m 9/26/95

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Winnemucca District Office
705 East 4th Street
Winnemucca, Nevada 89445

September 26, 1995

In Reply Refer To:
(NV-241.2)

Dear Interested Party:

Please find enclosed the draft Happy Creek Allotment Evaluation. I am seeking your input related to management of this allotment. Would you please review this draft evaluation and provide your comments to me by October 30, 1995. Please also feel free to contact Lynnda Jackson of my staff at 702-623-1500 if you have any questions.

Thank you for your time and concern for management of the public lands.

Sincerely yours,

Paradise-Denio Resource Area Manager

DRAFT Happy Creek Allotment Evaluation 9/26/95

I. Introduction

A. Happy Creek Allotment (00056)

B. Permittee - Happy Creek Land and Cattle LTD Partnership

C. Evaluation Period - 10/14/83 to present

D. Selected Management Category C

II. Initial Stocking Level

A. Livestock Use

1. Grazing Preference (AUMs)

a. Total Preference - 4,698

b. Suspended Preference - 974

c. Active Preference - 3,724

2. Season of Use - Spring/summer 04/01 - 09/30
Fall/winter 10/01 - 02/28

3. Kind and Class of Livestock - Cattle (cow/calf)

4. Percent Federal Range

Percent federal range is currently 100%. However, during the evaluation period the allotment has been licensed at 61%, 87% and 95% based upon tribal land that was leased by the permittee. These lands are no longer under exchange-of-use because they have either been fenced or are no longer under the control of the permittee.

5. Grazing System

There is no allotment management plan for Happy Creek Allotment. Throughout the evaluation period grazing use has varied. The allotment has been licensed at up to 2820 AUMs spring-summer use, with the balance of use made in the fall-winter.

In recent years spring-summer use has generally occurred from April into August in the portion of the allotment south of State Highway 140 and upper Happy Creek. Fall-winter use begins in October or later and ends in February or earlier. Fall-winter use generally occurs north of the highway. There is no fence along the highway separating the fall-winter and spring-summer use areas and drift between these areas does occur.

B. Wild Horse Use

A portion of the Jackson Mountains Herd Management Area (HMA) lies in the southwest portion of Happy Creek Allotment. The Paradise-Denio Land Use Plan identifies 30 horses and 0 burros as a starting point for monitoring for the Happy Creek portion of the HMA. An appropriate management level (AML) will be established through the allotment evaluation process based on resource monitoring.

C. Wildlife Use

Mule deer yearlong and summer range as well as pronghorn yearlong and winter, and bighorn yearlong habitats have been identified in the Happy Creek Allotment.

1. The following key or critical management areas and associated reasonable numbers have been developed for the Happy Creek Allotment.

   a. Mule Deer

      1. Reasonable Numbers: 262 AUMs

      2. Key/Critical management areas: deer summer-5,341 acres (Jackson Mountain DS-8) and deer yearlong-756 acres (Quinn River DY-6), 6,637 acres (Bilk Creek DY-9), and 16,391 acres (Jackson Mountain DY-18).

b. Pronghorn

1. Reasonable Numbers: Not established

2. Key/Critical management areas: pronghorn summer-3,419 acres (Buff Peak PS-12); Pronghorn yearlong-18,326 acres (Jackson Mountain PY-13),and pronghorn winter-9,204 acres (Bilk Creek PW-14).

c. Bighorn Sheep

1. Reasonable Numbers: 38 AUMs

2. Key/Critical management areas: bighorn yearlong; 5,792 acres (Jackson Mountain BY-6).

d. Sage Grouse

Both winter and general sage grouse distribution areas have been identified in the Happy Creek allotment. In addition, NDOW personnel have indicated that at least one previously unknown strutting ground is active on the allotment.

e. Other

Several game and non-game bird and mammal species occur throughout the allotment.

D. Riparian/Fisheries

Happy Creek begins from the east slope of the Jack Mountains, at an elevation near 6,880 feet, in Humboldt County, Nevada. Once the stream leaves the mouth of the canyon the channel travels northeasterly until its terminus with the Quinn River at an elevation on 4,080 feet. Water flow is mainly from springs. The stream is approximately 11.5 miles in length, however, only stations within publicly owned lands (4.5 miles) were surveyed. The stream at the lower portion of Happy Creek is dry during times of the year due to a pipeline diverting all flow to the Happy Creek Ranch for irrigation purposes (please see Appendix 1 for portions

of Happy Creek located on public land and above the irrigation diversion). During the 1992 survey period, the stream was dry in lower reaches (public and private) due to the sixth consecutive year of drought as well as degraded riparian conditions. All major tributaries for Happy Creek were found to be either dry or to have very low surface flows. A more detailed report regarding the results of stream surveys is available for review (BLM 1992, NDOW 1989).

E. Threatened and Endangered Species

Lahontan cutthroat trout, a Federally Listed threatened species, historically occurred in Happy Creek. According to the 1989 NDOW stream survey report, Happy Creek supported a hybrid trout (cutthroat x rainbow) population at the time of survey. According to an NDOW survey report of 1957, brook trout and rainbow trout were found in the drainage.

The January, 1995 Lahontan Cutthroat Trout Recovery Plan identified Happy Creek as a potential recovery site.

The following candidate species may occur in the Happy Creek Allotment.

Eriogonum anemophilum	C2	wind loving buckwheat
Athene cunicularia hypugea	C2	western burrowing owl
Brachylagus idahoensis	C2	pygmy rabbit
Myotis ciliolabrum	C2	small-footed myotis
Myotis evotis	C2	long-eared myotis
Myotis thysanodes	C2	fringed myotis
Myotis volans	C2	long-legged myotis
Plecotus townsendii pallescens	C2	pale Townsend's big-eared bat
Plecotus townsendii townsendii	C2	Pacific Townsend's big-eared bat
Euderma maculatum	C2	spotted bat
Plegadis chihi	C2	white-faced ibis
Ixobrychus exilis hesperis	C2	least bittern
Childonias niger	C2	black tern

Of these species, the wind loving buckwheat, pygmy rabbit, and western burrowing owl are most likely to occur in the allotment. Two of these, the western burrowing owl an pygmy rabbit are suceptible to impacts associated with livestock grazing.

The western burrowing owl is very likely to occur within the allotment. Known colonies of this species have been observed close by in habitat types similar to those present in the lower elevation areas of the allotment. Potential impacts livestock grazing could have on the well-being of this species are limited to destruction of burrow entrances by hoof action.

The potential effect on western Burrowing owl habitat by livestock grazing is highly improbable as livestock actively avoid stepping in and on open holes such as burrow entrances.

The pygmy rabbit is also likely to occur in the allotment. Livestock grazing could effect this species if livestock utilization levels resulted in heavy use of upland grass species, or if the shrub component of the community were altered. In the Granite Allotment, livestock utilization monitoring data indicate that under the current grazing system, slight to light use has occured. Based on this data, the continuation of livestock grazing is not likely to contribute to the need to list either the pygmy rabbit or the western burrowing owl.

III. Allotment Profile

A. Narrative Description

The Happy Creek Allotment is located in the west-central portion of Humboldt County. The allotment is approximately 45 air miles north-west of Winnemucca. It includes the north-east portion of the Jackson Mountains and extends north into the southern end of the Bilk Creek Mountains. The lower elevations are dominated by greasewood and shadscale. As elevations increase, sagebrush is dominate. Riparian and meadow, and mountain browse types are also included in the allotment.

B. Acreage

1.	Allotment total	97,679 acres
2.	Public land	95,566 acres
3.	Private land	897 acres
	Tribal land	1,216 acres

C. Allotment Specific Objectives

1. Land Use Plan Objectives

a. Objective RM-1

Provide forage on a sustained yield basis through natural regeneration. Reverse downward deterioration of public grazing lands by improving 1,000,000 acres in poor condition to fair condition, and 400,000 acres in fair condition to good condition within 30 years.

b. Objective WLA-1

Improve and maintain the condition of all the aquatic habitat of each stream, lake, or reservoir having the potential to support a sport fishery at a level conducive to the establishment and maintenance of healthy fish community.

c. Objective WL-1

Improvement and maintenance of a sufficient quantity, quality, and diversity of habitat for all species of wildlife in the planning area.

d. Objective WH/B-1

Maintain wild horses and burros on public lands, where there was wild horse or burro use as of December 15, 1971, and maintain a natural ecological balance on the public lands.

e. Objective W-1

Preservation and improvement of quality water necessary to support current and future uses.

f. Objective W-2

Provision of adequate water to support public land uses.

g. Objective W-3

Reduction of soil loss and associated flood and sediment damage from public lands caused by accelerated erosion (man-induced) from wind and water.

2. Rangeland Program Summary Objectives

a. Increase available forage for livestock to sustain an active preference of 3,724 AUMs.

b. Improve range condition from poor to fair on 93,654 acres and from fair to good on 1,912 acres by implementing an intensive management system.

c. Manage rangeland habitat and forage condition to support reasonable numbers of wildlife demand as follows:

Deer 262 AUMs
Bighorn sheep 38 AUMs

d. Improve condition of riparian habitat on Happy Creek.

e. Improve condition of deteriorating wildlife habitat.

f. Protect sage grouse breeding complexes.

g. Remove all wild horses from this allotment. This allotment is not recognized as being a

wild horse area in 1971 (Note- This objective is inconsistent with the Land Use Plan. The Land Use Plan will be followed as it is a decision document and the Rangeland Program Summary is not).

3. Habitat Management Plan Objectives

a. Jackson Mountain Habitat Plan (Bighorn Sheep Reintroduction) approved 09/21/79:

Establish a viable herd of California bighorn sheep.

b. Jackson Mountain Habitat Management Plan approved 01/06/81:

1. Manage the habitat toward optimum quality, quantity, and diversity of food, water, cover, and space for all terrestrial wildlife species.

2. Mitigate any present or potential adverse impacts placed upon wildlife habitat within the habitat area.

3. Encourage range and other resource developments that will benefit wildlife and wildlife habitat.

4. Provide additional cover for the major big game species.

5. Create habitat diversity in selected areas having large monotypic shrub communities in order to reduce the monotonous shrub component and increase the forb and grass composition.

6. Ensure that wildlife needs are coordinated during the design and implementation of all resource activity plans.

7. Vegetative composition objectives were also developed for the Jackson

Mountains. However, these recommendations were made without the benefit of an Ecological Site Inventory and the attainability of these objectives is not known.

8. Fence the following meadows:

T40N, R32E, Sec. 10, SWSW 1.0 acre
T41N, R32E, Sec. 29, NWSW 1.75 acres
T40N, R32E, Sec. 9, SWSE 7.7 acres

4. Allotment Objectives

The allotment specific objectives tie the Land Use Plan, Rangeland Program Summary and Habitat Management Plan objectives together into quantified objectives for this allotment.

a. Short Term Objectives

1. The objective for utilization of key species on streambank riparian habitat on Happy Creek is 30%.

2. The objective for utilization of key species on wetland riparian habitat is 50% utilization.

3. The objective for utilization of key species on upland habitat is 50%.

b. Long Term Objectives

1. Manage, maintain and improve public rangeland conditions to provide forage on a sustained yield basis for big game, with an initial forage demand of 262 AUMs for mule deer and 38 AUMs for bighorn sheep.

a. Improve to and maintain 5,341 acres of Jackson Mountain DS-8 in good or excellent mule deer habitat condition and 756 acres of Quinn

River DY-6, 6,637 acres of Bilk Creeek DY-9, and 16,391 acres of Jackson Mountain DY-18 in fair to good habitat condition.

b. Improve to and maintain 5,792 acres Jackson Mountain BY-6 in good to excellent bighorn sheep habitat condition.

c. Improve to and maintain 3,419 acres of Buff Peak PS-12, 9,204 acres of Bilk Creek PW-14, and 18,326 acres of Jackson Mountain PY-13 ranges in good or excellent pronghorn habitat condition.

