LAVA BEDS

INTERIM HERD MANAGEMENT AREA PLAN

AND

ENVIRONMENTAL ANALYSIS

LAVA BEDS

INTERIM - HERD MANAGEMENT AREA PLAN

1977

Cima Resource Area

Riverside District, Bureau of Land Management

Riverside, California

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BUREAU POLICY ON WILD BURROS

The Riverside District is responsible for the administration of the natural resources on approximately 9.5 million acres of Natural Resource Lands located in Southern California. The District office is located in Riverside, California.

On December 15, 1971, President Nixon signed the Wild Horse and Burro Act which is designated P.L. 92-195. The Bureau of Land Management policy for managing wild free-roaming burros comes directly from the Act which says, in part "... that wild free-roaming horses and burros are living symbols of the historic and pioneer spirit of the West; that they contribute to the diversity of life forms within the nation. It is the policy of Congress that they shall be protected from capture, branding, harassment, or death; and are to be considered in the area where presently found as an integral part of the natural system of the public lands.".

The Act further directs: "... the Secretary of the Interior shall manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands. Any adjustments in forage allocations on any such lands shall take into consideration the needs of other wildlife species which inhabit such lands."

Where an area is found to be overpopulated, the Act provides for wild free-roaming horses and burros to be captured and removed for private maintenance under humane conditions; transplanted to other

areas where they existed at the time of the Act; or, if no practical way of removal is possible, excess animals may be humanely destroyed. Bureau policy, at present, as directed by a Washington Office Instruction memo (#77-342), is to place all excess animals under the Adopt-a-Horse or Burro program.

INTRODUCTION

This Interim Herd Management Area Plan is being prepared prior to the completion of Management Framework Plan (MFP) because of present excessive resource damage resulting from large numbers of wild burros concentrating around one water source.

The water situation became critical in late July, 1977, when all but three water sources (Indian Creek, Henry Spring, and #3 trough of Twisselman Pipeline) became dry. The burros which were once spread over seven water sources have converged onto the three available waters with Indian Creek experiencing the heaviest concentration.

A Herd Management Area Plan (HMAP) is an activity plan that evolves after direction is provided from the MFP. The Lava Beds Herd Management Area is found within the Devil's Playground Planning Unit of the East Mojave. The entire East Mojave MFP (includes Devil's Playground, Mid Hills, and Piute Planning Units) is scheduled for completion by November, 1977.

This Interim Plan precedes an HMAP for the Lava Beds area and directs the methods necessary to diminish the resource damage pending the completion of the MFP which will provide future policy direction. The Interim Plan is analyzed in an Environmental Assessment to determine the effects of the proposed methods for management on the environment.

The approach for managing the burros will be to manage them such that their water and forage requirements are met between June and

October when stress situations are most likely to occur. Management consideration will emphasize the areas most likely to receive intense use by the burros during periods of stress. The "critical areas" as they will be termed are Indian Creek area and Henry Spring. (See Figure 2)

I. Herd Management Area Analysis

A. Background Information

1. Location and Area

a. Location

The Lava Beds Herd Management Area (HMA) is located in Southeastern California in San Bernardino County. It lies directly south of Interstate Highway 15 east of Baker and west of Cima Dome. The closest metropolitan areas are Las Vegas to the northeast and San Bernardino to the southwest. Baker is the closest community.

The major physical features of the Lava Beds are Cinder Cones (one as high as 4,925 feet) and long stretches of lava flows for which the area is aptly named.

The HMA encompasses 174,052 acres (38,467 acres in the critical area or 22% of the total acreage) which are primarily BLM national resource lands.

The Lava Beds HMA may be reached either from the north off Interstate Highway 15 or the south off Interstate Highway 40 by Kelbaker Road. Kelbaker Road stretches between Baker and Interstate Highway 40. The small community of Kelso is mid-way between the two interstate freeways (See Figures 1 and 2).

b. Land Ownership and Status

The Lava Beds Herd Management Area contains approximately 174,052 acres of land with ownership and administration as follows:

National Resource Lands (BLM)	165,172

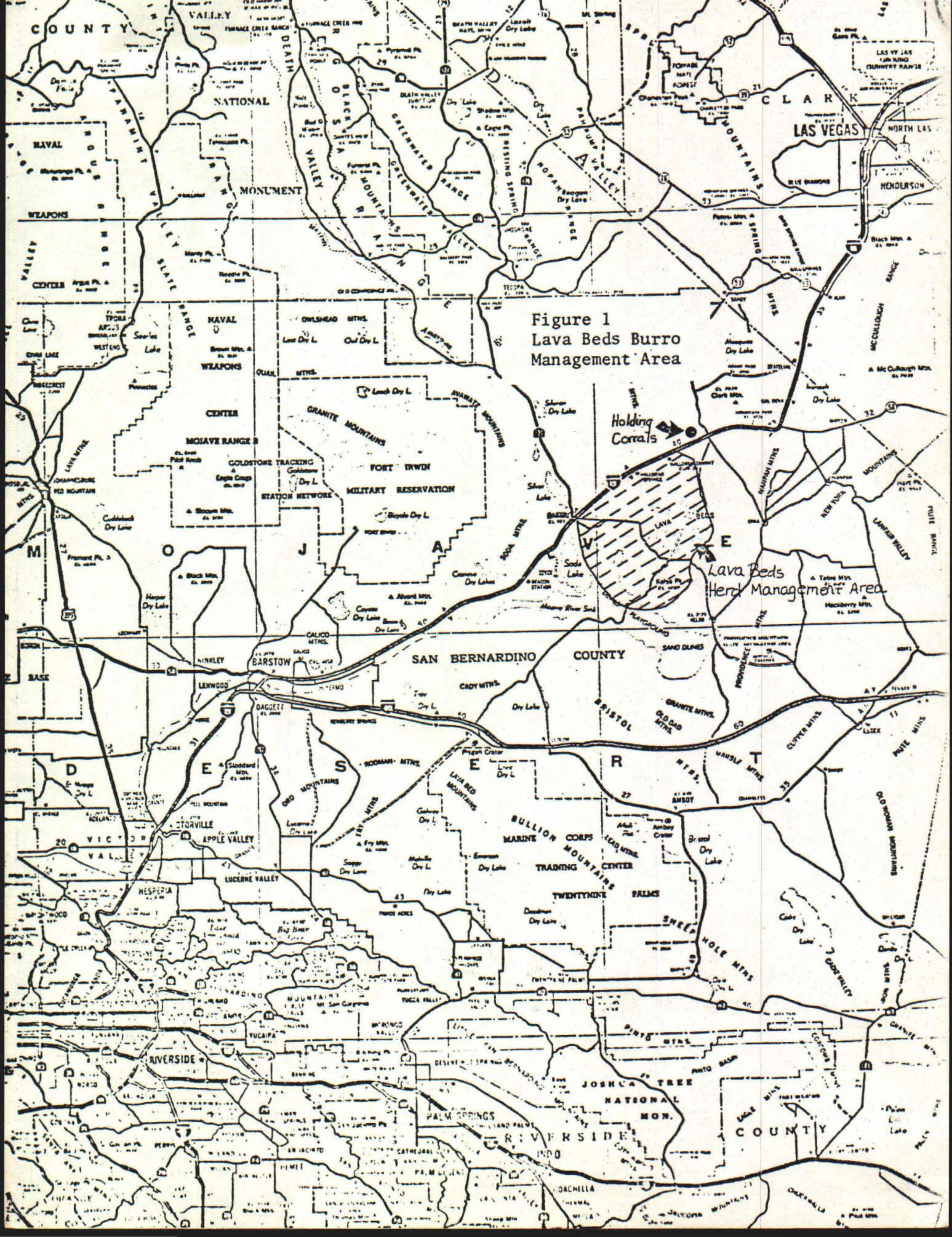

Figure 1
Lava Beds Burro
Management Area

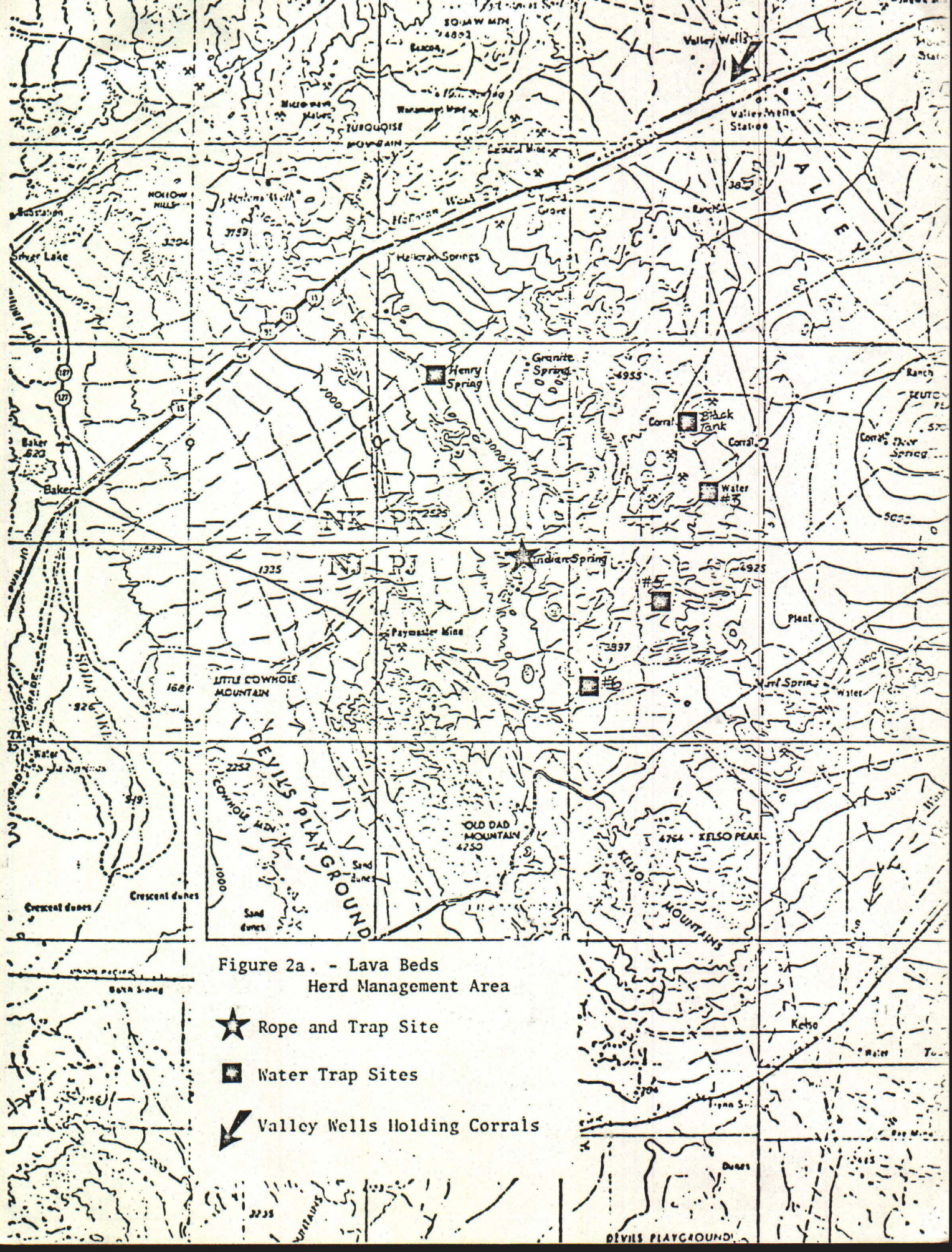

Figure 2a. - Lava Beds
Herd Management Area

★ Rope and Trap Site

■ Water Trap Sites

↙ Valley Wells Holding Corrals

State Lands (State Land Department)	6,080
Private Lands	2,800
Total Acres	174,052

See East Mojave Land Ownership Overlay, III-L-1 for land ownership patterns; Appendix I.

c. Herd Management Area Boundary

The Lava Beds Herd Management Area is roughly 17 x 16 miles in size. The boundary was defined by observing burro movements for an entire year, questioning locals and "old-timers" as to their movements, considering the existing fences to the north, east, southeast, and southwest, considering physical barriers and water distribution. There does not appear to have been or presently be any integration between the Lava Beds population and their counterparts to the south or east (See Figure 2 and East Mojave Burro Management Areas, RM-III-7).

d. History

The history of the domestication and dispersal as well as uses of the burro is discussed at length by Woodward (1976).[11] Many of the animals were used for transportation, pack animals by miners, food (it was a delicacy to the Indians), and the production of mules.

Mining was important to the East Mojave as early as the 1860's, and it continues to be so today. It appears that the first significant discoveries by American miners in the area were silver lodes discovered in 1863 (Casebier, 1976;300).[2]

It is relatively safe to assume that Equus asinus was brought in to carry tools and supplies into the area as well as transport the ore to the nearest station. When the mining boom declined in the area and automobiles became an economical feasibility the burros were left to fend for themselves in the desert. This they did with complete success.

Prior to 1971, the burros were more or less controlled by open hunting practices. In some areas, they were harvested for pet food, however, local residents have stated that this was not common practice in the East Mojave.

With the passage of P.L. 92-195 the indiscriminate taking of animals ended. As a result of no management for the past six years, the numbers have grown to far exceed the carrying capacity of the land.

The Wild Horse and Burro Act provided a claiming period for owners to gather their horses and/or burros from the BLM national resource lands. No claims were filed within the specified period.

2. Resource Data

a. Topography

As their name implies, the Lava Beds are a result of volcanic activity. Cinder cones and lava flows spot the area. The highest peak, Whitney, reaches an elevation of 4,925 feet and drops to an altitude of 2,000 feet. Old Dad Mountain is to the west of the cinder cones and reaches an elevation of 4,250 feet. The average altitude where the burros can be found is between 3,000 and 4,000 feet.

The geology of the area is volcanic in the cinder cones area and primarily metamorphic elsewhere. The relief varies from gentle flat terrain in the northerly portion of the HMA to steep, rocky, rugged terrain around the Lava Beds and Old Dad Mountain.

The steepest terrain is found in the Old Dad Mountains which have an average slope of 31%. Whitney, the highest cinder cone, has an average slope of 10%. An average slope of 17% is estimated, however, for the entire area due to the relatively flat terrain.

b. Climate

All climatological data were taken from the records of the U.S. Weather Bureau.[9] The information was collected from the Baker Weather Station (Baker NNN) which is approximately four air miles to the north of the HMA. The rain guages are located at 960 feet.

The average precipitation for seven years is 3.20 inches per year (See Figure 3 - Yearly Precipitation). Eighty percent of this precipitation falls between October and March.

The temperature varies from 28°F in January to 113°F in July and August. Summer minimums are in the mid-60's to high-70's June through August, while summer maximum temperatures fall between 102°F and 113°F. Winter maximums are from the mid-50's to 60's in December and January. The average maximum temperature for a six year period is 84.36°. The average minimum temperature is 52.78°.

(Table 1 gives the monthly precipitation for 7 years.)

PRECIPITATION

Table 1

Baker Weather Station 9NNW

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1969	1.35	1.82	.26	T	.33	.00	.12	.00	.15	T	.35	.07	4.45
1970	.11	.53	.78	.00	.00	.00	.13	T	.00	.02	.25	.27	2.09
1971	.00	.03	T	.00	.34	.00	T	.09	.00	.18	.00	.11	.75
1972	.00	.00	.00	.02	.06	1.25	.00	.21	.07	.64	.65	.07	2.99
1973	2.29	1.02	2.00	.08	.00	.00	.00	.00	.00	.00	.05	.03	5.47
1974	1.02	.00	1.09	.00	.02	.00	.15	.35	.00	2.28	.00	.33	5.24
1975	.09	.43	.32	.39	.00	.00	.04	.10	.00	.05	.00	.00	1.42
average	.69	.55	.63	.07	.11	.18	.44	.11	.04	.45	.18	.13	3.20

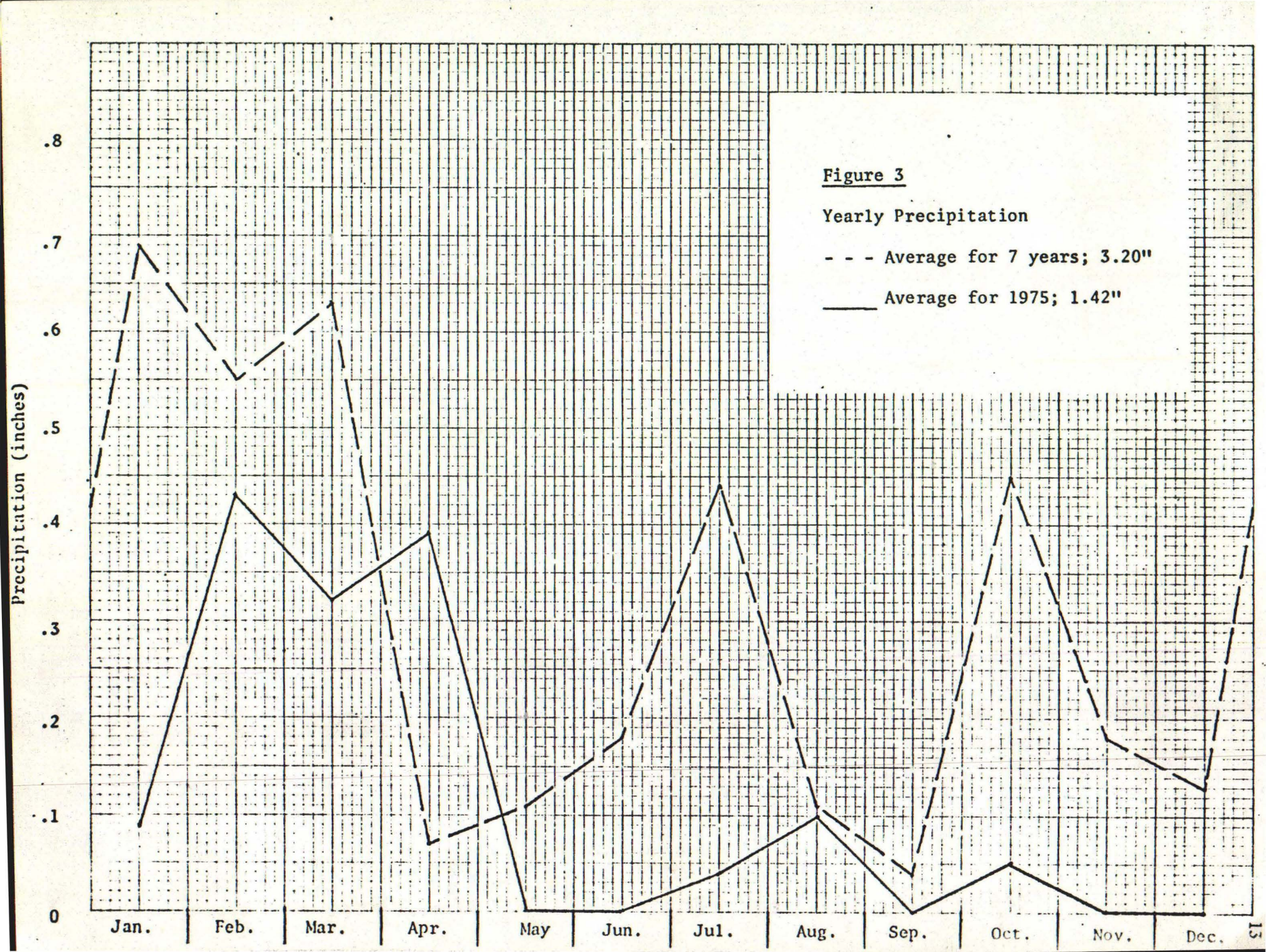
Figure 3
Yearly Precipitation
- - - Average for 7 years; 3.20"
____ Average for 1975; 1.42"
Precipitation (inches)
.8
.7
.6
.5
.4
.3
.2
.1
0
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.

c. Soils

The California State Water Resources Control Board [1] delineated six major soil associations in the Lava Beds HMA: Anthony-Cajon-Arizo (AC), Calvista-HiVista-Cinco (CH), Daggett-Tonapah-Bitter Spring (DT), Granite-Rockland (GR), Lava-Rockland (LR), and Vinton-Brazito-Duneland(VB) Associations.

The Anthony-Cajon-Arizo, Granite-Rockland, and Lava Rockland Associations comprise the majority of the management area and are found in the designated critical area.

A short description of each of the major associations follows:

Anthony-Cajon-Arizo (AC) Association. This association occurs on nearly level to moderately sloping alluvial fans. The surface and subsoil textures vary from neutral to alkaline sandy loam to grey-brown, pale brown, or grey loamy sand or silty clay loam.

Anthony soils make up 20% of the Association, Cajon 20%, and Arizo 60%. The soils of the AC Association have low to moderately low runoff potential. These soils are characterized by high infiltration rates even when thoroughly wetted and consist of deep, well to excessively drained sands or gravels.

Calvista-HiVista-Cinco (CH) Association. These soils occur on nearly level to strongly sloping uplands. The surface and subsoils have a parent material of granite. The surface soils consist of neutral to moderately alkaline yellowish brown or brown loamy sand. The subsoils are comprised of moderately alkaline calcarcons sandy clay loam or loamy

or loamy sand.

The CH Association include 60% Calvista, 30% HiVista, and 10% Cinco soils. Their hydrologic classifications range from low runoff potential to moderately high and high runoff potential. These soils are characterized by having slow to very slow infiltration rates when thoroughly wetted. Soils (Calvista) with a high runoff potential consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious materials.

Daggett-Tonapah-Bitter Spring (DT) Association. These soils occur on convex and smooth, nearly level to strongly sloping alluvial fans and terraces. These soils formed in very gravelly sandy alluvium from a variety of rocks, predominantly granitic with some basaltic and rhyolitic materials. The surface soils consist of moderately alkaline to strongly alkaline gravelly sandy loam to sand and the subsoil textures vary from very gravelly sandy loam to gravelly sand.

