7/26/95

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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

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
4400
(NV-03580)

JUL 26 1995

Nevada Commission for the
Preservation of Wild Horses
C/O Catherine Barcomb, Executive Director
255 West Moana Lane, Suite 207A
Reno, Nevada 89509

Dear Ms. Barcomb:

You and others have protested aspects of the Proposed Multiple Use Decision for the nine allotments which encompass the Pine Nut Herd Management Area. We are not sure we understand some of the points being raised. And possibly some points arise out of a misunderstanding of items within the proposed decision.

Let's get together for a discussion on Friday, August 4, at 2pm in the BLM conference room. We'll provide refreshments, maps, and any other material we have which will help you explain your points to us. Our range, wildlife, and wild horse specialists will also be prepared to discuss items in the decision which appear to us to have been misinterpreted. We hope you can join us on Friday to help clarify the issues.

Sincerely yours,

J. Matthiessen

John Matthiessen
Area Manager
Walker Resource Area

PINE NUT MOUNTAINS HISTORY

1. Grazing History

Buckeye allotment (exclosure stop) is grazed by sheep.

Sunrise allotment (chain/seed stop) the last time it was grazed was summer of 1985 by cattle. This is due to lack of forage and wild horse use.

2. History

The burns along the Sunrise Pass road are around 30 years old or older.

On average the Pine Nuts tree-growing zone soil/range site survey shows about 30% timber sites, 70% range sites.

No real good record of tree progression, but 1960 Range Survey came out with 550 AUMs in Rawe Peak allotment (nearly all tree covered). Our new evaluation is that Rawe Peak now produces 100 AUMs. Sunrise went from 1100 AUMs surveyed to present 320 AUMs.

3. Wild Horses

Presently 20 horses in Lebo spring vicinity, use in tree zone is slight to none. 26 horses in Sunrise chaining area, heavy use in seeding, light to moderate in tree edge, zero farther in. By 1986, gather had removed horses so very few remained in the area. Horses returned by 1992 to present number.