2. Manage, maintain and improve public rangeland conditions to provide forage on a sustained yield basis for livestock, with an initial stocking rate of 3,724 AUMs.

3. Improve range condition from poor to fair on 93,654 acres and from fair to good on 1,912 acres.

4. Maintain and improve free roaming behavior of wild horses by protecting and enhancing their home ranges.

5. Improve or maintain 463 acres of riparian and meadow habitat types in good condition with maximum species diversity, reproduction and recruitment for maintenance of herbaceous and woody species.

6. Improve or maintain 336 acres of mountain mahogany habitat in good condition by allowing for successful reproduction and recruitment in the stand.

7. Improve or maintain bitterbrush and 41 acres of serviceberry maximizing reproduction in the community.

8. Protect sage grouse strutting grounds and brooding areas. Maintain a minimum of 30% canopy cover of sagebrush for nesting and winter use.

9. Improve to or maintain the following stream habitat conditions from 50% on Happy Creek to an overall optimum of 60% or above.

   a) Streambank cover to 60% or above.

   b) Streambank stability 60% or above.

   c) Maximum summer water temperatures below 70 degrees Farenheidt.

10) Improve to and maintain water quality of the perennial reaches of Happy Creek to the state criteria set for the following beneficial uses: stockwater, cold water aquatic life, water contact recreation and wildlife propagation.

D. Key Species Monitored

1. Upland Species

Symbol	Scientific Name	Common Name
SIHY	Sitanion hystrix	bottlebrush squirreltail
POSE	Poa secunda	Sandberg bluegrass
ELCI2	Elymus cinereus	Great Basin wildrye
STTH2	Stipa thurberiana	Thurber needlegrass
AGSP	Agropyron spicatum	bluebunch wheatgrass
ATCO	Atriplex confertifolia	shadscale
PUTR2	Purshia tridentata	bitterbrush
AMAL2	Amelanchia alnifolia	serviceberry

Note- Salmon wildrye, Elymus ambiguus salmonis, should be utilized as a key species.

2. Riparian Species

Symbols	Scientific Names	Common Names
PONE3	Poa nevedensis	Nevada bluegrass
POPR	Poa pratensis	Kentucky bluegrass
JUNCU	Juncus spp.	rush
CAREX	Carex spp.	sedge
POMO4	Polypogon mospeliensis	rabbit foot grass
POPUL	Populus sp.	cottonwood
POTRT	Populus tremula tremuloides	quaking aspen
SALIX	Salix spp.	willow

E. Wilderness Study Area

Part of the North Jackson Mountain Wilderness Study Area (NV-020-606) occurs in the southwest portion of the Happy Creek Allotment.

IV. Management Evaluation

A. Purpose

The purpose of the monitoring evaluation is to determine if current management practices are meeting the allotment specific and Land Use Plan objectives and to identify management changes needed to meet objectives.

B. Summary of Studies Data

1. Actual Use

a Livestock

Year	Area South of Highway	Upper Happy Creek Area	Area North of Highway	Total
1994	881	400	192	1473
1993	1188	23	797	2008
1992	1184	349	349	1875
1991	Actual use by area of use not available for grazing prior to 1992			1412
1990				3104
1989				3815
1988				3206
1987				3724*
1986				3744
1985				3724*
1984				3724*
1983				3724

Note- Throughout the evaluation period Happy Creek Allotment has been licensed at 61%, 87%, 95% and 100% federal land. The variation in percent federal land is the result of 1) fence construction in 1989 which resulted in removing some land from exchange or use, 2) year to year variation lease land (and associated AUMs) under exchange of use and 3) in some years exchange of use lands were licensed separately from active preference rather than as a percent federal land. While 1994 use was licensed at 100% federal land and 1992 and 1993 use was licensed at 95% federal land, actual use for all three years were computed at 100% so data from those years can be accurately compared. 1987 use was licensed at 100% federal land. This is important because utilization data is available for 1987, 1993, 1993 and 1994 which may be used in conjunction with actual use data to determine carrying capacity.

* Actual use not available for 1987, 1985 and 1984, therefore AUMs displayed are licensed use.

b. Wildlife (existing numbers)

Mule Deer and Pronghorn Antelope

An apportioned population estimate for mule deer in the Happy Creek Allotment was calculated using the following information.

1. Combined total population estimates for hunt units 031, 032, 034, and 035 published annually by the Nevada Division of Wildlife (NDOW).

2. Proportional factor to determine estimated use in a specific hunt unit (031 and 035) submitted by NDOW.

3. Proportion of total winter, summer and yearlong habitat in hunt units 031 and 035 that is within the allotment (see Table 1).

Pronghorn actual use was estimated by calculating the percentage of winter and yearlong habitat in the hunt unit, as compared to the hunt area. Then the proportioned hunt unit population estimated is used together with a correction factor representing the percentage of habitat in the hunt unit that is contained in the allotment to arrive at an allotment estimate for proghorn population size.

Table 1- Percentage of Mule Deer and Pronghorn Winter, Summer, and Yearlong Habitat in the Happy Creek Allotment, as Compared to Hunt Units 031 and 035 representation of mule deer and pronghorn winter, summer, and yearlong Habitat.

Species	Winter	Summer	Yearlong	Winter + Yearlong	total habitat
Mule deer	0.00 (035)	0.00 (035)	9.63 (035)	8.64 (035)	9.62 (035)
	0.00 (031)	0.00 (031)	2.48 (031)	2.14 (031)	1.51 (031)
Pronghorn	0.00 (035)	0.00 (035)	4.25 (035)	4.16 (035)	5.02 (035)
	0.00 (031)	0.00 (031)	0.00 (031)	0.00 (031)	0.00 (031)

Pronghorn populations in unit 035 increased through 1991 and experienced a minor decline in 1992 and 1993. Mule deer populations experienced fluctuations in numbers in the observed years prior to the winter of 1992-93. This decline was caused primarily by the cumulative effects of six years of mild

winter weather and droughty summers resulting in poor body condition going into the winter of 1992-94 (see Table 2).

Table 2- Estimated existing numbers extrapolated from winter and yearlong habitats over the last five years and corresponding fawn recruitement data for the years 1990 through 1994.*

Year	Mule Deer		Pronghorn	
1994	108	323 AUMs	20	47 AUMs **
1993	73	291 AUMs	18	43 AUMs **
1992	232	234 AUMs	18	44 AUMs **
1991	102	302 AUMs	19	47 AUMs
1990	98	295 AUMs	15	37 AUMs
1989	103	309 AUMs	12	30 AUMs

* Evaluation methods used by NDOW for years prior to 1989 for mule deer population estimates differed from methods employed from 1989, therefore, pre-1989 estimates were not included in this table.

** Pronghorn population estimates for 1992, 1993 and 1994 are calculated using a population model developed by NDOW. This is the first year that estimates were made by modelling, all other years used professional judgement to estimate pronghorn population size.

Mule Deer populations in the Jackson Mountains and throughout Northern Nevada have fluctuated somewhat throughout the evaluation period, particularly over the last five years (see above Table 2). These fluctuations have been the result of the more then seven years of drought. The effects of the drought were emphasized over two consecutive winters and impacted seperate portions of the population.

The winter of 1991-92 saw over 60% mortality of young of the year in Unit 035 as very poor forage production and vigor during this year left the fawns unprepared for the winter (see Table 3 below). The second major impact to mule deer in Northwestern Nevada came in the winter of 1992-93 when stressed deer that had been sustaining lowered body conditions throughout the drought succumbed to near normal winter temperatures and precipitation which exceeded their endurance.

Pronghorn populations did not experience the same losses as mule deer populations, though their numbers did fluctuate. On the whole,

pronghorn throughout Humboldt County and Northern Nevada have been rapidly rising throughout the evaluation period.

Table 3- Hunt Unit 035 Mule Deer Fawn Recruitment

Sample period	fawns/100 adults	percent change
1994 spring	32.2	
1993 fall	49.6	- -35%
1993 spring	24.9	
1992 fall	34.4	-27.6%
1992 spring	8	
1991 fall	20	-60%
1991 spring	27	
1990 fall	58	-54%

California Bighorn Sheep

The Happy Creek Allotment also contains approximately 13.42% of Jackson Mountains BY-6. California bighorn sheep were established in the Parrot Peak area of the Jackson Mountain Range in 1983. The sheep were established as a result of the Jackson Mountains Bighorn Sheep Habitat Management Plan. While the initial release site was not within the Happy Creek Allotment, areas of suitable habitat do exist, and bighorn use of these suitable habitats has been increasing in recent years. Reliable estimates of actual bighorn sheep use of habitat in the allotment are not available. The following figures are for the Parrot Peak bighorn sheep herd, provided by NDOW for the years 1989-1994.

YEAR	NUMBER	AUMs
1994	40	96 AUMs
1993	37	89 AUMs
1992	35	84 AUMs
1991	34	82 AUMs
1990	33	79 AUMs
1989	31	74 AUMs

Sage Grouse

Strutting ground surveys in the Jackson Mountains in 1994 identified four new strutting grounds in the northern Bottle Creek Allotment. The crucial nesting areas for these strutting grounds fall within the Happy Creek Allotment.

c. Wild Horses

BACKGROUND

The Happy Creek Allotment lies in the northern portion of the Jackson Mountain Herd Management Area (HMA.) Only the southwest

portion of the Happy Creek Allotment lies within the Jackson Mountain HMA. The relationship between the Jackson Mountains HMA and the Happy Creek Allotment is depicted by Appendix 2.

Wild horses occupied the Jackson Mountain area at the time of the passage of PL-92-195. As such, they will be managed as an integral component of the ecosystem. Pursuant to PL-92-195 as amended and in accordance with subsequent regulations and directions the Jackson Mountain Herd Management Area (HMA) was identified and described. The intent of the law and regulations are interpreted to mean wild horses or burros may occupy any area identified as having provided habitat in 1971. This means that wild horses may occupy any area identified on the HMA map and referenced as Appendix 2, unless land use plan decisions provide other direction.

Two separate herds of wild horses occupy the Jackson Mountains HMA. The south herd; located within the Jackson Mountains Allotment and the north herd; located primarily within the Happy Creek Allotment. Movement between these two herds has not been documented.

AML's (Appropriate Management Levels) have been established in two allotments within the Jackson Mountains HMA: Deer Creek Allotment and the Jackson Mountains Allotment. The Deer Creek Allotment is used by a portion of the north herd being covered, at least in part, by this allotment evaluation.

DISTRIBUTION

Wild horses move between the Happy Creek Allotment, and Deer Creek, Wilder-Quinn and Bottle Creek Allotments. The relationship between these allotments is depicted by Appendix 3. Any discussion of wild horses in the Happy Creek Allotment would be incomplete

if the importance of adjacent allotments were not also discussed.

The Happy Creek boundary fence is not continuous so wild horse movement is generally around the end of fences or through breaks in the fences. It appears that the horses have adapted to the fences and move easily around them to seasonal use areas. Established horse trails into Deer Creek, Wilder-Quinn and Bottle Creek Allotments indicate movement has been habit for years and is not a recent response to population density. Due to the north population of horses moving freely between allotments, an analysis of data to establish an AML (Appropriate Management Level) must consider all horses and all allotments on the north end of the Jackson HMA. Happy Creek Allotment is the most significant portion of the horse use area but the other allotments are important to certain bands of horses. Distribution and census data since 1986 are presented as Appendix 3. Distribution data is obtained utilizing a fixed wing aircraft and is not an attempt to count all the horses. Census data is obtained with the use of a helicopter and is an attempt to count all the horses. The actual use by horses in the northern portion of the Jackson Mountain HMA is displayed in Appendix 5.

Competition between livestock and wild horses is low because the tend to concentrate in different areas within the allotment.