Daggett comprises 60% of the Association, Tonapah 20%, and Bitter Spring 20%. The Association is characterized by a moderately high runoff potential. These soils may be somewhat poorly drained and may have moderate water tables.

Granite-Rockland (GR) Association. This Association is characterized by granite rock outcrops that cover from 40 to 90 percent of the area. The soil is very shallow to non-existant in most places.

It is comprised of 100 percent granite rockland and has a high runoff potential as a result of its impermeable substrata and moderate to steep slopes.

Lava-Rockland (LR) Association. This Association has soils that vary from very shallow to non-existant. Because of the relatively young age of the volcanic activity in the area it is still devoid of soils in most places. The volcanic material covers 40 to 90 percent of the area.

The Association consists of 100 percent Lava-Rockland soils and has a slow runoff potential.

Vinton-Brazito-Duneland (VB) Association. This Association occurs on nearly level or very gently sloping flood plains or low terraces. The surface soils range from calcareous sand to sandy loam with the majority of the area having loamy sand textures. Fine sands comprising sand dunes make up the texture also. The subsoil textures range from sand to loamy sand.

The Vinton soils make up 30 percent of this Association, Brazito 40 percent, and Duneland 30 percent. These soils are characterized by low to moderately low runoff potential having moderate to high infiltration rates even when thoroughly wetted (See Figure 4 - Lava Beds Soil Key).

d. Watershed

The soil surface factor (SSF) which indicates the present erosion condition was determined by the Desert Plan Staff[3] Range Conservationists while they were conducting the vegetation studies. The different vegetative transects were related to the soil units and an erosion condition class determined for each soil mapping unit. The SSF ratings were grouped into five erosion condition classes: 0-20 stable, 21-40 slight, 41-60 moderate, 61-80 critical, and 81-100 severe

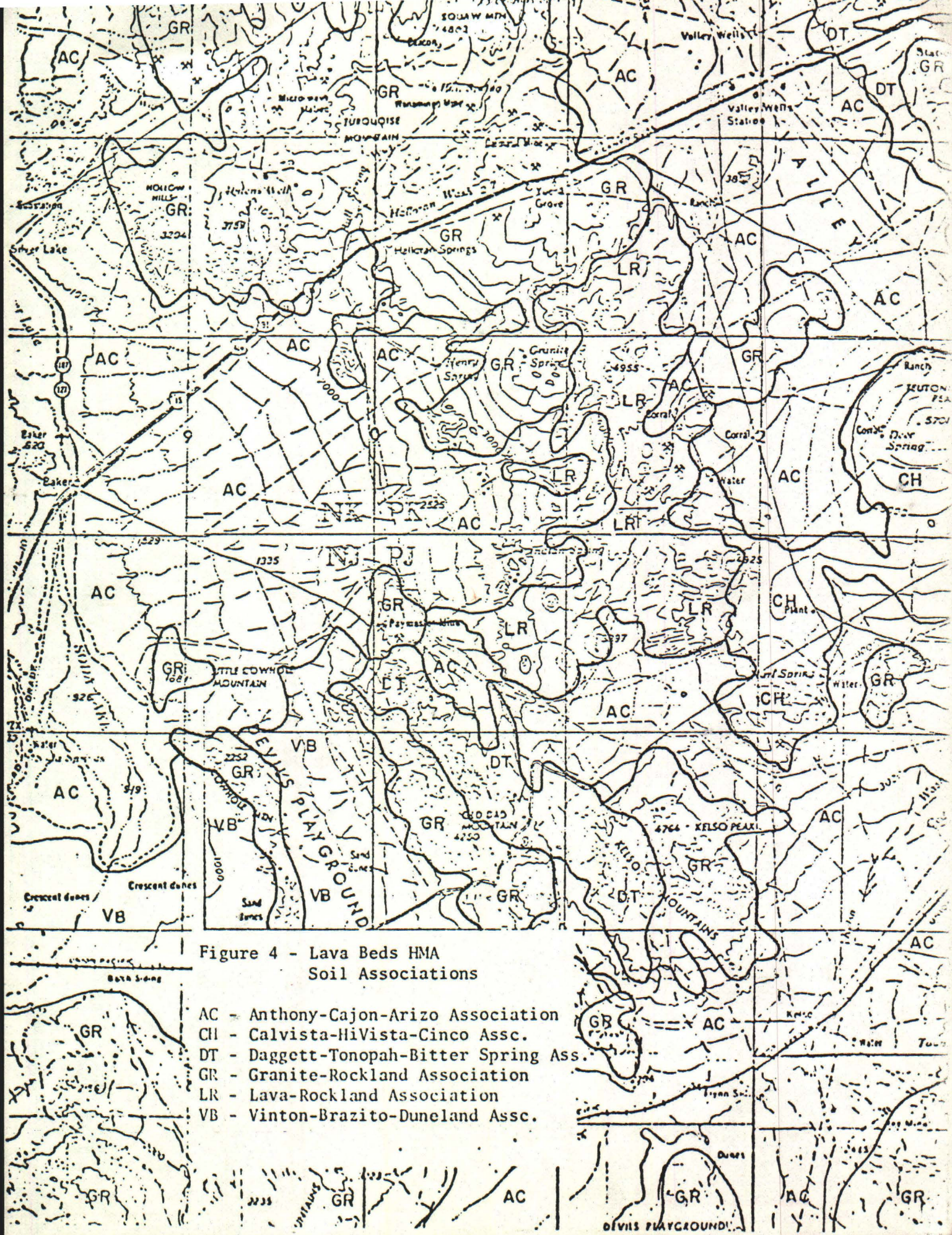

Figure 4 - Lava Beds HMA
Soil Associations

AC - Anthony-Cajon-Arizo Association
CH - Calvista-HiVista-Cinco Assc.
DT - Daggett-Tonopah-Bitter Spring Ass.
GR - Granite-Rockland Association
LR - Lava-Rockland Association
VB - Vinton-Brazito-Duneland Assc.

(Bureau Forms 7210-12 and Standard Unit Record for Vegetation and Soil Surface Resource Data are included in Appendix III).

The erosion condition and trend is broken down as follows for the Lava Beds HMA:

Erosion Class	% Acres in HMA
Stable	0.4%
Slight	29.4%
Moderate	59.5%
Critical	8.2%
Severe	2.5%

The Lava Rockland Association or the area where most of the burros concentrate is classified primarily as having a slight erosion condition and trend. This area has a slow runoff potential. The severe classification is found primarily near Seventeen-Mile Point and Henry Spring.

e. Vegetation

(1) Vegetation Types. There are seven major and three minor structural vegetation types recognized in the Lava Beds HMA. These types were delineated from the 1976 Vegetation Survey by the Desert Plan Staff. The types are identified as major or minor, named, and a brief description of each follows (Appendix I- Overlay II - V - 3) :

MAJOR TYPES:

Woody Scrub-Low Diversity

This is a low diversity type composed of many shrubs greater than 3 feet (90cm) in height. The major contributors to the plant cover

are Larrea tridentata and Ambrosia dumosa averaging 43 and 37 percent composition respectively and having an average of 8 percent cover. The type occurs predominantly on alluvial plains and bajadas between 1115 (340) and 3061 feet (1180m) in elevation.

Sparce Herbland - Low Diversity

This is another low diversity type composed of few shrubs, but many herbs, i.e. greater than 30% of the composition. An average of 15 percent Panicum urvilleanum and 44 percent Hilaria rigida are found distributed upon areas of sand dunes and blow-sand between elevations of 1625 (495 m) and 3050 feet (930 m). This type averages 4 percent cover.

Tall Woody Scrub - Moderate Diversity

This is a moderate-diversity type with many tall shrubs over 3 feet(90cm) tall. The major components of the type are Larrea tridentata and Ambrosia dumosa with 31 and 30 percent composition, respectively. The type covers bajadas, plains, and some slopes between 1525 (465 m) and 4500 feet (1365 m) in elevation. This type averages 9 percent cover.

Succulent Scrub - High Diversity

This is a high diversity succulent type with a short woody shrub understory, and less than 10 percent perennial grasses. The succulents Yucca schidigera, and Opuntia acanthocarpa each average 5 percent of the total plant composition. The type occurs on rocky bajadas and slopes between 2500 (775 m) and 4775 feet (1455 m) in elevation. This type averages 13 percent cover.

Succulent "Woodland" - Moderate Diversity With Tall Shrubs

This type has vegetation greater than 9.5 feet (3 m) tall though it is non-woody. Yucca brevifolia, the species that distinguishes this type and the following two, occurs in 1 percent of the total plant composition. Tall woody shrubs about 3 feet (90 cm) are present in the understory. Larrea tridentata, the major tall shrub averages 18 percent of the total plant composition. The type occurs on plains and slopes between 3450 (1050 m) and 4300 feet (1300 m) in elevation. Average cover for the type is 18 percent.

Succulent "Woodland" - High Diversity

Like the previous type, this is a moderate-diversity type with tall, non-woody trees, but the shrub understory is less than 3 feet (90 cm) tall. Yucca brevifolia averages 2 percent of the plant composition, while the short shrub component is quite variable. Grasses, however, average 24 percent of the plant composition. This type may cover bajadas and plains between 3061 (1180) and 4800 feet (1490 m) in elevation. This type averages 19 percent cover.

Succulent "Woodland" - High Diversity With Herbs

Yucca brevifolia, Lycium andersonii, and Ephedra nevadensis comprise 2, 5 and 7 percent of the plant composition in this type. Grasses such as Muhlenbergia porteri, Bouteloua eriopada, B. gracilis, and Hilaria jamesii average a combined total of 34 percent of the plant composition. The type may occur on bajadas and hillsides between elevations of 3772 (1150 m) and 5500 feet (1675 m). The average cover for the type is 20 percent.

MINOR TYPES:

Green Stemmed Scrub

This type is of low woody vegetation with greater than 30 percent obviously green-stemmed shrubs in occurrence. Hymenoclea salsola, Cassia armata, and Chrysothamnus paniculatus comprise 38, 12, and 6 percent of the total plant composition, respectively. This type occurs in washes between 2034 (620 m) and 4070 feet (1240 m) in elevation. This type averages 10 percent cover.

Sparce Deciduous "Woodland"

This is a type in which plants greater than 10 feet (3 m) in height occur. This type is distinguished by having deciduous trees. Acacia greggii is the major tree averaging 8 percent of the plant composition. Chilopsis linearis or Dalea spinosa may occur in up to 17 and 64 percent of the type in certain areas. Hymenoclea salsola averages 25 percent composition in the type. This type occurs in washes between 1740 (530 m) and 4790 feet (1460 m) in elevation. The type averages 13 percent cover.

Succulent "Woodland" - High Diversity

This is a high diversity type with non-woody trees and a short shrub understory including less than 10 percent perennial herbs. Yucca brevifolia averages 1 percent and other Yucca species average 3 percent of the plant composition. Lycium andersonii, Ephedra nevadensis, and Haplopappus cooperi average 7, 12, and 6 percent respectively. The type may occur on bajadas and hillsides between 3560 (1085 m) and 5475 feet (1670 m) in elevation. This type averages 25 percent cover.

(Appendix 2 includes complete plant list for the HMA.)

(2) Current Range Carrying Capacity. The current range carrying capacity for the East Mojave was determined by a Desert Plan Staff[3] vegetation survey in 1976. The carrying capacity was established for cattle using the standard Bureau concepts of species proper use factors (PUF), forage acre factors (FAF), and forage acre requirements (FAR) (Appendix III has detailed outlines to explain Grazing Capacity Determination). According to an Instruction Memorandum (#76-339) issued from the Washington Office one Animal Unit Month (AUM) will be used in determining forage allowances for wild burros.

The Lava Beds HMA can support 3688 A.U.M.'s or 307 animals when conditions are optimum; i.e. there is adequate water spread throughout the entire area. However, since the water sources are fairly localized and the burros concentrate in these areas (critical areas) the carrying capacity was determined for those areas (22% of the total area) where they are forced to concentrate due to paucity of water.

Two critical areas have been identified that the burros use; Indian Creek and Henry Spring. The following summarizes the determined carrying capacity:

Area	Acres	% Total Area	A.U.M.'s	Animals
Lava Beds HMA	174,052	100%	3688	307
Indian Creek	22,847	13.12%	455	38
Henry Spring	15,620	8.9%	361	30

(3) Condition and Trend

(a) Condition. The condition of the range was determined by using the key forage plant method. The key forage plant method is an ocular estimate method of judging utilization within one of five utilization calsses on one or more key species or on the area as a whole (See Appendix III for Utilization Class Descriptions). Data was taken from four permanent transects and plots which are located in high burro use areas. Most of the key species were browse plants. Very few seedlings of the key species were found in these areas. Hurricane Kathleen (in September 1976) dropped from 4"-7" of rain in the area giving seeds a chance to germinate. That amount of rainfall is very abnormal for the area, thus, it cannot be assumed that occurences like Hurricane Kathleen are common. Even with this extraordinary amount of precipitation, the range did not show a trend towards betterment. On the contrary, the condition and trend continue downward.

The following table summarizes the utilization data that was collected for each key species and compares the average utilization to the proper use factor. A proper use factor (PUF) is defined as the percent of annual growth that can be utilized per grazing season without degrading the range eco-system.

Key Species	Average % Utilization	PUF %
Acamptopappus sphaerocephala	74	-
Ambrosia dumoso	58.6	10
Ephedra nevadensis	53.6	25
Grayia spinosa	50	20
Hilaria jamesii	83	45
Krameria parviflora	50	5
Menodora spinescens	52	30
Muhlenbergia porteri	83	45

These studies will continue so that the effects of management practices can be evaluated. A fecal analysis study is being conducted presently. The information derived from the study will aid greatly in determining more accurately important forage plants desirable to the burros.

Further determination of the range condition is indicated by the soil surface factors obtained from the 1976 Vegetation Survey. The soil surface factors of the permanent plots and transects varied in erosion condition class from 32 to 48 where:

0-20 = Stable Erosion Condition Class

21-40 = Slight Erosion Condition Class

41-60 = Moderate Erosion Condition Class

61-80 = Critical Erosion Condition Class

81-100 = Severe Erosion Condition Class

(b) Trend. The present condition (poor) of the key (desirable) forage plants in the critical areas of the Lava Beds HMA indicates that there is a downward vegetative trend. If the burros are not managed within the area they will continue to utilize the vegetation at their current degree and possibly more. This will undoubtedly result in a condition that is not only severe for the vegetation but for the welfare of the burros.

In the Indian Springs and Black Tank vicinities many desirable forage plants are dead or are unhealthy due to the continuous over use. Very few to no seedlings were found in these areas.

The full value of the trend plots will be realized over a long term period (10 yrs.) as management practices continue.

The actual vegetative trend takes many years to determine, however, the condition and utilization data will provide information that will test the validity of management.

(c) Rare and Endangered Species. There are no rare and endangered species of vegetation known to exist in the HMA.

f. Recreation

The Lava Beds HMA has been designated as having from good to excellent potential for the following: scenic quality, geologic interpretation, upland game birds, and burros.

The area stands out visually with 32 cinder cones dotting the landscape. The recent volcanic activity in the area makes it especially valuable for geologic interpretation. Many local schools choose the area as an example of recent volcanics.

The potential of the area is high, however, present and past use by recreationalists is low.

g. Minerals

The principal rocks of the Lava Beds Mineral Area are early Precambrian metamorphics intruded by Mesozoic quartzmonzonite, occasional Cambrian-Devonian carbonates, Holocene basalt, basaltic pyroclastics (cinder cones) and quaternary alluvium. Gold, copper, silver, lead, zinc, and molybdenum are the metallic commodities while sand, gravel and volcanic cinders are the non-metallic commodities.

There are two active cinder mines in close proximity or within the critical area. The Cima Cinder Company operates Cima

Cinder Mine. Aiken's Cinder Mine is the other operation. Several prospects are located throughout the Lava Beds HMA that are not within burro use areas or the critical area.

h. Cultural Resources

Within the Lava Beds HMA there are currently 65 officially recorded cultural loci. These include the following types and numbers of sites.

Site Type	Number Recorded
Temporary camps	3
Rock shelters	12
Lithic scatters	2
Intaglio/rock alignments	3
Pictograph/petroglyph loci	36
Historic loci	2
Isolated finds	1
Sites of unknown type	8
Total	65

Only 5 of these 65 sites have been recorded as a result of systematic survey (which was conducted by the Desert Planning Staff of the Bureau of Land Management) while the remaining 60 sites have been recorded through the efforts of interested avocationalists. Given the approximately 272 square miles contained within the HMA this yields a site density of .24 sites per square mile. This is some 17 times less than the projected site density for the East Mojave Planning Units within which the HMA is situated.

i. Burros

(1) Population Dynamics

(a) Present Population and Projected Numbers. In July, 1976, 198 burros were counted in the Lava Beds Herd Management Area. Of that total, 26 were colts or 15%. An average colt crop from the 1975 and two 1976 inventories gives a 20.37% colt crop.[10]

The inventories are summarized as follows:

Lava Beds	Adults	Colts	Total	% Colts
1975	50	6	56	12
1976-1	94	32	126	34
1976-2	172	26	198	15

Average = 20.37% Colt Crop.

The projected number of animals in 1976 was 270 burros in the area. This figure is conservative compared to other areas, and based upon field observations and estimates given by the local miners and ranchers.

Using 20% colt crop for the annual population increase, there should be a projected number of 325 burros in the area in 1977.

Before any management is begun, another helicopter inventory will be conducted. The burros will be marked from the helicopter with a temporary dye on the left flank. After a certain number are marked another inventory will take place within two weeks to count the number of marked animals versus unmarked animals. This will give a more accurate indication of the population numbers in the area. The method is referred to as the Lincoln Index.

(b) Productivity. Based upon the 1975 and July, 1976, helicopter counts the observed productivity of the population is in the ratio of 20 colts per 100 adults.

(c) Sex Ratio. No data is available on male/female ratios in the HMA. Research on sex ratios has been done by Mochlman[6] (1974) who in Death Valley National Monument found a 50.5 male/49.5 female ratio in one area and a 70.6 male/29.4 female in another area. Ohmart and Woodward's [7] research in 1975 indicates that a 50 male/50 female ratio is normal for wild burros in the Colorado River area.

(d) Age Structure. No data is available to determine the age structure of the burros in the HMA.

(e) Mortality. Life or mortality data has not been determined in the Lava Beds HMA. Until the Act was passed in 1971, however, burros were captured off the range in order to keep the numbers down. One could conjecture that natural mortality rate due to old age is not present because many of the burros (approximately 73%, if one regresses the numbers back to 1971) were not there in 1971. That means that the majority of the burros are between three to six years of age. Predation has not been observed in the area, however, one burro was found shot on the main road that goes through the center of the HMA.

(f) Colors. The July 1976 helicopter inventory found four colors in the HMA. The percentages they comprised are summarized below:

Color	% Population Counted
Black	35

Grey	58
Brown	6
Tan	1

The majority of the burros possess the shoulder cross characteristic of their ancestors, the Nubian Ass, although it is difficult to discern on many of the darker animals.

(2) Burro Habitat

(a) Herd Management Area. The total HMA encompasses 174,052 acres of which the burros are known to cover approximately 65% or 115,000 of those acres during the year when it is feasible. After heavy rains in the fall and winter the burros move out to the peripheral areas to take advantage of the annuals and forage. Water pockets are formed and exist longer at this time of the year because the temperatures are not as extreme as in the summer.

(b) Critical Areas. The two critical areas, Indian Creek and Henry Spring, comprise 38,467 acres or 22% of the total HMA. The critical areas were delineated from observations made and data compiled from the past inventories. In addition, the area was surveyed on the ground to determine where the burros spend their time in the hot dry periods. Water availability and requirements were also considered when delineating the critical areas.

On a yearly basis, the burros spend all of their time in the critical areas from June through September or Mid-October (dependant upon the summer and fall thunderstorms). Between October and June they have few restraints to keep them from moving out

of the area unless there has been no rainfall. When there is adequate succulent forage they can go without water from 3 to 5 days. Jennies with colts and the older animals have more restraints, thus, not all of the burros leave the critical area.

(c) Forage Usage.

Burro Forage Usage Behavior. Burros are, by preference, grazers with a wide range of adaptability to grasses, forbs and shrub species.[12] The northeast and southeast portions of the HMA have perennial grasses as a major component of the vegetation. Throughout the rest of the area and in the critical areas it appears browse plants and annuals, when available, compose the major portion of the burros diet. The key species for the utilization and trend plots were picked from former studies of vegetation prefenences of burros by Moehlman and Woodward, observations of burros foraging, and consideration of heavily utilized species. Browse species noted to be utilized by burros in the HMA are burro-bush, Mormon-tea, Mesquite, Acacia, Menodora, white sage, Ratany, and Goldenhead.

A fecal analysis study is presently being conducted in the HMA. This information will give more adequate information as to preferred species, seasons of use, and overlap in dietary habits of burros and cattle. (The cattle have not been in the area for more than three months in the past year and will not be in the area again while the present numbers of burros are there.)

(d) Current Forage Use by Burros. The burros within the Lava Beds HMA are currently utilizing 3960 A.U.M.s of forage. The 1976 range survey determined that there are only 3688 A.U.M.s in

the HMA. In contrast, the critical areas currently produce only 816 A.U.M.'s of forage annually.

(e) Water. In the HMA, water distribution is the most prevalent limiting factor. As shown in Figure 1, very little water is available to the burros on a yearlong basis. Indian Creek and Henry Spring are the only water sources that can be relied upon. However, they are limited also with the amount of water produced.

Field observations have noted that the burros will range within three miles of water during hot, stressful times; however, when it rains they will move out of the area to take advantage of the forage and move back in when the water is gone from the potholes.

