reno RPS

Protect and improve riparian areas to a good or better condition class by May, 1989. Pine Nut HMP

Based on the latest census data, 90 mule deer use the Sunrise Allotment year-round with an additional 125 deer in winter. This would require 439 AUMs of forage (refer to Mule Deer, Existing Numbers on page 3). It is not known whether 471 AUMs of mule deer forage is available in accordance with the allotment objectives. It is felt that the main limiting factor is the amount and diversity of forage in the forested areas, which comprises over 81% of the Sunrise Allotment (refer to Wildlife Habitat, page 12). Areas with limited pinyon and juniper cover in the winter and key summer ranges were rated as being in good habitat condition. The main conflict to mule deer in the chainings and seedings is the competition for herbaceous vegetation by wild horses (i.e., there is little left for the wintering deer).

The amount and diversity of forage, prey species, and nesting habitat in the forested areas would also be a limiting factor to most other species of wildlife except, possibly, the western grey squirrel, northern flicker (*Colaptes auratus*), hairy woodpecker (*Picoides villosus*) and other species of woodpecker.

Based on observations during the use pattern mapping in 1992, the conflicts to riparian areas include over-utilization of meadow plant species and hoof damage to soil by wild horses. Soil damage had also occurred on meadow and creek-side habitat near roads and trails due to vehicular use. Therefore, riparian areas have not been protected or allowed to improve in accordance with allotment objectives.

#### D. Threatened and Endangered Species

There are no significant threats to the loggerhead shrike posed by wild horses or livestock. Management of horses and cattle should result in no significant changes to the suitability of the shrike's habitat. The biggest threat to this candidate species would result from loss of open areas due to the increasing density of pinyon - juniper trees. Heavy vehicular traffic in April may impact nesting birds.

Over-utilization of and hoof damage to riparian areas have a negative impact on important mountain quail habitat (refer to previous sections on Wildlife and Riparian Habitat). an additional

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<sup>10</sup>Seasons of use based on the growing season of bitterbrush, Indian ricegrass and needlegrass on Carson City study sites in Nevada Rangeland Phenology.

threat to the overall habitat of mountain quail would be a conversion of the shrub dominated habitat because of increasing tree dominance.

E. ORV / OHV Use

Reduce habitat loss and harassment of wildlife caused by off road vehicle (ORV) use along the Pine Nut crest by May 1994. Pine Nut HMP

Damage is still occurring on riparian habitats located near roads and trails. Therefore the HMP objective is not being met. Since most of the Sunrise Pass Road is surrounded by thick pinyon and juniper trees, the public will use whatever openings are available to them for parking while they are camping, hunting, pine-nut harvesting, bird-watching and otherwise using public land in the Sunrise Allotment.

VI. Technical Recommendations

A. Short Term Objectives

In order to reduce utilization levels on grazable rangeland in the Sunrise Allotment (i.e. non-woodland sites), the following recommendations are presented:

1. The maximum allowable use by wild horses in the Sunrise Allotment portion of the Pine Nut Herd Management Area (HMA) should not exceed 159 AUMs (Refer to Appendix II).
2. Establish an allowable use level (AUL) of 27.5% for yearlong use of perennial grasses and 22.5% on bitterbrush by wild horses.
3. Until utilization levels by wild horses are below the AUL, allow no livestock grazing in the Sunrise Allotment.
4. Once objective no. 3 is achieved, allow no more than 159 AUMs of livestock use. This use will occur under the following season of use constraints:
  - a. No area will be grazed for more than two weeks each year.
  - b. During most years, this two week period will occur sometime between 03/15 to 06/15.
  - c. At the discretion of the Area Manager, use may occasionally be authorized after 06/30.
5. Establish an AUL of 55% for use on perennial grasses and 22.5% on bitterbrush by both wild horses and cattle (combined use)<sup>11</sup>.

In order to reduce habitat loss and harassment of wildlife caused by off road vehicle (ORV) use, the following recommendation is presented:

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<sup>11</sup>Based on an AUL of 45% of bitterbrush, half (22.5%) will be retained for overwintering mule deer.



6. In addition to enforcing current restrictions on ORVs / OHVs, develop projects to physically block vehicles from driving on riparian habitats near designated roads. Include development of designated parking areas in less sensitive habitats.

All the above recommendations will protect and improve riparian areas, and improve habitat conditions for mule deer on non woodland sites.

#### B. Long Term Objectives

Based on the data analyzed in this evaluation, an ecosystem without human intervention would have probably resulted in a potential natural plant community of approximately 37% pinyon - juniper (P-J) woodland and 52% ecological sites dominated shrubs and grass species, aspen, and/or mountain mahogany. Instead, as determined in this evaluation and during preliminary research, human activities including fire suppression have resulted in an ecosystem containing over 81% P-J dominated plant communities. This, in turn, has resulted in a significant, adverse effect on biological diversity and therefore on wildlife, wild horse and livestock habitat. Therefore, a definite opportunity exists in the Sunrise Allotment for habitat improvement.

Since pinyon and juniper woodland has potential economic, aesthetic, cultural, and recreational values, it is important to manage for a long term ecosystem to include pinyon-juniper woodland.

Therefore, it is recommended that long term management in the Sunrise Allotment be directed toward achieving an ecosystem containing a natural balance of pinyon - juniper woodland, and other ecological sites.

APPENDIX I  
SUNRISE ALLOTMENT  
ECOLOGICAL SITE INVENTORY

1	2	3	4	5	6	7	8
Ecological Site Number	Ecological Site Name	Potential Dominant Plant Species	Elevation Range (feet)	INVENTORY RESULTS			
				Current Dominant Plant Species	Ecological Status	Public Land Acres	% of Allot.
026XY005NV	Loamy 12-14" P.Z.	STIPA, PUTR2, ARVA2	6000 - 9500	PIMO, JUOS, ARVA2	Early Seral	12,825	72.03
				ARTR2	Early Seral	1,320	7.41
				ARTR2	Mid Seral	1,145	6.43
SubTotal For Ecological Site =						15,290	85.88
026XY010NV	Loamy 10-12" P.Z.	STTH2, ARTRW, ELCI2, PUTR2	5500 - 6500	ARTR2	Early Seral	82	0.46
				PIMO, JUOS, ARTR2	Early Seral	168	0.94
SubTotal For Ecological Site =						250	1.40
026XY023NV	Claypan 10-12" P.Z.	STTH2, ARAR8, POCA, SIHY	6000 - 6500	ARTRW, ARARN	Early Seral	147	0.83
				PIMO, JUOS	Early Seral	1,449	8.14
SubTotal For Ecological Site =						1,596	8.96
026XY025NV	Claypan 8-10" P.Z.	ARAR8, STTH2, POSE	5000 - 6000	ARARN	Early Seral	668	3.75

Total Public Land Acreage = 17,804

## Explanation of Data in Appendix I

Column Number	Description																																													
1	Ecological Site Number. This number can be used to reference a site to the Soil Conservation Service Site Descriptions for Major Land Resource Area (MLRA) number 026. The data used in columns 2, 3, and 4 are derived from these descriptions.																																													
2	Ecological Site Name. "PZ" means Precipitation Zone and is measure in inches.																																													
3	<p>Potential Dominant Plant Species. These are the major plant species found in the Potential Natural Community (PNC). Plant codes are identified below.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: left;">Plant Code</th> <th style="text-align: left;">Scientific Name</th> <th style="text-align: left;">Common Name</th> </tr> </thead> <tbody> <tr> <td>ARAR8</td> <td><i>Artemisia arbuscula</i></td> <td>low sagebrush</td> </tr> <tr> <td>ARARN</td> <td><i>Artemisia arbuscula nova</i></td> <td>black sagebrush</td> </tr> <tr> <td>ARTR2</td> <td><i>Artemisia tridentata</i></td> <td>big sagebrush</td> </tr> <tr> <td>ARTRW</td> <td><i>Artemisia tridentata wyomingensis</i></td> <td>wyoming big sagebrush</td> </tr> <tr> <td>ARVA2</td> <td><i>Artemisia vaseyana</i></td> <td>mountain big sagebrush</td> </tr> <tr> <td>ELCI2</td> <td><i>Elymus cinereus</i></td> <td>basin wildrye</td> </tr> <tr> <td>JUOS</td> <td><i>Juniperus osteosperma</i></td> <td>Utah Juniper</td> </tr> <tr> <td>PIMO</td> <td><i>Pinus monophylla</i></td> <td>singleleaf pinyon pine</td> </tr> <tr> <td>POCA</td> <td><i>Poa canbyi</i></td> <td>Canby's bluegrass</td> </tr> <tr> <td>POSE</td> <td><i>Poa secunda</i></td> <td>Sandberg's bluegrass</td> </tr> <tr> <td>PUTR2</td> <td><i>Purshia tridentata</i></td> <td>Antelope bitterbrush</td> </tr> <tr> <td>SIIY</td> <td><i>Sitanion hystrix</i></td> <td>bottlebrush squirreltail</td> </tr> <tr> <td>STIPA</td> <td><i>Stipa sp.</i></td> <td>needlegrass</td> </tr> <tr> <td>STIH2</td> <td><i>Stipa thurberiana</i></td> <td>Thurber needlegrass</td> </tr> </tbody> </table>	Plant Code	Scientific Name	Common Name	ARAR8	<i>Artemisia arbuscula</i>	low sagebrush	ARARN	<i>Artemisia arbuscula nova</i>	black sagebrush	ARTR2	<i>Artemisia tridentata</i>	big sagebrush	ARTRW	<i>Artemisia tridentata wyomingensis</i>	wyoming big sagebrush	ARVA2	<i>Artemisia vaseyana</i>	mountain big sagebrush	ELCI2	<i>Elymus cinereus</i>	basin wildrye	JUOS	<i>Juniperus osteosperma</i>	Utah Juniper	PIMO	<i>Pinus monophylla</i>	singleleaf pinyon pine	POCA	<i>Poa canbyi</i>	Canby's bluegrass	POSE	<i>Poa secunda</i>	Sandberg's bluegrass	PUTR2	<i>Purshia tridentata</i>	Antelope bitterbrush	SIIY	<i>Sitanion hystrix</i>	bottlebrush squirreltail	STIPA	<i>Stipa sp.</i>	needlegrass	STIH2	<i>Stipa thurberiana</i>	Thurber needlegrass
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7	Public land acres covered by the specific ecological site, dominant plant species, and ecological status.																																													
8	Percentage of the allotment covered by the specific ecological site, dominant plant species, and ecological status.																																													