The map (Appendix 6) identifies known seasonal use areas and major routes used to move between allotments. Data was obtained from distribution flights and on the ground observations. The extent to which seasonal use zones are occupied depends upon the weather. During open winters horses may remain primarily in summer/fall use areas. However, distribution data and field observations indicate the bulk of the horses

using the Buff Peak area move down to the Buckbrush Spring area as early as August. This movement does not seem to be related to forage or water so it is not understood.

Key winter areas for the horses are around Buckbrush Spring and along the flats on the western boundary of the Happy Creek Allotment. A few horses move north and winter in the Wilder-Quinn Allotment. These horses stay south of the Paiute/Leonard Creek Road so they are within the HMA boundaries. Winter use areas were defined based on a distribution flight 1/18/93 where snow depth on the flats was estimated to be 12" to 24". This data was supplemented by observations based on the nature of the country and fecal material left by horses. The area around Buckbrush Spring is a critical wintering area. The remaining flats south and west of the Happy Creek Road are also used as winter range as weather conditions dictate. Wild horses have not been observed north and east of the Happy Creek Road.

Key spring/summer/fall areas are the Buff Peak area and the slopes along the western boundary extending into the Deer Creek Allotment. The area north of Bottle Creek to the Happy Creek Allotment boundary also used spring/summer/fall by selected bands of horses. Distribution flights indicate no use of Bottle Creek since 1989. On the ground observations indicate use of Bottle Creek yearlong. At least 20 horses have been using the area at least part of the time during the spring/summer of 1995. Old manure piles substantiate the conclusion that this area is used yearlong.

Distribution data indicate limited wild horse use of the upper Happy Creek area (Appendix 6). More recent observations support these conclusions. No evidence of horse use was found along the upper reaches of Happy Creek. Limited wild horse use was identified in the

basin above the private land and drift fence along Happy Creek.

Currently there are approximately 100 adult horses utilizing the northern end of the Jackson Mountains Herd Management Area. This number is based on the September 1994 census flight which identified 102 wild horses (adults and foals) on the north end of the Jackson Mountains. Movement among the allotments inhabited by this population is apparent through horse trails and seasonal variations in distribution. The general distribution of these 100 horses is: 60 head in Happy Creek Allotment, 20 head in Bottle Creek Allotment, 10 head in Deer Creek Allotment and 10 head in Wilder-Quinn Allotment. An AML of 10 horses has been established for the Deer Creek Allotment.

2. Climatological Data

The National Oceanic and Atmospheric Administration (NOAA) climatological station, Leonard Creek Ranch, is located approximately 18 miles west of Happy Creek Allotment. Precipitation data collected at that station are displayed below:

Precipitation
Monthly, Yearlong (Jan 1-Dec 31) and during Growing Season (Mar 1-Jun 30)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year-long	Mar-Jun
1983	1.30	1.48	2.64	0.71	0.20	1.44	0.01	1.94	1.49	0.49	1.91	4.13	17.74M	4.99M
1984	0.32	0.79	0.89	0.62	0.25	0.29	0.32	0.63	0.27	1.51	2.11	0.50	8.50	2.05
1985	0.39	0.73	1.20	0.04	0.05	0	1.09	0.10	1.13	M	1.59	0.50	6.82M	1.29
1986	0.49	2.80	1.35	0.83	0.72	0.47	0.48	1.00	0.93	0	0.15	0.38	9.60	3.37
1987	0.91	0.81	1.32	1.09	1.59	1.20	0.07	0.15	0	0.56	0.83	0.77	9.30	5.20
1988	1.52	0.26	0.30	1.67	0.09	0.56	0.14	0.18	0.33	0	1.53	1.53	8.11	2.62
1989	0.73	0.81	1.09	0.34	1.69	0.65	0	0.21	0.85	0.42	0.58	0.11	7.48	3.77
1990	0.28	1.15	0.47	1.86	1.55	0.02	0.21	0.56	0.53	0	0.12	0.44	7.19	3.90
1991	0.61	0.61	1.87	0.8	1.69	0.23	0.26	0.27	1.06	1.04	0.20	0.40	9.04	4.59
1992	0.07	0.81	1.00	0.26	0	0.70	0.40	0.02	0.03	2.00	0.76	1.77	7.82	1.96
1993	3.07	0.89	1.35	0.49	0.56	1.87	0.11	T	0.12	0.85	0.28	0.43	10.02	4.27
1994	0.12	1.71	0.67	0.52	0.95	0.00	0.01	0	0.25	0.18	1.81	2.09	8.31M	2.14

M- Insufficient data
1983 - Incomplete data for May
1985 - No data for October
1994 - Incomplete data for February

Precipitation and Deviation from Normal by Water Year				
Water Year Oct 1 - Sept 30	Total	Deviation from Normal (Total)	Mar-Jun	Deviation from Normal (Mar-Jun)
1982-1983	15.27M	M	4.99M	M
1983-1984	10.91	M	2.05	M
1984-1985	8.85	M	1.29	M
1985-1986	11.16M	M	3.37	M
1986-1987	7.67	M	5.20	M
1987-1988	7.21	M	2.62	M
1988-1989	9.43	M	3.77	M
1989-1990	7.74	M	3.9	M
1990-1991	7.96	M	4.59	M
1991-1992	4.93	M	1.96	M
1992-1993	12.99	M	4.27	M
1993-1994	5.79M	M	2.14	-0.75
M- Insufficient data 1983 - Incomplete data for May 1985 - No data for October 1994 - Incomplete data for February				

3. Utilization Data

Utilization studies were conducted with the following use ratings of the current year's growth:

Use Rating	Percent Utilization
No use	<1%
Slight	1-20%
Light	21-40%
Moderate	41-60%
Heavy	61-80%
Severe	81-100%

There are three use areas within the Happy Creek Allotment which are 1) the area north of Highway 140, 2) the area south of Highway 140 and 3) the upper Happy Creek area. Livestock use occurs on all three areas. The areas north and south of the highway are not separated by fencing and livestock drift between these areas occurs. Wild horses do not occupy the area north of the highway and do inhabit the area south of the highway and the upper Happy Creek area. The upper Happy Creek area is separated from the area south of the highway by drift fences which tie into fenced privately owned land along Happy Creek.

Livestock actual use by use area is available for 1992, 1993 and 1994. Prior to 1992 actual use data was not reported by use area and only allotment-wide actual use is available. Actual use by wild horses displayed is the use on the northern portion of the herd management area. Horses move between the allotments within the northern portion of the herd management area and actual use is not distinguishable by allotment.

Please note that additional discussion of utilization is included in the Wildlife Habitat Evaluation and Riparian/Fisheries sections of this evaluation (see page 35).

1987

Actual use by cattle and wild horses **at the time utilization data was collected** follows:

Area of Use	No.	Kind	Period of Use	AUMs
Allotment-wide	836	cattle	04/01/87 to 08/13/87	3710
	18	cattle	09/01/87 to 09/09/87	5
			Subtotal	3715
HMA (northern)	112	horses	03/01/87 to 09/09/87	711
			Total for cattle and horses	4426

Notes- 1) Utilization data was gathered 09/09/87.
2) No actual use report was provided for 1987. The above livestock use is licensed use and is not available by area of use. The gap in grazing (between 08/13 and 09/01) is a result of authorization of exchange-of-use grazing only

during that time period. No active use occurred during that time period.

Utilization was documented in 1987. Use pattern mapping was not completed. Areas observed were those in the vicinity of the road beginning above Happy Creek (at SW¼NW¼, Sec. 15, T40N, R32E), proceeding north and northeast to Happy Creek Ranch.

Riparian areas received heavy to severe use - this included the springs, tributaries and unfenced private land along Happy Creek itself. Key Species noted in riparian areas were Kentucky bluegrass, Nevada bluegrass and foxtail barley. Great Basin wildrye was observed in low density and received moderate use. Other key upland species included Sandberg's bluegrass, squirreltail and bluebunch wheatgrass. Slight to no use was evident on steeper and rocky slopes and light to moderate use was observed on other upland areas.

Use of the low lying areas of greasewood and rabbitbrush near the ranch appeared to have light use only. Cheatgrass was dominate grass in that section of the field.

1992

Actual use by cattle and wild horses **at the time utilization data was collected** follows:

Area of Use	No.	Kind	Period of Use	AUMs
South of Highway	354	cattle	04/01/92 to 06/17/92	908
	174	cattle	06/18/92 to 08/01/92	257
	15	cattle	08/02/92 to 09/08/92	19
			Subtotal	1184
Upper Happy Cr.	180	cattle	06/18/92 to 08/01/92	266
	61	cattle	08/02/92 to 09/08/92	76
			Subtotal	342
North of Highway	272	cattle	11/13/92 to 12/21/92	349
HMA (northern)	73	horses	03/01/92 to 02/28/93	876
			Total for cattle and horses	2751

Notes- 1) Utilization data was collected 03/16/93 and 04/14/93.
2) Utilization data was not collected for the Upper Happy Creek area in 1992.

South of the highway use pattern mapping at the end of the grazing year showed no detectable use on most of the area examined. Accurate assessment of utilization could not be made in some areas where Sandberg's bluegrass is the main forage. Heavy winter snow broke fragile Sandberg's bluegrass plants and discerning that breakage from grazing use was very difficult. Light use was found on portions of the area north of Buff Peak. Heavy use was observed on Thurber needlegrass and Sandberg bluegrass throughout the area west of Bottle Creek Road and north of the Bottle Creek Allotment boundary fence (approximately 780 acres). There was wild horse sign throughout the area. Eleven antelope were observed within the area and tracks were observed scattered throughout the area.

North of the highway, two areas with moderate use by cattle were found. One area had light to moderate use on bud sage and spiney hopsage. The other showed moderate use on Thurber needlegrass, Indian ricegrass Sandberg's bluegrass and squirreltail, with light to moderate use on winterfat.

1993

Actual use by cattle and wild horses **at the time utilization data was collected** follows:

Area of Use	No.	Kind	Period of Use	AUMs
South of Highway	286	cattle	03/27/93 to 03/31/93	47
	294	cattle	04/01/93 to 06/24/93	822
	227	cattle	06/25/93 to 07/29/93	261
			Subtotal	1130
Upper Happy Cr.	17	cattle	06/25/93 to 07/29/93	20
HMA (northern)	77	horses	03/01/93 to 07/29/93	382
			Total for cattle and horses	1532

Notes- 1) Utilization data was collected 07/29/93 and 08/04/93.
2) Data collected north of the highway reflects use by cattle that drifted from the area south of the highway. Use north of the highway is predominately from winter use and that use is not displayed in this section of the evaluation because data reflecting winter use was not collected in 1993.

Following spring-summer grazing, use pattern mapping showed slight use on the area north of the highway except in the vicinity of Kings River Well, which had light use. Use was also slight south of the highway on the east side of the allotment. Key species in these areas included Indian ricegrass, needle and thread, Great Basin wild rye, Sandberg bluegrass, shadscale and greasewood. This use was the result of cattle use. Horses make very little or no use of this area.

Use of the southernmost area, which includes the upper reaches of Happy Creek, showed slight use on most of the area on Thurber needlegrass and

bluebunch wheatgrass. Moderate use on squirreltail occurred at the lower elevations adjacent to fenced private land and ranged from light to slight on other areas. Heavy use of Poa sp. and sedge occurred in some streambank and wetland riparian areas. Use on bitterbrush was moderate at the lower elevations and slight at the higher elevations. Use in this area was the result of grazing by cattle and horses. Mule deer also use the area.