During the summer months the burro will drink from 2.5 to 4.0 gallons a day[5, 8] and normally does not travel more than 3 miles from an available water source. Moehlman observed some individuals, especially females with foals less than one month old, drinking 2 or 3 times a day.[6] During times of moderate temperatures and especially when succulant annuals are prevalent the burros will go without water for 3 to 5 days and will travel longer distances.

Watering habits vary from place to place in the HMA. At springs or water sources where accessibility is easy for the public they only come into water at night. This has been noted especially at Henry Spring and along the Twisselman Pipeline. The burros have been observed many times drinking at all times of the day at Indian Creek and Black Tank.

(f) Cover. Washes with abundant riparian vege-

tation provide cover and are preferred by the burros in the summer months. Thermal cover is at a premium. The burros use Mesquite, Desert Willow, Acacia, and Baccharis and Yucca as the primary cover plants.

(g) Seasonal Use Areas. During the summer months, the critical areas are heavily used. As mentioned before, when there is adequate precipitation they move at least 6 to 8 miles out of the critical area away from water and can withstand 2 to 3 days (or more if adequate annuals are available) without water while they forage.

(h) Home Range. There has not been any quantitative research done in this area on home ranges of individual animals. However, field observations have shown that the burros will travel from 7 to 12 miles away from a positive water source in search of adequate feed.

(i) Need for Further Studies. Quantitative studies with respect to vegetation studies and food preferences have been started. The fecal analysis study evaluating dietary overlap between burro and cattle and food preferences for both animals will be concluded in FY-78. The vegetation studies will continue with effort placed on utilization, condition and trend.

In order to better substantiate a long-term action plan, data such as Lincoln Indices or other population estimates, sex ratios, age structure, and mortality rates should be gathered and analyzed. In addition home range information should be collected.

(j) Wildlife

(1) Habitat. The Lava Beds HMA is comprised

of habitat ranging from Creosote/mixed shrub, rocky slopes/yucca, and joshua tree/mixed shrub. Several riparian habitat types are also represented in the form of desert willow, Acacia, and cheese bush washes. (Appendix II includes a list of wildlife species in HMA.)

The more common mammalian species occurring in the HMA are jackrabbits, cottontails, kangaroo rats, pocket mice, and ground squirrels, particularly in the flatten, more open areas of lower elevations. Higher and more rocky areas (Old Dad Mountains and Kelso Mountains) support bighorn sheep. Predatory mammals found in the HMA include foxes, coyotes, badgers, ringtails, bobcats and skunks.

Among the avian species to be found are Gambel's Quail, Chukar, mourning dove, several species of raptors and numerous passerive species. Dove, quail, and chukar occur chiefly in the riparian habitats due to good cover and water. Raptors include the red-tail hawk, Swainson's hawk, Golden eagle, prairie falcon, and American Kestrel. Common songbirds include the sage sparrow, sage thrasher, house finch, and black-throated sparrow, occupying a variety of habitat types. Waterfowl and shorebirds, such as coots, killdeer, and eared grebes have also been observed at cattle watering sites. Verified breeding areas for Bendire's thrasher, the American Kestrel and Swainson's hawk also exist with in the HMA.

A wide variety of reptiles and one amphibian are represented. The amphibian, the red-spotted toad, is restricted to riparian habitats. The more common reptiles are the desert

iguana, zebra-tailed lizard, Great Basin whiptail, side-blotched lizard, glossy snake, gopher snake, sidewinder, speckled and mojave rattlesnakes. In addition, prime habitat for chuckawallas and the desert rosy boa are to be found primarily in rocky slope/yucca associations. These species occupy a great variety of habitat types but are most often encountered in flatter, creosote dominated areas. Suitable desert tortoise habitat also exist in these areas. (See Figure 4 for tortoise and sheep habitat.)

(2) Crucial Areas. Several areas in the lava bed-cinder cones HMA may be considered crucial, or at least sensitive in terms of wildlife habitat. As already mentioned prime habitat exists for the chuckwalla and desert rosy boas both of which are partially protected by state law (Fisk, 1972)[4]. The desert tortoise, a fully protected species (Fisk, 1972) , has been observed at Henry Spring (a trap site) and in the vicinity of Twisselman Pipeline Tank #6. The Henry Spring site, which is prime tortoise habitat, is presently heavily disturbed due to cattle and burro trailing and grazing. To the south lie the sand dunes of Devil's Playground, prime habitat for the partially protected Mojave fringe-toed lizard.

Bendire's thrasher breeds in the vicinity of Black Tank and Tank #3 both of which suffer from overgrazing and trailing. The American Kestrel and Swainson's hawk also breed in this area as well as near Tank #6. LeConte's trasher and the Loggerhead shrike occur in the vicinity of Tanks #5 and #6.

Henry Spring and Black Tank provide habitat for the Chisel-toothed (Great Basin) Kangaroo rat (Figure 2 shows locations of water sources).

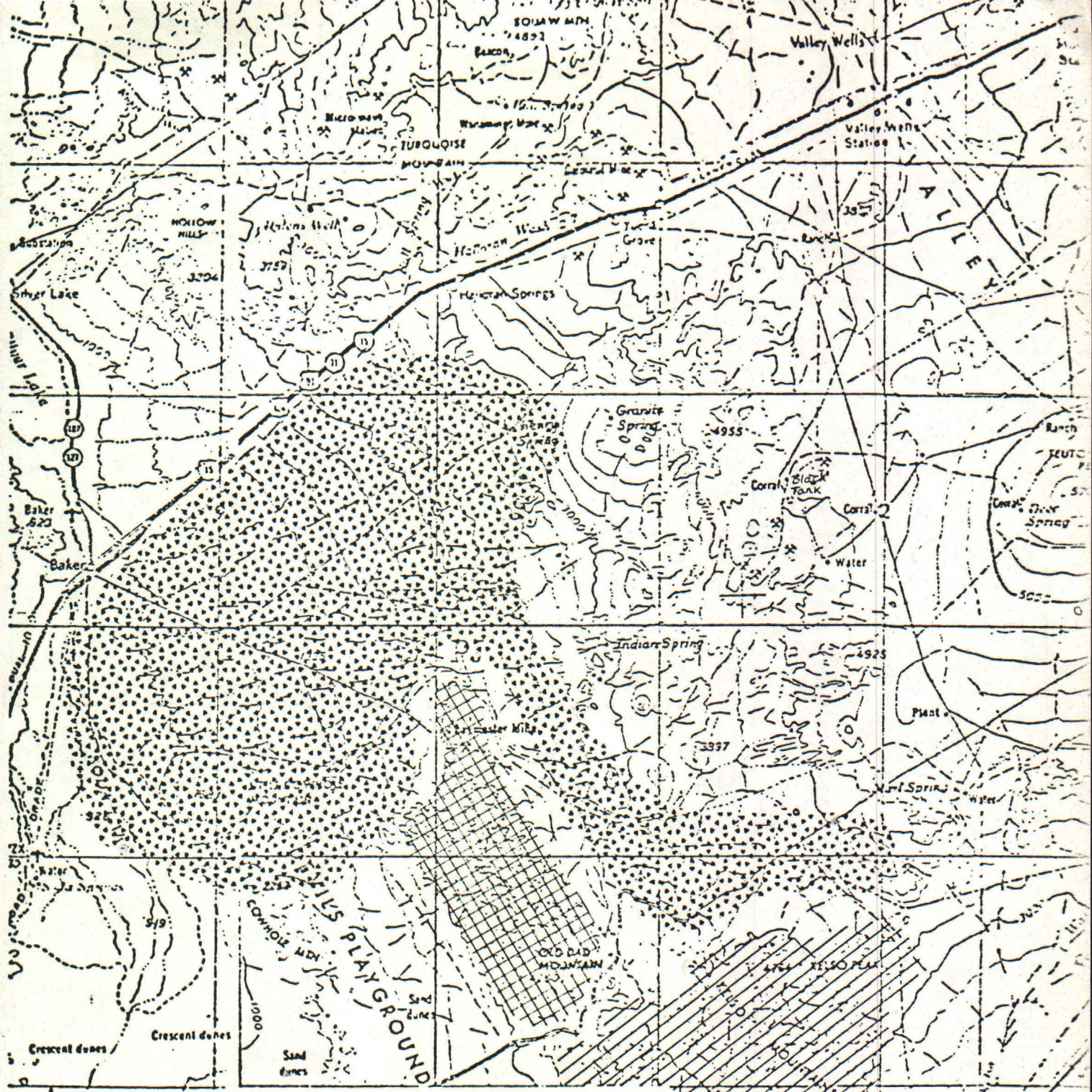

Figure 5. - Lava Beds
Herd Management Area

Bighorn Sheep - Permanent Range

Bighorn Sheep - Seasonal Range

Desert Tortoise Habitat

(3) Rare and Endangered Species and other Significant Wildlife Information

(a) Rare and Endangered Species. No rare, endangered or threatened species of wildlife inhabit the HMA. The prairie falcon was formerly listed as threatened but is presently listed as status undetermined (USDI, 1973) .

(b) Other Significant Wildlife Information. This section includes species which are fully protected under California law, Blue Listed bird species and or species nominated by Bureau of Land Mangement (Riverside District) as sensitive.

Fully protected species occurring in or near the lava beds-cinder cones HMA are the desert tortoise, kit fox, ringtail, mountain lion, bighorn sheep and feral burro.

Blue listed bird species include Cooper's Hawk, Swainson's Hawk, Prairie Falcon, American Kestrel, Burrowing Owl, Loggerhead shrike, Sharp-shinned Hawk, Mountain Bluebird and the barn Owl.

Bureau of Land Management nominated sensitive species include the desert tortoise, Prairie Falcon, Swainson's Hawk, the desert shrew, bobcat and bighorn sheep.

(k) Livestock. A portion of one grazing lease extends into the entire HMA. This allotment is managed as perennial - ephemeral range on a yearlong basis. In the last three years livestock use has averaged 33 cows yearlong in the critical area.

B. Existing Projects

There are three fence lines in the HMA which provide partial

boundaries, one windmill developed for domestic livestock, that when operating, provides water at four troughs for burros, a developed spring that is year-round, and a dirt tank that provides water after heavy precipitation. Without the range improvements for domestic livestock, there would be few burros in the area. Only one of the developed waters, Henry Spring, provides water year-round. The fences to the north and east provide definite boundaries while the fence to the southeast to the top of Kelso Peak is more of a drift fence. The western boundaries are designated more by lack of water than fencelines.

Table 2 gives a list of the existing improvements in the HMA.

Table 2

Range Improvements

FENCES

No.	Title	Completion (Date FY)	Location			Project Description
			T	R	Quadrangle	
0180	Twissleman	1951	15N	10E	Halloran Springs	4 strands b-wire, 3 gates 6.6 miles, addition
0120	Twissleman Pasture	1956	15N	12E	Mescal Range	3.6 miles, 3 strands
0127	Page Drift	1956	13N	12E	Kelso	2.0 miles
0128	Twissleman Drift	1956	13N	12E	Kelso	14.0 miles, 3 strands
0317	Sands RR	1960	11N	10E	Old Dad Mountains	21.5 miles, 2 and 3 strands
0035	Cowhole Mountain	1963	12N	10E	Old Dad Mountains	4.0 miles, 3 strands
0222	Kelso Peak Drift	1964	12N	12E	Kelso	6.3 miles, 3 strands 2 cattleguards
0373	Dunes Drift	1965	11N	10E	Old Dad Mountains	5 gates, 3 strands 7.8 miles

Table 2

CORRALS

No.	Title	Completion (Date FY)	Location			Project Description
			T	R	Quadrangle	
0180	Twissleman	1962	13N	11E	Old Dad Mountains	tie and post, woven wire
0184	Twissleman	1962	13N	12E	Kelso	tie and post, woven wire
0494	Black Tank Dry	1967	14N	12E	Mescal	2 corrals with loading chute, one all ties (50" dia.) one woven wire and posts 100' x 50'
0496	Three	1967	14N	12E	Mescal	ties with loading chute
0497	Two	1967	14N	12E	Mescal	ties with loading chute
0498	Henry	1967	14N	11E	Halloran Springs	ties with loading chute

Table 2

RESERVIORS

No.	Title	Completion (Date FY)	Location			Project Description
			T	R	Quadrangle	
0024	Twissleman	1943	14N	12E	Mescal	small, fenced

SPRING DEVELOPMENTS

No.	Title	Completion (Date FY)	Location			Project Description
			T	R	Quadrangle	
3521	Henry	1969	14N	11E	Halloran Springs	100' 1" steel pipe, 3 troughs (2) 4100 gal. tanks, sump

WELLS and WINDMILLS

No.	Title	Completion (Date FY)	Location			Project Description
			T	R	Quadrangle	
0122	Cinder Cone	1963	14N	12E	Mescal	windmill, tank, pipeline

PIPELINES

No.	Title	Completion (Date FY)	Location			Project Description
			T	R	Quadrangle	
0003	Twissleman Well	1966	14N	12E	Mescal	plastic and steel 12.0 miles, with 2 tanks, 5 bird ramps, trough

C. Coordination

There are several resource disciplines within the HMA that accentuate the need and urgency for this Interim Plan and burro management prior to the completion of the MFP.

1. Wildlife

The California Department of Fish and Game has verbally endorsed plans for burro management in the Lava Beds HMA.[13]

Management of the burro numbers in the HMA, as indicated by the Interim Burro Management Plan, will benefit wildlife species greatly. There will be less grazing pressure on forage species, resulting in increased plant vigor, production, and cover. There will also be less pressure on the water sources in the area; especially Indian Creek where the burros stand for hours around a pothole that contains 1-2 gallons of water. The summer not only brings increased stress to the burro but to native wildlife as well.

2. Livestock

There is one grazing allotment, Valley View, that utilizes the Lava Beds HMA (See Appendix I - Base Map and Overlay III-RM-4). The allotment is currently authorized 8,485 A.U.M.s of which 3 688 (or 43%) are in the HMA. The total lease encompasses 289,036 acres of which 13% are in the critical burro area and 60% in the HMA. The A.U.M.s in the critical area comprise 10% of the total authorized A.U.M.s for the allotment and 22% of the A.U.M.s for the HMA. Cattle do not utilize the Indian Creek area at all and have not for more than 10 years.

The lessee of the Valley View Allotment has taken a voluntary reduction from 8,485 A.U.M.s to 6,960 A.U.M.s (18% cut) to alleviate the situation in the HMA.

3. Minerals

Implementation of this Interim Burro Management Plan should have no effects on the present mining operations nor on development of other mineral resources in the Lava Beds area.

II. Objectives

A. Burros

1. Habitat

To stabilize the declining vegetative condition trend, and allow seedlings to grow and plant vigor to be restored within the HMA b reducing the utilization of the key species to the proper use factors (PUF) designated for each key species. provide AUM's of adequate forage and improve the desert willow, mesquite and Acacia cover for the burros in the critical areas. To relieve the pressure on the one natural water source (Indian Creek) in the area such that the water quality is improved and the water source sustained to support the burros and wildlife in the area.

2. Animals

Maintain a healthy viable population of 40 burros (58% of the total A.U.M.s available in critical area) in the Lava Beds HMA. Attempt to maintain a 60% male/40% female sex ratio such that there is an annual recruitment rate of 15 percent. Endeavor to maintain a similar percentage of coloring as seen in the 1976 inventory.

B. Other Resources

1. Watershed

Reduce soil movement in the HMA and improve soil protection by increasing the litter and the shrub canopy cover. Reduce the excessive trailing in the critical areas.

2. Wildlife

Improve the riparian habitat (mesquite, Acacia, and desert willow) directly around Indian Creek such that there is suitable water, cover, and forage for wildlife as well as burros. This will allow plants to recover and provide normal crops of seed.

3. Range Condition and Trend

Improve the range condition from poor to good in critical areas by managing the numbers of burros 40 percent below the current range carrying capacity. This will enable the condition of the vegetation as well as the trend to improve in a timely manner providing more and better forage for the burros and wildlife. Evaluate utilization and condition regularly so that the management action can be measured accurately.

III. Management Methods

A. Analysis of Methods

An analysis of the methods to be considered for accomplishing the objectives are stated as follows with a brief rationale for or against each method.

1. Management of Burros

a. No Removal

No action is contrary to the stated objectives. It would result in further degradation of the range as well as adversely effect the welfare of the burros and other animals.

b. Total Removal

Total removal is contrary to the stated objectives. In addition, it would be very difficult to capture all the burros in this area. Total removal also violates the Act and Bureau policy prior to completion of the MFP.

c. Partial Removal

Removal of burros that are in excess of the current carrying capacity for the critical area and maintenance at a number 40 percent below the carrying capacity will insure a healthy viable population of burros and, at the same time, protect and improve the habitat of the HMA.

d. Relocation

Relocation to other areas where there were burros at the time the Act was passed (December, 1971) has been considered. However, the MFP of the area to be considered for relocation must be

completed. An area for this use has not been found that would be suitable for the burros and stay within the constraints of proper burro management.

2. Change of Grazing Use

a. Development of additional waters outside the critical area would partially relieve the problem in the critical areas, at a tremendous cost. However, there still would not be adequate forage for the burros in the area as they already exceed the carrying capacity for the entire HMA by 272 A.U.M.s. Fencing the critical area to exclude the burros would have similar problems in that it would not alleviate the situation but move it.

3. Selected Method

For the reasons stated above, partial removal of burros is considered the only viable alternative at this time. The vegetative data and lack of water indicates an immediate need to reduce burro numbers down to the carrying capacity of the critical area. This will also meet the objective for maintaining a viable population for the future. Declining vegetation trend can be stabilized or improved; and the lacking information on age, sex, natality, and mortality of the animals can be obtained upon which to base a comprehensive long-range management plan in concert with MFP guidance.

B. Analysis of Management Techniques

1. Capture and Remove Animals from the Area

a. Water Trapping

This method is relatively easy, inexpensive, and safe.

It is a passive method used to capture the burros and has proved effective in other areas. There are five trap sites available in the area and the burros have utilized water in the corrals when it has been available in the past. Thus, they are accustomed to entering and leaving the corrals through the trap gates.

b. Using Helicopter to Move Animals to Water Trap Sites

This method would move the animals to the closest water trap site. The animals would not be herded but directed towards the area, thus, increasing the possibility of water trap. This method would be used only if the water trap method is insufficient.

c. Roping

Roping burros requires experienced horse people with excellent roping abilities supported by good horses. It is a time-consuming process and can be dangerous to the horse, the rider, and the burro. Due to the terrain roping will be limited to one area as shown in Figure 2.

d. Roping with the Help of Helicopters

This method requires the use of helicopters and experienced riders and horses. The helicopter is used to move the animals down to the ropers. It is far more effective than having to chase and rope the animals from horseback. This method also puts less stress on the burros, riders, and horses overall and is less dangerous than just roping. It has also been shown to be more economical than roping because of the time involved per burro. This method will also be limited to one area as shown in Figure 2.

e. Roundup and Trapping by Horseback

This method requires experienced riders and horses. The burros would be worked into a trap site which would block a canyon. Experience has shown that when burros are being pursued on horseback they tend to scatter and go away from the direction they are being lead. Trapping would only take place in the area as shown in Figure 2. This method does not require roping the animal.

f. Roundup and Trapping by Horseback and Helicopter

The helicopter has been shown to be an effective tool when trying to gather burros. It is flexible and can turn them when they deviate from the trail as well as lead them at a comfortable, safe pace. The riders and horses would be waiting near the trap to insure they all go in. This method does not require roping and would also take place in the area as shown in Figure 2.

g. Use of Tranquilizing Drugs and Guns

As pointed out previously, it is Bureau policy (as directed by Instruction Memorandum No. 77-342) to remove and place all of the excess burros under the Adopt-a-Horse or Burro program. Thus, this method of control is unfeasible.

2. Arrangements for Excess Burros

a. Adopt-a-Burro

The Adopt-a-Burro program is the Bureau's normal procedure used for taking care of excess animals gathered from over-populated areas.

During the past two years, the Bureau has placed

excess wild horses into "foster homes" through and "Adopt-a-Horse" program operating in Nevada, Oregon, and other western states. The adoption program complies with the spirit of the 1971 Wild and Free-Roaming Horse and Burro Act, and has been successful in removing excess animals from the public range.

Persons interested in adopting one or more burros receive a simple one-page application from a local BLM office, and submit the completed form to Washington, D.C. Individuals must demonstrate that they are able to properly house and feed the animals.

Applications which are accepted are forwarded to Denver Service Center for retention on a computerized list of prospective "foster parents." When the burros are rounded up, persons on the list will be notified where to pick up their burros.

All pick-up and transportation costs must be borne by the adoptee. Burros will be inspected following round-up and certified free of disease, and will be subject to periodic inspection by BLM.

Adoptees must agree that the animals will not be sold or used for commercial purposes. The burros will remain the property of the federal government for their own protection from misuse; any offspring belong entirely to the foster parent.

b. Tranquilizing Drugs and Guns

As discussed under Capture and Removal, this method is not feasible because of Bureau policy and public opposition.

3. Selected Method

The best methods for capturing the animals are water trap and use of the helicopter to move the animals to the ropers, water traps, or traps. Following the capture, the animals will be transported to a central corral for marking and identification and adopted out to qualified parties. Further information concerning gathering and removal is supplied in Appendix IV.

C. Management Facilities

Facilities, equipment, services required, and cost estimates for burro reduction and management in the HMA are discussed in Appendix IV.

D. Cooperative Agreements

The following cooperative agreements will be made for the protection and arrangement of burros after their capture:

1. Assignment for Private Maintenance of Wild Free - Roaming Horses or Burros

Outlines requirements necessary to maintain the animals under humane conditions. The private party does not have title to the animal, may not sell it or use it for commercial exploitation, nor may the animals be transferred or reassigned except with written permission of the Bureau. (Form 4710-9)

2. San Diego County Humane Society and S.P.C.A.

As outlined in a letter to Associate Director, George Turcott, they will treat any complaint relative to a wild horse or burro in the same manner they would treat a criminal complaint, utilizing the animal criminal code of the State of California. They will be furnished with the names of the adoptors in the region.