Appendix II  
Sunrise Allotment  
Wild Horse AUM Calculations

Shown below are the series of calculations used to derive the potential AUMs for horses in the Sunrise Allotment portion of the Pine Nut HMA.

- A. Use Pattern Mapping Data. Acreages shown below are taken from the 10/8/92 to 10/16/92 use pattern mapping. Although the "No Use" category is shown to account for the total acreage in the allotment, this acreage was not used in calculations relating to wild horses. Being free-roaming creatures of habit, the wild horses did not use these portions of the allotment due to topographical restrictions and/or lack of forage due to dense pinyon-juniper overstory. Therefore, these areas are considered to be ungrazable by wild horses.

No livestock was authorized to graze in 1992, therefore all use is by wild horses. The Utilization Class Midpoint values (y) are from the six utilization classes for herbaceous vegetation as described in BLM Technical Reference TR 4400-3<sup>1</sup>

Utilization Class	(y) Class Mid-Point	(x) Acres in Allot. by Class	(x * y) Weighted Acres
Slight	13%	0	0
Light	30%	284	85.2
Moderate	50%	0	0
Heavy	70%	1,413	989.1
Severe	90%	891	801.9
TOTALs		2,588	1,876.2
No Use		15,989	
Total		18,577	

- B. Average Utilization Inside the HMA. The source for the weighted average formula used below is from the BLM Technical Reference TR 4400-7<sup>2</sup>.

$$\text{Average Utilization} = \frac{\sum (\text{Acres per Util. Class} \times \text{Class Mid-Point})}{\sum \text{Acres}}$$

$$\text{Average Utilization} = \frac{\sum (x * y)}{\sum (x)} = \frac{1,876.2}{2,588.0} = 72.49\%$$

<sup>1</sup> Utilization Studies (1984). Pages 12 & 59.

<sup>2</sup> Rangeland Monitoring Analysis, Interpretation, and Evaluation (November, 1985) Appendix 1, page 52 & 53.

C. Wild Horse Actual Use in HMA. 35 head of wild horses were counted in the Sunrise Allotment in 1992. Based on yearlong grazing, wild horse actual use for the allotment is calculated as follows:

$$35 \text{ Head of wild horses} \times 12 \text{ months} = 420 \text{ AUMs}$$

D. Desired Utilization in HMA. Since these calculations are based on yearlong use of the allotment (i.e., during critical growth periods of plant species) it is appropriate to use the yearlong AUL for perennial grasses (55%) shown in the *Nevada Rangeland Monitoring Handbook* (September, 1984), page 23. An equal division of forage between wild horses and cattle results in the following:

$$\frac{55\% \text{ Yearlong Allowable Use}}{2} = 27.5\%$$

E. Potential Actual Use (AUMs) Calculation for HMA. The potential actual use (i.e., potential stocking level) of wild horses necessary to bring the average utilization down to 55% is calculated below. The source of this formula is TR 4400-7, Appendix 2, pages 54 - 56.

$$\frac{\text{Actual Use (AUMs)}}{\text{Average Utilization (\%)}} = \frac{\text{Potential Actual Use (AUMs)}}{\text{Desired Average Utilization (\%)}}$$

$$\frac{420 \text{ AUMs (from C, above)}}{72.49\% \text{ (from B, above)}} = \frac{\text{Potential Actual Use}}{27.5\% \text{ (from D, above)}}$$

$$159.32 \text{ AUMs} = \text{Potential Actual Use}$$

## APPENDIX III

### SINGLELEAF PINYON AND UTAH JUNIPER IN THE NORTHERN PINE NUT MOUNTAINS OF NEVADA

In preparation for evaluations on several grazing allotments located in the northern Pine Nut Mountain Range of Nevada, it was necessary to review the current research relating to singleleaf pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*). This report is the culmination of that research.

#### I. Prehistorical and Historical Overview

##### A. Prehistory

Single-leaf pinyon pine migrated into the Great Basin between 5,000 to 7,000 years ago, when temperatures reach their maximum during the Holocene [Tausch, Wigand, and Burkhardt (1993)]. Very little documentation could be located when pinyon actually reached the Pine Nut Mountains. Research of a pack rat midden site in western Nevada showed that Utah juniper was present in every sampled stratum of the 30,000 year of the record for this site.

Prior to the first settlers immigrating from the east, the native human population (Washoe Tribe) relied on pinyon nuts harvested in the Pine Nut Range as a major food source. Tribe members would camp in the mountains during the harvest season, removing cones from trees by flailing with long poles. More persistent cones were removed with a primitive 'hook' at the end of the flailing poles. Care was taken to avoid damaging trees during the harvest. Undergrowth was removed around the trees to aid in harvesting and to prevent the spreading of forest fires (Goodwin and Murchie, 1980). John C. Fremont contacted Washoe Tribe in 1844 near Topaz Lake in Antelope Valley, who harvested nuts from the southern Pine Nut Range. The entry in Fremont's Journal from January 25, 1844 contains the following:

**"These (the pinyon nuts) seemed to be a staple of the country, and whenever we met an Indian, his friendly salutation consisted of offering a few nuts to eat and trade..."**

Young (1983) asserted that ecosystems currently dominated by pinyon and juniper evolved under episodes of periodic burning. These fires occurred at frequencies between ten and thirty years apart, which probably restricted the trees to shallow, rocky soils in rough terrain. This idea is reflected in the climax plant community concept as it is used by the Soil Conservation Service to determine the differences in range sites and woodland suitability groups (Brackley, 1987). Wright et al (1979) maintained that droughts and competition with grass probably help slow the invasion of trees into grasslands, however the trees would easily be established during wet years. The 10 to 30 years fires as described above would restrict the trees to steep, rocky soils in rough terrain.

Although documentation exists to the importance of pine nut harvesting to the native population in the southern Pine Nut Range, very little information could be found of the importance of pinyon pine in the northern portion. Cultural Resource records at the Carson City District have very few prehistoric sites associated with the northern Pine Nuts.

## B. Discovery of the Comstock Lode

With the discovery of the Comstock Lode, pinyon and juniper in the vicinity of Virginia City was harvested extensively for fuel, being almost depleted by the 1860s (Van Hooser and Casey, 1987). Once this occurred, wood was harvested from the Sierra Nevadas and probably, to a large degree, throughout the northern Pine Nut Range. The Pine Nuts also supported the needs of communities such as Carson City (1851 to present), Dayton (1853 to present), and Como (1879 to 1881)<sup>1</sup>.

A map of the "Washoe" region from 1862 (Paher, 1970, page 42) described the lower and mid fans south of Dayton as "Sage Lands". The northern Pine Nut Mountains were described as "Sparsely Timbered with Scrubby Pine & Cedar". Cadastral Survey plats from between 1861 and 1881 generally described the habitat in the vicinity of Sunrise Pass as "Mountains with Pine and Cedar Timber". Based on the surveyors notes and "Timber Line" drawn on the plats, stands of "Heavy Nut Pine Timber" was frequently interrupted by openings. Due to their location next to roads, some of these openings were presumably from timber harvesting.

Photographs from 1902 in the vicinity of Como (Paher, 1970, page 72) showed very few old pinyon and juniper trees, although young trees were visible. This could be the results of the harvesting during the mining boom.

## C. Post Mining Boom

A twenty year depression between 1880 to 1900 resulted in a decline in population and mining activities (Pendleton et al, 1982), which in turn probably resulted in a decline in wood harvesting in the northern Pine Nut Range. The heavy livestock grazing in the late 1800s and early twentieth century reduced grass competition and fuel for fires, resulting in an increase in pinyon and juniper. These effects were described by Wright, Neuenschwander and Britton (1979), who maintained that the role of fire cannot be separated from the effects of competition and drought, especially with Utah juniper. Droughts and competition with grass probably slowed the invasion of juniper into grasslands, the trees being easily established during wet years. Fires occurring from 10 to 30 years served to restrict the pinyon and juniper trees to shallow, rocky soils and rough topography.