1994

Actual use by cattle and wild horses **at the time utilization data was collected** follows:

Area of Use	No.	Kind	Period of Use	AUMs
South of Highway	300	cattle	04/01/94 to 04/12/94	118
	323	cattle	04/13/94 to 05/17/94	372
	106	cattle	05/18/94 to 07/12/94	195
	323	cattle	07/13/94 to 07/29/94	181
	273	cattle	07/30/94 to 07/30/94	9
	190	cattle	08/01/94 to 08/01/94	6
			Subtotal	881
Upper Happy Cr.	217	cattle	05/18/94 to 08/01/94	542
HMA (northern)	80	horses	03/01/94 to 08/17/94	447
			Total for cattle and horses	1870

Notes- 1) Utilization data was collected August 10, 11 and 24 (mid-point August 17).
2) Utilization data reflects spring and summer use. Use north of the highway is not listed in this section of the evaluation because that area is predominantly winter use.

SOUTH OF THE HIGHWAY

Evidence of cattle use (tracks and droppings) was limited in the area east of Happy Creek except in the vicinity of the windmill located about two miles northwest of Happy Creek Ranch. Approximately 50 cattle were observed at that windmill on August 10 and were removed a few days later. The windmill is on a salt brush flat with very limited perennial grasses in the area. Only slight utilization observed. Three other cattle were also seen in other areas. Use was slight

over most of the area and was slight to moderate on all upland areas observed except in the immediate vicinity of water sources.

Utilization at springs follows:

1) Small areas of heavy use occurred at and in the vicinity of the spring located at NW¼SW¼, Section 29, T41N, R32E, on crested wheatgrass, Polypogon sp., Poa sp., Salix sp., and Wood's rose.

2) Small areas of heavy use also occurred on chokecherry at the spring at N½NE¼, Section 31, T42N, R32E. The area around the trough was powdered and devoid of vegetation. Powdered trails occurred leading away from the springs. Tracks and droppings indicated some cattle use, primarily use was by horses.

3) Utilization of Wood's rose was moderate at the spring located at SW¼SE¼, Section 30, T41N, R32E. This area appears to have been burned in the past and seeded to crested wheatgrass. The area was used by cattle and horses.

4) Use was slight on Salix sp. at the spring at NE¼NW¼, Section 6, T41N, R32E. The area around the trough was powdered and devoid of vegetation. Powdered trails occurred leading away from the springs. Use was primarily by horses as indicated by tracks and droppings. No recent cattle sign was observed, however some use by cattle probably occurred earlier in the spring.

The livestock manager has observed that when cattle are turned out at the beginning of April, they tend to use the slopes. Primary upland perennial grasses include squirreltail, Thurber needlegrass, Sandburg bluegrass and Great Basin wildrye. He reported that from the beginning of May through mid-June cattle move down to the flats and utilize the greasewood.

UPPER HAPPY CREEK AREA

Utilization ranged from moderate to heavy on the lower elevation upland areas with primarily slight utilization on the higher slopes (approximately 130 acres heavy use). Utilization at and adjacent to springs in Sections 9, 10 and 16 was heavy. Hummocks have formed in some riparian areas. Regrowth of herbaceous vegetation has occurred on wet areas. Young sagebrush in meadow areas indicates a trend of reducing the size of the meadows in some places. Utilization of bitterbrush was high moderate (60%). Utilization of 1-2 year old aspen was severe. Little use was observed on older trees. Both cattle and horses use this area. Cattle appear to be having a greater impact than horses on the springs as indicated by tracks and droppings.

The uplands adjacent to Cricket Spring had slight use and no cattle sign. The spring and immediate area was denuded of vegetation. Horses were present. There was no cattle sign observed. The willow and mature cottonwood on Happy Creek showed little (slight) use. However, portions of the tributaries to the fork have larger areas of herbaceous riparian vegetation that received heavy use and showed a lack of reproduction on cottonwood. Utilization of serviceberry was light. Horse use appears to be limited in this area.

Utilization was also documented in the Upper Happy Creek Area on 06/29/94 as follow:

Utilization rates were measured by twig count on three representative bitterbrush plants. Utilization levels on those three representative plants were found to be 60, 80, and 90% on current years growth (utilization data was collected 06/29/94). The growth form of the plants observed, which is an indication of past levels of use, indicated similar use levels have been common in the study area.

Utilization of serviceberry plants observed was estimated to be heavy, as indicated by the growth form, which was not normal for the species. Observations of serviceberry plants outside the study area indicated similar age and form classes. Older plants which have apparently been present in the area for a long time had

a characteristic "mushroom" shaped appearance which is an indication of heavy use over a long period.

4. Trend

Frequency trend data is not available for the Happy Creek Allotment. The Paradise-Denio EIS (1982) indicated an apparent downward trend.

Young sagebrush in meadow areas indicates a trend of reducing the size of the meadows in some places.

5. Range Survey Data/Range Condition Data

a. A Phase I Watershed Inventory was conducted between 1971 and 1974. Livestock forage condition was determined based upon data extrapolation and computations from this inventory. This data extrapolation resulted in the following condition classification for the Happy Creek Allotment:

Good Condition	Fair Condition	Poor Condition
0 acres	1912 acres	93,654 acres

Appendix G, pg 28, of the Paradise-Denio EIS provides more discussion on livestock forage condition.

In general, observations indicate the flats are in poor condition, the lower slopes are in poor/fair condition, the upper slopes in fair condition and the steep rough slopes are in good condition. Range conditions in most of the area used by the horses as winter range is poor/fair. This use is in the area identified as wild horse winter range. Most of the flats appears to have received heavy historical use. The visually dominant spring plant in 1995 was bur buttercup (Ranuculus testiculatus). This is an invader species well adapted to disturbed sites and this plant is indicative of heavy historical use. Due to the timing of wild horse use in this area, when the plants are dormant, it is not believed the wild horse has contributed significantly to poor range condition on the flats.

b. In 1978 a range survey was conducted using the Ocular Reconnaissance Method to provide baseline data of analysis purposes in the Paradise-Denio EIS. This survey, along with suitability criteria, indicated that 1,672 AUMs were available in 1978 for livestock and wild horses on Happy Creek Allotment.

6. Ecological Status

The soil survey (order 3) has been completed on the Happy Creek Allotment. Ecological Status Inventory has not been completed on this allotment.

7. Wildlife Habitat Inventory

a. Priority species: Mule deer, bighorn sheep, and sage grouse.

b. Other species: Chukar, Hungarian partridge, California quail, and pronghorn.

c. Special Habitat Features

A special habitat features inventory was conducted in September and October of 1977. This inventory identified locations and acres of special habitats, listed observed plant and wildlife species, and documented ocular observations of the condition and utilization of these habitats. This information was analyzed in the Paradise-Denio EIS.

1) Woody riparian and meadow habitat-463 acres exclusively in the southern portion of the Happy Creek Allotment.

2) Curlleaf mountain mahogany-336 acres located primarily in the upper elevations in the southern mountainous portion of the allotment.

3) Serviceberry-41 acres identified as a component of the upland communities along both the east and west forks of Happy Creek.

4) Bitterbrush-identified as a component in several ecological sites throughout the mid and upper elevations of the southern portion of the allotment.

8. Wildlife Habitat Evaluation

The dominant type of habitat in the Happy Creek Allotment is yearlong mule deer and pronghorn range primarily located in the allotment south of US highway 140. Winter and yearlong range is critical to the maintenance of healthy big game populations due to the crucial role these habitats play in determining reproductive health of adults and first year survival rates for yearlings.

Mule Deer

DS-HC-02 was established in the Jackson Mountains DY-18 use area and represents the majority of the yearlong habitat in the lower Happy Creek basin. This study established baseline cover, species composition, and browse age and form class data. Table 4 summarizes the findings of the key area.

Table 4. Summary of Data Collected at DS-HC-02 (loamy 10"-12" range site) in the Happy Creek Allotment October, 1993.

Key area Season of Use Use area	Mule Deer Forage Preference Value		%Composition Line Intercept Method	*Species Encountered (Sp.Richness)	Canopy Cover (Artem*/Total)	Cover Height (in.) Average value
DS-HC-02	1.0	good	PUTR2 2.5	11	13.9/23.4	38.4
deer winter	0.5	fair	ARTRV 62.9			
JMDY-18	1.0	good	AMEL 16.7			
	0.5	fair	CHRYS 12.6			
	0.5	fair	LUPIN 0.4			
	1.0	good	POSE 28.3			
	0.1	poor	COLLO 0.1			
	0.5	fair	SIHY 2.8			
	0.1	poor	PHLO 1.6			
	0.5	fair	BRTE 0.1			
	0.1	poor	COPA3 0.1			

The deer yearlong habitat analyzed by DS-HC-02 is a sagebrush/grass dominated community with interspersions of other quality deer winter forage species such as bitterbrush and serviceberry. This habitat type is also interspersed with a mosaic of low sage communities limited mostly to the tops of hills. Elevations in this habitat type range from 4,400 to 5,000 feet. Thermal cover is of high quality, dominated by vegetation, with isolated areas of good topographical

cover. Average vegetation height is approximately three feet on the uplands and slightly higher in drainage bottoms. The vegetation of the area is a mixture of species with respect to mule deer preference, 80% of which are rated as good or fair mule deer winter forage.

Two species, bitterbrush and serviceberry, were selected as the key browse species for the area and were rated as poor for age and form class. Age class observations are made to determine the condition and trend of the stand with respect to regeneration. Form class is an observation of the availability of a plant relative to current and past use which has a direct impact on the productivity of the plant and would limit efficient mule deer utilization of the plant. Data can be collected by ocularly estimating or measuring the degree of current and past utilization made on the plant by browsing.

Bitterbrush age distribution was limited in the study area. Only 19% of plants sampled were other than mature or decadent. Of these, none were seedlings. Utilization rates were measured by twig count on three representative plants. Utilization levels on those three representative plants were found to be 60, 80, and 90% on current years growth (utilization data was collected 06/29/94). The growth form of the plants observed, which is an indication of past levels of use, indicated similar use levels have been common in the study area.

Serviceberry age distribution was also lacking, with mature plants making up 100% of the sample. Only nine representative plants could be located within the sample area, therefore, sample size may have contributed to the deficiency in age class distribution. Utilization of the plants observed was estimated to be heavy, as indicated by the growth form, which was not normal for the species. Observations of serviceberry plants outside the study area indicated similar age and form classes. Older plants which have apparently been present in the area for a long time had a characteristic "mushroom" shaped appearance which is an indication of heavy use over a long period. These observations, which were made at the beginning of

the normal mule deer use period, indicate that the primary user of key browse species in the study area is livestock. The normal deer use period is winter (October through April).

The study area was also evaluated to determine what impact disturbance may be having on mule deer use of the area during the season of use. Factors which play a key role in this determination include fire, human access, and livestock use during the period of use. These three factors have a minimal impact on the habitat in the study area, resulting in a disturbance rating of good.

Water availability is of critical importance in summer ranges, but is not evaluated on winter habitat due to the presence of isolated snow pockets on north facing exposures, lowered water needs by deer (associated with decreased maximum daytime temperatures), and higher forage moisture levels. The final habitat condition rating for mule deer winter range in the Jackson Mountain DY-18 use area in the Happy Creek Allotment is good (raw score of 77).

California Bighorn Sheep

Bighorn sheep habitat has not been monitored in the Happy Creek Allotment. Population estimates for the Parrot Peak herd had indicated steady, though slow, growth. Population growth is one indication of overall habitat condition and the continued growth suggests habitat conditions are good. As the population reaches carrying capacity, deficiencies in habitat will become more apparent.

Pronghorn

Antelope have been expanding their range in recent years and have begun using the Happy Creek Allotment, to a limited degree, on the lower elevation areas of the northern and eastern areas. Primary habitat use in these areas, by antelope is in winter. AW-HC-01 was tentatively established in the allotment to monitor winter habitat condition and trend, but data was not collected at the site due to accessibility problems caused by muddy conditions at the time of evaluation.

Data to assess antelope habitat condition will be collected by the next evaluation.

Sage Grouse

The Western States Sage Grouse Committee, 1974 presents a comprehensive guide to habitat requirements for sage grouse in Guidelines for Habitat Protection in Sage Grouse Range (Report). In this report, habitat conditions observed most frequently, and which resulted in the highest success for sage grouse strutting, nesting, brood rearing, and wintering ranges in the west are summarized.