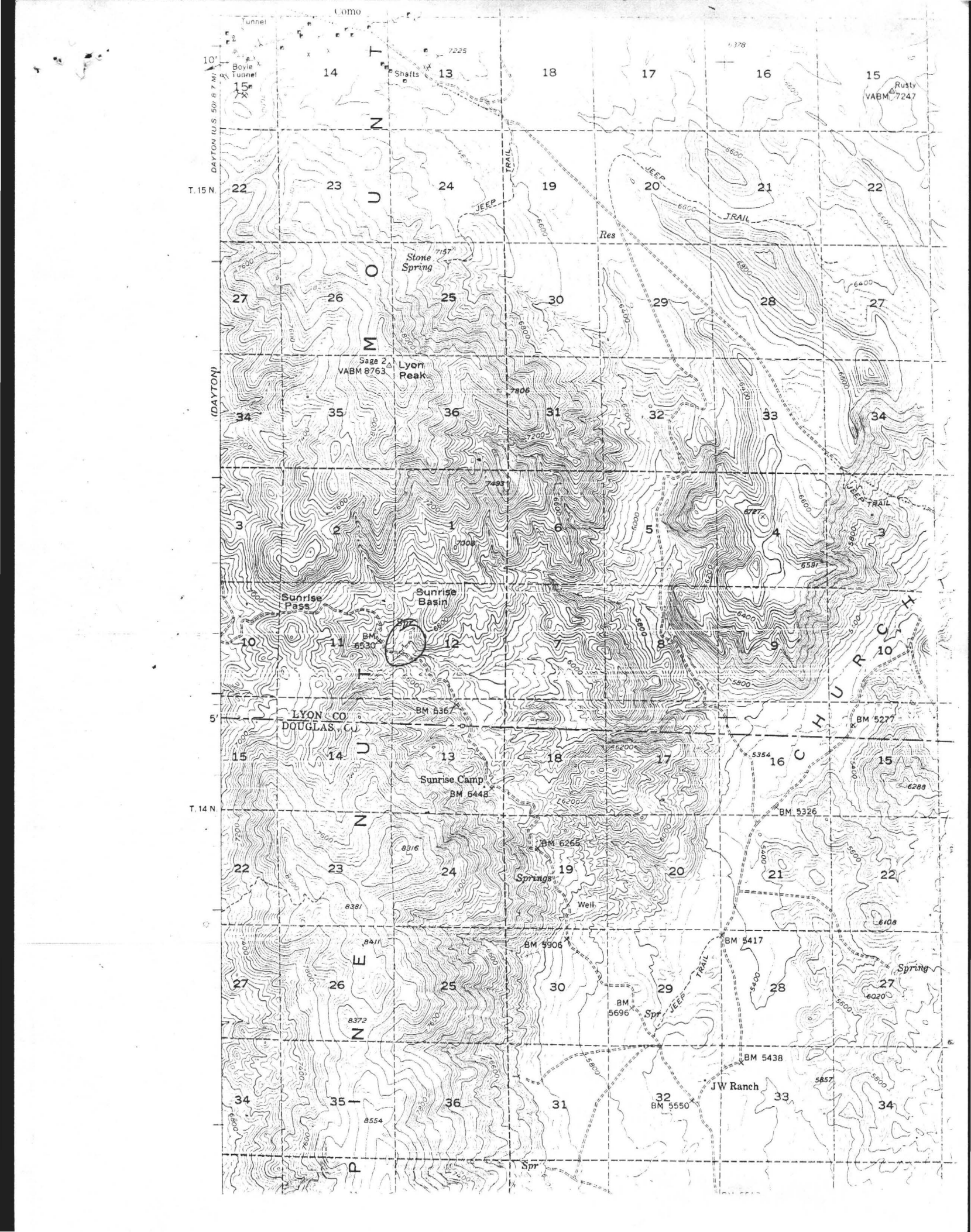
4. Exclosures

Exclosures were built in 1976 for the purpose of aiding phenology study. Grazing must have been heavy enough impact in the 70's that ungrazed plants were scarce.

5. Deer

Area is summer range for deer. Deer are found at the higher elevations in the aspen and mountain shrubs zones.

In the 1960's the Pine Nut range was a hot spot for deer in Nevada. The only hot spot remaining is the bitterbrush/sagebrush area at the edge of alfalfa fields near Wellington.


Como
Tunnel
Boyle Tunnel
Shafts
Rusty
VABM 7247
DAYTON (U.S. 50) 6.7 MI.
T. 15 N.
T. 14 N.
(DAYTON)
TRAIL
JEEP
Res
Stone Spring
Sage 2
VABM 8763
Lyon Peak
Sunrise Pass
Sunrise Basin
Spr
BM 6530
BM 6367
LYON CO
DOUGLAS CO
Sunrise Camp
BM 6448
BM 6265
Springs
Well
BM 5906
BM 5417
BM 5696
BM 5438
JW Ranch
BM 5550
BM 5277
BM 5326
Spring
Spr
10'
5'

Carson City Range Meeting Evaluation
8/23-24, 1995

Name	Organization	Phone
CHRISTI MASON	WASHOE TRIBE	702 265-4191
Diane Doonan	Washoe Tribe	265-4191
NED HABICH	BLM Service Center	303 236-0166
Bill Phillips	Susanville	916-257-67[illegible]
Gary Brackley	NRCS - Reno SO	702\784-5318
Ed Blake	NRCS - Reno F.O.	702-784-5408
BRUCE DURTSCHE	BLM-Susanville, CA	916-257-5381
Desi Zamudio	FS Sparks NV	702 355 5344
Allen RASMUSSEN	USU Logan UT	801-797-2469
David Pate	NRS, Corvallis OR	~~503-750-7334~~
Rene Strickland	Swim Club	702 329-6118
Elsie Dupree	NV. WF	702-885-7965
Andrea Minor	BLM - Carson City	885-6000
ROBERT MEAD	BLM - CARSON CITY	885-6000
Randy Trujillo	BLM - Carson City	885-6000
Neil VANZANDT	BLM - Reno	785-6631
STEVE LEONARD	BLM - RENO	785-6630
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[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
TONY TATON	Ranching - BLM/FS Austin	702 964-2227