## II. Impacts of Pinyon - Juniper Overstory to Understory Plant Species

Effects on understory decline due to increasing single-leafed pinyon pine and Utah juniper cover was documented by Everett and Sharrow (1983). These effects include the following:

- A. The ability of pinyon to utilize soil moisture before many of the understory species breaks dormancy and the ability of the taproot to draw moisture at greater levels than most understory species gives an extreme competitive advantage.
- B. Duff accumulation inhibits the establishment of understory species.
- C. Shading and/or toxic influences reduces understory species.

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<sup>1</sup> Dates of communities from Pendleton et al, 1982.

D. As pinyon - juniper cover increase, understory cover decreases as a whole.

Everett and Sharrow (1985) found in studies from west central Nevada that grass cover, yield and nutrient content increased substantially following single-leaved pinyon and Utah juniper harvesting on north and west facing aspects, but minimal response was observed on south aspects. Based on this, tree harvesting for the purpose of improving livestock forage should not be done on south aspects. They also concluded that nitrogen levels in grasses were adequate for livestock during the summer on tree-harvested sites, but nitrogen and phosphorus levels in grasses were inadequate for deer on both harvested and non-harvested sites. Of course, overstory removal would also result in an increase in forbs and shrubs. Transition zones near the edge of wooded areas produced the best quality and quantity of grass. Although this research was directed toward livestock production, the results should be directly applicable to habitat managed for wild horses and many species of wildlife.

Tausch, Nabi, and West (1977) monitored singleleaf pinyon and Utah juniper sites throughout the Great Basin. They noted that there appears to be four stages in the takeover of an understory. The first step is seedling establishment until trees are about the size of the largest shrubs. Trees may not be noticeable in this stage. The second stage is when the trees reach one to two meters (approx. 3 to 6 feet). At the end of this stage, about 1/3 or less of the understory productivity has been lost. The plant community is completely dominated by trees by the end of the third stage, and 2/3s to over 3/4s of the understory productivity has been lost. According to Tausch, Nabi and West, stage one was completed between 1860's and 1890's and stage two was completed on more productive sites between 1940's and 1950's. This seems to concur with information under Section I of this report. They also state:

**Much of the remainder of the Great Basin woodlands where invasion is taking place are moving into stage three and are now undergoing a rapid decline in understory productivity. By the year 2000, all but the more marginal sites of pinyon-juniper woodlands in the Great Basin will have lost most of their productive capability, if present trends continue.** Tausch, Nabi and West (1977), page 29.

The effects of overstory removal in the Pine Nut Mountains was monitored on a 10 acre experimental pinyon - juniper clearcut done in 1977. Quadrat frequency study data was collected in accordance to procedures adapted from Tueller, etal (1972)<sup>2</sup>. The results are shown in Table 1 and Figure 1. Note that the 1977 recording was done immediately prior to the cut.

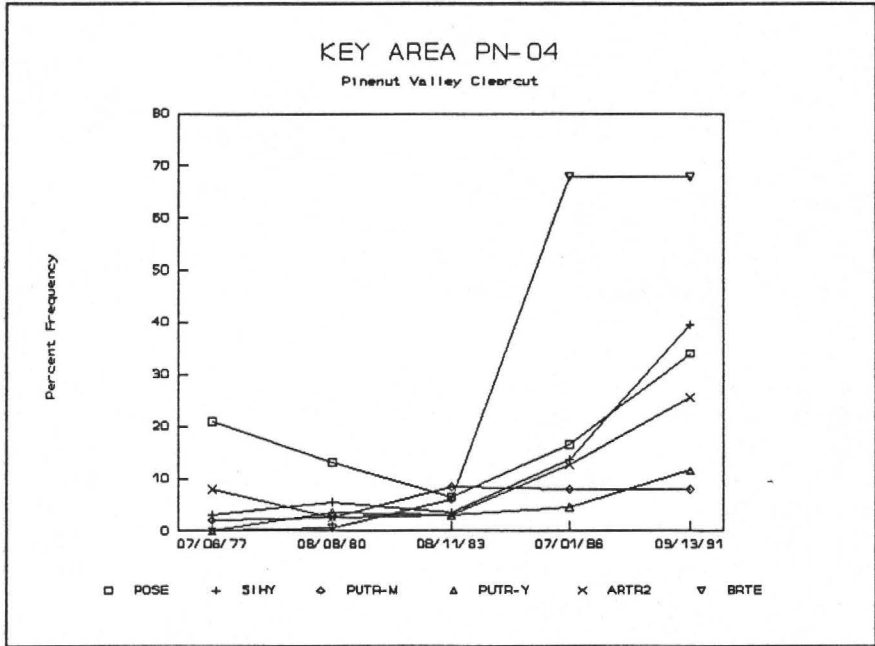
Table 1--Major Plant Species at Key Area PN04 (Pinenut Valley Clearcut).

Plant Code	Common Name	Scientific Name
ARTR2	big sagebrush	<i>Artemisia tridentata</i>
BRTE	cheatgrass brome	<i>Bromus tectorum</i>
POSE	Sandberg bluegrass	<i>Poa secunda</i>
PUTR-M	antelope bitterbrush - mature	<i>Purshia tridentata</i>
PUTR-Y	antelope bitterbrush - young	<i>Purshia tridentata</i>
SIHY	bottlebrush squirreltail	<i>Sitanion hystrix</i>

<sup>2</sup> Procedures eventually included in BLM Technical Reference 4400-4 (Trend Studies) 1985, pages 29 - 35.



Figure 1.--Frequency study results for Key Area PN04 (Pinenut Valley Clearcut).



Note that the frequency initially declined or remained static on all species except mature bitterbrush. Based on Carson City and Yerington precipitation data, this coincides with a short drought between 1977 and 1979. After 1983 (a peak precipitation year), Sandberg bluegrass, bottlebrush squirrel, big sagebrush and cheatgrass showed dramatic increases. Although mature bitterbrush frequency leveled out, young bitterbrush plants increase.

The beneficial effects of reduced overstory competition could be easily be negated by improper management of wild horses and livestock. This is quite evident in quadrat frequency and key area utilization data from a chaining and seeding the Sunrise Allotment. Monitoring results showed that significant reductions in crested wheatgrass (*Agropyron cristata*, *A. desetorum*, or crosses) coincided with heavy and severe use levels due primarily to wild horses<sup>3</sup>.

### III. Impacts of Fire on Pinyon - Juniper Community

Based of the state-of-the-art review by Wright, et al (1979), pinyon and juniper less than 4 feet in height were killed during spring fires when temperatures were 70 to 74° F. (21 to 23° C.), relative humidity of 20 to 40 percent and wind speeds were 10 to 20 miles/hour. June fires when temperatures were 97° F. resulted in 100 percent kill on trees less than 4 feet, but was no more effective in killing taller trees than the spring burn. Fine fuels in the understory (approximately 600 to 800 lbs/acre) are necessary to carry the fires, which means that the reduced understory from dense stands of pinyon and juniper (495 to 988 trees / acre) may result in reduced tree kill. In this situation, winds greater than 35 mi/h would be required. The "White Pine County Formula" was developed to determine whether pinyon - juniper stands will burn or not:

$$\text{Index} = \text{Maximum wind (mi/hr)} + \text{Shrub and tree cover (\%)} + \text{Air temperature (° F.)}$$

<sup>3</sup> This is discussed in the Sunrise Allotment Evaluation completed by the Walker Resource Area on January 11, 1994.

An index higher than 110 will result in the fire being carried and large pinyon and juniper trees being killed. If the index is above 130, the conditions are too dangerous to burn. Pure stands of juniper are more difficult to kill than mixed stands of pinyon and juniper.

However, if fire prescriptions are developed for the northern Pine Nut Mountains, it is important to consider the impacts to other plant species. Tables 2 and 3 are summaries of fire effects on major plant species found in the Pine Nut Mountains. This data is based on information from Wright, et al (1979).

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Table 2.--Summary of fire effects on major plant species found in the Northern Pine Nut Mountains of Nevada. Information contained in this table is from Wright, et al (1979).