The following criteria were found to sustain the highest levels of use and success by sage grouse:

Strutting Habitat

Low sagebrush or brush free areas for strutting, and nearby areas of sagebrush having 20-50% canopy cover for loafing.

Nesting Habitat

1. Areas within 2 miles of strutting grounds.
2. Sagebrush between 7 and 31 inches in height (optimum = 16 inches).
3. Sagebrush canopy coverage 20-30% (optimum = 27%).

Brood Rearing Habitat

1. Sagebrush canopy cover 10-21% (optimum = 14%)
2. High composition of forb species
3. Vigorous-available meadow vegetation in late summer and fall.

Winter Habitat

1. Greater than 20% sagebrush canopy cover

2. Areas do not maintain high winter snow depth as a function of elevation of topography.

In addition, there are various literature sources which indicate the importance of good understory growth beneath and surrounding the nest bush. Understory cover helps to conceal the nests from predation from the air and creates a microclimate around the nest which is warmer than the ambient air temperature. Therefore, key areas which are identified as potential nesting habitat will also be evaluated relative to the abundance of understory cover beneath and surrounding sagebrush.

Field methods to measure understory nesting cover have not been developed for the Happy Creek Allotment to date, therefore, the evaluation of understory nesting cover will be limited to whether it is present or not. Specific studies evaluating the understory ground cover and/or understory vegetation height will be developed and established during the next evaluation period on the Happy Creek Allotment, and should allow a better analysis of understory nesting cover.

Optimum sagebrush canopy coverage, as indicated in BLM Technical Note; "Habitat Requirements and Management Recommendations for Sage Grouse" (1979) for high quality nesting and brood rearing habitat, is approximately 30%. This recommended sagebrush canopy coverage is not present at the key area.

It is unclear whether the vegetation communities sampled by the key areas are capable of obtaining the recommended sagebrush canopy coverage for nesting and brood rearing habitat. Passey et.al (1982) in: "Relation Between Soil, Plant Communities, and Climate on Rangelands of the Intermountain West", while working in the Sagebrush Steppe eco-region, found that **total** vegetative canopy coverage under Potential Natural Community conditions, in Big Sagebrush communities ranged from eight to twenty four percent with an average plant cover of seventeen percent. Review of the Range Site Description for the community sampled by the key area indicated that total plant cover possible for the site was 30-45%. Given this range of total plant cover, the probability of sagebrush reaching a ground cover of 30% is low.

Specific sage grouse habitat condition studies have not been established. Forage condition and vigor, "edge", forage diversity (species richness), and forb composition are factors known to be of critical importance in habitat selection behaviors in sage grouse. The studies data collected from DS-HC-02 is, however, suitable for the assessment of sage grouse habitat condition on the Happy Creek Allotment. This study's data was evaluated with respect to the criteria identified above.

DS-HC-02 is in a sagebrush dominated community representing habitats in the lower Happy Creek basin between the elevations of 4,400 and 5,000 feet. Species richness and forb composition are rated fair. Sagebrush canopy cover is fourteen percent, and average vegetation height is thirty-eight inches. Water is relatively abundant in the lower Happy Creek basin, and understory nesting cover is present. The habitat represented by DS-HC-02 is not well suited for nesting or strutting use by sage grouse due to vegetation height which exceeds the maximum recommended values for both strutting and nesting habitat use.

Brood Rearing Habitat Quality

The habitat parameters for quality brood rearing habitat are all present in the habitat area represented by DS-HC-02. Sagebrush canopy cover is at optimum.

Forb composition is somewhat limited, and detracts from the overall brood rearing habitat rating by pushing grouse broods onto the surrounding meadow habitats early on in the summer use period. There are, however, several nearby wet meadow areas within the habitat area which could potentially support sage grouse broods through the period when sage grouse would be dependent on forbs. Utilization measurements taken in 1993 indicated heavy use on these sites however, and result in a final sage grouse brood rearing habitat quality estimate of fair.

Winter Habitat Quality

Winter habitat quality in the area represented by DS-HC-02 is estimated to be fair. Sagebrush canopy cover is approximately seven percent less than optimum. Winter snow depth in this area is not generally considered limiting to forage availability.

9. Riparian/Fisheries

Functioning Condition

Inventory has not been conducted to determine the functioning condition of riparian-wetland areas within Happy Creek Allotment.

Happy Creek

Happy Creek was first surveyed by the BLM in 1976 and again in 1992. NDOW surveyed the system in 1989. Data on habitat parameters was collected for all three surveys, while fish population data was collected in 1989. Hybrid trout (cutthroat x rainbow) were the only fish species found in Happy Creek during the 1989 survey. Similar fish were observed in pools located within a short high gradient reach of Happy Creek in 1992. In addition to the hybrid trout, brook and rainbow trout were encountered in 1957 by NDOW. Operators of the Happy Creek Ranch reported observing trout at a diversion structure in the spring of 1992. This structure is located about three miles upstream from the ranch.

Stream Habitat Conditions

A comparison of changes in percent habitat optimum and the riparian condition class between 1976, 1989, and 1992 show that habitat conditions have remained the same at fair (Table 1). Major limiting factors on public land portions include declining pool-riffle ratios (fair), a near absence of quality pools, and poor bank cover.

Results of the 1992 stream survey indicated that the lower reaches of Happy Creek were in very poor condition. These conditions combined with the sixth consecutive year of drought have resulted in a dry stream channel for most of the year. The stream channel has downcut in several locations with very little riparian vegetation present.

Table 1. Changes in stream and riparian habitat condition ratings for Happy Creek between 1976, 1989 (NDOW), and 1992. Data are shown for the public land portion of the stream.

Year of Survey	% Optimum	HCI
Stream Habitat Condition		
1976 (BLM)	53	
1989 (NDOW)		56
1992 (BLM)	50	
Riparian Condition Class		
1976 (BLM)	51	
1992 (BLM)	51	

Because Happy Creek is a fairly high gradient stream, this system is prone to erosion problems (during average or greater rainfall seasons) in the absence of a healthy, vigorous riparian zone. Severe erosion in the form of downcutting and mass wasting of streambanks are occurring in both the lower and a few upper reaches as a result of a deteriorating riparian zone combined with the effects of record flooding in 1983 and 1984. Bank cuts of six to eight feet are common.

Heavy browsing of young willow and cottonwood is preventing regeneration of woody species. The continued moderate to heavy use will soon result in the complete loss of willow and cottonwood.

1992 BLM Stream Survey

Conditions vary on Happy Creek depending on land use practices, wild horse use, and natural geomorphic features. Lower reaches showed poor quality riparian areas with little to no stream flow. A 1/2 to 3/4 mile section of the middle reach was high gradient with a few quality pools, large boulders, and good cover. These natural features appear to be preventing livestock and horse access to the stream/riparian area as was evidenced by improved stream conditions. The upper reaches of Happy Creek had wide and shallow streamflow, some bank cutting, and fair canopy cover. Bank trampling and overuse of riparian forage by livestock are a major contributor to the less than satisfactory stream conditions.

A review of actual use records for this area shows grazing has been from the first of April through the end of July. This indicates that there has been grazing during part of the hot season since 1989. Woody riparian vegetation, critical for stabilizing bank and channel cutting, is being severely browsed in lower reaches and moderately browsed in upper reaches of Happy Creek.

9. Water Quality

No water quality data was collected during the evaluation period.

V. Conclusions

A. Short Term Objectives

1. OBJECTIVE

The objective for utilization of key species on streambank riparian habitat on Happy Creek is 30%.

CONCLUSION

This objective has not been met on portions of Happy Creek.

While willow and mature cottonwood showed little use in 1994 at mid-elevations, heavy use of herbaceous vegetation was observed in some areas. In 1993 heavy use of Poa sp. and sedge was observed in some riparian areas in the upper Happy Creek area. During stream survey in 1992 severely browsed woody riparian vegetation was observed in the lower reaches of Happy Creek and woody vegetation was moderately browsed in the upper reaches. In 1987 heavy to severe use was observed on springs, tributaries and unfenced private land along Happy Creek (key species- Kentucky bluegrass, Nevada bluegrass and foxtail barley).

Failure to meet this objective appears to be primarily the result of grazing by cattle.

2. OBJECTIVE

The objective for utilization of key species on wetland riparian habitat is 50% utilization.

CONCLUSION

This objective has not been met on several wetland riparian habitats within the allotment.

In 1994 this objective was met at two out of four springs in the hills on the west side of the area south of the highway. Where the objective was not met, heavy use occurred on Polypogon sp., Poa sp., willow, Wood's rose and chokecherry. While both cattle and wild horses utilize the area, tracks and droppings suggest use was predominantly by horses. In the upper Happy Creek area heavy utilization was observed at several springs. While both cattle and wild horses use these springs, tracks and droppings suggest that use was predominantly by cattle.

In 1993 heavy use of Poa sp. and sedge was observed in the upper Happy Creek area. In 1987 heavy to severe use was observed on springs, tributaries and unfenced private land along Happy Creek. Use was by cattle and wild horses.

3. OBJECTIVE

The objective for utilization of key species on upland habitat is 50%.

CONCLUSION

This objective has been met over the great majority of the allotment. However, it has not been met in two areas which include 1) the basin at the lower elevations of the upper Happy Creek area and 2) the area west of Bottle Creek Road and north of the Bottle Creek Allotment boundary fence.

Within the basin, utilization of 1-2 year old aspen was severe in 1994. Utilization of bitterbrush was 60%. During evaluation of mule deer habitat utilization of three representative bitterbrush plants was found to be 60%, 80% and 90% Utilization of serviceberry was estimated to be heavy. The observations made during mule deer habitat evaluation were made at the beginning of the normal mule deer use period indicate that the primary user was livestock and/or wild horses. Heavy utilization was documented on approximately 130 acres adjacent to the gate into the area.

Within the area west of Bottle Creek Road heavy use was documented on Thurber needlegrass and Sandberg bluegrass. There was horse sign throughout the area suggesting the use resulted from wild horse use. However, cattle also had access to the area.

B. Long Term Objectives

1. OBJECTIVE

Manage, maintain and improve public rangeland conditions to provide forage on a sustained yield basis for big game, with an initial forage demand of 262 AUMs for mule deer and 38 AUMs for bighorn sheep.

a. Improve to and maintain 5,341 acres of Jackson Mountain DS-8 in good or excellent mule deer habitat condition and 756 acres of Quinn River DY-6, 6,637 acres of Bilk Creeek DY-9, and 16,391 acres of Jackson Mountain DY-18 in fair to good habitat condition.

b. Improve to and maintain 5,792 acres Jackson Mountain BY-6 in good to excellent bighorn sheep habitat condition.

c. Improve to and maintain 3,419 acres of Buff Peak PS-12, 9,204 acres of Bilk Creek PW-14, and 18,326 acres of Jackson Mountain PY-13 ranges in good or excellent pronghorn habitat condition.

CONCLUSION

This objective was met with respect to mule deer habitat condition. Evaluation of habitat condition at Key area DS-HC-02 found mule deer habitat in the Jackson Mountain DY-18 use area to be in good condition. The primary limiting factor for habitat represented by the key area is livestock utilization of key browse species. Trend cannot be determined at this time due to limited data.

Studies were not established to evaluate the condition and trend of bighorn sheep habitat on the allotment. Population growth rates since establishment of the Parrot Peak herd in 1983 suggest that significant conflicts with livestock are not occurring at this time.

Age and form class observations for bitterbrush and serviceberry indicate that progress is not being made toward attainment of good condition stands in the lower Happy Creek basin.

2. OBJECTIVE

Manage, maintain and improve public rangeland conditions to provide forage on a sustained yield basis for livestock, with an initial stocking rate of 3,724 AUMs.