Rich Benson	BLM - Carson City	702-885-6100
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DAVE WEIXELMAN	FOREST SERVICE (TOIYABE)	702-331-6444
John Hall	BLM CCDO	885-6000
Peter Raffetto	BLM - Carson City	885-6000
W. Rick Brigham	BLM - Carson City	885-6000
JIM LINEBAUGH	Carson City	702-246-7930
Chuck Soukup	Carson City - Consultant	883-0345
MARK GISH	BLM BISHOP R.A.	(619) 872-4881

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NEVADA
Range Site Description

A. PHYSICAL CHARACTERISTICS

1. PHYSIOGRAPHIC FEATURES

This site occurs on summits and sideslopes of hills and upper fan piedmonts. Slopes range from 2 to 50 percent, but slope gradients of 5 to 30 percent are most typical. Elevations are 5500 to 6500 feet.

2. CLIMATIC FACTORS

Average annual precipitation is 10 to 12 inches. Mean annual air temperature is 48 to 51 degrees F. The average growing season is about 90 to 110 days.

3. SOIL FACTORS

The soils in this site are moderately deep to deep and well drained. The available water holding capacity is moderate.

For a listing of soils correlated to this range site and representative pedon, see Appendix II.

4. VEGETATION FACTORS

a. Potential Native Vegetation

The plant community is dominated by Thurber needlegrass and big sagebrush. Antelope bitterbrush and basin wildrye are other important species associated with this site.

Potential vegetative composition is about 60% grasses, 10% forbs and 30% shrubs.

4. VEGETATION FACTORS (Continued)

b. Major plant species and percentages of the total community by air-dry weight:

PLANT SYMBOL	COMMON NAME	PERCENT BY WEIGHT (AIR-DRY)
Grasses		
STTH2	Thurber needlegrass	15-25
ELCI2	basin wildrye	2-8
POA++	bluegrass species	2-8
PPGG	other perennial grasses	5-10**
ORHY	Indian ricegrass	
SIHY	bottlebrush squirreltail	
STOC2	western needlegrass	
STCO4	needleandthread	
Forbs		
PPFF	other perennial forbs	5-15**
BASA3	arrowleaf balsamroot	
CRAC2	tapertip hawksbeard	
LUPIN	lupine	
Shrubs		
ARTR2	big sagebrush	15-25
ARTRW	Wyoming big sagebrush	
ARVA2	mountain big sagebrush	
ARTRT	basin big sagebrush	
PUTR2	antelope bitterbrush	2-8
SSSS	other shrubs	5-15**
CHVI8	Douglas rabbitbrush	
PRAN2	Anderson peachbrush	
EPVI	green ephedra	
RIBES	currant	
TETRA3	horsebrush	
ERIOG	eriogonum	
LEPTO2	pricklygilia	

**Allow no more than 3% of each species of this group and no more than 10% in aggregate.

**Allow no more than 3% of each species of this group and no more than 15% in aggregate.

**Allow no more than 3% of each species of this group and no more than 15% in aggregate.

4. VEGETATION FACTORS (Continued)

c. Approximate ground cover (basal and crown) is 25 to 35 percent.

d. Total annual air-dry production:

	LBS/AC
Favorable years	1100
Normal years	800
Unfavorable years	600

e. Plant community dynamics

Where management results in abusive use by livestock and feral horses, big sagebrush, currant and rabbitbrush will increase, while Thurber needlegrass, basin wildrye and antelope bitterbrush will decrease. Species most likely to invade this site are cheatgrass, mustards and other annual forbs. Singleleaf pinyon and Utah juniper will invade this site where it occurs adjacent to these woodlands. When pinyon and juniper occupy this site they compete with other species for available light, moisture and nutrients.

