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Environmental Assessment
NV065-2005-042

Montezuma Complex
Rangeland Health Evaluation

Tonopah Planning Area
Battle Mountain District

Environmental Assessment - NV065-2005-042

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1.0 INTRODUCTION

1.1 Background Information

The evaluation area is located in Esmeralda County and Nye County, Nevada. The assessment area is comprised of the Montezuma, Razorback and Springdale 2 Allotments (refer to Map 1.0) known as the Montezuma Complex. The Bullfrog, Stonewall, Goldfield, most of Montezuma Peak and a small portion of Paymaster wild horse and burro Herd Management Areas (HMAs) occur in the area.. The desert tortoise habitat is in the extreme southern part of the Montezuma and Razorback Allotments. The Montezuma Complex is comprised of 612,643 acres based on the Tonopah Resource Management Plan data.

The Montezuma Allotment is currently vacant and would be available for TNR grazing use until a proposed decision is issued. Livestock grazing in the Montezuma Allotment is to be determined in the evaluation (refer to Appendix A) and in this Environmental Assessment. The Razorback Allotment was evaluated in 1994 prior to the development of the Standards for Rangeland Health in 1997. It is being re-evaluated in this environmental assessment (EA). The Springdale 2 Allotment has not yet been evaluated, and is also being evaluated in this EA. Appropriate Management Levels (AML) for the Goldfield, Montezuma Peak, Stonewall, Bullfrog and a small portion of the Paymaster HMAs are being re-evaluated at this time. AML was established in 2005 for the portion of the Bullfrog HMA within the Springdale 2 Allotment.

The Wild Horse and Burro Act of 1971 determined that the Secretary of the Interior will manage "wild and free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands." In 1971, the BLM established Herd Management Areas (HMAs) to manage wild horses and burros within their habitat under a multiple-use initiative. They also determined the interim herd size (IHS) for each HMA based on early census data. As range monitoring data were collected and analyzed in the rangeland health assessment and Final Multiple Use Decision (FMUD) process, the IHS numbers were re-evaluated and Appropriate Management Levels (AMLs) were established. The Mojave/Southern Great Basin Area RAC Standards and Guideline 4.2 states, "AMLs should be set to reflect the carrying capacity of the land in dry conditions based upon the most limiting factor: living space, water or forage." The AML is the maximum number of horses or burros an HMA can sustain to maintain a healthy ecosystem. As range monitoring data are collected and analyzed in the Final Multiple Use Decision (FMUD) process, the Appropriate Management Levels (AML) are to be re-evaluated and set. The rangeland health assessment is a tool used to establish AML, or re-evaluate existing AML, based on the most current population and range monitoring data.

Since 1994 when much of this area was evaluated last, several years of drought has necessitated emergency gathers of starving wild horses and burros from the assessment area. Thin, unhealthy horses are a major cause for concern. The AML for wild horses and burros would be evaluated and re-established as needed for the Montezuma Peak, Stonewall, Bullfrog, Goldfield, and Paymaster Herd Management Areas (HMAs) in this evaluation (refer to Map 2.0). AML would be established as a range between the minimum and maximum number of wild equids that an HMA can sustain to maintain a natural ecological balance on the rangeland.

AMLs have historically been expressed as a single number, which is the maximum population of wild horses and/or burros sustainable for an area. The current National Wild Horse and Burro Policy emphasizes achieving a four-year gather cycle for herd management areas. Establishing an AML range allows for a four-year gather cycle and maintenance of a thriving natural balance. An AML range would also ensure that the wild horse and burro populations would survive and be successful within the HMAs during poor years when elements of the habitat are limiting due to severe weather conditions or uncontrollable and unforeseeable environmental influences on the herds. The AML range is derived by establishing the maximum AML (carrying capacity), then subtracting the annual rate of increase for 4 years for the minimum AML. For the Montezuma Complex, the annual rate of increase is 14 percent for Montezuma Peak, Goldfield, Stonewall, and Bullfrog HMAs. Paymaster has an annual increase of 16 percent.