CONCLUSION

Heavy utilization on some areas is expected to result in a decline in range condition and forage production if that use continues. Under current management many riparian areas receive heavy use while large areas of upland vegetation receive slight use. Under current management a stocking rate of 3,724 AUMs is not expected to be sustained.

In addition, wild horse numbers have been increasing. Horses and cattle have similar forage preferences.

3. OBJECTIVE

Improve range condition from poor to fair on 93,654 acres and from fair to good on 1,912 acres.

CONCLUSION

Ecological Site Inventory has not been conducted on Happy Creek Allotment. This objective will be redefined/quantified utilizing desired plant communities as information becomes available.

4. OBJECTIVE

Maintain and improve free roaming behavior of wild horses by protecting and enhancing their home ranges.

CONCLUSION

The Happy Creek Allotment boundary fence is not continuous so wild horse movement is generally around the end of fences. It appears that the horses have adapted to the fences and move easily around them to seasonal use areas.

5. OBJECTIVE

Improve or maintain 463 acres of riparian and meadow habitat types in good condition with maximum species diversity, reproduction and recruitment for maintenance of herbaceous and woody species.

CONCLUSION

Failure to meet the short term objective for utilization of key species on wetland riparian habitat indicates that progress towards meeting this objective is not occuring in those areas. In addition, sagebrush encroachment into some meadows also indicates progress is not being met in those meadows.

6. OBJECTIVE

Improve or maintain 336 acres of mountain mahogany habitat in good condition by allowing for successful reproduction and recruitment in the stand.

CONCLUSION

Data was not collected to evaluate the attainment of the objective for Mahogany habitats. Observations of bitterbrush and serviceberry utilization (see below) suggests that mahogany types, which are limited to high elevation areas in the allotment, are not being significantly impacted by livestock or wild horses.

7. OBJECTIVE

Improve or maintain bitterbrush and 41 acres of serviceberry maximizing reproduction in the community.

CONCLUSION

The objective for maintenance of good condition bitterbrush and serviceberry stands was not met at the lower elevations. Age and form class data gathered at DS-HC-02 indicated heavy and severe use had occurred during the 1993 grazing season. Form class observations based on the Cole Browse Method indicated that heavy and severe use has occurred regularly in the study area. Use pattern mapping data in other areas in the allotment indicated that bitterbrush in higher elevations had not been subjected to the same pattern of use as was observed at the key area on stands of bitterbrush and serviceberry were meeting the objective. This evidence of little or no use in summer deer range, and heavy and severe use on deer winter range, which was measured at the close of the summer livestock use period suggests that livestock are the principle contributor to the non-attainment of the bitterbrush/serviceberry objective.

8. OBJECTIVE

Protect sage grouse strutting grounds and brooding areas. Maintain a minimum of 30% canopy cover of sagebrush for nesting and winter use.

CONCLUSION

The objective for canopy cover was not met, however, based on other documentation, it can be concluded that maintenance of 30% canopy cover is not the only consideration. The attainability of 30% canopy cover is also questionable.

Sage grouse brood rearing habitat was estimated to be of fair quality with the primary limiting factors being overuse of the upland meadow sites by livestock and a lack of forbs as a component of the understory community in the uplands. These two factors significantly impact the available annual forage resource for both young and adult birds during the summer when they are heavily dependent on forbs and result in a significant reduction of habitat quality. Winter habitat quality was estimated to be fair with the major limiting factor being deficient sagebrush canopy cover.

Based on these findings, the objective for protection and maintenance of strutting, nesting, brood rearing, and wintering habitat has been met.

9. OBJECTIVE

Improve to or maintain the following stream habitat conditions from 50% on Happy Creek to an overall optimum of 60% or above.

a. Streambank cover to 60% or above.

b. Streambank stability 60% or above.

c. Maximum summer water temperatures below 70 degrees Farenheidt.

CONCLUSION

Results of the BLM and NDOW stream surveys show little improvement in overall stream conditions over the past 17 years. While stream conditions were not evaluated in 1992 for the lower reaches of Happy Creek due to intermittent stream flow, observations indicated that channel parameters have not improved. Stream conditions for the remainder of Happy Creek are currently fair at 50%. Riparian habitat conditions are also fair at 51%. Downcutting is continuing in several locations and unless riparian vegetation is allowed to recover and stabilize the system, the stream will become increasingly less suitable for the existence of trout and potential recovery of Lahontan cutthroat trout. Therefore, the cover and stability portions of this objective have not been met.

Stream temperature was not measured in 1992. The 1989 NDOW survey documented stream temperatures averaging 56.9 degrees Farenheit with temperatures fluctuating between a maximum of 70 degrees and a minimum of 49 degrees. Mmaximum summer water temperatures occur in August rather than September when this data was collected. The temperature portion of this objective probably has not been met.

10. OBJECTIVE

Improve to and maintain water quality of perennial reaches of Happy Creek to the state criteria set for the following beneficial uses: stockwater, cold water aquatic life, water contact recreation and wildlife propagation.

CONCLUSION

Water quality data has not been collected from Happy Creek.

VI. Technical Recommendations

Alternative 1

Under this alternative no changes in management of livestock or wild horses would occur except that numbers of animals would be reduced to a level that would be expected to allow objectives to be met.

Under this alternative 1471 AUMs would be available for livestock and wild horse with either 1) 1324 AUMs available for livestock and 147 AUMs available for wild horse (AML would be 12 horses) or 2) 871 AUMs available for livestock and 600 AUMs available for wild horses (AML would be 50 horses).

CALCULATION OF STOCKING RATE THAT WOULD BE EXPECTED TO RESULT IN MEETING OBJECTIVES

Calculations were based upon the following:

1. While utilization objectives were met on the great majority of the areas where data was collected, objectives were not met on parts of the allotment including on some riparian areas and on part of the wild horse winter range. Therefore, since under this alternative no other management would be implemented to assist in meeting those objectives, stocking levels would be reduce to a level that would allow utilization to be met.

2. Although wild horses and cattle tend to concentrate in different areas, both wild horses and cattle occupied areas where objectives where not met. A precise measurement of the amount of forage harvested by cattle relative to the amount harvested by wild horses in those areas is not available. Therefore, actual use by wild horses and by cattle at the time data was collected was used to calculate stocking rates.

3. Desired stocking rates were calculated for each year utilization data was collected using the following formula:

$$\frac{\text{Actual Use (AUMs)}}{\text{Actual Utilizations}} = \frac{\text{Desired Stocking Rate (AUMs)}}{\text{Desired Utilization}}$$

The results of those calculations were averaged to yield the stocking rate that would be expected to result in meeting objectives.

These calculations are displayed on the following table:

Calculation of Stocking Rate				
Year	Actual Use (AUMs)	Actual Util. (%)	Desired Util. (%)	Desired Stocking Rate (AUMs)
1987	4426	90	50	2459
1992	2751	70	50	1965
1993	1532	70	30	657
1994	1870	70	30	801
Average Desired Stocking Rate				1471

As shown above, the calculations resulted in a stocking rate of 1471 AUMs.

APPORTIONMENT OF AVAILABLE AUMS

Under this alternative 1471 AUMs are available for livestock and wild horses. Two methods of apportioning the forage are presented under this alternative. The first utilizes the land use plan proportions of 35 head of horses (420 AUMs) and 3724 AUMs livestock use. These were the starting points for monitoring identified in land use plan. The second method considers 50 horses a minimal, viable herd size, provides those AUMs for horses and allows the balance for livestock use.

Using the starting points for monitoring identified the land use plan, 90% of the available forage would be apportioned to livestock and 10% would be apportioned to wild horses. Those percentages were calculated as follows:

Starting point for monitoring:

$$\frac{3724 \text{ AUMs}}{(3724 \text{ AUMs} + 420 \text{ AUMs})} = \frac{\% \text{ AUMs livestock}}{100\%}$$

$$90\% = \% \text{ AUMs livestock}$$

and:

$$\frac{420 \text{ AUMs}}{(3724 \text{ AUMs} + 420 \text{ AUMs})} = \frac{\% \text{ AUMs wild horses}}{100\%}$$

$$10\% = \% \text{ AUMs wild horses}$$

If 1471 AUMs are available for harvest by wild horses and livestock then:

1471 AUMs X 0.9 = 1324 AUMs available for livestock

and:

1471 AUMs X 0.1 = 147 AUMs available for wild horses

$$\frac{147 \text{ AUMs}}{12 \text{ months}} = 12 \text{ wild horses}$$

Using a minimal herd size of 50 wild horses the available forage would be apportioned as follows:

If 1471 AUMs are available for harvest by wild horses and livestock then:

50 Wild horses X 12 months = 600 AUMs available for wild horses

and:

1471 AUMs - 600 AUMs = 871 AUMs available for livestock

RATIONALE

Reducing the stocking rate of livestock and wild horses would increase the probability of meeting utilization objectives for the allotment and progress towards meeting long term objectives would be expected.

On this allotment the objectives have been met over the great majority of the areas monitored indicating that poor distribution, particularly of livestock, is a primary factor resulting in failure to met utilization objectives in some riparian areas. Wild horses appear to be the primary cause of high utilization levels in a portion of the wild horse winter use area. For these reasons, stocking rates calculated above may be overly simplified solutions to more complex problems.

An AML of 12 horses may not provide a viable herd size. An active preference of 871 AUMs may not provide a viable livestock operation. These factors need to be weighed when considering this alternative and whether these uses are appropriate for this public land.

Alternative 2

Under this alternative livestock would be removed from the Upper Happy Creek Use Area by July 15. The remaining portion of Happy Creek that is located on public land and is above the irrigation diversion would be fenced to eliminate grazing use. The present active preference (3724 AUMs) would be maintained.

Under this alternative, the recommended appropriate management level for wild horses in Happy Creek Allotment is 60 adult horses. The AML of 60 horses would be the upper range. The number of horses would be reduced to approximately 40% below AML and be allowed to increase up to the AML of 60 horses.

The northern population inhabits four allotments, Happy Creek, Deer Creek, Bottle Creek and Wilder-Quinn Allotments. The AML for the northern population would be the sum of the AMLs of these four allotments. The northern population would be managed as a unit rather than as separate allotments.

LIVESTOCK USE

Area of Use	No.	Period of Use	% Fed. Land	AUMs
South of Highway	408 c	04/01 to 07/15	100	1422
	508 C	07/16 to 08/30	100	768
Upper Happy Cr.	100 c	04/15 to 07/15	100	348
North of Highway	300 c	11/01 to 02/28	100	1184
			Total	3722

Terms and Conditions

To control livestock distribution water will only be pumped from wells located within the authorized area of use.

Salt and/or mineral blocks shall not be placed within one quarter (1/4) mile of springs, meadows, streams, riparian habitats or aspen stands.

You are required to perform normal maintenance on the range improvements for which you have maintenance responsibility as per your signed cooperative agreements.

Your certified actual use report, by pasture, is due 15 days after the end of you authorized grazing period.

STRUCTURAL PROJECTS

Under this alternative the following project would be evaluated through the project planning process:

> Corridor fence along Happy Creek extending 1.5 mile from NW¼NE¼, Sec. 33, T41N, R32E to SW¼SW¼, Sec. 22, T41N, R32E.
>
> This project would allow elimination of grazing from the unfenced, public portion of Happy Creek that has not been diverted for irrigation and that is outside the Upper Happy Creek Use Area. A gap would be left at the south end to allow access to water and to allow movement of horse between areas of use. This alternative is dependent upon construction of this fence. If the fence is not constructed, alternate methods of reducing grazing use of this portion of Happy Creek are needed.

ADDITIONAL OBJECTIVE

If this alternative is implemented it is recommended the following additional objective be established for the allotment:

> The objective for utilization of key species within wild horse winter range is 25% on September 1 and 50% on March 1.