5. ASSOCIATED AND COMPETING SITES

a. Principal sites that commonly occur in association with the potential plant community include:

(026XY016NV) Loamy 8-10" P.Z.
(026XY023NV) Claypan 10-14" P.Z.
(026XY030NV) Loamy Bottom 10-14" P.Z.

b. Competing sites (and their differentiae) that are similar to this potential plant community:

(026XY015NV) Shallow Loam 10-12" P.Z.
[Less productive site]
(026XY016NV) Loamy 8-10" P.Z.
[STSP3 dominant grass; ARTRW dominant shrub; less productive site]
(026XY017NV) Loamy Hill 10-12" P.Z.
[JUOS important species on site]
(026XY026NV) Granitic Slope 10-12" P.Z.
[STTH2-STSP3 codominant grasses; soils of granitic origin]

APPENDIX I

Reference Data

1. Site Documentation (number and kind of site inventory records).

____	SCS-ECS-5	__1__	NV-ECS-1
____	SCS-RANGE-417	____	NV-4400-13 (BLM)
____	Other _____		

2. Distribution and extent.

   Carson City, Douglas, Lyon, Mineral, Storey and Washoe Counties, Nevada.

3. Location of typical example of this site.

Approved by: _____
STATE RANGE CONSERVATIONIST
SCS NEVADA

Date approved: June 1992

APPENDIX II

1. Soil taxonomic unit representative of this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Springmeyer gravelly loam, 2 to 15% slopes	NV0530	773 772	fine-loamy, mixed, mesic, Aridic Argixerolls

2. Type location for soil taxonomic unit representative of this site:

3. Listing of soils correlated to this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Arzo very stony loam, 8 to 30% slopes	NV0569	628	fine, montmorillonitic, mesic, Aridic Calcic Argixerolls
Borda very cobbly clay loam, 4 to 15% slopes	NV0628	773	fine, montmorillonitic, mesic, Xerollic Paleargids
Cagle very stony clay loam, 15 to 30% slopes	NV0037	628	fine, montmorillonitic, mesic, Aridic Argixerolls
Cassiro extremely stony loam, 15 to 30% slopes	NV0692	773	clayey-skeletal, montmorillonitic, mesic, Aridic Argixerolls
Cassiro gravelly sandy loam, 2 to 4% slopes	NV0090	628	clayey-skeletal, montmorillonitic, mesic, Aridic Argixerolls

APPENDIX II (continued)

3. Listing of soils correlated to this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Galeppi sandy loam, 4 to 8% slopes	CA0221	628	fine-loamy, mixed, mesic Durargidic Argixerolls
Holbrook gravelly fine sandy loam, 4 to 15% slopes	NV0047	773 779	loamy-skeletal, mixed, mesic, Aridic Haploxerolls
Holbrook variant very stony fine sandy loam, 30 to 50% slopes	NV5001	625	loamy-skeletal, mixed, mesic, Xerollic Camborthids
Holbrook very stony sandy loam, 4 to 15% slopes	NV0048	625	loamy-skeletal, mixed, mesic, Aridic Haploxerolls
Indian Creek variant very stony loam, 30 to 50% slopes	NV5123	773	loamy-skeletal, mixed, mesic, shallow, Xerollic Durargids
Indiano gravelly loam, 15 to 50% slopes	NV0053	628 772	fine-loamy, mixed, mesic, Aridic Argixerolls
Ister very stony sandy loam, 30 to 50% slopes	NV0711	772	loamy-skeletal, mixed, mesic, Aridic Argixerolls
Lemm very gravelly coarse sandy loam, 4 to 30% slopes	NV0315	628	loamy-skeletal, mixed, mesic, Aridic Argixerolls
Leviathan extremely stony sandy loam, 2 to 8% slopes	NV0381	628	loamy-skeletal, mixed, mesic, Aridic Argixerolls

APPENDIX II (continued)

3. Listing of soils correlated to this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Leviathan stony sandy loam, 15 to 30% slopes	NV0391	628	loamy-skeletal, mixed, mesic, Aridic Argixerolls
Nevador variant fine sandy loam, 0 to 4% slopes	NV5100	773	fine-loamy, mixed, mesic, Aridic Durixerolls
Oest very bouldery loam, 2 to 8% slopes	NV0386	628	loamy-skeletal, mixed, mesic, Aridic Argixerolls
Oest very gravelly loam, 8 to 15% slopes	NV0387	628	loamy-skeletal, mixed, mesic, Aridic Argixerolls
Oppio very stony fine sandy loam, 30 to 50% slopes	NV0052	625	fine, montmorillonitic, mesic, Xerollic Haplargids
Orr stony sandy loam, 4 to 8% slopes	NV0303	628	fine-loamy, mixed, mesic, Aridic Argixerolls
Pedee variant sand, 2 to 15% slopes	NV7023	774	clayey-skeletal, mixed, frigid, Mollic Palexeralfs
Prey gravelly loamy sand, 0 to 4% slopes	NV0054	773	coarse-loamy, mixed, mesic, Haploxerollic Durargids
Prey stony sandy loam, 4 to 15% slopes	NV0473	773	coarse-loamy, mixed, mesic, Haploxerollic Durargids