Species	Sprouting Ability	Response to fire	Recovery Time (Years)	Remarks
SHRUBS				
Antelope bitterbrush ( <u>Purshia tridentata</u> )	Weak Sprouter	Severely Damaged by summer and fall burns	30 - 40	Effect determined by growth form; decumbent form sprouts vigorously, columnar form is a weak sprouter. If plants sprout, they will recover in 9 to 10 years. Spring burns enhance sprouting but fall burns are best for reproduction from seed. Burn when soil is wet.
Big sagebrush ( <u>Artemisia tridentata</u> )	Non-sprouter	Severely harmed	30	Good seed crop before burning hastens recovery. Effective control requires burning before seed-set.
Low sagebrush ( <u>Artemisia arbuscula</u> )	Non-sprouter	Rarely burned.		May be used as a fuel break.
Rubber rabbitbrush ( <u>Chrysothamnus nauseosus</u> ) & Douglas rabbitbrush ( <u>C. viscidiflors</u> )	Vigorous sprouter	Enhanced	20 - 25	May be killed if burned after heavy grazing or burned in early summer.
Horsebrush ( <u>Tetradymia</u> sp)	Vigorous sprouter	Enhanced	30 - 35	Toxic, increases fivefold within 12 years.
Snowberry ( <u>Symphoricarpos</u> sp)	Sprouter	Unharmed	10 - 15	Enhanced by cool fires but harmed by hot fires.
Curleaf mountain mahogany ( <u>Cercocarpus ledifolius</u> )	Sprouter	Moderately harmed	Not available	More information is needed.
Serviceberry ( <u>Amelanchier</u> sp)	Sprouter	Slightly harmed	30 - 50	Highly adaptable to fire; soil being moist at the time of the burn is important. Usually poor reproduction from seed.
Ocean-spray ( <u>Holodiscus</u> sp)	Sprouter	Enhanced	20 - 30	
Rose ( <u>Rosa</u> sp)	Sprouter	Enhanced	15 - 30	
GRASSES				
Nevada bluegrass ( <u>Poa nevadensis</u> )	N/A	Slight damage	1 - 3	The bluegrasses are generally small plants and fire damage is minimal with late summer and fall burns.
Sandberg bluegrass ( <u>Poa secunda</u> )		Undamaged	1 - 3	

Species	Response to Fire	Recovery Time (Years)	Remarks
GRASSES (Cont.)			
Cheatgrass ( <i>Bromus tectorum</i> )	Undamaged	1	Any reduction to cheatgrass stands is usually short lived.
Indian ricegrass ( <i>Oryzopsis hymenoides</i> )	Slight damage	2 - 4	Good resistance to burning but slow to increase in density.
Needle-and-thread ( <i>Stipa comata</i> )	Severe damage	4 - 8	Needle grass are generally the least fire-resistant bunchgrasses. Large plants are damaged more than small plants. A 50 percent reduction in basal area should be anticipated among the various size plants in a given area.
Thurber needlegrass ( <i>Stipa thurberana</i> )	Severe damage	4 - 8	
Bottlebrush squirreltail ( <i>Sitanion hystrix</i> )	Slight damage	1 - 3	One of the most fire resistant bunchgrasses, although burning in a dry year can reduce basal area. Bottlebrush squirreltail can increase several years after burning.
Crested wheatgrass ( <i>Agropyron cristata</i> , <i>A. desertorum</i> & crosses)	Undamaged	1 - 2	Wheatgrasses are difficult to burn in seeded monocultures.
Riparian wheatgrass ( <i>Agropyron dasystachyum riparium</i> )	Undamaged	1 - 2	
Western wheatgrass ( <i>Agropyron smithii</i> )	Undamaged	1 - 2	

Table 3.-- Response of forbs in Northern Pine Nut Mountain to fall burning. From Wright, et al (1979)

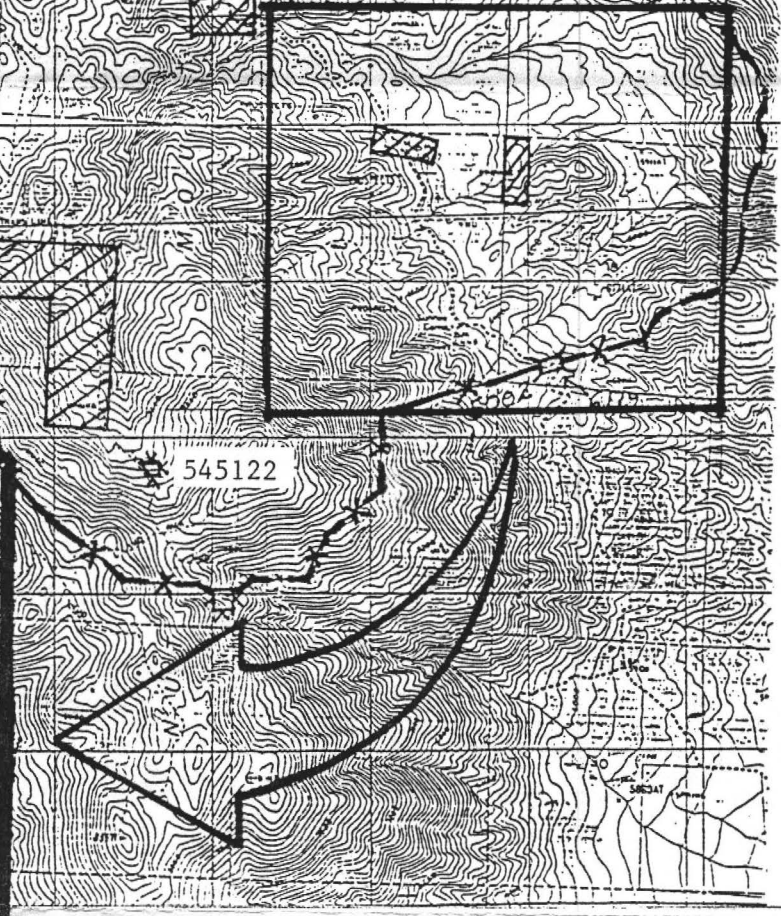
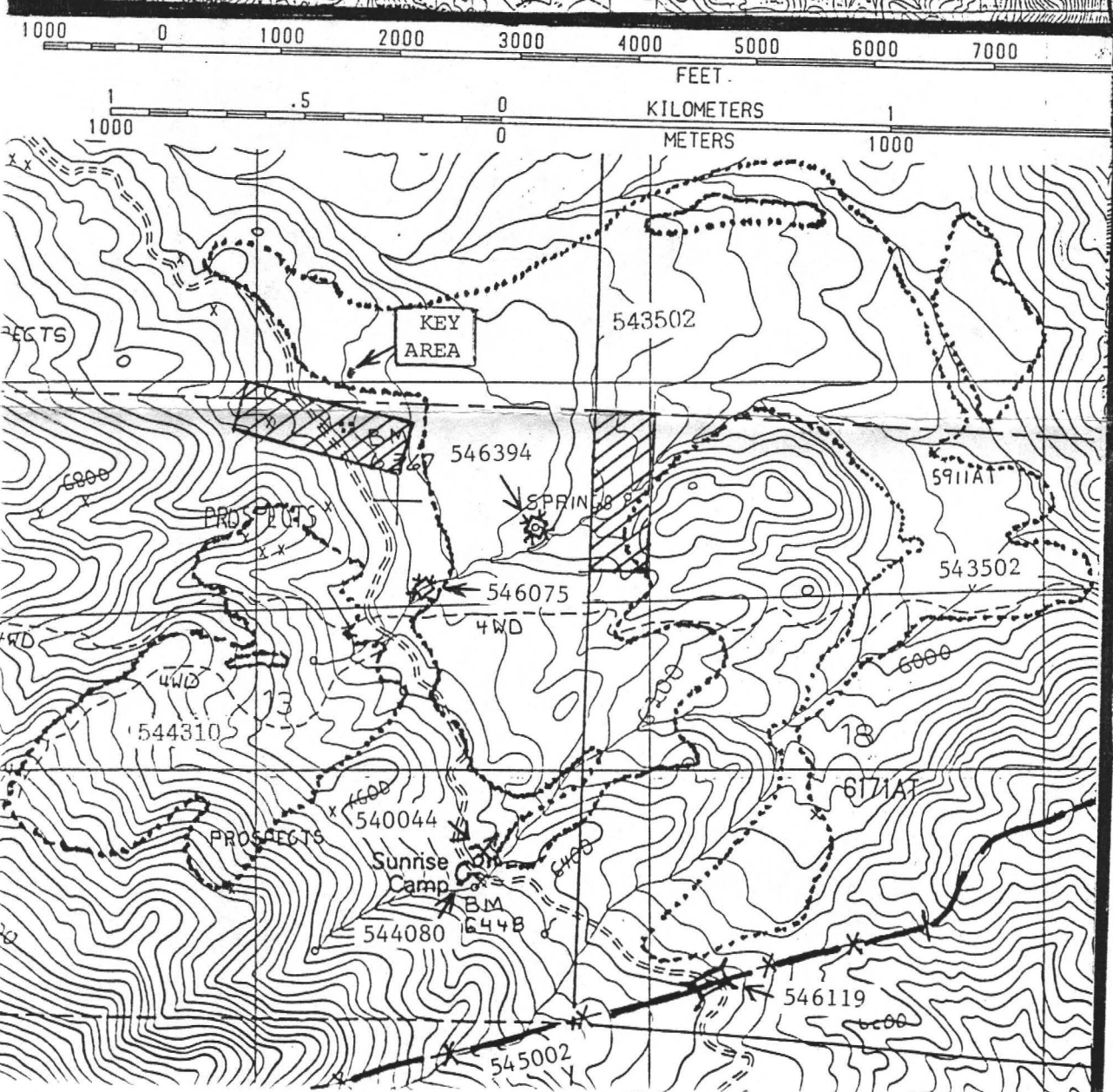
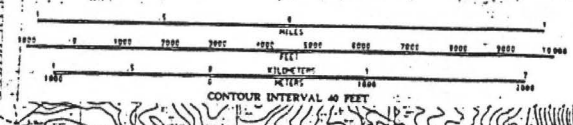
Severely Damaged	Slightly Damaged	Undamaged
None listed in Wright et al are found in Pine Nut Mountains	Milkvetches ( <i>Astragalus</i> sp) Pinnate tansymustard ( <i>Descurania pinnata</i> ) Globemallows ( <i>Sphaeralcea</i> sp) Tapertip hawkbeard ( <i>Crepis acuminata</i> ) Tumblemustard ( <i>Sisymbrium altissimum</i> )	Arrowleaf balsamroot ( <i>Balsamorhiza sagittata</i> ) Common sunflower ( <i>Helianthus annuus</i> ) Coyote tobacco ( <i>Nicotiana attenuata</i> ) Foothill deathcamas ( <i>Zigadenus paniculatus</i> ) Longleaf phlox ( <i>Phlox longifolia</i> ) Russian thistle ( <i>Salsola kali</i> ) Common yarrow ( <i>Achillea millifolium</i> ) Wild onion ( <i>Allium</i> sp)