The Proposed Action in this EA is to analyze and implement certain actions to help meet the Resource Advisory Council (RAC) - Mojave-Southern Great Basin Standards and Guidelines, 1997 and the Tonopah RMP, 1997, objectives based on findings and recommendations of the Rangeland Health Evaluation. The BLM, Tonopah Field Station (TFS) proposes to implement the actions identified in the Montezuma Complex Rangeland Health Evaluation and from the interested parties in order to make progress towards meeting the Standards and Guidelines and Objectives.

The following tables display the RAC Mojave-Southern Great Basin Standards and RMP Objective level of achievements or the lack thereof by allotments. More in depth analyses are located in Appendix A.

a. <u>Montezuma Allotment</u>

Table 1.0 – RAC Standards level of Achievement at Key Areas on the Montezuma Allotment

Montezuma Allotment						
Key Area	**Standard 1**		**Standard 2**		**Standard 3**	
		Causal Factor		**Causal Factor**		**Causal Factor**
1	Not Met	Drought Excessive use	Not Met	Drought Excessive use	**Met**	
2	Not Met	Drought Excessive use	Not Met	Drought Excessive use	**Met**	
3	Not Met	Drought Excessive use	Not Met	Drought Excessive use	**Met**	
4	**Met**		**Met**		Not Met	Drought
5	**Met**		**Met**		Not Met	Drought
6	**Met**		**Met**		Partially Met	Drought Excessive use
8	**Met**		**Met**		**Met**	
9	**Met**		**Met**		Not Met	Drought Excessive use
10	**Met**		**Met**		Not Met	Drought Excessive use

1. Excessive use by cattle or wild horses or wild burros
2. Frequent droughts due to highly variable weather patterns.

Table 2.0 - RMP Objectives Level of Achievement for the Montezuma Allotment

Allotment	RMP Objective	Met	Partially Met	Not Met
Montezuma	*Fire Management*		X	
	Forestry and Vegetative products	X		
	Livestock Grazing Management			X
	Livestock Management RMP determinations Desert Tortoise Habitat	X		
	Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat	X		
	Riparian Habitat	X		
	Vegetation		X	
	Wild Horse and Burro			X
	Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat	X		
	Wildlife Habitat Management	X		
	Special Status Species	X		
Allotment Specific Objectives				
Montezuma	Refer to section VI of Appendix A		X	

b. Razorback Allotment

Table 3.0 – RAC Standards Level of Achievement at Key Areas on the Razorback Allotment

Razorback Allotment						
Key Area	**Standard 1**		**Standard 2**		**Standard 3**	
		Causal Factor		**Causal Factor**		**Causal Factor**
1	Not Met	Drought Poor soils	Not Met	Drought Poor soils	Not Met	Drought Poor soils
3	**Met**		**Met**		**Met**	
4	**Met**		**Met**		**Met**	

Table 4.0 - RMP Objectives Level of Achievement for the Razorback Allotment

Allotment	RMP Objective	Met	Partially Met	Not Met
Razorback	*Fire Management*		X	
	Livestock Grazing Management	X		
	Livestock Management RMP determinations Desert Tortoise Habitat	X		
	Livestock and Wild Horse And Burro Management 2003 Biological Opinion Desert Tortoise Habitat	X		
	Riparian Habitat	X		
	Vegetation		X	
	Wild Horse and Burro			X
	Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat	X		
	Wildlife Habitat Management	X		
	Special Status Species	X		
Allotment Specific Objectives				
Razorback	Refer to section VI of Appendix A		X	