APPENDIX II (continued)

3. Listing of soils correlated to this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Prey variant stony loam, 2 to 15% slopes	NV5C81	773	loamy, mixed, mesic, shallow, Aridic Durixerolls
Pula very cobbly loam, 30 to 50% slopes	NV0699	773	clayey-skeletal, montmorillonitic, mesic, Xerollic Haplargids
Pung stony loam, 15 to 30% slopes	NV0721	773	fine, montmorillonitic, mesic, Durargidic Argixerolls
Saralegui coarse sand, 2 to 8% slopes	CA0797	773	coarse-loamy, mixed, mesic, Xerollic Haplargids
Shree very gravelly fine sandy loam, 2 to 8% slopes	NV0726	773	loamy-skeletal, mixed, mesic, Aridic Argixerolls
Springmeyer loam, 0 to 15% slopes	NV0392	772 628	fine-loamy, mixed, mesic, Aridic Argixerolls
Springmeyer silt loam, 0 to 2% slopes	NV0706	773	fine-loamy, mixed, mesic, Aridic Argixerolls
Springmeyer stony loam, 2 to 4% slopes	NV0393	628 772	fine-loamy, mixed, mesic, Aridic Argixerolls
Sutro very stony loam, 30 to 50% slopes	NV0043	773	fine-loamy, mixed, mesic, Aridic Haploxerolls

APPENDIX II (continued)

3. Listing of soils correlated to this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Tristan very stony loam, 15 to 50% slopes	NV0606	628 772	loamy-skeletal, mixed, mesic, Aridic Argixerolls
Whichman cobbly loamy sand, 30 to 50% slopes	NV0872	625	loamy-skeletal, mixed, mesic, Aridic Haploxerolls

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NEVADA
Range Site Description

A. PHYSICAL CHARACTERISTICS

1. PHYSIOGRAPHIC FEATURES

This site occurs on mountain sideslopes and mountain valley fans. Slopes range from 2 to 50 percent, but slope gradients of 4 to 30 percent are most typical. Elevations are 6,000 to 9,500 feet.

2. CLIMATIC FACTORS

Average annual precipitation is 12 to 14 inches. Mean annual air temperature is 47 to 49 degrees F. The average growing season is about 80 to 100 days.

3. SOIL FACTORS

The soils of this site are moderately deep and well drained. Available water holding capacity is moderate. The inherent fertility is high and the soils are slightly acid to neutral in reaction. The soils are moist from fall until early summer when plant growth depletes soil moisture.

For a listing of soils correlated to this range site and representative pedon, see Appendix II.

4. VEGETATION FACTORS

a. Potential Native Vegetation

The plant community is dominated by western and/or Letterman needlegrasses, mountain brome, basin wildrye, antelope bitterbrush and mountain big sagebrush.

Potential vegetative composition is about 55% grasses, 10% forbs and 35% shrubs.

4. VEGETATION FACTORS (Continued)

b. Major plant species and percentages of the total community by air-dry weight:

PLANT SYMBOL	COMMON NAME	PERCENT BY WEIGHT (AIR-DRY)
Grasses and Grass-like Plants		
STIPA	needlegrass	15-30
STOC2	western needlegrass	
STLE4	Letterman needlegrass	
BRCA5	mountain brome	10-20
ELCI2	basin wildrye	5-15
POA++	bluegrass	2-5
PPGG	other perennial grasses	5-15**
MESP	purple oniongrass	
STCO4	needleandthread	
CAREX	sedge	
SITAN	squirreltail	
LEKI2	spike-fescue	
STTH2	Thurber needlegrass	
Forbs		
PPFF	other perennial forbs	5-15**
CRAC2	tapertip hawksbeard	
LUPIN	lupine	
PHLOX	phlox	
BASA3	arrowleaf balsamroot	
DELPH	larkspur	
CANU3	sego lily	
ALLIU	onion	
ZIGAD	deathcamas	
PENST	penstemon	
LEPTO2	pricklygilia	