T. 15 N.

R. 22 E.

R. 23 E.

T. 14 N.



MAP NO. 2  
 SUNRISE ALLOTMENT  
 PROPERTY STATUS AND RANGE IMPROVEMENT PROJECTS

- Deeded Land
- Allotment Boundary
- Vegetative Manipulation Boundary
- Fence & Cattleguard
- Developed Spring
- Exclosure

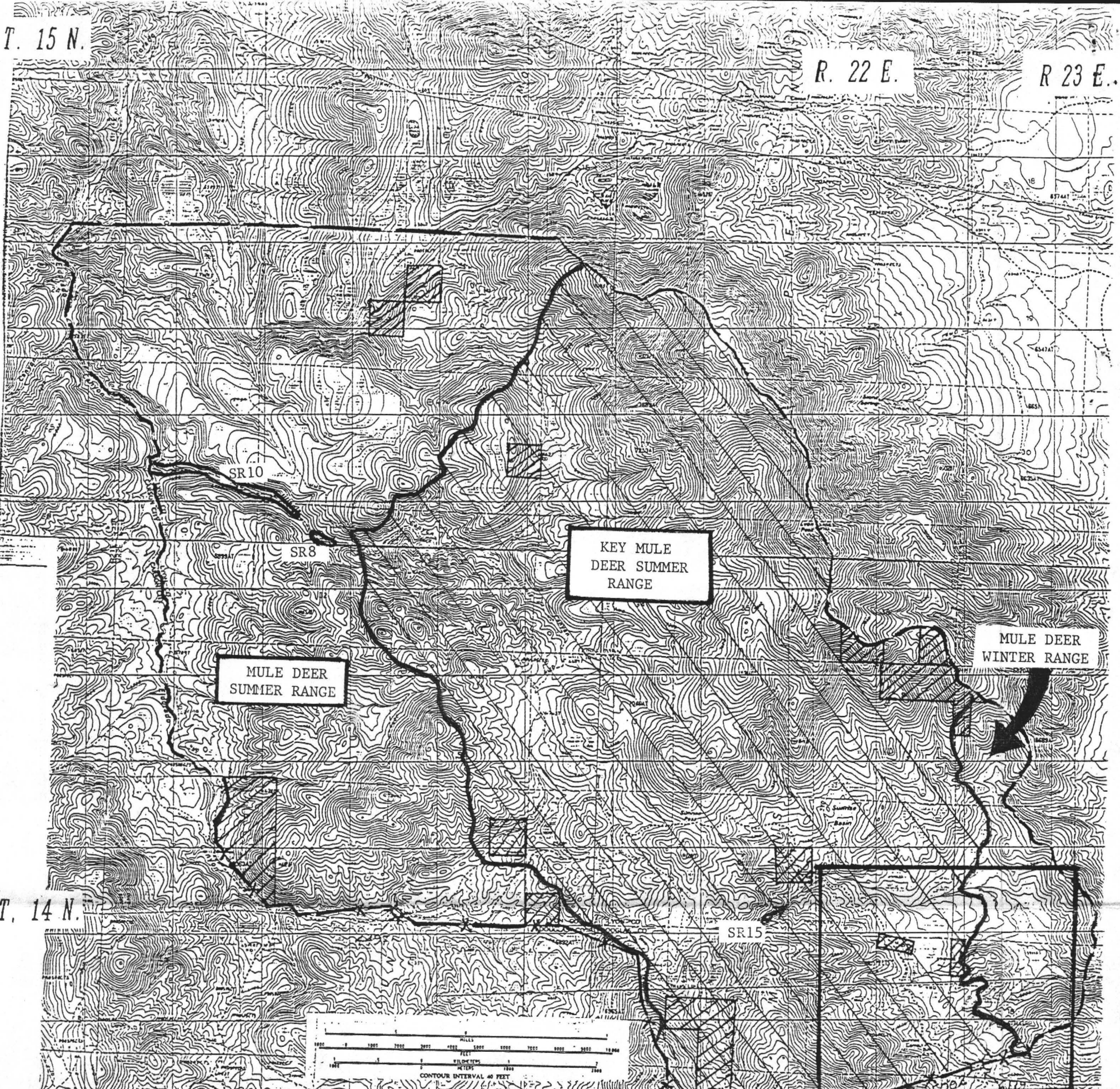
- 540044 - Lowney Spring
- 540195 - Martin Spring
- 540217 - Big Basin Spring Development
- 543501 - Illinois Canyon Seeding
- 543502 - Sunrise Chaining & Seeding
- 544080 - Lowney Spring Holding Corral
- 544310 - Sunrise Basin Pinyon Thinning
- 544341 - Quail Spring
- 544497 - Sunrise Cattleguard #1
- 545001 - Pine Nut Mountain Fence
- 545002 - Sunrise Drift Fence
- 545122 - Phenology Study Plot No. 7
- 546075 - Powerline Spring Development
- 546119 - Sunrise Cattleguard #2
- 546394 - Chaining Springs Protection Fence
- 546667 - Eldorado Canyon Stabilization

T. 15 N.

R. 22 E.

R. 23 E.

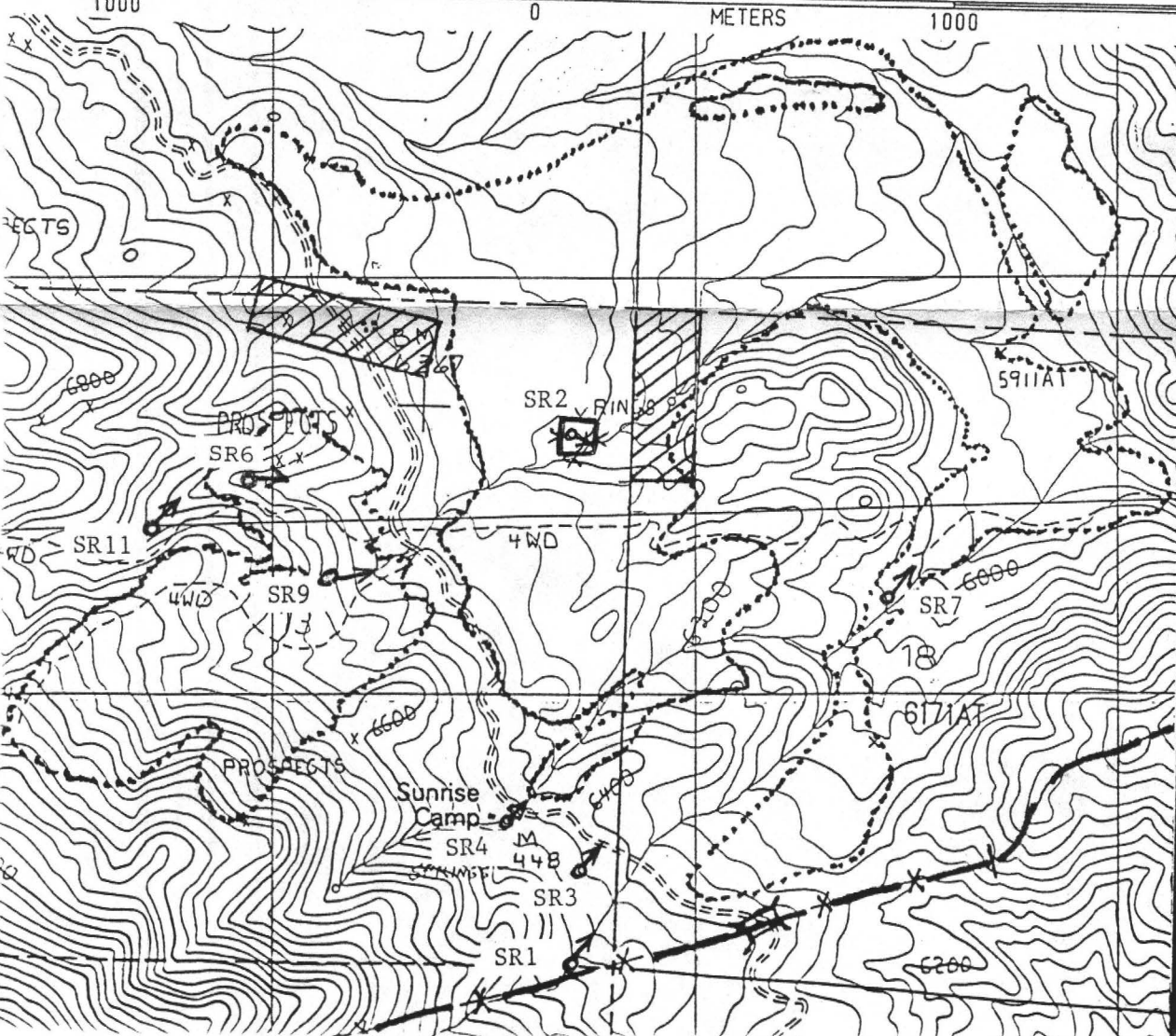
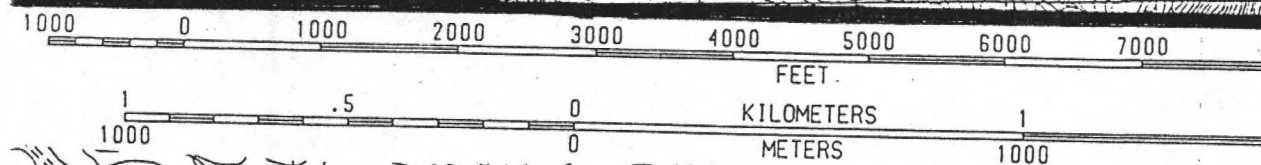
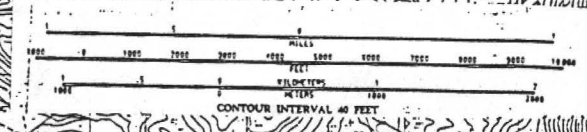
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