RATIONALE

While utilization objectives have been met over the great majority of the Upper Happy Creek Use Area, utilization levels have been exceeded on meadows, streambank habitat on portions of Happy Creek and its tributaries, and upland browse species. While wild horses have access to the areas of high utilization, tracks and droppings indicate that failure to meet utilization objectives is primarily the result of livestock use. Utilization objectives have been exceeded even with small numbers of livestock. Failure to meet objectives appears to be primarily the result of livestock use during the hot season. After mid-July drying of upland grasses and higher temperatures result in the tendency for cattle to concentrate in riparian areas and also in increased utilization of woody species. Under this

alternative, livestock would be removed from the Upper Happy Creek Use Area by July 15. In addition to improved livestock distribution during the grazing period, removal of livestock by July 15 would allow regrowth of herbaceous vegetation were adequate soil moisture is available. Because even small numbers of cattle can result in heavy utilization during the hot season, it is important that **all** cattle be removed by July 15. Herding of cattle by the permittee would also improve distribution.

Heavy utilization has occurred adjacent to the gate into the Upper Happy Creek Use Area. It is expected that this objective can be met by 1) actively herding livestock into the use area and away from areas that tend to receive heavy use, rather than allowing them to distribute themselves, and 2) removing cattle from the use area if they congregate near the fence ready to come home. Actively herding and removing cattle ready to come home would be expected to also reduce use in riparian areas. If these activities, when used in conjunction with the July 15 removal date, are not feasible and/or not successful in allowing utilization objectives to be met, reducing numbers of livestock in the Happy Creek Use Area is recommended.

Currently there are approximately 100 adult horses utilizing the northern end of the Jackson Mountains Herd Management Area. Movement among the allotments inhabited by this population is apparent through horse trails and seasonal variations in distribution. However, the general distribution of these 100 horses is: 60 head in Happy Creek Allotment, 20 head in Bottle Creek Allotment, 10 head in Deer Creek Allotment and 10 head in Wilder-Quinn Allotment. An AML of 10 horses has been established for the Deer Creek Allotment. AMLs are scheduled to be established for Bottle Creek and Wilder-Quinn Allotments in the near future. This northern population would be managed as a unit rather than as separate allotments. Movement of horses among allotments is recognized as normal. Therefore, when horses move from one allotment into the other, that alone does not mean that either allotment is over or under the AML. Unless monitoring data indicates otherwise, the AML for an allotment would not be considered exceeded unless the number of horses throughout the northern HMA exceeded the sum of the AMLs for all four allotments.

The recommended appropriate management level of 60 horses in Happy Creek Allotment is based upon condition of the horses, available forage and the tendency for horses and cattle to concentrate in different areas within the allotment.

If problems with the condition of wild horses exist, they will be apparent in the spring. The horses were in good condition this spring with approximately 60 head utilizing the allotment. Observations and utilization data indicate that adequate forage is available for that number of horses. The limiting factor for the herd size appears to be adequate winter range. This professional assessment is supported by utilization data which showed heavy use, primarily by wild horses, within the winter range in the 1992 grazing year with approximately 25% fewer horses than are now present. While this suggests that 1992 levels may have been too high for the range resources, this conclusion must be tempered with the knowledge that weather conditions were unusually poor for plant production in 1992. Precipitation for the water year (October 1, 1991, through September 30, 1992) was the lowest of all years through the evaluation period and no rain fell in May, which a critical period for growth. Competition for forage and space between cattle and horses appears to be low at this time. Weighing these factors, it appears that the horses are currently in ecological balance. Because of potential resource damage to winter range, it is recommended that numbers not exceed the present level. An additional objective of 25% utilization of key upland species within wild horse winter use areas on September 1 is recommended under this alternative. The purpose of the objective is to help assess the adequacy of winter forage for horses.

Maintenance of existing numbers would assure genetic viability while protecting range resources. There is cause for concern if numbers are allowed to increase until a large number of horses need to be removed in order to bring the population into an ecological balance. Because young horses are far more likely to be adopted than older horses, Bureau policy requires that generally only horses age five years or younger be removed during gathers. If a large percentage of the population must be removed, only older horses remain. If repeat removals are required the population becomes older and older until only older horses and their recent offspring are present. Younger adults would be absent from the population. This is illustrated in the following table:

Ages of horses within a population if repeat removals are required to bring the population into ecological balance		
Year	Ages of horses prior to removal of horses age 5 and under	Ages of horses after removal of horses age 5 and under
Year 1	All ages	6 yrs. and older
Year 2	7 yrs. and older; foals	No removals in Year 2
Year 3	8 yrs.and older; 1 yr. and foals	No removals in Year 3
Year 4	9 yrs. and older; 1-2 yrs. and foals	9 yrs. and older
Year 5	10 yrs. and older; foals	No removals in Year 5
Year 6	11 yrs. and older; 1 yr. and foals	No removals in Year 6
Year 7	12 yrs and older; 1-2 years and foals	12 yrs. and older

A healthy population is composed of all age classes. Fertility drops as mares age so reduced productivity would be expected with an older population. Data indicates the most productive age class mares are 4-9 years old. This fact, coupled with their ability to produce adequate nutrition for the nursing foal, give these mares a better chance of producing a live foal and providing the foal with a better chance of survival. Older horses are also more susceptible to death loss from disease or starvation during tough winters. For this reason, in addition to avoiding degrading range resources, it is preferable not to allow numbers to increase until a large number of horses need to be removed in order to bring the population back into ecological balance.

Alternative 3

This alternative is the same as Alternative 2 except that no fences would be constructed and all livestock would be removed from the allotment by 07/15 and would not return to the allotment until 11/01.

LIVESTOCK USE

Area of Use	No.	Period of Use	% Fed. Land	AUMs
South of Highway	629 c	04/01 to 07/15	100	2192
Upper Happy Cr.	100 c	04/15 to 07/15	100	348
North of Highway	300 c	11/01 to 02/28	100	1184
			Total	3724

Terms and Conditions

To control livestock distribution water will only be pumped from wells located within the authorized area of use.

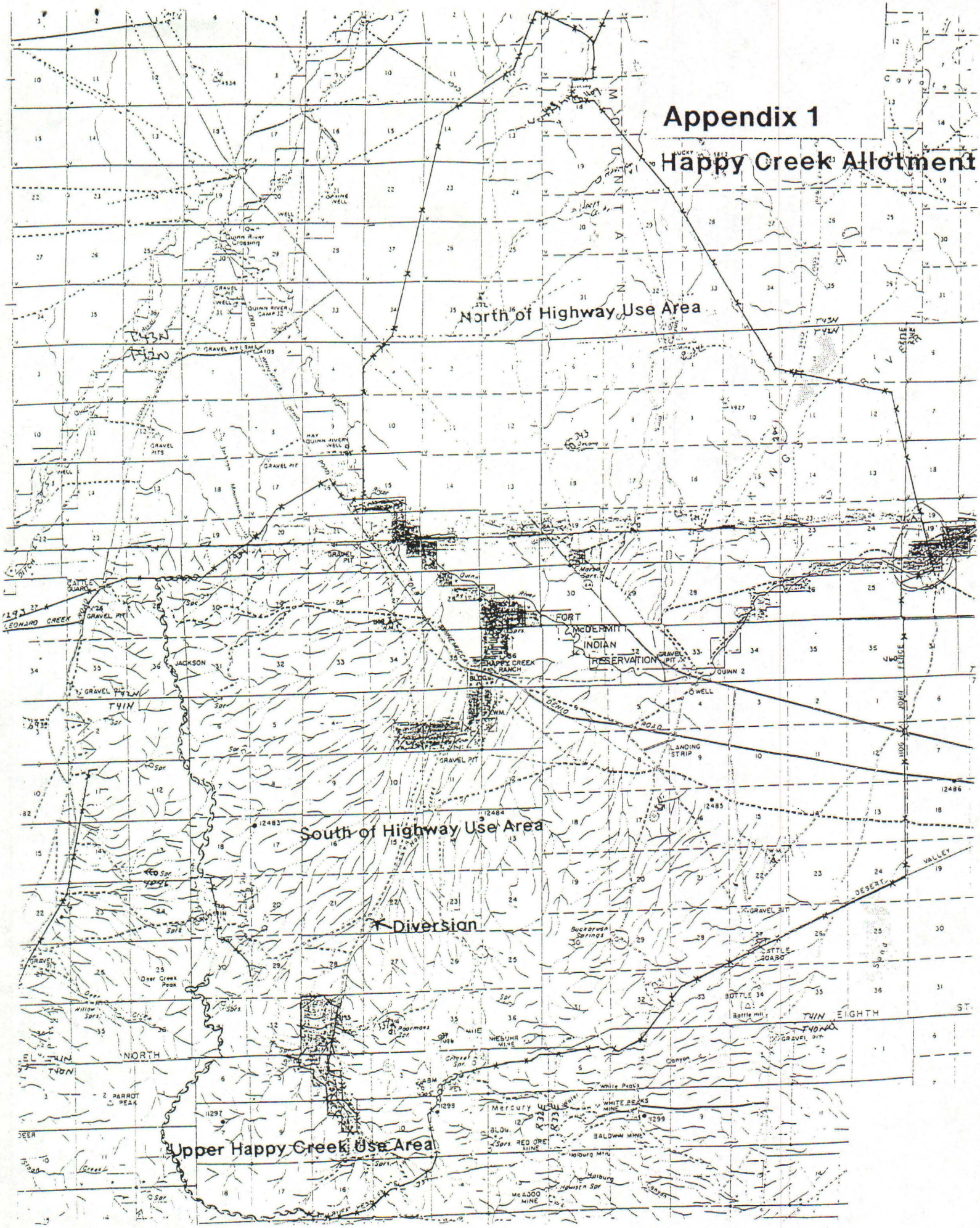
Salt and/or mineral blocks shall not be placed within one quarter (1/4) mile of springs, meadows, streams, riparian habitats or aspen stands.

You are required to perform normal maintenance on the range improvements for which you have maintenance responsibility as per your signed cooperative agreements.