**Allow no more than 5% of each species of this group and no more than 15% in aggregate.

**Allow no more than 3% of each species of this group and no more than 15% in aggregate.

4. VEGETATION FACTORS (Continued)

b. Major plant species and percentages of the total community by air-dry weight:

PLANT SYMBOL	COMMON NAME	PERCENT BY WEIGHT (AIR-DRY)
Shrubs		
ARVA2	mountain big sagebrush	15-25
PUTR2	antelope bitterbrush	5-15
SSSS	other shrubs	5-10**
SYMPH	snowberry	
EPVI	green ephedra	
RIBES	currant	
CHRYS9	rabbitbrush	
ERIOG	eriogonum	
AMELA	serviceberry	

**Allow no more than 3% of each species of this group and no more than 10% in aggregate.

c. Approximate ground cover (basal and crown) is 25 to 40 percent.

d. Total annual air-dry production:

	LBS/AC
Favorable years	1300
Normal years	1100
Unfavorable years	800

e. Plant community dynamics

Where management results in abusive livestock use, mountain big sagebrush, rubber rabbitbrush and Douglas rabbitbrush will become more dominant, while antelope bitterbrush and needlegrasses will decrease. Cheatgrass, annual forbs, singleleaf pinyon and Utah juniper are the species most likely to invade this site.

5. ASSOCIATED AND COMPETING SITES

a. Principal sites that commonly occur in association with the potential plant community include:

(026XY007NV)	Steep North Slope 14+" P.Z.
(026XY010NV)	Granitic Loam 14-16" P.Z.
(026XY030NV)	Loamy 10-12" P.Z.
(026XY039NV)	Claypan 14+" P.Z.
(026XY053NV)	Loamy 16+" P.Z.

b. Competing sites (and their differentiae) that are similar to this potential plant community:

(026XY006NV)	Granitic Loam 14-16" P.Z. [BRCA5 minor species; soils from granitic parent materials]
(026XY008NV)	Granitic Fan 10-12" P.Z. [STOC4-ORHY codominant grasses; soils from granitic parent materials]
(026XY010NV)	Loamy 10-12" P.Z. [STTH2 dominant grass]
(026XY018NV)	Granitic South Slope 10-12" P.Z. [STSP3 dominant grass; ARTRW dominant shrub; soils from granitic parent material]
(026XY026NV)	Granitic Slope 10-12" P.Z. [STTH2-STSP3 codominant grasses; soils from granitic parent materials]
(026XY038NV)	Loamy Slope 14+" P.Z. [STOC2 dominant grass; PUTR2 minor plant]
(026XY040NV)	Gravelly Loam 14-18" P.Z. [PUTR2 typically most prevalent shrub; STNE3 dominant grass]
(026XY046NV)	Granitic Slope 12-14" P.Z. [Less productive site; soils derived from granitic rock]
(026XY048NV)	South Slope 12-16" P.Z. [STOC2 and/or STTH2 dominant grasses; less productive site; steep south slopes]
(026XY053NV)	Loamy 16+" P.Z. [More productive site]

APPENDIX I

Reference Data

1. Site Documentation (number and kind of site inventory records).

____	SCS-ECS-5	____	NV-ECS-1
____	SCS-RANGE-417	____	NV-4400-13 (BLM)
____	Other _____		

2. Distribution and extent.

   Carson City, Churchill, Douglas, Lyon, Mineral and Pershing Counties, Nevada.

3. Location of typical example of this site.

   NE1/4 Section 22, T5N. R28E. MDBM.
   Approximately 1 mile east of Aurora Peak, Mineral County, Nevada.