KEY MULE DEER SUMMER RANGE

MULE DEER SUMMER RANGE

MULE DEER WINTER RANGE



MAP NO. 3  
SUNRISE ALLOTMENT  
RIPARIAN HABITAT AND MULE DEER RANGE

-  - Key Deer Summer Range
-  - Spring
-  - Enclosure

- SR1 - Upper Fenceline Spring
- SR2 - Chaining Spring
- SR3 - Trail Spring
- SR4 - Sunrise Cabin Meadow
- SR5 - Phenology Study No. 7
- SR6 - Hidden Spring
- SR7 - Pinyon Spring
- SR8 - Illinois Canyon
- SR9 - Mystery Spring
- SR10 - Lower Illinois Spring
- SR11 - Upper Hidden
- SR15 - Taylor Spring

T. 15 N.

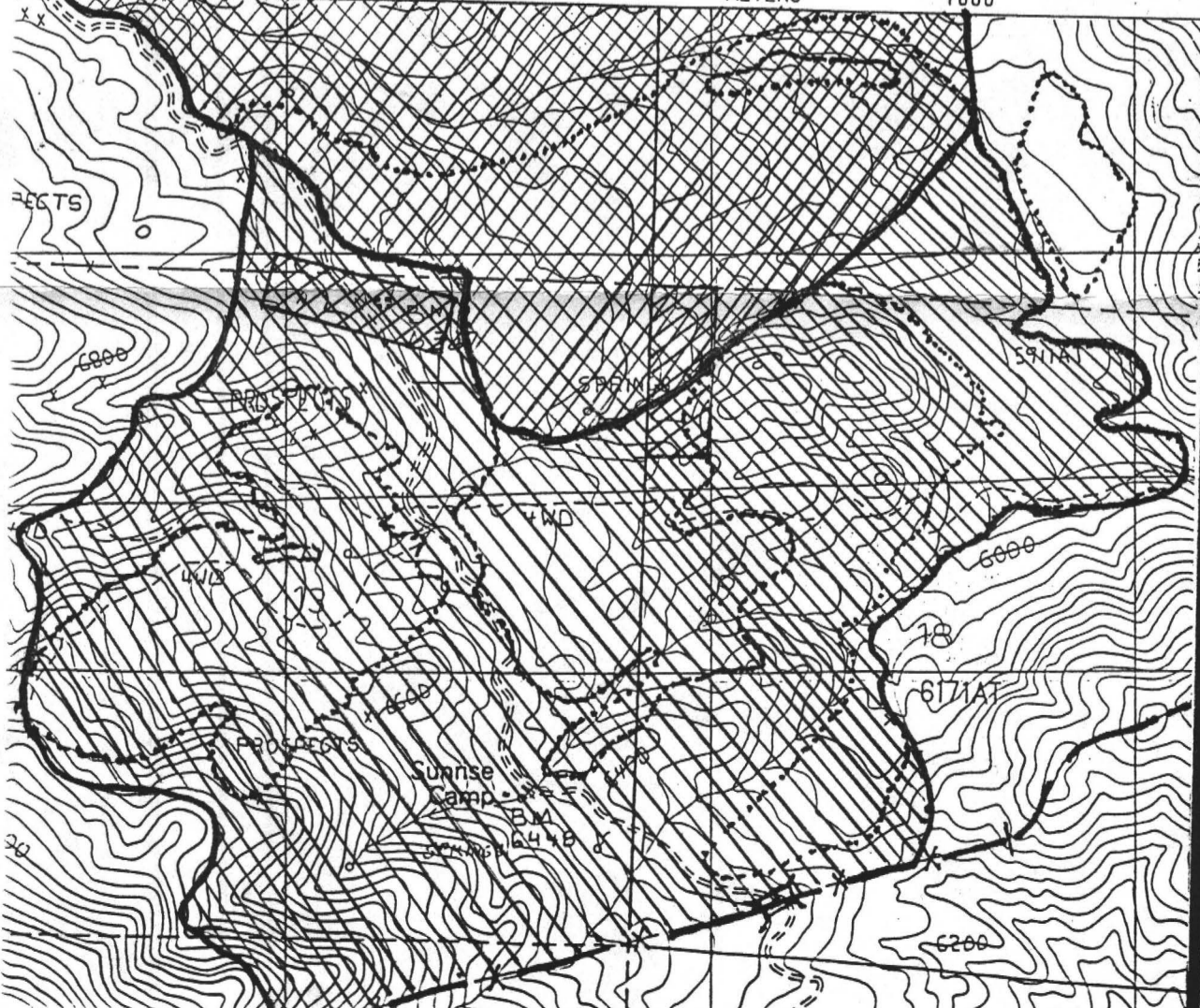
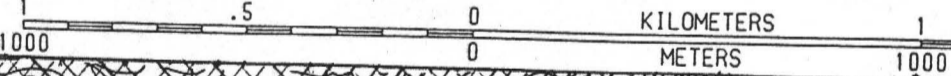
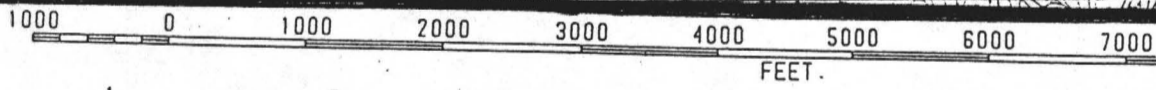
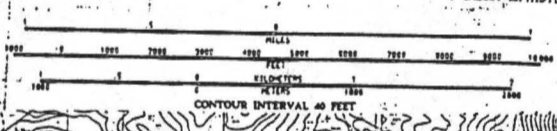
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R. 23 E.







Light use on bench above creek - Heavy use on riparian vegetation on creek.