IV. Evaluation Studies

A. Habitat Studies

1. Utilization and Trend

The permanent trend and utilization plots will be read twice a year. Color photos will be used to record the plot data. Utilization will record the percent of growth utilized that year.

2. Exclosure Plots

Exclosure plots will be established in the HMA after completion of the MFP. Complete plant inventories will be made in each of the following:

a. Species identification

b. Composition and density

c. Utilization

d. Plant Vigor

e. Map of desirable species

f. Litter information

g. Soil analysis.

3. Climate

Annual precipitation and temperature data will be obtained from the Baker GNNW weather station. Rain gauges will be supplied at each exclosure plot.

4. Fecal Analysis

The fecal samples will be collected through FY78 each month and analyzed.

B. Animal Studies

1. Biological Data

a. Sex Ratio

All animals captured will have the sex determined and a sex ratio will be obtained for the population.

b. Age Structure

All animals captured will be aged according to their dentition and age structures for the burro population.

c. Health Inspection

Blood samples will be taken from all the burros and analyzed for Equine Infectious Anemia, Western, and Eastern Encephalitis. The animals will be inspected for external parasites, injuries, and any other physical problems which may be present.

C. Other Studies

Inventories will be conducted regularly using the Lincoln Index procedure. This method entails marking the animals with paint and counting the total number of marked versus unmarked animals within two weeks. Once it has been established that the burros have been reduced to approximately 40 animals, an inventory should be conducted at least every other year to determine population increase. This information coupled with the vegetation studies and evaluation will dictate further needs for management as they arise.

V. Modification

This plan is adaptable to any changes or modifications that may be necessary because of evaluation studies. Any modifications will be documented in the plan. This interim plan will be analyzed after

completion of the MFP to determine conformity to the MFP. Nonconformance will require modification of the plan.

VI. Approval.

Prepared by Damara P. Kennedy Date 9/28/77

Range Technician, Burro Specialist

I concur.

[signature] Date 9/28/77

Cima Resource Area Manager

Conrad E Hilen Date 9/28/77

District Manager, Riverside

_____ Date _____

State Director, California

APPENDIX I

Base Maps and Overlays

The base map shows the entire East Mojave Planning Unit and is made from one-half inch to the mile topographic maps. The following lists overlays referred to in the text. The overlays are on clear acetate and because of their size and complexity are not reproducible.

East Mojave Land Ownership III - L - 1

East Mojave Burro Management Areas RM - III - 7

East Mojave Vegetation II - V - 3

East Mojave Grazing Leases III - RM - 4

Other overlays that provide information are those that coincide with the 1976 Burro Inventory Technical Report. These include information on boundaries, fencelines, water sources, numbers of burros counted, location counted, and information on the two critical area, Indian Creek and Henry Spring.

All of the above maps and overlays are available for review at the Riverside District Bureau of Land Management Office.

SHRUBS

Family	Scientific Name	Common Name	Symbol
Fabaceae	Acacia greggii	Catclaw	Acgr
Asteraceae	Acamptopappus sphaerocephalus	Goldenhead	Acsh
Asteraceae	Ambrosia dumosa	Burrobush	Amdu
Asteraceae	Ambrosia eriocentra	Wool Fruited Burbush	Amer
Asteraceae	Artemesia dracunculatus	Sagebrush	Ardr
Asteraceae	Artemisia spinescens	Bud Sagebrush	Arsp
Asteraceae	Artemisia tridentata spp. tridentata	Big Sagebrush	Artr
Chenopodiaceae	Atriplex canescens spp. canescens	Four-winged Saltbush	Atca
Chenopodiaceae	Atriplex hymenelytra	Desert Holly	Athy
Chenopodiaceae	Atriplex polycarpa	Desert Saltbush	Atpo
Asteraceae	Baccharis emoryi	Emory Baccharis	Baem
Asteraceae	Baccharis sergiloides	Squaw Waterweed	Base
Asteraceae	Bebbia juncea	Chuchwalla's Delight	Beju
Asteraceae	Brickellia desertorum	Desert Brickellbush	Brde
Asteraceae	Brickellia incana	White Brickellbush	Brin
Fabaceae	Cassia armata	Desert Senna	Caar
Asteraceae	Chrysothamnus paniculatus	Black-banded Rabbitbrush	Chpa
Rosaceae	Coleogyne ramosissima	Blackbrush	Cora
Fabaceae	Dalea fremontii var. minutifolia	Fremont Dalea	Dafr
Asteraceae	Encelia farinosa	Brittle bush	Enfa
Asteraceae	Encelia frutescens	Bush Encelia	Enfr
Asteraceae	Encelia virginensis var. actoni		Envi

SHRUBS con't

Family	Scientific Name	Common Name	Symbol
Ephedraceae	Ephedra californica	Cal. Joint Fir	Epca
Ephedraceae	Ephedra funerea	Death Valley Joint Fir	Epfu
Ephedraceae	Ephedra nevadensis	Nevada Joint Fir	Epne
Ephedraceae	Ephedra viridis	Mountain Joint Fir	Epvi
Polygonaceae	Eriogonum faciculatum spp. polifolium	Cal. Buchwheat	Erfa
Polygonaceae	Eriogonum plumatella spp. jaegeri	Flat-top	Erpl
Polygonaceae	Eriogonum wrightii ssp. membranaceum		Erwr
Chemopodiaceae	Eurotia lanata	Winter Fat	Eula
Rosaceae	Fallugia paradoxa	Apache Plume	Fapa
Oleaceae	Forestierra neomexicana	Desert Olive	Fone
Chemopodiaceae	Grayia spinosa	Spiny Hop-sage	Grsp
Asteraecea	Gutierrezia microcephala	Matchweed	Gumi
Asteraceae	Gutierrezia sarothrae	Broom Snakeweed	Gusa
Asteraceae	Haplopappus cooperi	Cooper Goldenbush	Haco
Asteraceae	Haplopappus cuneatus	Wedgeleaf Goldenbush	Hacu
Asteraceae	Haplopappus linearifolius	Narrowleaf Golden-bush	Hali
Asteraceae	Hymenoclea salsola var. salsola	Cheesebush	Hysa
Capparaceae	Isomeris arborea	Bladderpod	Isar
Krameriacae	Krameria grayi	Gray Krameria	Krgr
Krameriaceae	Krameria parvifolia var. glandulosa		Krpa
Krameriaceae	Krameria parvifolia var. imparata	Littleaf Krameria	Krpa
Zygophyllaceae	Larrea tridentata ssp. tridentata	Creosote Bush	Latr

SHRUBS con't

Family	Scientific Name	Common Name	Symbol
Brassicaceae	Lepidium fremontii	Desert Alyssum	Lefr
Fabaceae	Lotus rigidus	Desert Rock-pea	Lori
Solanaceae	Lycium andersonii ssp. andersonii	Anderson Desert Thorn	Lyan
Solanaceae	Lycium cooperi	Cooper Desert Thorn	Lyco
Asteraceae	Machaeranthera tortifolia	Desert Aster	Mato
Oleaceae	Menodora spinescens	Spiny Mendora	Mesp
Loasaceae	Petalonyx thurberi spp. thurberi	Sandpaper Plant	Peth
Asteraceae	Peucephyllum schottii	Pigmy Cedar	Pesc
Asteraceae	Pluchea sericea	Arroweed	Plse
Rosaceae	Prunus fasciculata	Desert Almond	Prfa
Asteraceae	Psilastrophe cooperi	Paperflower	Psco
Anacardinaceae	Rhus trilobata ssp. anisophylla	Squawbush	Rhtr
Lamiaceae	Salazaria mexicana	Bladder Sage	Same
Lamiaceae	Salvia dorrii ssp. dorrii	Purple Sage	Sado
Lamiaceae	Salvia mohavensis	Mojave Sage	Samo
Asteraceae	Senecio douglasii ssp. monoensis	Bush Groundsel	Sedo
Asteraceae	Tetradymia stenolepis	Mojave Horsebrush	Test
Rutaceae	Thamnosma montana	Turpentine Broom	Thmo
Asteraceae	Viguiera deltoidea var. parishii	Desert Sunflower	Vide

SUCCULENTS

Family	Scientific Name	Common Name	Symbol
Cacteceae	Echinocereus engelmannii	Hedgehog Cactus	Ecen
Cactaceae	Echinocereus triglochidiatus	Mound Cactus	Ectr
Cactaceae	Echinocactus polycephalus	Cottontop	Ecpo
Cactaceae	Ferocactus acanthodes var. acanthodes	Barrel Cactus	Feac
Cactaceae	Ferocactus acanthodes var. lecontei	Barrel Cactus	Feac
Cactaceae	Opuntia acanthocarpa	Buckhorn Cholla	Opac
Cactaceae	Opuntia basilaris var. brachyclada	Beavertail Cactus	Opba
Cactaceae	Opuntia echinocarpa	Silver Cholla	Opec
Cactaceae	Opuntia erinacea var. erinacea	Old Man	Oper
Cactaceae	Opuntia erinacea var. ursina	Old Man Cactus Grizzly Bear	Oper
Cactaceae	Opuntia ramosissima	Pencil Cholla	Opra
Agavaceae	Yucca baccata	Spanish Bayonet	Yuba
Agavaceae	Yucca brevifolia	Joshua Tree	Yubr
Agavaceae	Yucca schidigera	Mojave Yucca	Yusc

GRAMINOIDS

Family	Scientific Name	Common Name	Symbol
Poaceae	Aristida glauca (A)	Reverchon Three-Awn	Argl
Poaceae	Bouteloua eriopoda (P)	Black Grama	Boer
Poaceae	Bromus rubens (A)	Red Brome	Brru
Poaceae	Bromus tectorum (A)	Cheat Grass	Brte
Poaceae	Carex sp. (A)		
Poaceae	*Distichlis spicata (A)	Saltgrass	Disp
Poaceae	Erioneuron pulchellum (A)	Fluffgrass	Erpu
Poaceae	Festuca octoflora (A)	Six-weeks Foscue	Feoc
Poaceae	Hilaria jamesii (P)	Galleta Grass	Hija
Poaceae	Hilaria rigida (P)	Big Galleta	Hiri
Poaceae	Hordeum glaucum (A)		Hogl
Poaceae	Juncus sp.		
Poaceae	Muhlenbergia porteri (P)	Bush Muhly	Mupo
Poaceae	Oryzopsis hymenoides (P)	Indian Ricegrass	Orhy
Poaceae	Polypogon monspeliensis (A)	Rabbitfoot Grass	Pomo
Poaceae	Schismus arabicus (A)		Scar
Poaceae	Schismus barbatus (A)		Scba
Poaceae	Scirpus olneyi ( )	Olney Bulrush	Scol
Poaceae	Sitanion hystrix var. californicum (P)	Squirreltail	Sihy
Poaceae	Sporobolus airoides (P)	Alkalai Sacaton	Spai
Poaceae	Sporobolus cryptandrus (P)	Sand Dropseed	Spcr

(A) = Annual
(P) = Perennials

GRAMINOIDS con't.

Family	Scientific Name	Common Name	Symbol
Poaceae	Stipa speciosa (P)	Desert Needlegrass	Stsp
Poaceae	Typha sp.		

(A) = Annual
(P) = Perennials

PERENNIAL FORBS

Family	Scientific Name	Common Name	Symbol
Nyctaginaceae	Abronia nana	Sand Verbena	Abna
Papaveraceae	Argemone corymbosa ssp. corymbosa	Prickly Poppy	Arco
Asclepiadaceae	Asclepias sp.		
Fabaceae	Astragalus lentiginosus var. fremontii	Dapple Pod	Asle
Asteraceae	Baileya multiradiata	Wild Marigold	Bamu
Scrophulariaceae	Castilleja chromosa	Desert Paintbrush	Cach
Scrophulariaceae	Castilleja linariaefolia	Long-leaved Paint-Brush	Cali
Pteridaceae	Cheilanthes sp.		
Asteraceae	Cirsium nidulum	Thistle	Cini
Boraginaceae	Coldenia plicata	Plicate Coldenia	Copl
Cucurbitaceae	Curcurbita palmata	Palmate-leaved Gourd	Cupa
Fabaceae	*Dalea parryi		Dapa
Solanaceae	Datura meteloides	Western Jimson	Dame
Asteraceae	Dyssodia cooperi	Cooper Dyssodia	Dyco
Equisetaceae	Equisetum laevigatum	Smooth Horsetail	Eqla
Polemoniaceae	Eriastrum densiflorum ssp. mojavense		Erde
Euphorbiaceae	Euphorbia albomarginata	Whitemargin Spurge	Eual
Euphorbiaceae	Euphorbia polycarpa var. hirtella	Small-seeded Sandmat	Eupo
Gentianaceae	Frasera albomarginata	Green Gentian	Fral
Boraginaceae	Heliotropium curassavicum var. oculatum	Chinese Pusley	Hecu

PERENNIAL FORBS con't

Family	Scientific Name	Common Name	Symbol
Liliaceae	Hesperocallis undulata	Desert Lily	Heun
Asteraceae	Hymenoxys acaulis var. arizonica	Arizona Actinea	Hyac
Asteraceae	Machaeranthera canescens ssp canescens	Hoary Machaeranthera	Maca
Oleaceae	Menodora scoparia	Broom Twinberry	Mesc
Scrophulariaceae	Mimulus guttatus ssp. depauperatus	Common Mimulus	Migu
Nyctaginaceae	Mirabilis bigelovii var. aspero	Wishbone Bush	Mibi
Nyctaginaceae	Mirabilis froebelii	Giant Four O'Clock	Mifr
Solanaceae	Nicotiana trigonophylla	Desert Tobacco	Nitr
Pteridaceae	Notholaena parryi	Parry Cloak Fern	Nopa
Onagraceae	Onenothera caespitosa var marginata	Large White Desert Primrose	Onca
Onagraceae	Oenothera californica	California Primrose	Oeca
Onagraceae	Oenothera longissima ssp. clutei	Evening Primrose	Oelo
Pteridaceae	Pellaca mucronata var. mucronata	Bird's Foot Ferm	Pemu
Viscaceae	Phoradendrom californicum	Mistletoe	Phca
Solanaceae	Physalis crassifolia var. crassifolia	Thick-leaved Ground Cherry	Phcr
Plantaginaceae	Plantago major	Common Plantain	Plma
Asteraceae	Porophyllum gracile	Odora	Pogr
Potamogentonaceae	*Potamogeton sp.	Pondweed	
Polygonaceae	Rumex hymenosepalus	Wild Rhubarb	Ruhy

PERENNIAL FORBS con't

Family	Scientific Name	Common Name	Symbol
Asteraceae	Senecio multilobatus	Lobeleaf Groundsel	Semu
Asteraceae	Solidago sp.		
Malvaceae	Sphaeralcea ambigua ssp. monticola	Desert-mallow	Spam
Asteraceae	Stephanomeria parryi	Parry Rock-pink	Stpa
Asteraceae	Stephanomeria pauciflora	Wire-lettuce	Stpa

ANNUAL FORBS

Family	Scientific Name	Common Name	Symbol
Nyctaginaceae	Abronia micrantha	Small-flowered Abronia	Abmi
Nyctaginaceae	Abronia villosa	Hairy Sand-verbena	Abvi
Amaranthaceae	Amaranthus albus	Tumbleweed	Amal
Amaranthaceae	Amaranthus fimbriatus	Fringed Amaranthus	Amfi
Boraginaceae	Amsinckia intermedia		Amin
Boraginaceae	Amsinckia tesselata	Checker Fiddleneck	Chfi
Asteraceae	Baileya pleniradiata	Wooly Marigold	Bapl
Asteraceae	Calycoseris parryi	Yellow Tack-stem	Capa
Onagraceae	Camissonia brevipes ssp. brevipes	Yellow Cups	Cabr
Onagraceae	Camissonia claviformis ssp. aurantiaca	Brown-eyed Primrose	Cacl
Asteraceae	Chaenactis fremontii	Fremont Pincushion	Chfr
Asteraceae	Chaenatis macrantha	Mojave Pincushion	Chma
Asteraceae	Chaenatis stevioides var. brachypappa	Esteve Pincushion	Chst
Chenopodiaceae	Chenopodium fremontii	Fremont Goosefoot	Chfr
Polygonaceae	Chorizanthe brevicornu	Brittle Spine-flower	Chbr
Polygonaceae	Chorizanthe rigida	Rigid Spiny-herb	Chri
Boraginaceae	Cryptantha angustifolia	Narrow-leaved Forget-me-not	Cran
Boraginaceae	Cryptantha gracilis	Slender Forget-me-not	Crgr
Boraginaceae	Cryptantha pterocarya	Wing-nut Forget-me-not	Crpt

ANNUAL FORBS con't

Family	Scientific Name	Common Name	Symbol
Boraginaceae	Cryptantha utahensis	Scented Forget-me-not	Crut
Brassicaceae	Descurainia pinnata ssp. glabra	Yellow Tansy Mustard	Depi
Asteraceae	Dicoria canescens ssp. canescens	Desert Dicoria	Dica
Brassicaceae	Dithyrea californica	Spectacle-pod	Dica
Polygonaceae	Eriogonum deflexum ssp. deflexum	Skeleton Weed	Erde
Polygonaceae	Eriogonum inflatum var. inflatum	Desert Trumpet	Erin
Polygonaceae	Eriogonum nidularium	Whisk Broom	Erni
Polygonaceae	Eriogonum reniforme	Kidney-leaved Buck-wheat	Erre
Polygonaceae	Eriogonum thomasii	Thomas Eriogonum	Erth
Asteraceae	Eriophyllum wallacei	Wallace Eriophyllum	Erwa
Geraniaceae	Erodium cicutarium	Filaree	Erci
Papaveraceae	Eschscholzia glyptosperma	Desert Gold Poppy	Esgl
Papaveraceae	Eschscholzia minutiflora	Pigmy Poppy	Esmi
Hydrophyllaceae	Eucrypta micrantha	Small-flowered Eucrypta	Euci
Asteraceae	Geraca concensens	Desert Sunflower	Geco
Polemoniaceae	Gilia latifolia	Broad-leaved Gilia	Gila
Polemoniaceae	Gilia scopulorum		Gisc
Brassicaceae	Lepidium densiflorum	Peppergrass	Lede
Brassicaceae	Lepidium lasiocarpum var. georginum	Harypod Pepperweed	Lela

ANNUAL FORBS con't

Family	Scientific Name	Common Name	Symbol
Brassicaceae	Lesquerella palmeri	Palmer Bead-pod	Lepa
Polemoniaceae	Linanthus arenicola		Liar
Fabaceae	Lupinus flavoculatus		Lufl
Asteraceae	Malacothrix coulteri	Snakes Head	Maco
Asteraceae	Malacothrix glabrata	Desert Dandelion	Magl
Fabaceae	Melilotus albus	White Sweet-clover	Meal
Loasaceae	Metzelia sp.		
Scrophulariaceae	Mimulus pilosus		Mipi
Onagraceae	Oenothera deltoides ssp. deltoides	Dune Primrose	Oede
Onagraceae	Oenothera primiveris ssp. primiveris	Desert Evening Primrose	Oepr
Polygonaceae	Oxytheca perfoliata	Punctured Bract	Oxpe
Asteraceae	Palafoxia lineris	Spanish Needles	Pali
Asteraceae	Pectis papposa	Chinch Weed	Pepa
Boraginaceae	Pectocarya setosa	Stiff-stemmed Comb-bur	Pesc
Hydrophyllaceae	Phacelia crenulata var. ambigua	Notch-leaved Phacelia	Phcr
Hydrophyllaceae	Phacelia fremontii	Fremont Phacelia	Phfr
Borginaceae	Plagiobothrys arizonicus var. arizonicus	Arizona Popcorn Flower	Plar
Plantaginaceae	Plantago insularis var. fastigiata	Woolly Plantain	Plin
Asteraceae	Psthyrotes ramosissima	Velvet Rosette	Psra
Brassicaceae	Rorippa nasturtium-aguaticum	Water Cress	Rona

ANNUAL FORBS con't

Family	Scientific Name	Common Name	Symbol
Chenopodiaceae	Salsola iberica	Tumbleweed	Saib
Lamiaceae	Salvia columbariae	Chia	Saco
Solanaceae	Solanum nodiflorum		Sono
Brassicaceae	Thelypodium lasiophyllum var. utahense	Thelypody	Thla

TREES

Family	Scientific Name	Common Name	Symbol
Bignoniaceae	*Chilopsis linearis*	Desert Willow	Chli
Fabaceae	*Dalea spinosa*	Smoke Tree	Dasm
Oleaceae	*Fraxinus velutina*		Frve
Cypressaceae	*Juniperus osteosperma*	Utah Juniper	Juut
Fabaceae	*Prosopis glandulosa* spp. *torreyana*	Honey Mesquite	Prgl
Salicaceae	*Salix exigua*	Narrowleaf willow	Saex

APPENDIX II

Fauna of the Lava Beds HMA

HERPS

Bufonidae
- Bufo alvarius (Colorado R. toad)

Testudinidea
- Gopherus agassizi (Desert tortiose)

Gekkonidae
- Coleonyx variegatus (Banded gecko)

Iguanidae
- Dèpsosaurus dorsalis (Desert iguana)
- Sauromalus obesus (Chuckwalla)
- Callisaurus draconoides (Zebra-tailed lizard)
- Crotaphytus collaris (Collared lizard)
- C. wislizenii (Leopard lizard)
- Sceloporus magister (Desert spiny lizard)
- Uta stansburiana (Side-blotched lizard)
- Urosaurus graciosus (Long-tailed brush lizard)
- Phrynosoma coronatum (Coast horned lizard)

Xantusiidae
- Xantusia vigilis (Desert night lizard)