Approved by: _____
STATE RANGE CONSERVATIONIST
SCS NEVADA

Date approved: June 1992

APPENDIX II

1. Soil taxonomic unit representative of this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Softscrabble very stony loam, 15 to 50% slopes	NV0608	628	loamy-skeletal, mixed, frigid Pachic Argixercills

2. Type location for soil taxonomic unit representative of this site:

3. Listing of soils correlated to this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Booford very stony loam, 30 to 50% slopes	NV0767	628	fine, montmorillonitic, frigid Typic Argixerolls
Burnborough very gravelly loam, 30 to 50% slopes	NV0605	772 773	loamy-skeletal, mixed, frigid Aridic Argixerolls
Clanalpine family very cobbly very fine sandy loam, 15 to 50% slopes	NV7010	774	loamy-skeletal, mixed, frigid Typic Argixerolls
Devils variant gravelly loam, 4 to 15% slopes	NV5116	625	fine-loamy, mixed, frigid Aridic Argixerolls
Drit coarse sandy loam, 30 to 50% slopes	NV0703	625	loamy-skeletal, mixed, mesic Pachic Haploxerolls
Drit extremely stony sandy loam, 50 to 75% slopes	NV0704	773	loamy-skeletal, mixed, mesic Pachic Haploxerolls

3. Listing of soils correlated to this site:

Soil Taxon	SCS-SOILS-5 Number	SSA	Taxonomic Classification
Epvip gravelly sandy loam, 15 to 50% slopes	NV1926	774	loamy-skeletal, mixed, frigid, shallow Aridic Argixerolls
Glean very gravelly sandy loam, 30 to 50% slopes	CA1488	625	loamy-skeletal, mixed, frigid Pachic Haploxerolls
Hartig very gravelly sandy loam, 30 to 50% slopes	NV2497	625	loamy-skeletal, mixed, frigid Aridic Haploxerolls
Ister very stony sandy loam, 30 to 75% slopes	NV0711	772 625	loamy-skeletal, mixed, mesic, Aridic Argixerolls
Nire stony fine sandy loam, 4 to 15% slopes	NV2020	774	loamy-skeletal over clayey, mixed, Argic Pachic Cryoborolls
Nosrac extremely stony loam, 30 to 50% slopes	NV0471	772	loamy-skeletal, mixed, mesic Aridic Argixerolls
Nosrac stony fine sandy loam, 30 to 50% slopes	NV0042	772 773	loamy-skeletal, mixed, mesic Aridic Argixerolls
Uhaldi stony loam, 30 to 50% slopes	NV0722	773	fine-loamy, mixed, mesic Aridic Argixerolls
Welch loam, 4 to 15% slopes	NV2061	799	fine-loamy, mixed, frigid Cumulic Haplaquolls

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. Freemont contacted Washoe Tribe in 1844 near Topaz Lake in Antelope Valley, who harvested nuts from the southern Pine Nut Range. The entry in Freemont'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 Load, 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)[1].

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 etal, 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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[1] Dates of communities from Pendleton etal, 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-leafed 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.