Heavy use on bench above creek - Severe use on riparian vegetation on creek

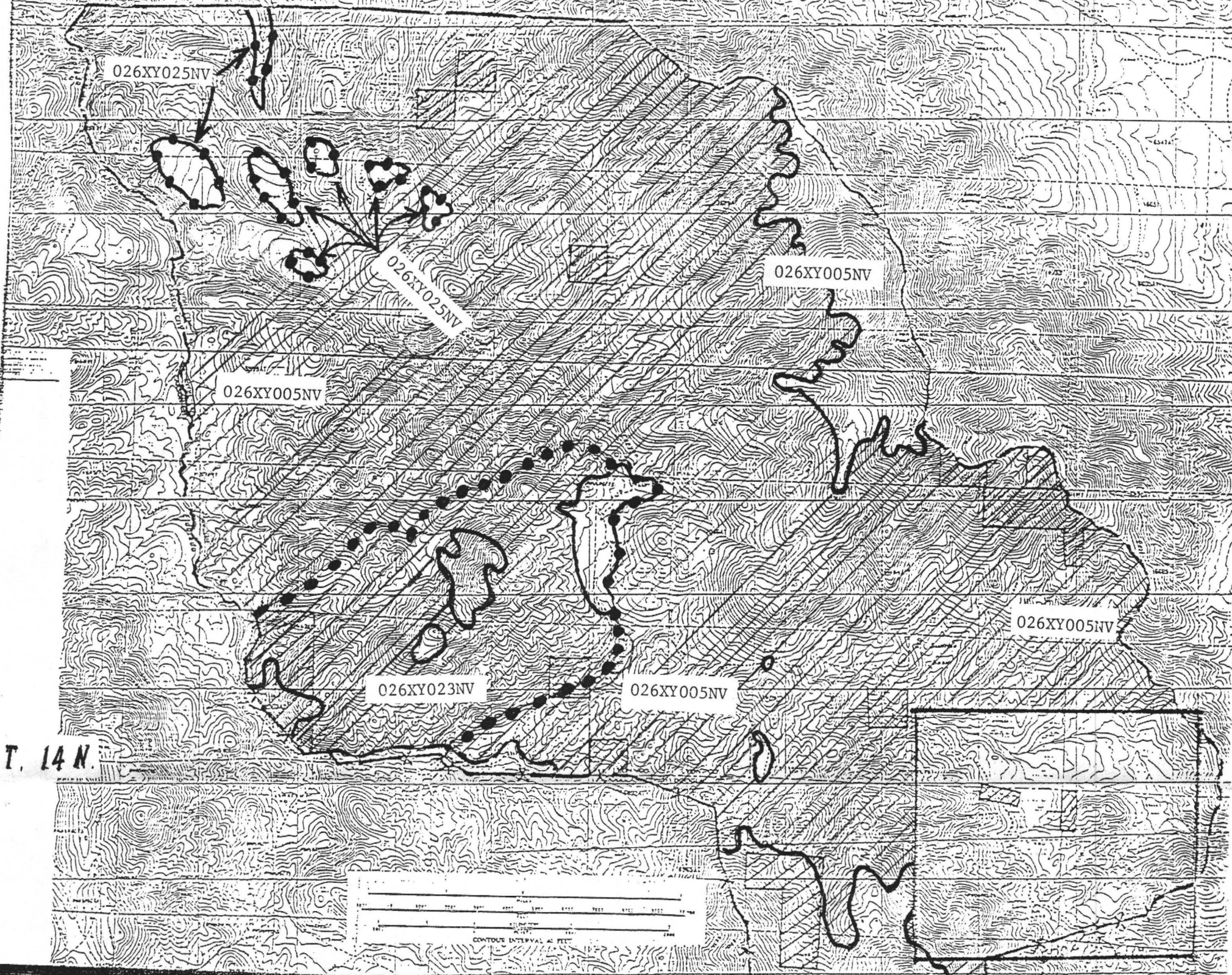
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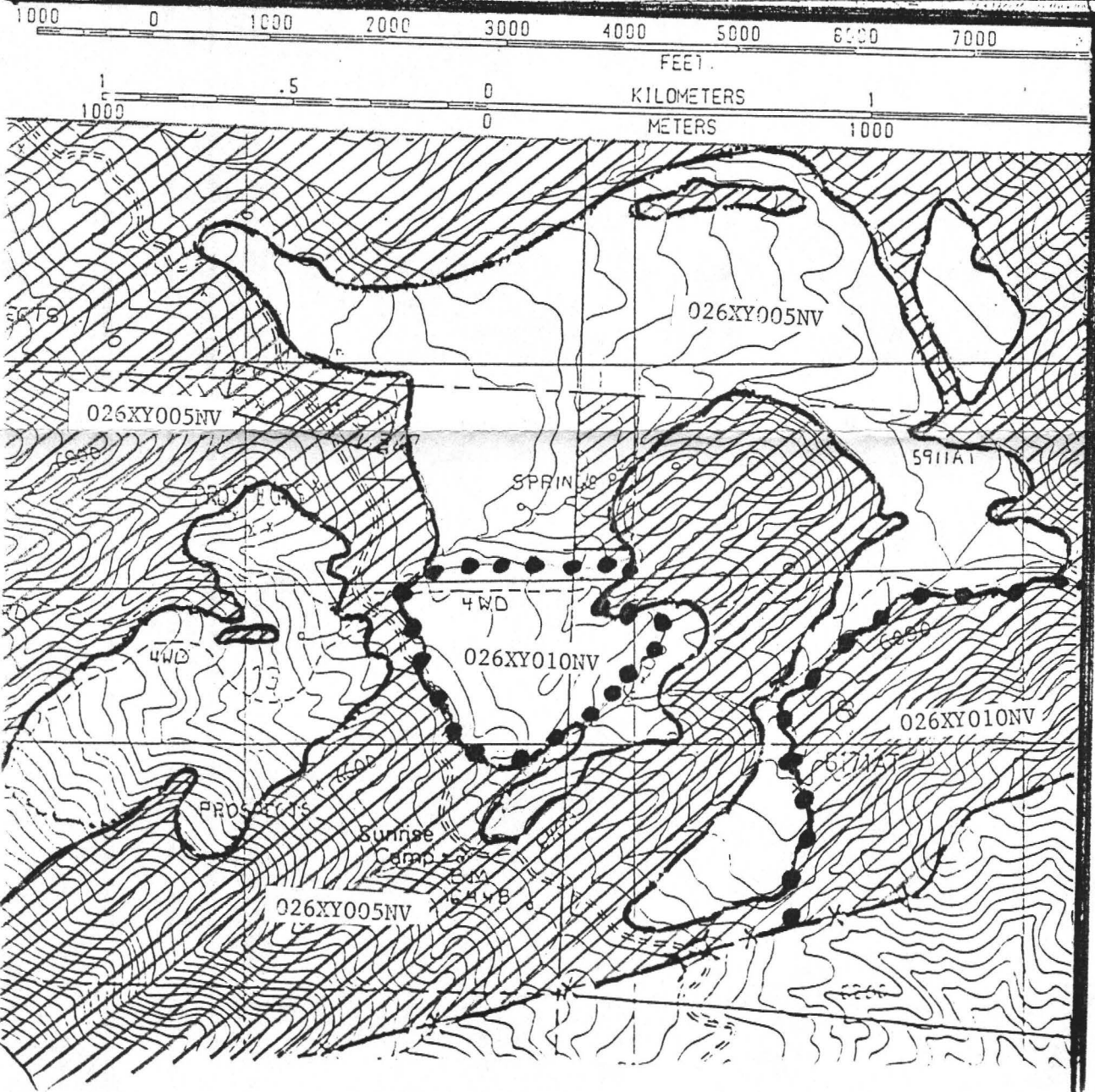
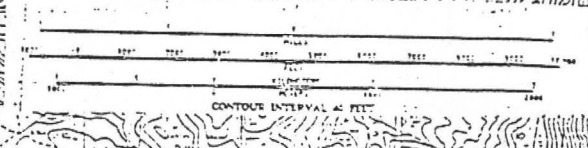
MAP NO. 4  
SUNRISE ALLOTMENT  
10/8/92 TO 10/16/92 USE PATTERN MAPPING

-  - No Use
-  - Slight Use
-  - Light Use
-  - Moderate Use
-  - Heavy Use
-  - Severe Use







T. 14 N.



MAP NO. 5  
 SUNRISE ALLOTMENT  
 ECOLOGICAL SITES AND PINYON - JUNIPER COVER

-  - Pinyon - Juniper Cover
-  - Ecological Site Boundary

SUNRISE ALLOTMENT EVALUATION  
ERRATA AND ATTACHMENTS

Insert the attached Sections VII and VIII after page 17. In the Table of Contents, insert the following under Section VI:

VII. CONSULTATIONS ..... 18  
VIII. MANAGEMENT ACTIONS SELECTED ..... 18

## VII. Consultations

On July 19, 1993, a letter was sent to persons and organizations that have shown interest in resource management in the Walker Resource Area. The purpose of the letter was to gather additional information and to determine who would be interested in participating in the evaluation process on nine allotments in the northern Pine Nut Mountain Range. Sunrise was among these allotments.

Sections I (Introduction) through VI (Technical Recommendations) of this evaluation were sent out for public review on February 11, 1994. Fifteen copies were sent to the Nevada State Clearinghouse for distribution among state agencies. In addition, the following were sent copies of this evaluation.

Rutgers University, S.I. Newhouse Center of Law and Justice	Bureau of Indian Affairs, Western Nevada Agency
Washoe Tribe	Craig C. Downer
The Honorable Barbara Vucanovich	The Honorable Harry M. Reid
The Honorable Richard Bryan	Paul Clifford
Joe Ricci Estate	Wild Horse Organize Assistance
Borda Brothers Company	F. M. Fulstone, Inc.
Natural Resource Defense Council	Sierra Club, Toiyabe Chapter
Carson City District Grazing Advisory Board	Nevada Cattlemen's Association
U.S. Fish and Wildlife Service, Reno Field Office	Nevada Woolgrowers Association
	Animal Protection Institute

Grace Ricci (representing the Joe Ricci Estate) was the only person to respond. Ms. Ricci supported the removal of pinyon and juniper trees to increase forage for livestock, wild horses and wildlife. This issue is addressed in the next section.

## VIII. Management Actions Selected

Due to the necessity of implementing the wild horse decisions on a herd management area basis, only one PMUD will be issued for all nine allotment in the Pine Nut HMA.

All short term technical recommendations except Technical Recommendation No. 6 will be included within the Proposed Multiple Use Decision (PMUD). Recommendation No. 6 related to off highway vehicle (OHV) management, which will be addressed in the upcoming land use plan amendment. It was decided by the Carson City District staff that, because of the potential economic, aesthetic, cultural and recreational values associated with pinyon - juniper woodlands, the long term management of the woodlands in the Pine Nut Mountains should also be addressed in the land use plan amendment. At the time of this writing, an amendment team had been formed and letters had been sent out to the public soliciting comments.