Teiidae
- Cnemidophorus tigris (Western whiptail)

Leptotyphlopidae
- Leptotyphlops humilis (Western blind snake)

Boidae
- Lichanura trivirgata (Rosy boa)

Colubridae
- Phyllorhynchus decurtatus (Spotted leaf-nosed snake)
- Masticophis flagellum (Coachwhip)
- Salvadora hexalepis (Western patch-nosed snake)
- Arizona elegans (Glossy snake)
- Pituophis melanoleucus (Gopher snake)
- Lampropeltis getulus (Common kingsnake)
- Rhinocheilus lecontei (Long-nosed snake)
- Chionactis occipitalis (Western shovel-nosed snake)
- Trimorphodon lambda (Sonora lyre snake)
- Hypsiglena torquata (Night snake)
- Crotalus mitchelli (Speckled rattlesnake)
- C. cerastes (Sidewinder)
- C. scutulatus (Mojave rattlesnake)

Resident and/or Breeding or Wintering Birds

Podicipedidae
- Podiceps nigricollis (Eared Grebe (Black Tank)

Cathartidae
- Cathartes aura (Turkey vulture)

Accipitridae
- Buteo jamaicensis (Red-tailed hawk)
- Aquila chrysaetos (Golden eagle)

Falconidae
- Falco mexicanus (Prairie falcon)
- F. sparverius (American kestrel)

Phasianidae
- Lophortyx gambelii (Gambel's quail)
- Alectoris chukar (Chukar)

Charadriidae
- Charadrius vociferus (Killdeer)

Columbidae
- Zenaida macrours (Mourning dove)

Cuclidae
- Geococcyx californianus (Roadrunner)

Tytonidae
- Tyto alba (Barn owl)

Strigidae
- Otus asio (Screech owl)
- Bubo virginianus (Great horned owl)
- Speotyto cunicularia (Burrowing owl)
- Asio otus (Long-eared owl)

Caprimulgidae
- Phalaenoptilus nuttallii (Poor-will)
- Chordeiles minor (Common-highthawk)
- C. acutipennis (Lesser nighthawk)

Apodidae
- Aeronautes saxatalis (White-throated swift)

Trochilidae
- Archilochus alexandri (Black-chinned hummingbird)
- Selasphorus rufus (Rufous hummingbird)

Picidae
- Colaptes auratus (Common flicher)
- Dendrocopos scalaris (Ladder-backed woodpecker)

Tyrannidae
- Tyrannus verticalis (Western kingbird)
- T. vociferans (Gassin's kingbird)
- Myiarchus cinerascens (Ash-throated flycatcher)
- Sayornis nigricans (Black Phoebe)
- S. saya (Say's Phoebe)
- Empidonax difficilis (Western flycatcher)
- Contopus sordidulus (Western wood pewee)

Alaudidae
- Eremophila alpestris (Horned Lark)

Hirundinidae
- Tachycinetta thalassina (Violet-green Swallow)
- Stelgidopteryx ruficollis (Rough-winged Swallow)

Corvidae
- Aphelocoma coerulescens (Scrub Jay)
- Corvus corax (Common Raven)

Paridae
- Auriparus flaviceps (Verdin)

Troglodytidae
- Thryomanes bewickii (Bewick's Wren)
- Campylorhynchus brunneicapillus (Cactus Wren)
- Catherpes mexicanus (Canyon Wren)
- Salpinctes obsoletus (Rock Wren)

Mimidae
- Mimus polyglottos (Mockingbird)
- Toxostoma bendirei (Bendire's Thrasher)
- T. lecontei (Le Conte's Thrasher)
- T. dorsale (Crissal Thrasher)
- Oreoscoptes montanus (Sage Thrasher)

Turdidae
- Turdus migratorius (American Robin)
- Catharus ustulatus (Swainson's Thrush)

Sylviidae
- Polioptila melanura (Black-tailed gnatcatcher)
- Regulus calendula (Ruby-crowned kinglet)

Ptilogonatidae
Phainopepla nitens (Phainopepla)

Laniidae
Lanius ludovicianus (Loggerhead Shrike)

Vireonidae
Vireo gilvus (Warbling Vireo)

Parulidae
Vermivora celata (Orange-crowned Warbler)
Dendroica coronata (Yellow-rumped Warbler)
Wilsonia pusilla (Wilson's Warbler)

Icteridae
Sturnella neglecta (Western Meadowlark)
Icterus cucullatus (Hooded Oriole)
I. parisorum (Scott's Oriole)
I. galbula (Northern Oriole)
Molothrus ater (Brown-headed Cowbird)

Fringillidae
Carpodacus mexicanus (House Finch)
Spinus psaltria (Lesser Goldfinch)
Amphispiza bilineata (Black-throated Sparrow)
Zonotrichia leucophrys (White-crowned Sparrow)

Mammals

Soricidae
- Notiosorex crawfordi (Shrew)

Phyllostomatidae
- Macrotis californicus (Ca. leaf-nosed bat)

Vespertilionidae
- Myotis californicus (Ca. myotis)
- Eptesicus fuscus (Big brown bat)
- Pipistrellus hesperus (Western pipistrelle)
- Antrozous pallidus (Pallid bat)
- Plecotus townsendi (Lump-nosed bat)

Molossidae
- Tadarida brasiliensis (Brazilian free-tailed bat)

Leporidae
- Lepus californicus (Black-tailed hare)
- Sylvilagus nuttalli (Nuttall cottontail)

Sciuridae
- Ammospermophilus leucurus (Antelope squirrel)
- Spermophilis tereticandus (round-tailed ground squirrel)

Geomyidae
- Thomomys bottae (Botta pocket gopher)

Heteromyidae
- Perognathus longimembris (Little pocket mouse)
- P. formosus (Long-tailed pocket mouse)
- Depodomys panamintinus (Panamint kangaroo rat)
- D. merriami (Merriam kangaroo rat)
- D. microps (Great Basin kangaroo rat)
- D. deserti (Desert kangaroo rat)

Cricetidae
- Reithrodontomys megalotis (Western harvest mouse)
- Peromyscus crinitus (Canyon mouse)
- P. eremicus (Cactus mouse)
- P. maniculatus (Deer mouse)
- Onychomys torridus (Southern grasshopper mouse)
- Neotoma albigula (Desert woodrat)

Canidae
- Vulpes macrotis (Kit fox)
- Canis latrans (Coyote)

Procyonidae
Bassariscus astutus (Ringtail)

Mustelidae
Taxidea taxus (Badger)
Spilogale putorius (Spotted skunk)

Felidae
Lynx rufus (Bobcat)

Equidae
Equus asinus (Wild burro)

Bovidae
Ovis canadensis (Bighorn)

APPENDIX III

GRAZING CAPACITY DETERMINATION

Formulas used for computing carrying capacity in AUM's for polygons, pastures, grazing allotments and the combined planning units.

$$\Sigma[(\%\ \text{forage species comp.}) \cdot (\text{density or cover}) \cdot (\text{PUF})] = \text{FAF}$$

$$(\text{FAF}) \cdot (\text{Acres}) = \text{FA}$$

$$\frac{\text{FA}}{\text{FAR}} = \text{AUM's}$$

Range Quality Criteria and Classification Scheme

FAF Values	FAR Value	Range Quality	Acres/AUM
> .030	.6	Good	20
.020 - .029	.6	Medium	21-30
.015 - .019	.7	Poor	31-50
< .015	.8	Ephemeral	50

Slope Deductions Used for Carrying Capacity Determinations

Slope (percent)	Deduction
0 - 25	none
26 - 50	0.5
50	1

Proper Use Factors for Important East Mojave Forage Plants Based on Year-Long Use

Species	PUF (Cattle)
Hilaria jamesii	.45
Hilaria rigida	.40
Muhlenbergia porteri	.45
Bouteloua eriopoda	.45
Grass (other)	.50
Ambrosia dumosa	.10
Coleogyne ramosissima	.10
Ephedra nevadensis	.25
Eriogonum fasciculatum	.10
Eurotia lanata	.40
Grayia spinosa	.20
Hymenoclea salsola	.05
Krameria sp.	.05
Menodora spinescens	.30
Purshia glandulosa	.40
Salazaria mexicana	.10

CALIFORNIA DESERT PROJECT
STANDARD UNIT RECORD
FOR
VEGETATION & SOIL SURFACE
RESOURCE FIELD DATA

(1) RECORD TYPE	V 1
(2) STATE	
(3) DISTRICT	
(4) PLANNING UNIT	
(5) POLYGON NUMBER	
(6) TRANSECT NUMBER	
(7) ACTION (A = ADD C = CHANGE D = DELETE	

(8) SECTION I — GENERAL SITE DESCRIPTION

(9) DATE OF SURVEY (YR.-MO.-DAY)	(10) RECORDER	(11) TRANSECTS IN POLYGON	(12) VEGETAL ASPECT	13. ASPECT	(14) SLOPE (% AVE)

(15) GEOMORPHOLOGY	(16) ELEVATION (IN 100')	[illegible] VEGETATIVE USES (CIRCLE NUMBER)							
		[illegible]					[illegible]		
		HORSES 1	BURROS 2	BIG GAME 3	SMALL GAME 4	REPTILES 5	CATTLE 1	HORSES 2	SHEEP 3

(19) AERIAL PHOTO ID		(20) ORTHO PHOTO QUAD NAME
PHOTO SYMBOL	PHOTO NUMBER	

(8) SECTION II — VEGETATIVE TRANSECT DATA

GROUND COVER DATA (100 PTS.)							PLANT COMPOSITION				
LINE #(S)	BASAL (10)	CANOPY 1 (11)	CANOPY 2 (12)	CANOPY 3 (13)	DOT COUNT	NO. (14)	PERENNIAL SPECIES (15)	DOT COUNT	% COMP (16)	UTILIZATION & CONDITION CLASS (17)	ANNUAL SPECIES (18)
-1											
-2											
-3											
-4											
-5											
-6											
-7											
-8											
-9											
0											
-1											
-2											
-3											
-4											
-5											
-6											
-7											
-8											
-9											
-0											

GROUND COVER CODES: L = LITTER; S = ROCK 1/8"-2"; R = ROCK>2"; B = BARE GROUND

SEE PLANT SPECIES LIST FOR PLANT SYMBOLS AND NAMES

(8) SECTION III — EXISTING & FUTURE SSF & EST. PROD. CAP.

VEGETAL SUBTYPE		EXISTING FACTORS	FUTURE POTENTIAL FACTORS			
			NO MGMT	INTENSIVE MGMT	WITH TREATMENT 1	WITH TREATMENT 2
(9) CATEGORY		1	2	3	4	5
(10) TYPE OF TREATMENT						
SOIL SURFACE FACTORS	(11) SOIL MOVEMENT					
	(12) SURFACE LITTER					
	(13) SURFACE ROCK					
	(14) PEDESTALLING					
	(15) FLOW PATTERNS					
	(16) RILLS					
	(17) GULLIES					
	TOTALS					
	(18) EST. PROD. CAP. 100 LBS.					

(8) SECTION IV — FUTURE PLANT DENSITY & SPECIES COMPOSITION

		LINE #	FUTURE POTENTIAL FACTORS			
			NO MGMT	INTENSIVE MGMT	WITH TREATMENT 1	WITH TREATMENT 2
			(10)	(11)	(12)	(13)
FUTURE PLANT DENSITY	PERENNIALS	01	%	%	%	%
	ANNUALS	02	%	%	%	%

NOTE OF CHANGES:

FUTURE PERENNIAL PLANT COMPOSITION

	SPECIES	%COMP.	SPECIES	%COMP.	SPECIES	%COMP.	SPECIES	%COMP.
03								
04								
05								
06								
07								
08								
09								
10								
11								
12								
13								
14								
15								
16								
17								

REMARKS:

Form 7310–12
(May 1973)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

By | Date

Location

Treatment affecting the SSF

DETERMINATION OF EROSION CONDITION CLASS

SOIL SURFACE FACTORS (SSF)

SOIL MOVEMENT *	No visual evidence of movement 0 1 2 3	Some movement of soil particles 4 5	Moderate movement of soil is visible and recent. Slight terracing generally less than 1" in height. 6 7 8	Occurs with each event. Soil and debris deposited against minor obstructions. 9 10 11	Subsoil exposed over much of area, may have embryonic dunes and wind scoured depressions 12 13 14
SURFACE LITTER *	Accumulating in place 0 1 2 3	May show slight movement 4 5 6	Moderate movement is apparent, deposited against obstacles 7 8	Extreme movement apparent, large and numerous deposits against obstacles 9 10 11	Very little remaining *(use care on low productive sites)* 12 13 14
SURFACE ROCK *	If present, the distribution of fragments show no movement caused by wind or water 0 1 2	If present, coarse fragments have a truncated appearance or spotty distribution caused by wind or water 3 4 5	If present, fragments have a poorly developed distribution pattern caused by wind or water 6 7 8	If present, surface rock or fragments exhibit same movement and accumulation of smaller fragments behind obstacles 9 10 11	If present, surface rock or fragments are dissected by rills and gullies or are already washed away 12 13 14
PEDESTALLING *	No visual evidence of pedestalling 0 1 2 3	Slight pedestalling, in flow patterns 4 5 6	Small rock and plant pedestals occurring in flow patterns 7 8 9	Rocks and plants on pedestals generally evident, plant roots exposed. 10 11	Most rocks and plants pedestalled and roots exposed 12 13 14
FLOW PATTERNS *	No visual evidence of flow patterns 0 1 2 3	Deposition of particles may be in evidence 4 5 6	Well defined, small, and few with intermittent deposits 7 8 9	Flow patterns contain silt and sand deposits and alluvial fans 10 11 12	Flow patterns are numerous and readily noticeable. May have large barren fan deposits. 13 14 15
RILLS	No visual evidence of rills 0 1 2 3	Some rills in evidence at infrequent intervals over 10' 4 5 6	Rills ½" to 6" deep occur in exposed places at approximately 10' intervals 7 8 9	Rills ½" to 6" deep occur in exposed area at intervals of 5 to 10' 10 11 12	May be present at 3" to 6" deep at intervals less than 5' 13 14
GULLIES	May be present in stable condition. Vegetation on channel bed and side slopes 0 1 2 3	A few gullies in evidence which show little bed or slope erosion. Some vegetation is present on slopes. 4 5 6	Gullies are well developed with active erosion along less than 10% of their length. Some vegetation may be present. 7 8 9	Gullies are numerous and well developed with active erosion along 10 to 50% of their lengths or a few well developed gullies with active erosion along more than 50% of their length 10 11 12	Sharply incised gullies cover most of the area and over 50% are actively eroding 13 14 15
SITUATION	TOTAL				

Erosion Condition Classes: Stable 0–20; Slight 21–40; Moderate 41–60; Critical 61–80; Severe 81–100

(Instructions on reverse)

EXAMPLES

ITEM	EXAMPLE ONE			EXAMPLE TWO**			EXAMPLE THREE***		
	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR	POTENTIALLY PRESENT	IDENTIFIED FACTORS	POSSIBLE FACTOR
Soil Movement	Yes	8	14	Yes	8	14	Yes	8	14
Surface Litter	Yes	9	14	Yes	9	14	Yes	9	14
Surface Rock	Yes	7	14	No	–	--	No	–	--
Pedestalling	Yes	10	14	Yes	10	14	Yes	10	14
Rills	Yes	8	14	Yes	8	14	No	–	--
Flow Patterns	Yes	10	15	Yes	10	15	Yes	10	15
Gullies	Yes	6	15	No	–	--	No	–	--
TOTAL		58	100		45	71		37	57
Total SSF		$\frac{58}{100} \times 100 = 58$			$\frac{45}{71} \times 100 = 63$			$\frac{37}{57} \times 100 = 65$	

GENERAL INSTRUCTIONS

District prepares one (1) copy and files in district with particular study under consideration.

Do *not* include items in computations which are not potentially present.

Identify numerical factor that most nearly describes the conditions observed by circling the factor given for each logical item.

SPECIFIC INSTRUCTIONS

Total all factors at bottom of page. Divide total identified factors by total possible factors for items considered and multiply by 100 in order to compute the SSF.

Situation – Describe situations being evaluated such as present, geologic, with mechanical treatment in effect for 10 years, under a 5 pasture livestock management system for last 8 years, etc.

Total – Total computed SSF.

**Wind and water are considered eroding agents when evaluating item*

***A soil with no rocks in its profile and no probability of gullying*

****A pumice soil area where no water erosion occurs*

U.S. GPO 1976-678-777-6786

Form 4412–12
(April 1966)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RANGE UTILIZATION
KEY FORAGE PLANT METHOD

District	Date	Examiner
Planning Unit	Allotment	Pasture
Vegetation Type	Class of Stock	
Season of Use	Grazing Management System	

Transect Location

CLASS		KEY SPECIES					
INTERVAL	INTERVAL MIDPOINT	Species		Species		Species	
		FREQUENCY		FREQUENCY		FREQUENCY	
	(x)	(f)	(f) × (x)	(f)	(f) × (x)	(f)	(f) × (x)
Slight 0–20	10						
Light 21–40	30						
Moderate 41–60	50						
Heavy 61–80	70						
Severe 81–100	90						
	TOTAL						
Average Utilization = $\frac{\Sigma fx}{\Sigma f}$ *							

Remarks *(Use back of sheet if necessary)*

* Where f = the frequency or number of observations within each class interval (*f column*), x = the class interval midpoint (*x column*), and Σ = the summation symbol

(5) Utilization classes are used to show five relative degrees of use. The descriptive term represents a numerical range of percent utilization. Estimate utilization within one of the five classes. Utilization classes are described as follows:

Slight (0-20%): Range shows no evidence of use by livestock, or range has the appearance of very light grazing. The key forage plants may be topped or slightly used. Current seedstalks and young plants of key species are little disturbed.

Light (21-40%): Range may be topped, skimmed, or grazed in patches, low value plants ungrazed; 60 to 80 percent of the number of current seedstalks of key plants remain intact. Most young plants are undamaged.

Moderate (41-60%): Range appears entirely covered as uniformly as natural features and facilities will allow. Fifteen to 25 percent of the number of current seedstalks of key species remain intact. No more than 10 percent of the number of low value forage plants utilized. (Moderate use does not imply proper use).

Heavy (61-80%): Range has appearance of complete search. Key species almost completely utilized with less than 10 percent of the current seedstalks remaining. Preferred shrubs hedged, shrub clumps may be slightly broken, shoots of rhizomatous grasses missing. More than 10 percent of the number of low value forage plants utilized.

Severe (81-100%): Range has mown appearance. Indications of repeated coverage. No evidence of reproduction or current seedstalks of key species. Key forage species completely utilized. Remaining stubble of preferred grasses grazed to soil surface. Shrub clumps hedged or broken.

APPENDIX IV

BURRO REDUCTION PLAN
LAVA BEDS HERD MANAGEMENT AREA

I. INTRODUCTION

The need has been demonstrated for management of the burro numbers in the Lava Beds HMA. This is based upon habitat consideration and the current range carrying capacity which the present numbers of burros far exceed. The following Burro Reduction Plan outlines the methods to be utilized in order to accomplish reduction of the burros to 40% below carrying capacity.

Comments at our "pre-management plan" public meeting in June, 1977, indicated a strong sentiment from concerned groups (both conservation and burro protection oriented) to reduce the burro numbers below carrying capacity. This would allow better habitat recovery and eliminate the need for another reduction the following year, thus, providing more time for other critical areas.

All the burros gathered will be placed throught the Adopt-A-Burro program to private hands. Every attempt will be made to place all the animals with private individuals before humane disposal is considered.

II. TIME SCHEDULE

1977 - September - October: trapping and roping of burros

1977 - September - October: Adoption of burros to be run concurrently with the capture program.

1977 - November: follow-up arrangements for excess burros, if necessary.

III. CAPTURE METHODS, TRANSPORATION, HOLDING FACILITIES AND OPERATIONS.

A. Capture Methods.

As outlined in the plan, there will be three methods employed to accomplish reduction. These methods are water trapping, roping, and trapping. Contracting will be utilized for the work and facilities. Depending upon the length of time it may take to bring down the population to 40% below carrying capacity the cost will range from $100.00 to $150.00 per head for capturing, transporting to holding facilities, feed, marking, and Veternarian checking.

Presently, there are five corral facilities in the HMA available for water trapping. All the sites have received BLM cultural resources clearance. Herding activities would be accomplished by helicopter either to ropers or into the trap. Funnel-type facilities will be used to move the animals into the trap.

The corrals all contain adequate water and fencing. There is no barb wire in any of the corral facilities.

B. Transportation.

The burros would be hauled by BLM personnel and the contractor. They will be hauled primarily in horse trailers, except when large numbers are captured it will be necessary to use a stock truck.

C. Holding Facilities.

The holding facility consists of a corral structure with a 50-acre pasture. Any sick animals will be held, watered, and fed from a sick pen that is detached from the area healthy animals would be held.

The 50-acre pasture will be used to hold animals that are held either for a long period of time or are in exesss of the capabilities of the corrals. The corrals include a squeeze shute, loading shute, scales, individual pens, fenced paddock and working area. The facility has been located at Valley Wells.

In addition, there are facilities for personnel to stay at the corral site. This will increase security and reduce the need for long-distance travel between the corrals and workers homes.

D. Operations.

1. Inventory. A helicopter inventory will be coordinated with the capture activities. The numbers of animals to be removed will be calculated using the count. This will insure that more burros are not removed than the prescribed management level.