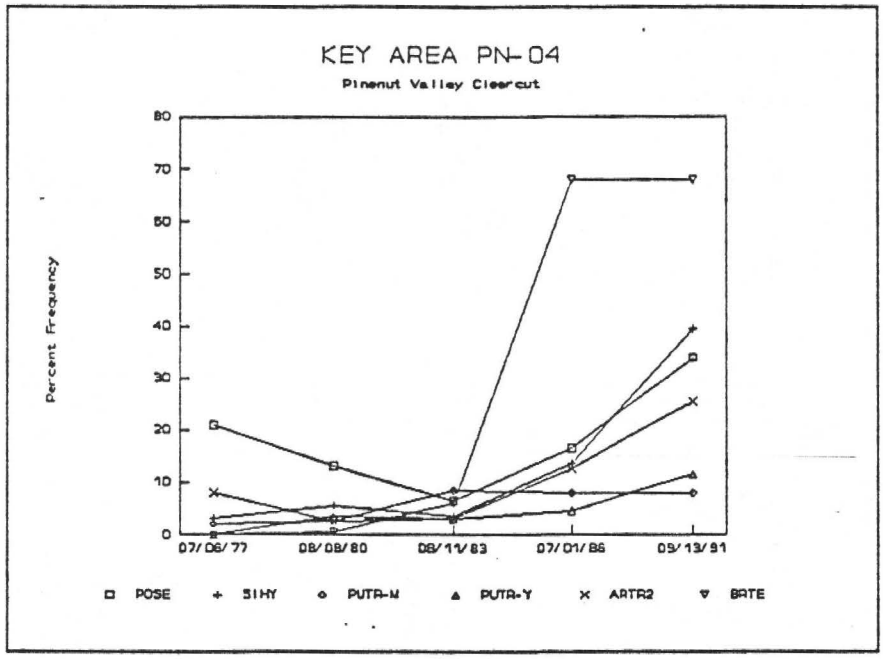
The effects of overstory removal in the Pine Nut Mountains was monitored on a 10 acre experimental pinyon - juniper clearcut done in 1977. Quadrat frequency study data was collected in accordance to procedures adapted from Tueller, etal (1972)[2]. The results are shown in Table 1 and Figure 1. Note that 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	*Artemisia tridentata*
BRTE	cheatgrass brome	*Bromus tectorum*
POSE	Sandberg bluegrass	*Poa secunda*
PUTR-M	antelope bitterbrush - mature	*Purshia tridentata*
PUTR-Y	antelope bitterbrush - young	*Purshia tridentata*
SIHY	bottlebrush squirreltail	*Sitanion hystrix*

[2] 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[3].

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:

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

[3] 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 (Purshia tridentata)	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 (Artemisia tridentata)	Non-sprouter	Severely harmed	30	Good seed crop before burning hastens recovery. Effective control requires burning before seed-set.
Low sagebrush (Artemisia arbuscula)	Non-sprouter	Rarely burned.		May be used as a fuel break.
Rubber rabbitbrush (Chrysothamnus nauseosus) & Douglas rabbitbrush (C. viscidiflors)	Vigorous sprouter	Enhanced	20 - 25	May be killed if burned after heavy grazing or burned in early summer.
Horsebrush (Tetradymia sp)	Vigorous sprouter	Enhanced	30 - 35	Toxic, increases fivefold within 12 years.
Snowberry (Symphoricarpos sp)	Sprouter	Unharmed	10 - 15	Enhanced by cool fires but harmed by hot fires.
Curlleaf mountain mahogany (Cercocarpus ledifolius)	Sprouter	Moderately harmed	Not availabl e	More information is needed.
Serviceberry (Amelanchier 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 (Holodiscus sp)	Sprouter	Enhanced	20 - 30	
Rose (Rosa sp)	Sprouter	Enhanced	15 - 30	
GRASSES				
Nevada bluegrass (Poa nevadensis)	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 (Poa secunda)		Undamaged	1 - 3	

Species	Response to Fire	Recovery Time (Years)	Remarks
GRASSES (Cont.)			
Cheatgrass (Bromus tectorum)	Undamaged	1	Any reduction to cheatgrass stands is usually short lived.
Indian ricegrass (Oryzopsis hymenoides)	Slight damage	2 - 4	Good resistance to burning but slow to increase in density.
Needle-and-thread (Stipa comata)	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 (Stipa thurberana)	Severe damage	4 - 8	
Bottlebrush squirreltail (Sitanion hystrix)	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 (Agropyron cristata, A. desertorum & crosses)	Undamaged	1 - 2	Wheatgrasses are difficult to burn in seeded monocultures.
Riparian wheatgrass (Agropyron dasystachyum riparium)	Undamaged	1 - 2	
Western wheatgrass (Agropyron smithii)	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 (Astragalus sp) Pinnate tansymustard (Descurania pinnata) Globemallows (Sphaeralcea sp) Tapertip hawksbeard (Crepis acuminata) Tumblemustard (Sisymbrium altissimum)	Arrowleaf balsamroot (Balsamorhiza sagittata) Common sunflower (Helianthus annuus) Coyote tobacco (Nicotiana attenuata) Foothill deathcamas (Zigadenus paniculatus) Longleaf phlox (Phlox longifolia) Russian thistle (Salsola kali) Common yarrow (Achillea millifolium) Wild onion (Allium sp)