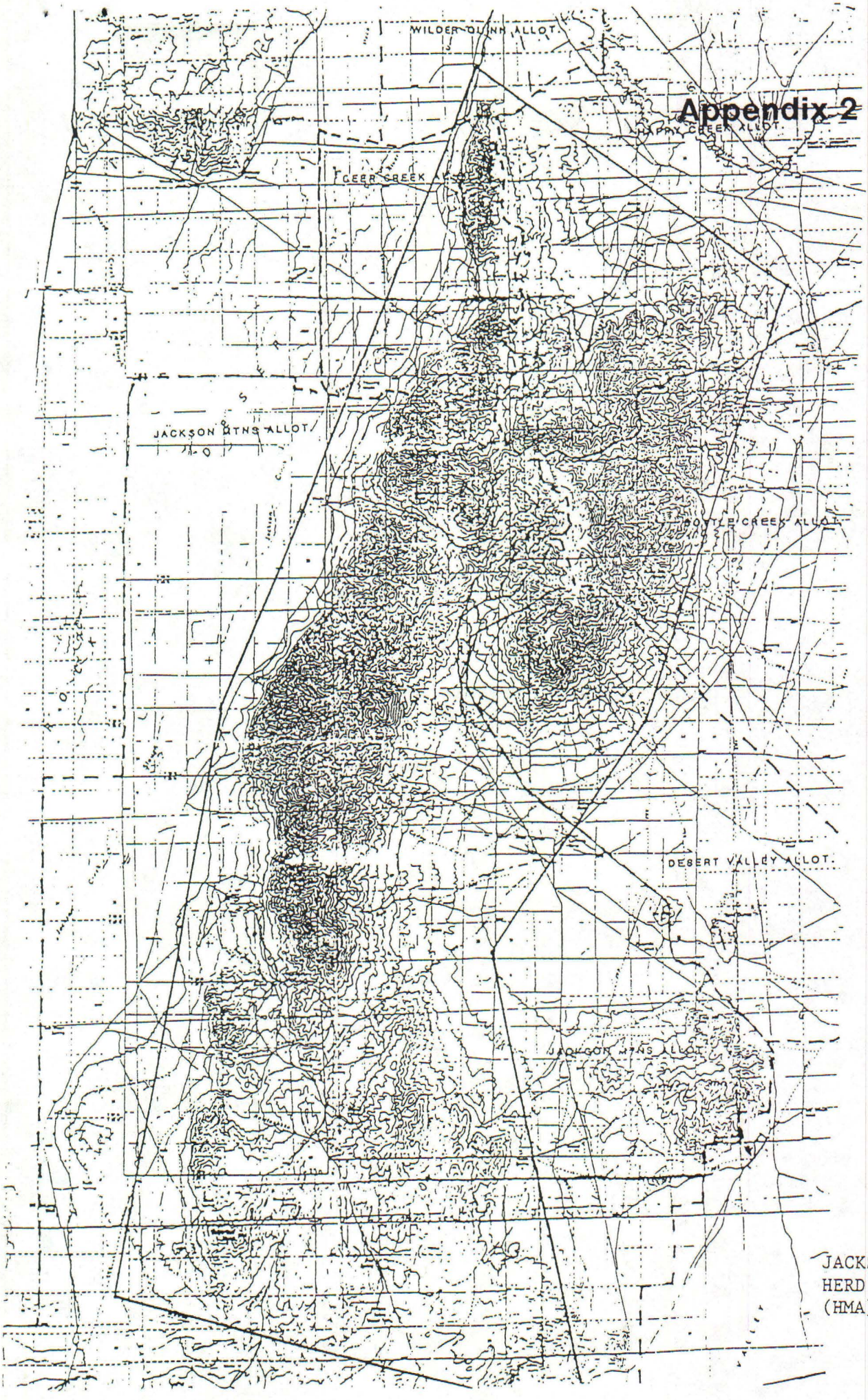
Your certified actual use report, by pasture, is due 15 days after the end of your authorized grazing period.

RATIONALE

Removal of cattle by July 15 would be expected to allow utilization objectives to be met on riparian areas. After mid-July drying of upland grasses and higher temperatures result in the tendency for cattle to concentrate at riparian areas. Under these conditions utilization levels can quickly be exceeded, even with smaller numbers of cattle. In addition, removal by July 15 would allow for regrowth where adequate soil moisture is available.


Appendix 1
Happy Creek Allotment
North of Highway Use Area
South of Highway Use Area
Diversion
Upper Happy Creek Use Area
FORT McDERMITT INDIAN RESERVATION
HAPPY CREEK RANCH
QUINN 2
LEONARD CREEK
QUINN RIVER CROSSING
QUINN RIVER CAMP 32
GRAVEL PIT
LANDING STRIP
OREGON ROAD
DESERT VALLEY
EIGHTH ST
NORTH
PARROT PEAK
Mercury
WHITE PEAKS MINE
BALDWIN MINE
RED ORE MINE
MEADOO MINE
WEBSTER MINE
Buckaroo Springs
Deer Creek Peak
Bottle Hill
Canyon
Quilburg
Quilburg Mtn
Houston Spr
12483
12484
12485
12486
11297
11299

Appendix 2



ALLOTMENT BOUNDARY/HMA RELATIONSHIPS

JACKSON MOUNTAINS
HERD MANAGEMENT AREA
(HMA)

Appendix 3


WILDER/QUINN
HAPPY CREEK ALLOTMENT
DEER CREEK
JACKSON MOUNTAIN ALLOTMENT
BOTTLE CREEK ALLOTMENT
Gravel Pit
Springs
Spring
Well
Buckbrush Spring
Bottle Hill
Deer Creek Peak
Parrot Peak
Poorman Spring
Cricket Spring
Buff Peak
Niebuhr Mine
White Peaks
Red Ore Mine
Mc Adoo Mine
Howison Spring
Halburg Canyon
Iron King Mine
Redbird Mine
Happy Creek
Bottle Creek
Bills Creek
Happy Ck. Boundary
Other Allotment Boundari
ALLOTMENT BOUNDARIES ARE APPROXIMATIONS

Appendix 4

Census and Distribution Data on Wild Horses in the Northern Portion of the Jackson Mountain HMA

Date	Type Flight	Number of Horses (adults/foals) by Allotment					
		Happy Creek	Deer Creek	Bottle Creek	Desert Valley	Wilder -Quinn	Total
11/04/94	Dist.	40/4	0	0	0	0	40/4
09/27/94	**Census**	**67/17**	**13/5**	**0**	**0**	**0**	**80/22**
10/26/93	Dist.	43/2	0	0	0	0	43/2
01/18/93	**Census**	**36/3**	**10/1**	**0**	**0**	**9/0**	**55/4**
09/27/92	Dist.	16/0	1/0	0	0	0	17/0
07/24/92	Dist.	39/8	0	0	0	0	39/8
05/20/92	Dist.	47/8	5/0	0	0	0	49/8
03/04/92	Dist.	44/1	2/0	0	0	0	46/1
07/30/91	Dist.	44/11	0	0	0	0	44/11
02/01/91	Dist.	41/0	4/0	0	0	0	44/0
02/28/90	Dist.	21/2	0	0	0	0	21/2
07/19/89	**Census**	**47/12**	**2/1**	**7/2**	**0**	**5/0**	**61/15**
09/28/88	**Census**	**109/23**	**6/2**	**1/0**	**0**	**0**	**116/25**
06/13/86	**Census**	**54/12**	**2/1**	**14/6**	**1/0**	**0**	**71/19**

Notes 1) Number of horses is displayed number adults/number foals.
2) The purpose of the census flights is to count all horses. Numbers of horses counted during census flights are displayed in **bold** type. The census flights were conducted by helicopter. The purpose of distribution flights is to determine the general distribution of horses and all horses are not counted during these flights. The distribution flights were conducted by fixed-wing aircraft.
3) The gather conducted 12/88-01/89 removed 102 horses from Happy Creek Allotment, 108 horses from Jackson Mountain Allotment and 15 horses from Wilder-Quinn Allotment. Those horses removed from Wilder-Quinn Allotment were removed from outside the HMA boundary.

Appendix 5

Actual or Estimated Horse Numbers by Year, and AUMs Harvested by Year

Grazing Year	Total	No. Adults	No. Foals	AUMs
1994	102	80	22	960
1993	96	77	19	924
1992	91	73	18	876
1991	85	69	16	828
1990	81	65	16	780
1989	76	61	15	732
1988	*	*	*	1208
1987	112	85	27	1020

Please see Appendix 7 for calculation of actual use displayed on this table.

AUMs calculated based upon adults only.

* A gather was conducted in the winter of 1988-89. Prior to the gather there were 109 adult horses (for 10 months harvesting 1090 AUMs) and there were 59 adult horses after the gather (for 2 months harvesting 118 AUMs).


Appendix 6
WILDER/QUINN
HAPPY CREEK ALLOTMENT
DEER CREEK
KEY WINTER AREA
KEY SUMMER/SPRING/FALL AREA
BOTTLE CREEK ALLOTMENT
Happy Ck. Boundary
Other Allotment Boundari
ALLOTMENT BOUNDARIES ARE APPROXIMATIONS
KEY SUMMER/SPRING/FALL
KEY WINTER
TRAILS AROUND FENCES

Appendix 7

Wild horse numbers calculation

The results of the helicopter census done in January 1993 were disregarded because the higher elevations were not flown due to cloud cover, and there might have been horses there that were missed. The percentage rate of increase from 1989 to 1994, which are the two years for which there is believed to be an accurate census, was calculated. There were a total of 76 animals counted in the northern HMA in 1989 and 102 in 1994. This translates into a linear rate of increase of 6.06 percent. The formula is:

$$x=\left(\sqrt[y]{\frac{b}{a}}-1\right)\times 100$$

where X = percent rate of increase ; y = # of years in interval between censuses, a = population at start of interval, and b = population at end of interval. Applying this formula gives the following population estimates:

1989 76
1990 81
1991 85
1992 91
1993 96
1994 102

However, for actual use calculations the adults only are used, so it is necessary to know the number of adults in the above total numbers. In 1989 there were 61 adults and 15 foals for a foal crop (foals/100 adults) of 20%. In 1994 there were 80 adults and 22 foals for a foal crop of 28%. To determine the foal crop for the intervening years the average number of the two years (24%) was applied to the total numbers as follows.

Solve the simultaneous equations F + A = T and F/A = .24, where F = # of foals, A = # of adults and T = total # of animals. Thus A = T/1.24 and F = T - A. Then AUMs are calculated by multiplying # adults x 12, with a final result of:

Year	Total	Adults	Foals	AUMs
1989	76	61	15	732
1990	81	65	16	780
1991	85	69	16	828
1992	91	73	18	876
1993	96	77	19	924
1994	102	80	22	960

A similar calculation was used to determine 1987 total numbers and adult foal by imterpolating between the 1986 and the 1988 census figure (1986- 90 total horses, 1988- 141 total horses, percent rate of increase 25%, average foal crop 24%, resulting in 1987- 112 total horses, 85 adults and 27 foals).

BOB MILLER
Governor

STATE OF NEVADA

CATHERINE BARCOMB
Executive Director

**COMMISSION FOR THE
PRESERVATION OF WILD HORSES**
**255 W. Moana Lane
Suite 207A
Reno, Nevada 89509
(702) 688-2626**

October 26, 1995

Mr. Pete Christensen
Paradise-Denio Resource Area
Bureau of Land Management
705 East 4th Street
Winnemucca, Nevada 89445

Subject: Draft Happy Creek Allotment Evaluation

Dear Mr. Christensen:

The Nevada Commission for the Preservation of Wild Horses has reviewed the draft evaluation. We are pleased with the content and thorough analysis of this evaluation. Many of the issues important to the Commission have been addressed by the District in a comprehensive and professional manner.

Please accept the following comments for the final draft:

Page 18, Wild Horses

It is exciting to find that additional wild horse distribution and herd data has been collected since the land use plan. The District's overview of the other allotments within the herd management area supports the concepts of ecosystem management. Distribution data supports your finding that livestock and wild horses do not necessarily occupy the same portions of the area.

The establishment of a key winter area in Buckbrush Spring is critical to determining the appropriate management level for this sub-herd. Wild horse mortalities during the winter of 1993 presents the limiting factor to this sub-herd's potential.

Page 24, Utilization Data

We appreciate the distinction of wild horse and livestock utilization on this allotment. Often use pattern mapping data are only collected on areas of joint use and cannot determine the differences in ungulate use. This is a good professional approach to monitoring.

Page 44, Conclusions

Studies indicate that wild horses do not utilize bitterbrush. Field observations throughout the District confirm these findings. We would like to provide the literature to support this statement.

Page 51, Technical Recommendations

We support the carrying capacity computations. As proposed as an alternative to the Bottle Creek Allotment Evaluation, we suggest a proportional reduction based upon actual use data. This can be determined by the percentages of actual use applied to the necessary reductions to achieve the carrying capacity.

We strongly support your conclusion of a minimum herd to sustain genetic viability. However, Alternative 2 proposes a 40% reduction below AML that would result in less than 50 animals.

We can support the proposed new allotment specific objective that allocates 25 percent of annual growth of key forage species to wild horses. This objective will further define the foraging differences between wild horses and livestock.

We appreciate your explanation of herd structuring by removal. This issue should be included in any future gather plan for the sub-herd.

Pete, we are highly impressed with the District's monitoring, data analysis and alternatives to achieve a thriving natural ecological balance. Studies conducted by the District to determine wildlife, wild horse and livestock use of critical key areas of this allotment are excellent. We hope that the decisions are forthcoming and the good work by the District will continue.

Sincerely,

Catherine Barcomb

Catherine Barcomb
Executive Director