2. Capture. There will be an authorized BLM person present during all capture activities to insure humane handling of the animals. All helicopter work will involve a BLM person who is thoroughly acquainted with the terrain and movements of the animals. Helicopters will be used as follows:

a. Burros will be spotted and, if it is possible, moved without undue stress to the ropers or into a trap facility.

b. Burros will not be run at a fast pace nor will they be moved continuouslly for more than one (1) mile. Flights will be terminated if fatigue or stress is noted in any of the animals.

c. Any aircraft employed for gathering purposes will be

under the direct supervision of the round-up supervisor and BLM. The aircraft will be in radio contact with any ground people being coordinated with to insure safety and no surprises.

d. Captured animals will be held for no longer than eight (8) hours without water. There will also be feed available at all the water trap sites for the burros.

e. Animals captured by roping will be haltered, is necessary, and led to the nearest holding or loading facility. Animals noted to be in stress will not be hauled until an improved condition is noted.

f. Operations will be halted if ANY animals (horses or burros) and/or men are injured during any of the gathering process; be it water trap, roping or trapping. The injured will be tended immediately.

3. Transportation. The BLM will approve all trucks and trailers used for transporting captured animals. Sand, straw, or rubber mats will be placed in the bottom of any stock trucks or trailers hauling burros to aid in keeping them on their feet during transport. Young colts will be transported with their mothers away from the other larger animals.

4. Holding Facilities. After transporting to the holding facilities, the animals will be tagged, marked with a number, and aged by tooth wear or weights. They will also be inspected for injury or sickness and treated, when necessary. Blood samples will be taken and tested for Equine Infectious Anemia and Western and Eastern Encephalitis.

The animals will then be marked using liquid nitrogen and then ear tattoed.

While in the pens, adult estrous females will be held away from the other animals preferably in a facility detached from the other animals. Any "problem animals" that consistantly cause stress or injury to other animals will also be separated from the group.

Animals will have enough feed available to feed when necessary. They are free-feeding animals and will only consume what is necessary. Straw-cat hay and low grade alfalfa will be replenished daily. Water will be available continuously.

Animals will be inspected daily by BLM personnel for signs of injury or disease. If symtoms are detected, veternary services will be obtained immediately for the animal. Animals will be held until a clean bill of health is given before adoption is completed. Dogs will not be allowed in and around any of the corral facilities.

Holding facilities will be under 24-hour supervision by BLM personnel. They, and the entire area (corrals, house, etc.) will be padlocked at night when there is no numan activity.

The interested public will be allowed to view the animals, however, observations must be made outside the mainstream of activity. If necessary, a special area for public viewing will be designated.

5. Sick or Injured Animals

a. Round-up Area. Any animals severely injured or in critical condition from illness will be desposed of immediately. Biological data

will be taken on all animals disposed of to keep the data consistant. Only authorized qualified BLM personnel will dispose of injured animals. The carcass will either be left or taken to open range, tagged, and left to decompose.

b. Holding Area. Animals severely injured or becoming sick during holding will be treated upon the advice of a veternarian. Any animals desposed of in the holding area will be transported back to the Lava Beds area ,inventoried, tagged and opened to accelerate decomposition. Diseased animals that are disposed of will be buried immediately in a limed pit.

All sick animals will be separated and quarentined in a sick pen. They will have no contacts with other burros, horses, or livestock.

6. Adopt-A-Burro Program. A list of prospective adoptors will be obtained from Denver Service Center so that those people can be contacted to inform them of the gathering plans. After capture activities have begun the potential adoptors will be called to notify them of the arrangements necessary to pick up their animal. An appointment will be made for loading the animal(s). If the adoptor is more than three days late for his appointment, the animal(s) will be adopted to other recipients.

BLM personnel will be on hand to inspect all hauling equipment. Those deemed unsafe or inadequate (without halter ties, etc.) will not be accepted. The adoptor will be given a period of time to

to comply with necessary hauling equipment before the animal is adopted out to another recipient. Qualified BLM personnel or the contractor will be available to help load the burro(s) into the recipients hauling vehicle.

Paperwork and other administrative duties regarding burro adoption will be handled by BLM personnel.

7. Disposal of Lame, Sick, or Injured Animals. Disposal of any lame, sick, or injured animals will be done only by qualified BLM personnel who will be on site during the gathering and handling of burros at all times. When an animal is injured seriously it will be disposed of immediately to relieve it of any suffering. Animals detected to be lame or in very poor health during the gathering will also be disposed of so that there is not undue suffering. No animals will be shot from the helicoptor or from distances greater than 200 yards. Carcasses will either be left to decompose on the range or will be taken to a remote part of the HMA. All animals disposed of will be sexed, aged and other biological data will be collected.

Public Law 92-195
92nd Congress, S. 1116
December 15, 1971

An Act

85 STAT. 649

To require the protection, management, and control of wild free-roaming horses and burros on public lands.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Congress finds and declares that wild free-roaming horses and burros are living symbols of the historic and pioneer spirit of the West; that they contribute to the diversity of life forms within the Nation and enrich the lives of the American people; and that these horses and burros are fast disappearing from the American scene. It is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands.

Wild horses and burros. Protection.

SEC. 2. As used in this Act—

Definitions.

(a) "Secretary" means the Secretary of the Interior when used in connection with public lands administered by him through the Bureau of Land Management and the Secretary of Agriculture in connection with public lands administered by him through the Forest Service;

(b) "wild free-roaming horses and burros" means all unbranded and unclaimed horses and burros on public lands of the United States;

(c) "range" means the amount of land necessary to sustain an existing herd or herds of wild free-roaming horses and burros, which does not exceed their known territorial limits, and which is devoted principally but not necessarily exclusively to their welfare in keeping with the multiple-use management concept for the public lands;

(d) "herd" means one or more stallions and his mares; and

(e) "public lands" means any lands administered by the Secretary of the Interior through the Bureau of Land Management or by the Secretary of Agriculture through the Forest Service.

Jurisdiction; management.

SEC. 3. (a) All wild free-roaming horses and burros are hereby declared to be under the jurisdiction of the Secretary for the purpose of management and protection in accordance with the provisions of this Act. The Secretary is authorized and directed to protect and manage wild free-roaming horses and burros as components of the public lands, and he may designate and maintain specific ranges on public lands as sanctuaries for their protection and preservation, where the Secretary after consultation with the wildlife agency of the State wherein any such range is proposed and with the Advisory Board established in section 7 of this Act deems such action desirable. The Secretary shall manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands. He shall consider the recommendations of qualified scientists in the field of biology and ecology, some of whom shall be independent of both Federal and State agencies and may include members of the Advisory Board established in section 7 of this Act. All management activities shall be at the minimal feasible level and shall be carried out in consultation with the wildlife agency of the State wherein such lands are located in order to protect the natural ecological balance of all wildlife species which inhabit such lands, particularly endangered wildlife species. Any adjustments in forage allocations on any such lands shall take into consideration the needs of other wildlife species which inhabit such lands.

Destruction or removal, authority.

(b) Where an area is found to be overpopulated, the Secretary, after consulting with the Advisory Board, may order old, sick, or lame animals to be destroyed in the most humane manner possible, and he may cause additional excess wild free-roaming horses and burros to be captured and removed for private maintenance under humane conditions and care.

(c) The Secretary may order wild free-roaming horses or burros to be destroyed in the most humane manner possible when he deems such action to be an act of mercy or when in his judgment such action is necessary to preserve and maintain the habitat in a suitable condition for continued use. No wild free-roaming horse or burro shall be ordered to be destroyed because of overpopulation unless in the judgment of the Secretary such action is the only practical way to remove excess animals from the area.

(d) Nothing in this Act shall preclude the customary disposal of the remains of a deceased wild free-roaming horse or burro, including those in the authorized possession of private parties, but in no event shall such remains, or any part thereof, be sold for any consideration, directly or indirectly.

Private maintenance.

SEC. 4. If wild free-roaming horses or burros stray from public lands onto privately owned land, the owners of such land may inform the nearest Federal marshall or agent of the Secretary, who shall arrange to have the animals removed. In no event shall such wild free-roaming horses and burros be destroyed except by the agents of the Secretary. Nothing in this section shall be construed to prohibit a private landowner from maintaining wild free-roaming horses or burros on his private lands, or lands leased from the Government, if he does so in a manner that protects them from harassment, and if the animals were not willfully removed or enticed from the public lands. Any individuals who maintain such wild free-roaming horses or burros on their private lands or lands leased from the Government shall notify the appropriate agent of the Secretary and supply him with a reasonable approximation of the number of animals so maintained.

Recovery rights.

SEC. 5. A person claiming ownership of a horse or burro on the public lands shall be entitled to recover it only if recovery is permissible under the branding and estray laws of the State in which the animal is found.

Agreements and regulations.

SEC. 6. The Secretary is authorized to enter into cooperative agreements with other landowners and with the State and local governmental agencies and may issue such regulations as he deems necessary for the furtherance of the purposes of this Act.

Joint advisory board.

SEC. 7. The Secretary of the Interior and the Secretary of Agriculture are authorized and directed to appoint a joint advisory board of not more than nine members to advise them on any matter relating to wild free-roaming horses and burros and their management and protection. They shall select as advisers persons who are not employees of the Federal or State Governments and whom they deem to have special knowledge about protection of horses and burros, management of wildlife, animal husbandry, or natural resources management. Members of the board shall not receive reimbursement except for travel and other expenditures necessary in connection with their services.

Penalty.

SEC. 8. Any person who—

(1) willfully removes or attempts to remove a wild free-roaming horse or burro from the public lands, without authority from the Secretary, or

(2) converts a wild free-roaming horse or burro to private use, without authority from the Secretary, or

(3) maliciously causes the death or harassment of any wild free-roaming horse or burro, or

(4) processes or permits to be processed into commercial products the remains of a wild free-roaming horse or burro, or

(5) sells, directly or indirectly, a wild free-roaming horse or burro maintained on private or leased land pursuant to section 4 of this Act, or the remains thereof; or

(6) willfully violates a regulation issued pursuant to this Act, shall be subject to a fine of not more than $2,000, or imprisonment for not more than one year, or both. Any person so charged with such violation by the Secretary may be tried and sentenced by any United States commissioner or magistrate designated for that purpose by the court by which he was appointed, in the same manner and subject to the same conditions as provided for in section 3401, title 18, United States Code.

Power of arrest.

(b) Any employee designated by the Secretary of the Interior or the Secretary of Agriculture shall have power, without warrant, to arrest any person committing in the presence of such employee a violation of this Act or any regulation made pursuant thereto, and to take such person immediately for examination or trial before an officer or court of competent jurisdiction, and shall have power to execute any warrant or other process issued by an officer or court of competent jurisdiction to enforce the provisions of this Act or regulations made pursuant thereto. Any judge of a court established under the laws of the United States, or any United States magistrate may, within his respective jurisdiction, upon proper oath or affirmation showing probable cause, issue warrants in all such cases.

Limitation.

SEC. 9. Nothing in this Act shall be construed to authorize the Secretary to relocate wild free-roaming horses or burros to areas of the public lands where they do not presently exist.

Report to Congress.

SEC. 10. After the expiration of thirty calendar months following the date of enactment of this Act, and every twenty-four calendar months thereafter, the Secretaries of the Interior and Agriculture will submit to Congress a joint report on the administration of this Act, including a summary of enforcement and/or other actions taken thereunder, costs, and such recommendations for legislative or other actions as he might deem appropriate.

Studies.

The Secretary of the Interior and the Secretary of Agriculture shall consult with respect to the implementation and enforcement of this Act and to the maximum feasible extent coordinate the activities of their respective departments and in the implementation and enforcement of this Act. The Secretaries are authorized and directed to undertake those studies of the habits of wild free-roaming horses and burros that they may deem necessary in order to carry out the provisions of this Act.

Approved December 15, 1971.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 92-450 accompanying H.R. 9890 (Comm. on Interior and Insular Affairs) and No. 92-681 (Comm. of Conference).

SENATE REPORT No. 92-242 (Comm. on Interior and Insular Affairs).

CONGRESSIONAL RECORD, Vol. 117 (1971):

June 29, considered and passed Senate.

Oct. 4, considered and passed House, amended, in lieu of H.R. 9890.

Dec. 2, House agreed to conference report.

Dec. 3, Senate agreed to conference report.

WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 7, No. 51:

Dec. 17, Presidential statement.

GPO 63-139

Title 43—Public Lands: Interior

CHAPTER II—BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR

SUBCHAPTER D—RANGE MANAGEMENT (4000)

[Circular No. 2422]

PART 4700—WILD FREE-ROAMING HORSE AND BURRO PROTECTION, MANAGEMENT, AND CONTROL

Use of Helicopters in Management of Wild Free-Roaming Horses and Burros

1. Section 4700.0–3 is revised to read as follows:

§ 4700.0–3 Authority.

The Act of December 15, 1971 (16 U.S.C. 1331–1340), as amended, and the Act of June 28, 1934 (43 U.S.C. 314–315r).

2. Section 4700.0–5 is amended by revising paragraph (i) and by adding new paragraphs (k), (l), and (m) to read as follows:

§ 4700.0–5 Definitions.

• • • • • •

(i) "Act" means the Act of December 15, 1971 (16 U.S.C. 1331–1340), as amended.

• • • • • •

(k) "Malicious harassment" means any intentional act which demonstrates a deliberate disregard for the well-being of wild free-roaming horses and burros and which creates the likelihood of injury, or is detrimental to normal behavior patterns of wild free-roaming horses and burros including feeding, watering, resting, and breeding. Such acts include, but are not limited to, unauthorized chasing, pursuing, herding, roping, or attempting to gather or catch wild free-roaming horses and burros. It does not apply to lawfully conducted activities by or on behalf of the Bureau of Land Management or the Forest Service in implementation or performance of duties and responsibilities under this Act.

(l) "Captured animal" means a wild free-roaming horse or burro taken and held in the custody of the authorized officer. This term does not apply to an animal placed in private custody through a cooperative agreement under § 4740.2 (b) or § 4750.2.

(m) "Humane procedure" means kind and merciful treatment, without causing unnecessary stress or suffering to the animal.

3. Section 4720.2 is amended by revising paragraph (a) to read as follows:

§ 4720.2 Claimed animals.

(a) Any person claiming ownership under State branding and estray laws of unbranded or branded horses or burros on public land where such animals are not authorized must present evidence of ownership to justify a roundup before permission will be granted to gather such animals. Claims of ownership with supporting evidence were required to be filed during a 90-day claiming period which expired November 15, 1973. Unauthorized privately owned horses or burros entering onto the public lands after November 15, 1973, may be claimed by filing an application with the District Manager. All written authorizations to gather claimed animals shall be on a form approved by the Director and shall provide for compliance with appropriate provisions of Subpart 4720. After such public notice as the authorized officer deems appropriate to inform interested parties, he may authorize the gathering or roundup. The authorized officer shall provide in the authorization that the gathering or roundup shall be consistent with these regulations; shall establish in the authorization a reasonable period of time to allow the gathering of the claimed animals; and shall provide such other conditions in the authorization which he deems necessary to minimize stress on any associated wild free-roaming horses or burros and to protect other resources.

(b) Animals captured in Bureau of Land Management conducted roundups and determined to be privately owned may be secured by the appropriate claimant upon payment of trespass charges in accordance with § 4720.3, and a per head share of helicopter rental and other associated costs determined appropriate by the authorized officer.

• • • • • •

4. Subpart 4730 is amended by adding §§ 4730.7, 4730.7–1, 4730.7–2 and 4730.7–3 to read as follows:

Published in 42 F.R. 26653, May 25, 1977 - Effective May 25, 1977.

Circular Distribution List

§ 4730.7 Aircraft and motor vehicles.

§ 4730.7–1 Fixed-wing aircraft.

Fixed-wing aircraft may be used for inventory, observation, and surveillance purposes required for the administration of the Act. Such aircraft use shall be consistent with the Act of September 8, 1959, as amended (13 U.S.C. 41 et seq.). Fixed-wing aircraft shall not be used in connection with capture operations except as support vehicles.

§ 4730.7–2 Helicopters.

Only the authorized officer may use or contract for the use of helicopters in the administration of the Act. Helicopters may be used in all phases of the administration of the Act including, but not limited to, inventory, observation, surveillance, and capture operations (see § 4740.4). Helicopters may be used in areas where all animals are claimed, only if forage, habitat, or watershed resources are being adversely affected by horses and burros and helicopters are the only feasible method available to capture and remove the animals. The authorized officer shall supervise all helicopter use as follows:

(a) The authorized officer shall have the means to communicate with the pilot and be able to direct the use of the helicopter.

(b) The authorized officer shall be able to observe the effects of the use of the helicopter on the well-being of the animals.

§ 4730.7–3 Motor vehicles.

Motor vehicles may be used in the administration of the Act except that such vehicles shall not be used in connection with capture operations for driving or chasing the animals. The use of motor vehicles for the purpose of transporting captured animals is subject to the provisions of § 4740.4(b)

5. Subpart 4740 is amended by adding § 4740.4 to read as follows:

§ 4740.4 Humane use of helicopters and motor vehicles.

(a) The use of helicopters is authorized to locate the animals involved and for related purposes such as to transport personnel and equipment. The condition of the animals shall be continuously observed by the authorized officer and should signs of unnecessary stress be noted, the source of stress shall be removed so as to allow for recovery. Helicopters may be used in roundups or other capture operations subject to the following humane procedures:

(1) Helicopters shall be used in such a manner that bands or herds will tend to remain together.

(2) The rate of movement shall not exceed limitations set by the authorized officer who shall consider terrain, weather, distance to be traveled, and condition of animals.

(3) The helicopter shall be used to enable the authorized officer to look for the presence of dangerous areas and move the animals away from hazards during the capture operation.

(4) During capture operations, animals shall be moved in such a way as to prevent unnecessary stress or injury.

(b) Motor vehicles may be used for the purposes of transporting captured animals, subject to the following humane procedures:

(1) All such transportation shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of horses and burros.

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

(3) Vehicles shall be inspected and approved by an authorized officer prior to use.

(4) Where necessary and practical, animals shall be sorted as to age, size, temperament, sex, and condition when transporting them so as to minimize, to the extent possible, injury due to fighting and trampling.

(5) The authorized officer shall consider the condition of the animals, weather conditions, type of vehicles, and distance to be transported when planning for the movement of captured animals.

GUY R. MARTIN,
Assistant Secretary of the Interior.

MAY 20, 1977.

[FR Doc.77-14929 Filed 5-24-77;8:45 am]

GPO 841-242

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UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
1695 Spruce Street
Riverside, California 92507

EA-CA-060-7-BU

IN REPLY REFER TO:
4700
(C-068.5)

To : District Manager, Riverside **Date:**

From : Cima Resource Area Manager

Subject : Recommendation for Environmental Analysis Record - Burro Reduction in Lava Beds Area.

After thorough review of the Environmental Analysis Record for Burro Reduction in the Lava Beds Area, I conclude that the action is not a major federal action with significant impact to the human environment pursuant to Section 102(c) of the National Environmental Policy Act. Therefore, I recommend that an Environmental Impact Statement not be prepared.

Jorgen J. Gulbrandsen

I concur

Gerald E. McCabe

District Manager, Riverside

I concur

State Director, California

DSC-1541-2
Mar. 1974

ENVIRONMENTAL ANALYSIS RECORD

Burro Management
Lava Beds Herd Management Area

I. Description of the Proposed Action and Alternatives

A. Background Data and Action Purpose

The Lava Beds Herd Management Area (HMA) is located in Southeastern California in San Bernardino County. It lies directly south of Interstate Highway 15 east of Baker and west of Cima Dome. The HMA encompases 174,052 acres of which 94.8% are National Resource Lands (NRL) administered by the Bureau of Land Management.

The Management Frameword Plan (MFP) for the area has not been completed. Current schedule calls for completion in 1978. The Unit Resource Analysis (URA; inventory which precedes the MFP) was completed in the summer of 1976 and provides much of the data for this document and the Interim Management Plan.

Vegetation studies in the area have shown that the carrying capacity of the area is 3,688 A.U.M.s and that utilization of key forage species far exceeds proper use as determined by proper use factors (PUF) for each species. It has been determined from these studies that an excessive number of burros inhabit the area, resulting in severe degradation of the ecosystem. An Interim Herd Management Plan has been prepared to acknowledge and respond to the situation until the MFP is completed. This plan is addressing "critical areas" within the HMA for proper burro management such that the burros requirements for forage and water are met year round. The critical areas are the two areas in the HMA where

permanent water can be found and where the burros concentrate during the hot, dry season. Within the Interim Plan an Action Plan - called Lava Beds Burro Reduction (Appendix IV of Interim Herd Management Area Plan) - has been developed. The Bureau is proposing to implement this plan.

This EAR is in accordance with the National Environmental Policy Act of 1969 which directs Federal agencies to use a systematic interdisciplinary approach in accessing impacts which affect man's environment. All of the following suggested alternatives, where necessary, would be implemented by the Bureau of Land Management.

B. Objectives and Available Alternatives

1. Objectives

To manage the burros in the Lava Beds HMA under the principles of multiple use, sustained yield, and environmental quality, to protect the burros from unauthorized actions, to manage their habitat in a manner to achieve and maintain an ecological balance and a population of healthy individuals consistant with P.L. 92-195, the Bureau's multiple use planning system, and Bureau policy.

2. Available Alternatives

a. Alternative #1 - No Action

This alternative would be to not address burro management in the Lava Beds HMA until the multiple use planning (MFP) is completed in 1978. It would require no action by the Bureau of Land Management.

b. Alternative #2 - Reduce to Grazing Capacity

This action would reduce the Lava Beds burro population to 68 animals within the critical management areas. An inventory held in

July, 1976 located 198 burros in the area. A population of 270 animals was projected for 1976 in the area (based on 35-40% error in count, personal observation in areas where none were counted, and information supplies by local people). An annual population increase of 20% would yield approximately 330 burros in the area presently. Approximately 260 burros would have to be removed in order to bring the numbers in line with the current carrying capacity. Burro reduction would be accomplished using one or a combination of the following methods:

(1) Water Trapping. This method is most effective in the hot, dry season when water is absolutely necessary for survival to the burro. There are five existing water trap sites located in the HMA that would be utilized.