RATIONALE

The area adjoining the allotment is a developing urban area. As Carson City continues to expand, the public lands will become valuable as open space for residents. It has become impractical as a cattle allotment.

However, it may be in the best interest of the public to use intensively managed livestock grazing as a tool in accomplishing specific environmental goals ( e.g., noxious weed control, trampling seed into the soil on barren areas, stimulating decadent vegetation, etc.). Authorizing grazing use on a temporary non-renewable basis is at the discretion of the authorized officer. If the authorized officer determines that livestock grazing, as applied for, would not meet an objective(s), the application would not be authorized. If the authorized officer determines that a modification to the application would meet objective(s), use would be authorized accordingly.

**SUNRISE ALLOTMENT**  
**LIVESTOCK GRAZING MANAGEMENT DECISION**

Decisions relating to the grazing of livestock on public lands in the Sunrise Allotment are as follows:

A. In accordance with §4110.3-2(b) and §4130.6-1(a), the active preference for livestock will be adjusted from 1092 AUMs to 159 AUMs. In accordance with §4110.3-3(a) &(b), this reduction in active preference will be phased in over a five year period, beginning with the effective date of the Final Multiple Use Decision (1995). The reduction will be implemented as follows:

- 1995 From 1092 AUMs to 781 AUMs
- 1997 From 781 AUMs to 470 AUMs
- 1999 From 470 AUMs to 159 AUMs

In accordance with §4110.3-2(c), 933 AUMs will be suspended.

B. In accordance with §4130.6, the following terms and conditions will apply:

1. Specific areas within the allotment will be grazed for two weeks or less each year.
2. During most years, these two week grazing authorizations will occur between 3/15 - 6/15.
3. At the discretion of the authorized officer, grazing can occasionally be authorized after 6/30.
4. The allowable use level of 27.5% is established for use on perennial grasses and 22.5% on bitterbrush by livestock.
5. No livestock grazing will be authorized until utilization levels by wild horses are below the allowable use level for grasses and/or bitterbrush.

## RATIONALE

Insufficient forage is available to provide 1092 AUMs for livestock. This is a result of use by wild horses and the influence of pinyon-juniper woodlands. The terms and conditions set forth will provide plants the opportunity to regrow during their active growing season (spring and summer).

## AUTHORITY

Authority for this decision is found in Title 43 of the Code of Federal Regulations, which states in pertinent parts:

§4100.0-8: "The authorized officer shall manage livestock grazing on the public lands under the principle of multiple-use and sustained yield, and in accordance with applicable land use plans. Land use plans shall establish allowable resource uses (either singly or in combination), related levels of production or use to be maintained, areas of use and resource condition goals and objectives to be obtained. The plans also set forth program constraints and general management practices needed to achieve management objectives. Livestock grazing activities and management actions approved by the authorized officer shall be in conformance with the land use plan as defined at 43 CFR §1601.0-5(b)."

§4110.3: "The authorized officer shall periodically review the grazing preference specified in a grazing permit or grazing lease and may make changes in the grazing preference status. These changes shall be supported by monitoring, as evidenced by rangeland studies conducted over time, unless the change is either specified in an applicable land use plan or necessary to manage, maintain, or improve rangeland productivity."

§4110.3-2(a): "Active use may be suspended in whole or in part on a temporary basis due to drought, fire, or other natural causes, or to facilitate installation, maintenance, or modification of range improvements."

§4110.3-2 (b): "When monitoring shows active use is causing an unacceptable level or pattern of utilization or exceeds the livestock carrying capacity as determined through monitoring, the authorized officer shall reduce the active use if necessary to maintain or improve rangeland productivity, unless the authorized officer determines a change in management practices would achieve the management objectives."

§4110.3-2(c): "Where active use is reduced it shall be held in suspension or in nonuse for conservation/protection purposes, until the authorized officer determines that active use may resume."

§4110.3-3(a): "Changes in active use in excess of 10 percent shall be implemented over a 5-year period, unless after consultation with the affected permittees or lessees and other affected interests, an agreement is reached to implement the increase or decrease in less than 5 years."

§4110.3-3(b): "After consultation, coordination and cooperation, suspensions of preference shall be implemented through a documented agreement or by decision. If data acceptable to the authorized officer are available, an initial reduction shall be taken on the effective date of the



**United States Department of the Interior**

**Bureau of Land Management**

**Carson City Field Office**

5665 Morgan Mill Road  
Carson City, Nevada 89701  
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<http://www.nv.blm.gov>

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OFFICE OF THE DIRECTOR

2000 MAR -1 PM 2:26

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**In Reply Refer To:**

4130  
(NV-03200)

February 28, 2000

Dear Interested Party:

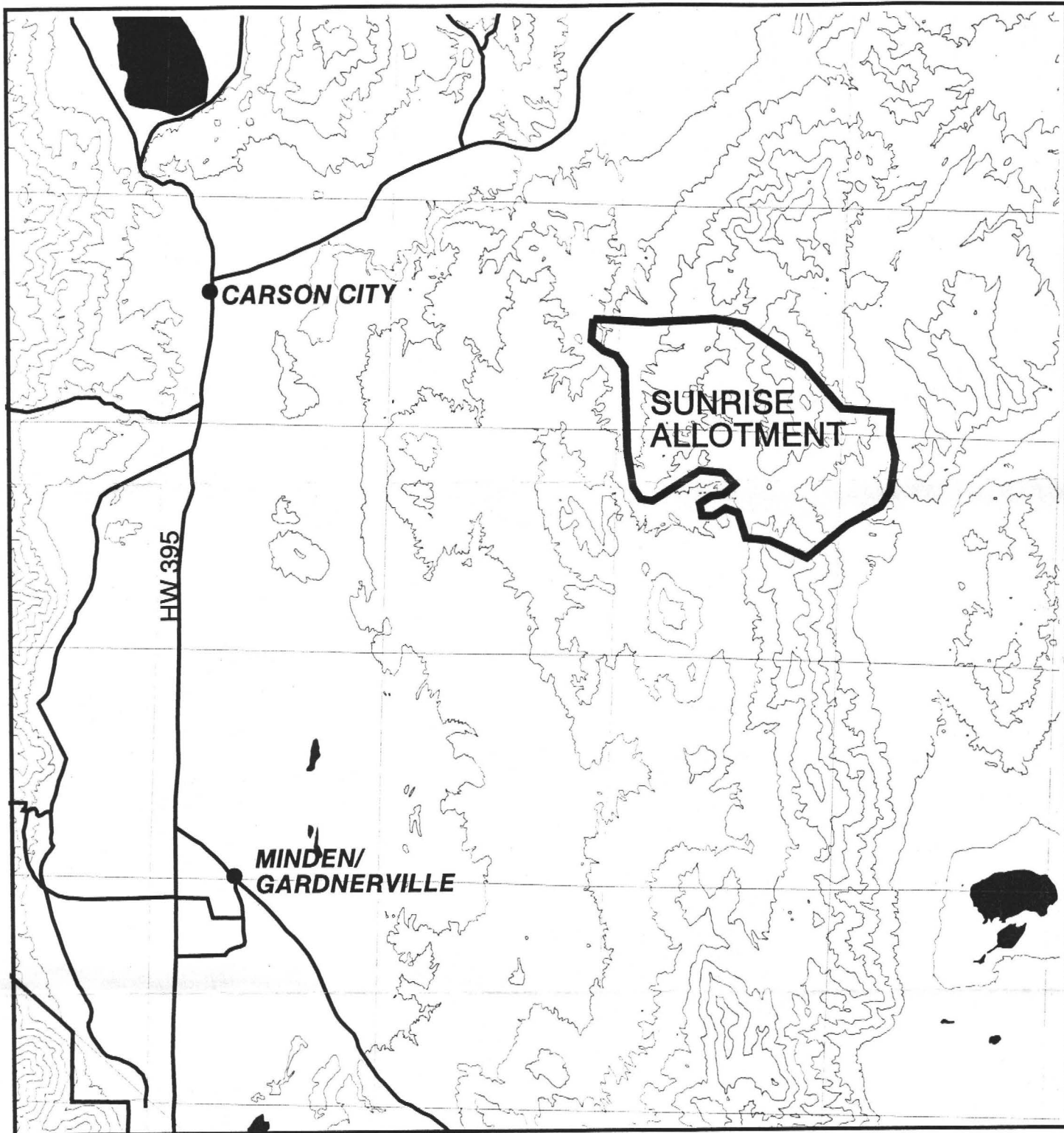
The Carson City Field Office is considering a temporary and nonrenewable (TNR) authorization for the Sunrise Allotment (refer to the Attached Map). There will be no change in the permitted use, kind of livestock or period of use as established in the Pine Nut Final Multiple Use Decision dated August 18, 1995. If you have any data, information or comments concerning this action, please contact me prior to March 15, 2000.

Sincerely,

Richard C. Benson  
Rangeland Management Specialist  
Renewable Resources

1 Enclosure:

1. Map of Sunrise Allotment



**Enclosure No. 1**  
**LOCATION OF SUNRISE ALLOTMENT**