(2) Roping. This action would be done when the burros are concentrated around Indian Spring. This area is highly utilized during most of the year except when heavy precipitation falls making water and annual forage available elsewhere. Roping would be done by qualified horsemen who are excellent ropers and have roping experience with burros prior to enactment of the 1971 Act.

(3) Trapping. This method would also be used when burros are concentrated at Indian Spring. It entails moving the animals (using either horsemen or a combination of horsemen and helicopter) to the trap site. Roping is not necessary in this process.

(4) Moving Animals to Water Trap Sites. This activity would involve horsemen or a combination of horsemen and helicopter

moving the animals out of a heavily utilized area to the water trap sites forcing an opportunistic situation to arise. This would also be most easily applied in the hot, dry season but would also be feasible at other times of the year.

Following capture activities, the burros would be taken to a large holding corral where they would be tested and held pending further arrangements. Adopt-a-Burro has been identified as the most palatable arrangement for excess burros. It is Bureau policy that every effort will be made to place the burros with bonafide applicants. No other alternatives will be considered until such time as the names of applicants on the list for excess animals has been exhausted. The Western Representative of the American Horse Protection Association (Chris Hawkins) has identified over fifty qualified applicants in San Diego County that are waiting for burros. It is anticipated that all the animals will be placed. If it appears that not all the animals will be placed no action will be taken until the Washington Office is consulted. Direction as to the disposal of the excess unadoptable burros will come from there. Any animals determined to be lame, sick, or having other physical ailments will be humanely disposed of by qualified BLM personnel according to the humane and sanitation requirements of California. Any disposal for humane reasons will be thoroughly documented.

An aerial census will be conducted after 200 animals have been gathered. This will provide a key as to what percentage of the population has been removed and what further action is necessary to attain the goal of grazing capacity.

c. Alternative #3 - Reduce to 40% below Grazing Capacity.

This action would reduce the Lava Beds burro population to approximately 40 animals within the critical management areas and allowing growth to 68. This alternative was the recommendation made at a public meeting in Baker and received positive response. This recommendation would utilizethe same methods as discussed in Alternative #2.

d. Alternative #4 - Relocation

Relocation as an alternative must be considered only in those areas where the MFP has been completed. The Act provides that burros can be relocated to areas where they were at the time the Act was passed. However, no sites exist in the East Mojave presently; thus, this is not a viable alternative at this time.

II. Description of the Existing Environment

A. Non-living Components

1. Air

The air in the Lava Beds HMA is generally clear and free of pollutants. Interstate Highway 15 defines the northern boundary of the HMA and is heavily travelled by people travelling between the Los Angeles Basin and Las Vegas. Barstow is 60 miles to the west and Las Vegas 90 miles to the east of the HMA. Occasionally, stagnant air patterns cause the smog from Las Vegas to drift near the area. There are also dust storms which at times temporarily degrade the air quality.

Climate in the HMA is typical of the Mojave Desert. The average precipitation for a seven year period from 1969-1975 was 3.20 inches per year. The majority of the rain falls between October and March. Temperatures vary from 113° in June, July, and August to 28° in January. The relative humidity is low.

2. Land

The Lava Beds HMA main characteristic landmarks are the lava beds or cinder cones which occupy the center of the area. The highest peak, Whitney, reaches an elevation of 4,925 feet. Old Dad Mountain is to the west of the cinder cones and reaches an elevation of 4,250 feet. The steepest terrain is found in the Old Dad Mountains which have an average slope of 31%. Whitney, the highest cinder cone, has an average slope of 10%. An average slope of 17%, however, is estimated for the entire HMA due to the relatively flat terrain overall.

Geologically, the area is varied also. The geology is

primarily volcanic in the Lava Beds area and metamorphic elsewhere. The principle rocks in the Lava Beds area are early Precambiran metamorphics, intruded by mesozoic quartz-monzorates, Holocene basalt, cinder cones (basaltic pyroclastics), and quaternary alluvium. Gold, copper, silver, lead, zinc, and molybdenum are metallic commodities found in crystalline rocks, while sand, gravel, and cinders are found in volcanic areas. There are some prospects in the area, however, cinders are the only economically recoverable resource at the present time.

The California State Water Resources Control Board delineated six major soil associations in the Lava Beds HMA: Anthony-Cajon-Arizo (AC), Calvista-HiVista-Cinco (CH), Daggett-Tonapah-Bitter Spring (DT), Granite-Rockland (GR), Lava-Rockland (LR), and Vinton-Brazito-Duneland (VB) Associations.

The Anthony-Cajon Arizo, Granite-Rockland, and Lava-Rockland Associations comprise the majority of the management area and are found in the designated critical area.

A short description of each of the major associations follows:

Anthony-Cajon-Arizo (AC) Association. This association occurs on nearly level to moderately sloping alluvial fans. The surface and subsoil textures vary from neutral to alkaline sandy loam to grey-brown, pale brown, or grey loamy sand or silty clay loam.

Anthony soils make up 20% of the Association, Cajon 20%, and Arizo 60%. The soils of the AC Association have low to moderately low runoff potential. These soils are characterized by high infiltration rates even when thoroughly wetted and consist of deep, well to excessively drained sands or gravels.

Calvista-HiVista-Cinco (CH) Association. These soils occur on nearly level to strongly sloping uplands. The surface and subsoils have a parent material of granite. The surface soils consist of neutral to moderately alkaline yellowish brown or brown loamy sand. The subsoils are comprised of moderately alkaline calcarcons sandy clay loam or loamy or loamy sand.

The CH Association include 60% Calvista, 30% HiVista, and 10% Cinco soils. Their hydrologic classifications range from low runoff potential to moderately high and high runoff potential. These soils are characterized by having slow to very slow infiltration rates when thoroughly wetted. Soils (Calvista) with a high runoff potential consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervions materials.

Daggett-Tonapah-Bitter Spring (DT) Association. These soils occur on convex and smooth, nearly level to strongly sloping alluvial fans and terraces. These soils formed in very gravelly sandy alluvium from a variety of rocks, predominantly granitic with some basaltic and rhyolitic materials. The surface soils consist of moderately alkaline to strongly alkaline gravelly sandy loam to gravelly sand.

Daggett comprises 60% of the Association, Tonapah 20%, and Bitter Spring 20%. The Association is characterized by a moderately high runoff potential. These soils may be somewhat poorly drained and may have moderate water tables.

Granite-Rockland (GR) Association. This Association is characterized by granite rock outcrops that cover from 40 to 90 percent of the

area. The soil is very shallow to none in most places.

It is comprised of 100 percent granite rockland and has a high runoff potential as a result of its impermeable substrata and moderate to steep slopes.

Lava-Rockland (LR) Association. This Association has soils that vary from very shallow to none at all. Because of the relatively young age of the volcanic activity in the area it is still devoid of soils in most places. The volcanic material covers 40 to 90 percent of the area.

The Association consists of 100 percent Lava-Rockland soils and has a slow runoff potential.

Vinton-Brazito-Duneland (VB) Association. This Association occurs on nearly level or very gently sloping flood plains or low terraces. The surface soils range from calcareous sand to sandy loam with the majority of the area having loamy sand textures. Fine sands comprising sand dunes make up the texture also. The subsoil textures range from sand to loamy sand.

The Vinton soils make up 30% of this Association, Brazito 40%, and Duneland 30%. These soils are characterized by low to moderately low runoff potential having moderate to high infiltration rates even when thoroughly wetted (See Figure 4 - Lava Beds Soil Key).

Overall, the erosion potential for the area is relatively low because the soils are primarily sand and Lava-Rockland Association having low to moderately low runoff potential. The Lava Beds IMA has been identified as having some high recreational potential, however, present and past use has been relatively low. There are two cinder mines

in the area and several prospects for minerals. One grazing lease for livestock is in the HMA. Use has been voluntarily curtailed in the past and recently because of the large and increasing numbers of burros in the area. Many wildlife species inhabit the area; there are an estimated 5-15 bighorn in the Old Dad Mountains.

3. Water

Water on a yearlong basis is only available from Indian Spring and Henry Spring. These two springs receive the heaviest use from burros because of the availablility of water. Burros are the dominant user of Indian Spring and have been for over ten years. Other waters are temporary and not highly reliable. "Potholes" will develop from heavy rainfall but only exist temporarily; the length of their existance depends upon present weather conditions.

Water quality varies from good to poor. Indian Springs has characteristically poor water quality. Indian Spring (also referred to as Indian Creek) is a perennial stream which runs for approximately one mile after a heavy storm. The rest of the year it runs underground surfacing occasionally to form a pothole. Generally, there are pools of water throughout the area. When the pools dry up the burros will dig for water which is readily avilable. The depth normally required for digging varies from 4 inches to 3½ feet in depth. By defacating in the washes the burros foul the water held below.

B. Living Components

1. Plants

There are seven major and three minor structural vegetation types recognized in the Lava Beds HMA. These types were delineated from

1976 Vegetation Survey by the Desert Plan Staff. The types are identified as major or minor, named, and a brief description of each follows:

MAJOR TYPES:

Woody Scrub-Low Diversity

This is a low diversity type composed of many shrubs greater than 3 feet (90 cm) in height. The major contributors to the plant cover are Larrea tridentata and Ambrosia dumosa averaging 43 and 37 percent composition respectively and having an average of 8 percent cover. The type occurs predominantly on alluvial plains and bajadas between 1115 (340) and 3061 feet (1180m) in elevation.

Sparce Herbland - Low Diversity

This is another low diversity type composed of few shrubs, but many herbs, i.e. greater than 30% of the composition. An average of 15 percent Panicum urvilleanum and 44 percent Hilaria rigida are found distributed upon areas of sand dunes and blow-sand between elevations of 1625 (495m) and 3050 feet (930 m). This type averages 4 percent cover.

Tall Woody Scrub - Moderate Diversity

This is a moderate-diversity type with many tall shrubs over 3 feet (90cm) tall. The major components of the type are Larrea tridentata and Ambrosia dumosa with 31 and 30 percent composition, respectively. The type covers bajadas, plains, and some slopes between 1525 (465 m) and 4500 feet (1365 m) in elevation. This type averages 9 percent cover.

Succulent Scrub - High Diversity

This is a high diversity succulent type with a short woody shrub understory, and less than 10 percent perennial grasses. The

succulents Yucca schidigera, and Opuntia acanthocarpa each average 5 percent of the total plant composition. The type occurs on rocky bajadas and slopes between 2500 (775 m) and 4775 feet (1455 m) in elevation. This type averages 13 percent cover.

Succulent "Woodland" - Moderate Diversity with Tall Shrubs

This type has vegetation greater than 9.5 feet (3 m) tall though it is non-woody. Yucca brevifolia, the species that distinguishes this type and the following 2, occurs in 1 percent of the total plant composition. Tall woody shrubs about 3 feet (90 cm) are present in the understory. Larrea tridentata, the major tall shrub averages 18 percent of the total plant composition. The type occurs on plains ans slopes between 3450 (1050 m) and 4300 feet (1300 m) in elevation. Average cover for the type is 18 percent.

Succulent "Woodland" - High Diversity

Like the previous type, this is a moderate-diversity type with tall, non-woody trees, but the shrub understory is less than 3 feet (90 cm) tall. Yucca brevifolia averages 2 percent of the plant composition, while the short shrub component is quite variable. Grasses, however, average 24 percent of the plant composition. This type may cover bajadas and plains between 3061 (1180) and 4800 feet (1490 m) in elevation. This type averages 19 percent cover.

Succulent "Woodland" - High Diversity With Herbs

Yucca brevifolia, Lycium andersonii, and Ephedra nevadensis comprise 2, 5 and 7 percent of the plant composition in this type respectively. Grasses such as Muhlenbergia porteri, Bouteloua eriopada,

B. gracilis, and Hilaria jamesii average a combined total of 34 percent of the plant composition. The type may occur on bajadas and hillsides between elevations of 3772 (1150 m) and 5500 feet (1675 m). The average cover for the type is 20 percent.

MINOR TYPES:

Green Stemmed Scrub

This type is of low woody vegetation with greater than 30 percent obviously green-stemmed shrubs in occurrence. Hymenoclea salsola, Cassia armata, and Chrysothamnus paniculatus comprise 38, 12, and 6 percent of the total plant composition, respectively. This type occurs in washes between 2034 (620 m) and 4070 feet (1240 m) in elevation. This type averages 10 percent cover.

Sparce Deciduous "Woodland"

This is a type in which plants greater than 10 feet (3 m) in height occur. This type is distinguished by having deciduous trees. Acacia greggii is the major tree averaging 8 percent of the plant composition. Chilopsis linearis or Dalea spinosa may occur in up to 17 and 64 percent of the type in certain areas. Hymenoclea salsola averages 25 percent composition in the type. This type occurs in washes between 1740 (530 m) and 4790 feet (1460 m) in elevation. The type averages 13 percent cover.

Succulent "Woodland" - High Diversity

This is a high diversity type with non-woody trees and a short shrub understory including less than 10 percent perennial herbs. Yucca brevifolia averages 1 percent and other Yucca species average 3 percent of the plant composition. Lycium andersonii, Ephedra nevadensis, and Haplopappus cooperi average 7, 12, and 6 percent respectively. The

type may occur on bajadas and hillsides between 3560 (1085 m) and 5475 feet (1670 m) in elevation. This type averages 25 percent cover.

2. Range Condition

The range is in poor condition within the critical areas as determined from trend and condition plots in the area. Utilization of key forage species is well above the designated proper use factors (PUF) for each species. In the areas from 6 to 12 miles from water, the range is in fair to good condition.

3. Rare and Endangered Species

There are no known rare and endangered plant species found within the HMA.

4. Animals

a. Wildlife

The Lava Beds HMA is comprised of habitat ranging from Creosote/mixed shrub, rocky slopes/yucca, and joshua tree/mixed shrub. Several riparian habitat types are also represented in the form of desert willow, Acacia, and cheese bush washes.

The more common mammalian species occurring in the HMA are jackrabbits, cottontails, kangaroo rats, pocket mice, and ground squirrels, particularly in the flatter, more open areas of lower elevations. Higher and more rocky areas (Old Dad Mountains and Kelso Mountains) support bighorn sheep. Predatory mammals found in the HMA include foxes, coyotes, badgers, ringtails, bobcats and skunks.

Among the avian species to be found are Gambel's Quail, Chukar, mourning dove, several species of raptors and numerous passerive

species. Dove, quail, and chukar occur chiefly in the riparian habitats due to good cover and water. Raptors include the red-tail hawk, Swainson's hawk, Golden eagle, prairie falcon, and American Kestrel. Common songbirds include the sage sparrow, sage thrasher, house finch, and black-throated sparrow, occupying a variety of habitat types. Waterfowl and shorebirds, such as coots, killdeer, and eared grebes have also been observed at cattle watering sites. Verified breeding areas for Bendire's thrasher, the American Kestrel and Swainson's hawk also exist within the HMA.

A wide variety of reptiles and one amphibian are represented. The amphibian, the red-spotted toad, is restricted to riparian habitats. The more common reptiles are the desert iguana, zebra-tailed lizard, Great Basin whiptail, side-blotched lizard, glossy snake, gopher snake, sidewinder, speckled and mojave rattlesnakes. In addition, prime habitat for chuckawallas and the desert rosy boa are to be found primarily in rocky slope/Yucca associations. These species occupy a great variety of habitat types but are most often encountered in flatter, creosote dominated areas. Suitable desert tortoise habitat also exist in these areas.

(1) Crucial Areas. Several areas in the lava bed - cinder cones HMA may be considered crucial, or at least sensitive in terms of wildlife habitat. As already mentioned prime habitat exists for the chuckwalla and desert rosy boas both of which are partially protected by state law (Fisk, 1972) . The desert tortoise, a fully protected species (Fisk, 1972) , has been observed at Henry Spring (a trap site) and in the vicinity of Twisselman Pipeline Tank #6. The Henry Spring site, which is prime tortoise habitat, is presently heavily

disturbed due to cattle and burro trailing and grazing. To the south lie the sand dunes of Devil's Playground, prime habitat for the partially protected Mojave fringe-toed lizard.

Bendire's thrasher breeds in the vicinity of Black Tank and Tank #3 both of which suffer from overgrazing and trailing. The American Kestrel and Swainson's hawk also breed in this area as well as near Tank #6. LeConte's trasher and the Loggerhead shrike occur in the vicinity of Tanks #5 and #6 (Figure 2 shows the tank locations).

Henry Spring and Black Tank provide habitat for the Chisel-toothed (Great Basin) Kangaroo rat.

(2) Rare and Endangered Species and other Significant Wildlife Information

(a) Rare and Endangered Species. No rare, endangered or threatened species of wildlife inhabit the HMA. The prairie falcon was formerly listed as threatened but is presently listed as status undetermined (USDI, 1973) .

(b). Other Significant Wildlife Information. This section includes species which are fully protected under California law, Blue Listed bird species and or species aminated by the Bureau of Land Management (Riverside District) as sensitive.

Fully protected species occurring in or near the lava beds-cinder cones HMA are the desert tortoise, kit fox, ringtail, mountain lion, bighorn sheep and feral burro.

Blue listed bird species include Cooper's Hawk, Swainson's Hawk, Prairie Falcon, American Kestrel, Burrowing Owl, Loggerhead

shrike, Sharp-shinned Hawk, Mountain Bluebird and the Barn Owl.

Bureau of Land Management nominated sensitive species include the desert tortoise, Prairie Falcon, Swainson's Hawk, the desert shrew, bobcat and bighorn sheep.

b. Livestock

A portion of one grazing lease extends into the entire HMA. This allotment is managed as perennial range on a yearlong basis. In the last three years livestock use has averaged 33 cows yearlong in the critical areas. The cattle do not use Indian Creek critical area and have not for more than 10 years. Henry Spring critical area has received cattle use for only 2 months in the past year and a half.

The leasee has also taken a voluntary reduction of 18% to alleviate the situation.

C. Ecological Interrelationships.

1. Plant Succesion.

The normal climatic vegetation types in the Lava Beds HMA are described in the previous section on plants under Living Components. The vegetation types vary by soil series, infiltration rates, and water holding capabilities.

Due to the combination of livestock and burro grazing in the critical areas, (primarily burros since livestock only use the easier terrain) important plants for burro use such as the mojave aster (Machearanthera tortifolia), golden head (Acamtopappus sphaerocephala), and burrobush (Ambrosia dumosa) are severely overgrazed and need rest to restore vigor.

In some places, the desirable or key species such as the above may already be replaced by invader species such as cheesbush (Hymenoclea salsola), cholla (Opuntia acanthocarpa), matchweed (Gutierrezia microcephala), and even creosote bush (Larrea triaentata). Perennial grasses such as desert needle grass (Stipa speciosa) and galleta (Hilaria rigida) have been eliminated except in the most unaccessible areas (rocky slopes and outcrops). Future soil and vegetation interpretation will provide information as to whether the grasses did exist in the open more accessible areas.

Several species were introduced from Spain in the early 1700's and later and have occupied much of the area. Whether this has been detrimental to the native plant species is not known. The most common of those species are: Schismus barbatus, Schismus arabicus, Bromus rubens (Red brome), Erodium circutarium (filarce), and Salsola iberica (Russion-thistle).

The HMA is within the Mojave Desert Floristic region but includes many of the warm season plants or Colorado River vegetation. These are plants that depend primarily on rainfall and warm temperatures rather than water holding capacity of the soil.

Munz refers to the Plant Communities as:

1) Shadscale Scrub. In heavy soil, often with underlying hardpan, and at about 3000-6000 feet is another low shrubby vegetation, with perhaps 6-15 inches of rain and often near Joshua Tree Woodland, but apparently with different soils. Largely in the extreme northern Mojave Desert, it includes such species as Atriplex confertifolia, Grayia spinosa,

Eurotia lanata, Artemisia spinescens, Menodora spinescens, Gutierrezia sarothrae, Coleogyne ramosissima.

2) Joshua Tree Woodland. At 2500-4000 feet, with 6-15 inches of rain, partly as summer showers, extends from extreme west to extreme east of the Mojave Desert. Yucca brevifolia, Y. schidigera, Salazaris, Lycium, Salvia, Eriogonum.

3) Creosote Bush Scrub. The great mass of the floor of the deserts and their lower slopes are covered by a scrub vegetation of Larrea or Creosote Bush. Rainfall 2-8 inches, partly in summer. Burr weed (Ambrosia dumosa), Incienso(Encelia), etc.

2. Food Relationships and Community Relationships.

Rabbits and small rodent populations periodically increase to levels resulting in significant use on the grasses, forbs, and shrubs. Thus, they reduce forage available to other wilflife, livestock, and burros. Antelope ground squirrels store food, including seeds, which helps maintain certain vegetation species.

When the rodent populations are high the predator populations soar. The highest concentration of predators are found in riparian habitat which is suitable to a wider variety of animals than the flatter slopes which provide little cover for protection.

High rodent populations generally indicate a deteriorated range, however, the range condition can become so poor as to not support even the rodent populations. Poor range condition is generally indicated by a lack of seed production, no seedlings and poor plant vigor. Many insects,

rodents and other wildlife depend on the whole plant for sustenance of life. Some insects derive a singular benefit from the flower, rodents eat the seed, and herbivores the herbaceous portion and often the flowers and seeds of the plant. Without the total plant only certain members of the community are favored.

Concentration of burros around the riparian habitat of Indian Creek has damaged much of the available forage and cover for other wildlife as well as the burro. The situation becomes even more serious in the hot summer months when all species that require water for survival converge on the water sources; particularly the natural water sources.

Different life patterns dominate the small species compared to the larger species. The smaller animals, game birds, (and rodents) have a short life span but high reproductive rate. The larger hervacious mammals and predators are characterized by a longer life span but lower reproductive rate. The yearly or seasonal booms of rodents in a localized area has a tremendous effect on the welfare of the predators. Any pressure or stress on the predator will first affect the young and weak animals. Continued stress will eventually affect an entire population.

D. Human Values

1. Landscape Character.

a. Natural Processes.

The topography of the Lava Beds HMA is characterized by lava flows with numerous cinder cones, alluvium, riparian areas, and the Old Dad Mountains.

The lava flows and cinder cones are found in the center of the HMA. It is believed that the volcanic activity which resulted in these landmarks occurred from 800 to 1,000 years ago. Aesthetically, the values range from high to moderate depending on the time of day and each individual. The cones themselves rise off the desert floor to as high as 4,925 feet and present a stark appearance at all times of the day. The lava flows are characterized by rocky slopes with Yucca schidigera and Larrea tridentata while the cinder cones have very little growth.

The lower elevations feature alluvium which is interspersed with riparian habitat. The most common vegetal types supported in this area are creosote/burrobush and creosote/mixed shrub. The aesthetic values of these areas vary from moderate to low.

Within the Lava Beds area and to the south of it are riparian habitats characterized by cheesebush washes and Acacia washes. One of the southernmost washes contains a large stand of desert willow and is adequately named Willow Wash. The scenic values of the riparian areas vary from low to high depending upon the density of deciduous plant life in the wash.

The Old Dad Mountains lie to the west of the Lava Beds and present a very rugged appearance. The average slope of these mountains is 30-40%. The mountains are very steep, very difficult to maneuver and support sparce vegetation with the main component being creosote bush. The scenic value of the Old Dad Mountains vary from low to moderate. To the west of the Old Dad Mountains lies Devil's Playground which has a

large expanse of sand dune habitat that supports galleta grass and numerous annuals.

During the spring after heavy rains annuals (sand verbena, prickley poppy, evening primrose, etc.) line Kelbaker Road to the south of Baker. The vegetation responds rapidly after desert storms making the area lush and green. The early morning and evening light enhances the scenery giving the cinder cones a mystical appearance. Sunrises and sunsets are spectacular especially when the cinder cones are silohetted.

b. Human Cultural Processes

Historic uses in the area have altered the natural aesthetics of the desert. The area has experienced pioneer movement, mining activity and livestock use.

Mining and prospecting of gold, lead, silver, molybdenum and other mineral commodities has occurred in spotty distribution throughout the HMA. Mining has been on a small scale with respect to the human population with the exception of the cinder cone operations in the Lava Beds where large quantities of cinders are withdrawn and eventually used for building material.

The other major historic use has been by livestock. The HMA supports a portion of one grazing lease. Range improvements for livestock are scattered throughout the area. The range improvements consist of fences, water developments, and corrals.

Today, livestock use and the cinder cone mines continue. There are two powerlines and accessory roads in the HMA; one in the north-

ernmost portion and one in the southernmost portion.

2. Socio-Cultural Interests

Cultural resources are defined as those fragile and non-renewable evidences of human activity, occupation and endeavour as reflected in districts, sites, structures, artifacts, objects, ruins, works of art, architecture, and natural features that were of importance in human events. Cultural resources are further categorized in terms of thier prehistoric and historic values, however, each of these aspects represents a part of the continuum of events representing the earliest evidences of man to the present day.

As the initial step in complying with Federal antiquities legislation, an intensive cultural resource survey was conducted at each of the six proposed trap locations within the Lava Beds HMA by Cima Resource Area Archaeologist Richard A. Weaver (For details of the pertinent environmental background, cultural history, survey methodology and recommendations see Weaver 1977).

Two cultural loci were encountered during the course of these investigations. At the Henry Springs trap site a flake scatter (EM-371) was encountered, which included 25 Basalt, 5 quartz and 6 chalcedony flakes spread over a 50 x 75 meter area. One single piece of manganese glass was also noted at this location, but because of the distrubed nature of the area it was not possible to determine whether the glass was contemporaneous with or post-dated to flake scatter.

At the Indian Springs location one previously recorded site

(EM-317) and one new site (EM-370) were located. Both are milling stations situated upon terraces above the adjacent stream bed.

National Register Eligibility

Executive Order 11593 and the National Historic Preservation Act of 1966 require federal agencies to consider the eligibility of cultural resources for placement on the National Register of Historic Places.

Although the cultural loci previously described do contain some information relevant to prehistory, this information does not appear to be of a significant level: neither site is unique in character and the overall integrity of the sites, expecially EM-371 both as individual or as components in a National Register District is poor.

The large population of burros in the Lava Beds HMA are descendants of the animals used for pack animals by miners from the 1880's to 1920's. The majority of the burros were released after the car became a feasible mode of transportation and the mining industry floundered after World War I.

The burros are protected by P.L. 92-195, the Wild Horse and Burro Act If 1971. Much controversy surrounds these animals and their status. Some feel they are a part of America's heritage and should be preserved for future generations; others feel they are detrimental to the environment and in direct conflict with other resource values.

III Analysis of Proposed Action and Alternatives.

A. Environmental Impacts

1. Alternative #1 - No Action

a. Anticipated Impacts

Air. Air quality as affected by dust pollution may or may not be influenced. Continued overuse resulting in heavy trailing and overutilization of the vegetation will result in less vegetal and litter cover, especially within the critical area. This will affect how much dust pollution occurs with high intensity dust storms.

Soil Erosion. An increasing population of burros will have a direct impact on soil erosion. Excessive trailing, dust bowls (for burro baths) and increasing utilization of the vegetation will increase the potential for soil erosion, particularly during dust storms and high intensity rainfall. Future studies will determine the impacts of excessive trailing on the recoverability of the soild. At the present time the sediment yield in the HMA is not known, however, it can be conjectured with a fair degree of certainty that it would increase if the burro population is left unchecked.

Vegetation. The utilization o f vegetation would continue unchecked. The key species or desirable plants would continue to be overgrazed. Continued overgrazing will ultimately reduce the vigor and forage providing capabilities of the desirable species until these plants would eventually disappear or be greatly reduced as a percent of the vegetation composition. Plant cover would be reduced or removed also providing less cover for both burros and wildlife. The number of

burros will also increase considerably above the established carrying capacity of the area. The intensity of grazing for adequate forage would continue out as far away from water as the burros could physically go.

Water. Indian Spring (or Indian Creek) is one of the few perennial streams in the desert. It runs the majority of the year several inches below the sand in the water. Intensive storms, however, will cause it to run for several months above the surface depending upon the temperatures. Many potholes can be found that were either dug by the burros or were formed by impediments in the wash. Left unchecked, the burros will continue to pollute the water source. During stressful times, the pollution increases as the amount of water decreases.

Aesthetics. Burros provide aesthetic appeal to certain portions of the population. However, the animals will provide no aesthetic values if they continue to reproduce and starve to death Continued overutilization of vegetation, water resources, and excessive trailing will reduce the visual enhancement of the entire area.

Cultural Values and Socio-Economic Factors. Initially, burro visability would be very good. However, as the range and water condition worsens, the burros condition will worsen and eventually the numbers will decline. Wildlife visability would decline at a more rapid rate and also take longer to replenish. Economically, the increasing burro population will ruin suitable livestock range and force the livestock operator to withdraw from the area entirely.

Cultural Resources. Failure to manage the burros will lead to continued and ever increasing deterioration of the local environment and natrual ecosystems. Owing to the intimate bond that exists between man and the environment, long-term negative effects could be expected either through ourtight loss of sites or destruction of critical site associated interpretive data.

Animals (Wildlife). Since no action would be taken, no impacts to wildlife or habitat would result from activity. However, competition for forage and water resources between burros, wildlife and livestock would continue to increase to an increasingly critical level. This would lead ultimately to range decimation and subsequent population crashes of many wildlife species. In addition, much available cover for birds and other wildlife species would be lost. Were this general situation to continue, the habitat would require many years to recover.

Animals (Burros). An increasing population will also effect the welfare of the burros. It will become necessary for them to travel great distances for adequate forage. In the hot dry season, stress caused from lack of water will degrade the condition of the animals. Eventually, they too will either be forced th leave the area (if it is possible) or the population will experience high mortality rates.

Land Use Suitability. The environment in which the burros are presently found would be adversely impacted to the extreme. Unchecked, the burro populations would increase far beyond the carry-

ing capacity of the land to support them. A similar situation cound be cited here as an example of what happens when an animal population has all restraints removed that would normally control population increases, and that is the Kaibab deer herd. Predators were destroyed and no hunting was allowed. In brief, a population explosion occurred, the landscape was denuded, and massive starvation of the deer followed. The population eventually stabilized at fewer numbers than the original level before the factors helping to keep the population in check were removed. Wild burros have no natural predators other than man in this area.

As the wild burro populations increase, the critical use areas around waters will become even more extensive than they are now. Forage production withing grazing distance from water will decrease to a point where all classes of herbivores will have much less forage than is necessary for survival.

Livestock grazing could not take place in the HMA. Wildlife populations would decline drastically as their forage, water, and cover requirements are not met. The concept of dominate single species land use is neither compatible nor suitable.

Attitudes and Expectations. The Bureau of Land Management would face tough opposition to this alternative from not only conservation groups but humane and burro protection groups. The Bureau is mandated in PL92-195 to maintain, manage, and control burros and to consider the ecosystem as well. Severe damage to the ecosystem will not aid in maintaining a healthy population of animals. It is also against the concept of multiple use on National Resource Lands.

2. Alternative #2 - Reduce to Carrying Cacacity.

a. Anticipated Impacts.

Air. Removal Activities will increase particulate matter in the air to a temporary and local extent. There will be more travel on the roads than normal.

Soil Erosion. Reducing the burro numbers down to grazing cacacity would increase the vigor of key forage species and eventually slightly increase plant density, which will tend to decrease runoff and soil loss, particularly in the critical areas. Lowering the burro numbers would improve the soil structure slightly by reducing the soil compaction caused by heavy trailing and "fine powder" caused by either trailing or numerous dust bathes.

Vegegation. Reduced grazing pressure by burros will result in an improvement in plant vigor of key species which would assist in plant productivity. Key species which have been eliminated may reestablish. This would take at least several decades depending on precipitation and other climatic and environmental factors. Total plant density of key species should increase.

Water. Implementation of the management plan would alleviate pressure on Indian Creek in the critical area. Water quality would improve and more water would be available to meet the needs of both the burro and other wildlife during times of stress.

Aesthetics. The natural landscape would be enhanced if vegetation cover, water quality and quantity, and the animals were in balance

with each other. The burros would not face a situation of starvation and stress. The majority of the population is more stimulated by environments of high quality as opposed to one that is obviously being abused.

Cultural Values and Socio-Economic Factors. Removing the burros to grazing capacity will reduce burro visability in the Lava Beds. Wildlife visability may improve, particularly near Indian Creek critical area. The entire environment should be improved aesthetically as the ecosystem regains vigor and becomes balanced. Multiple use with livestock would continue under the same authorization. A variety of animal life in a given environment is generally considered a healthy environment. Therefore, some use by all classes rather than dominate use by one class would be most beneficial for all components making up the environment, including wildlife.

Cultural Resources. Reduction of burros to current carrying capacity in critical areas would alleviate direct impacts and loss or destruction of the informational/environmental association data. However, it would not allow for improvement in the situation. Further, this option would necessitate yearly gathering of the burros in order to maintain a reduced population at the carrying capacity. In turn, this would make it increasingly likely that cultural resources would be both directly and indirectly impacted through increased utilization and accessibility of the present and any new trap locations.

Animals (Wildlife). There will be temporary disturbance of

wildlife during reduction activities. Some species, especially diurnal birds, will be driven from the immediate area (including water troughs) during human activity and while the burros are in the corrals overnight. Any destruction to the habitat will depend upon the extent of activity. Habitat destruction will occur only to relatively small areas and, therefore, should be slight from an overall perspective. In terms of long-term impacts reducing the burros to grazing capacity should result in stabilization of wildlife populations. From an overall perspective, the positive impacts upon wildlife should substantially outweigh any negative impacts accrued from the program. Reducing the burros only to carrying capacity would result in a necessity for a yearly gathering program. This would increase the stress and interruptions made to normal wildlife activity.

Animals (Livestock). Livestock use would be benefitted by increased vegetation productiveity as outlined above.

The horses used for any roping operations may undergo many stressful situations and some may sustain injury during the operation.

Animals (Burros). Reducing the burros to carrying capacity would result in a healthy stable population of animals. Initially, the burros would undergo a stress situation as they are trapped or roped and transported to the holding facilities. The reduction plan details measures to be used to keep stress at a minimum. Some animals may sustain injury during the capture (roping, herding, or trapping) operations. Again, measures will be followed to insure injury is kept

at a minimum. Reduction to carrying capacity would necessitate a yearly gathering operation which would cause the burros more stress and upset their normal activites.

Land Use Suitability. Implementation of the burro reduction plan would bring all the uses into balance, provide increased productivity and suitable habitat for burros, wildlife, and livestock.

Attitudes and Expectations. Generally, there has been a favorable response from horse and burro protection groups, humane groups, conservation and preservation societies towards burro reduction in the Lava Beds HMA. The horse and burro protection groups feel BLM is responsible to maintain a healthy environment if burros are to be maintained in healthy viable population without damaging habitat for wildlife and themselves. Conservation groups, etc. feel that since the burro is an exotic species it should be managed giving preferential treatment to all native species.

3. Alternative #3 - Reduce 40% Below Carrying Capacity.

The impacts of this alternative are basically the same as those for reducing to current carrying capacity, except the beneficial ecosystem responses would be accelerated. Equally as important, less harrassment to the burros, wildlife, and cultural resources would take place because gathering processes would only occur every three to five years. Significant differences are:

Soil Erosion. Soil erosion would be reduced significantly faster because ground cover and vegetation would be improved more rapidly.

Vegetation. This alternative, if implemented, would result in a mjch better vegetative response in the currently over-utilized areas than reducing to carrying capacity. The additional rest would result in much greater vigor and productiviy. Chance for increase in plant density would also be much greater.

Cultural Resources. As is the case with Option II, Option III will also have the effect of reducing both direct and indirect impact due to natural burro acitvity. Further, while some negative impact can also be expected due to forced burro movement and increased use of and accessibility to the trap locations, the sub capacity removal would not require that round-ups be held as frequently. Thus the resulting negative impacts should be less severe.

Animals (Wildlife). The lowering of competition between burros and wildlife in terms of food, cover and water resources would likely result in increased wildlife populations owing to quantitative and qualitative habitat improvement. In the long-term, wildlife and burro populations would probably be higher in the future due to the increased primary production and ecosystem improvement. In addition, gathering processes would not have to be held yearly. Instead, every three to five years the burro population would be reduced thus, decreasing impacts from gathering on wildlife activity.

Animals (Burros). Reduction to 40% below carrying capacity would result in a greater possibility that the established population size would be able to be increased to the current carrying capacity

because of the increased production and improvement of the ecosystem.

There would also be less stress to the burros since this would eliminate the need to repeat gathering yearly. Instead, the population would be able to increase to carrying capacity and then be managed. Until such time as the environment is improved substantially the burros would be managed at 40% below carrying capacity.

Long-Term vs. Short-Term. This alternative would allow for a larger long-term productivity of the ecosystem than just reducing to grazing capacity. This increase could be at the short-term expense of individual burros; however, the population would benefit over the long-term.

B. Relationship Between Short-term Use and Long-term Productivity.

The objective of the Lava Beds Burro Reduction Plan is to lessen habitat destruction caused by burro numbers that far exceed the current carrying capacity of the land. Implementation of this short-term (three to six months) management plan should have far-reaching effects on the land's long-term productivity. If the plan is implemented and succeeds, vegetative response will likely be slow because of the general lack of precipitation. However, time and natural ecological processes, if not constrained, will heal the Lava Beds ecosystem. If the plan is not implemented further vegetative, habitat and wildlife destruction will occur.

C. Irreversible or Irretrievable Commitments of Resources.

There are two major irreversible commitments of resources which will occur with the implementation of the Plan. The first involves

those burros that must be disposed of because they were in excess of the demands for adiption or because of injury or sichness. However, the carcasses would be left to decompose and remain part of the ecosystem and hence retained in the food cycle. The second point involves the cultural resource loci. While mitigation does reduce negetive impact, the insitu removal of data under the present state of interpretive technology also constitutes an irreversible and irretrievable commitment of the resource.

SUMMARY - CONCLUSION

The burro population in the Lava Beds HMA has continued to grow unchecked for the past six years. The areas they utilize primarily and appear to prefer are Henry Springs and Indian Creek areas. These two areas are referred to as the critical areas in the text of the Plan and Environmental Analysis. There are only 819 A.U.M.'s in the critical area. The burros converge on these areas during the hot, dry season and remain there until it either cools down or it rains and succulent annuals become available elsewhere. An estimated 330-350 burros inhabit the area utilizing from 3960-4200 A.U.M.'s. The critical areas can only support approximately 12 percent of the animals. As a result, there has been severe overutilization of the range. This affects not only the welfare of the burros, but wildlife and vegetation. Negative impacts to the soils. vegetation, wildlife, and burros will continue until a management plan is implemented.

An environment that supports vegetation in good condition, diverse wildlife populations, and a smaller, but healthier population of burros is by far the best alternative.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ANALYSIS WORKSHEET

1. Action
BURRO REDUCTION IN THE LAVA BEDS HERD MANAGEMENT AREA

2. Stages of implementation
TOTAL

3. ALTERNATIVES

4. COMPONENTS, SUBCOMPONENTS, AND ELEMENTS IMPACTED	5. ANTICIPATED IMPACTS: NO ACTION	REDUCE TO GRAZING CAPACITY	REDUCE 40% BELOW GRAZING CAPACITY			6. REMARKS
I. NONLIVING COMPONENTS						
A. AIR						
AIR QUALITY	O	L+	L+			
B. LAND						
GEOLOGY	O	O	O			
SOILS	M-	L+	M+			
LAND USE	M-	L+	M+			
C. WATER						
WATER QUALITY-INDIAN SPR.	H-	L+	M+			
II. LIVING COMPONENTS						
A. PLANTS (Aquatic)						
INDIAN SPRING	M-	L+	M+			

DISCRETE OPERATIONS

COMPONENTS, SUBCOMPONENTS, AND ELEMENTS IMPACTED	NO ACTION	REDUCE TO GRA... CAPACITY	REDUCE 40% BE... GRAZING CAPAC...			REMARKS
II. LIVING COMPONENTS (Cont.)						
B. PLANTS (*Terrestrial*)						
FORAGE SPECIES	H-	L+	M+			
COVER	H-	L+	M+			
C. ANIMALS (*Aquatic*)						
INDIAN CREEK	M-	L+	M+			
D. ANIMALS (*Terrestrial*)						
BURROS (short-term)	0	M-	M-			
BURROS (long-term)	M-	L+	M+			
BIGHORN SHEEP	L-	L+	M+			May begin to use Indian Creek are
LIVESTOCK	M-	L+	L+			Livestock does not use Indian Cre... area; thus little overlap.
OTHER WILDLIFE	H-	L+	M+			
III. INTERRELATIONSHIPS						
A. ECOLOGICAL PROCESSES	H-	M+	H+			
IV. HUMAN VALUES						
A. LANDSCAPE CHARACTER						
AESTHETICS	M-	L+	M+			
B. SOCIOCULTURAL INTERESTS						
CULTURAL RESOURCES	L-	L-	L+			
BURRO PRESERVATION (long-term)	M-	L+	M+			
BURRO PRESERVATION (short-term)	M+	L-	L-			

INSTRUCTIONS

1. *Action* – Enter action being taken, analytic step for which worksheet is being used, environmental viewpoint of impact, and any assumptions relating to impact.
   a. Worksheet is normally used to analyze "*Anticipated Impacts*" of action, however, it may be used to analyze "*Residual Impacts.*" Worksheets may also be used to compare impacts before and after mitigating measures are applied.
   b. State viewpoint that best describes environmental impact. For example, a fence viewed down the fence line has greater impact than the same fence viewed over an entire allotment. Generally, narrow viewpoints better illustrate specific impacts than will broad viewpoints.
   c. Assumptions may be made to establish a base for analysis (*e.g. estimated time periods, season of year, etc.*).
2. *Stages of Implementation* – Identify different phases of proposed project (*e.g. a road project consists of survey, construction, use, and maintenance stages*).
3. *Discrete Operations* – Identify separate actions comprising a particular stage of implementation (*e.g. the construction stage of the road project has the discrete operations of clearing, grading, and surfacing*).
4. *Elements Impacted* – Enter under appropriate heading all environmental elements susceptible to impact from action and alternatives. Relevant elements not contained in the digest should also be entered. See BLM Manual 1791, Appendix 3, Environmental Digest.
5. *Anticipated Impact* – Evaluate anticipated impact on each element and place an entry in the appropriate square indicating degree of impact as low (L), medium (M), high (H), no impact (O), or unknown or negligible (X). Precede each entry by a plus (+) or minus (-) sign indicating a beneficial or adverse type of impact. If type of impact reflects a matter of opinion or is not known, do not precede with a sign. For example, construction of a wind mill on open range has a definite visual impact, however to some people the effect is detrimental while to others it is an improvement. By not entering a plus (+) or minus (-) sign the worksheet is kept factual and unbiased. If both degree and type of impact are unknown, place an (x) in the appropriate square.
   a. The measures of impact (*e.g. low, medium, and high*) are relative and their meaning may vary slightly from action to action. The term "low" should not be applied to impacts of a negligible nature. For example, we know that a pickup truck driving down a primitive fence line laying wire has some impact on air quality. However, the significance of this impact is not normally great enough to warrant even a "low" rating. In cases like this, the impact will usually be marked "O" or the element left off the worksheet.
   b. It is recognized that some environmental elements may defy accurate measurement or in-depth analysis within current Bureau capabilities or expertise. The nature of the action as well as type and degree of impact should guide in the decision to seek outside expertise or assistance.
6. *Remarks* – Enter clarifying information.

Signatures

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Reviewed by Albert S. Feasman Jr. Date 9/28/77
Environmental Coordinator

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