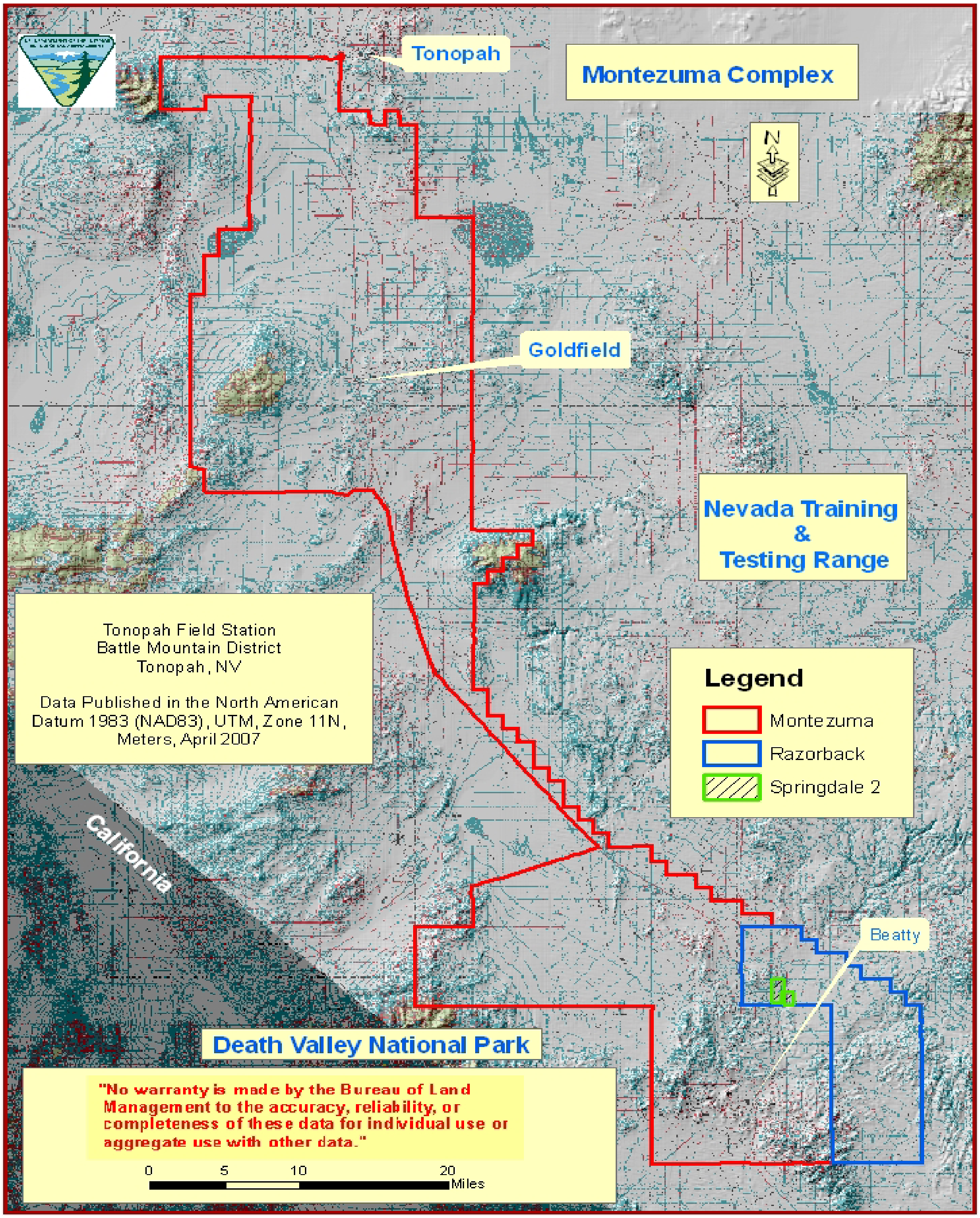
c. __Springdale 2 Allotment__

Springdale 2 does not have Key Areas but use pattern data was collected (refer to Appendix E).

Table 5.0 - RMP Objectives Level of Achievement for Springdale 2 Allotment

Allotment	RMP Objective	Met	Partially Met	Not Met
Springdale 2	*Livestock Grazing Management*	X		
	Riparian Habitat	X		
	Vegetation	X		
	Wild Horse and Burro			X
Allotment Specific Objectives				
Springdale 2	Refer to section VI of Appendix A		X	

Map 1.0 – Allotments in the Montezuma Complex Assessment Area



1.2 Purpose and Need

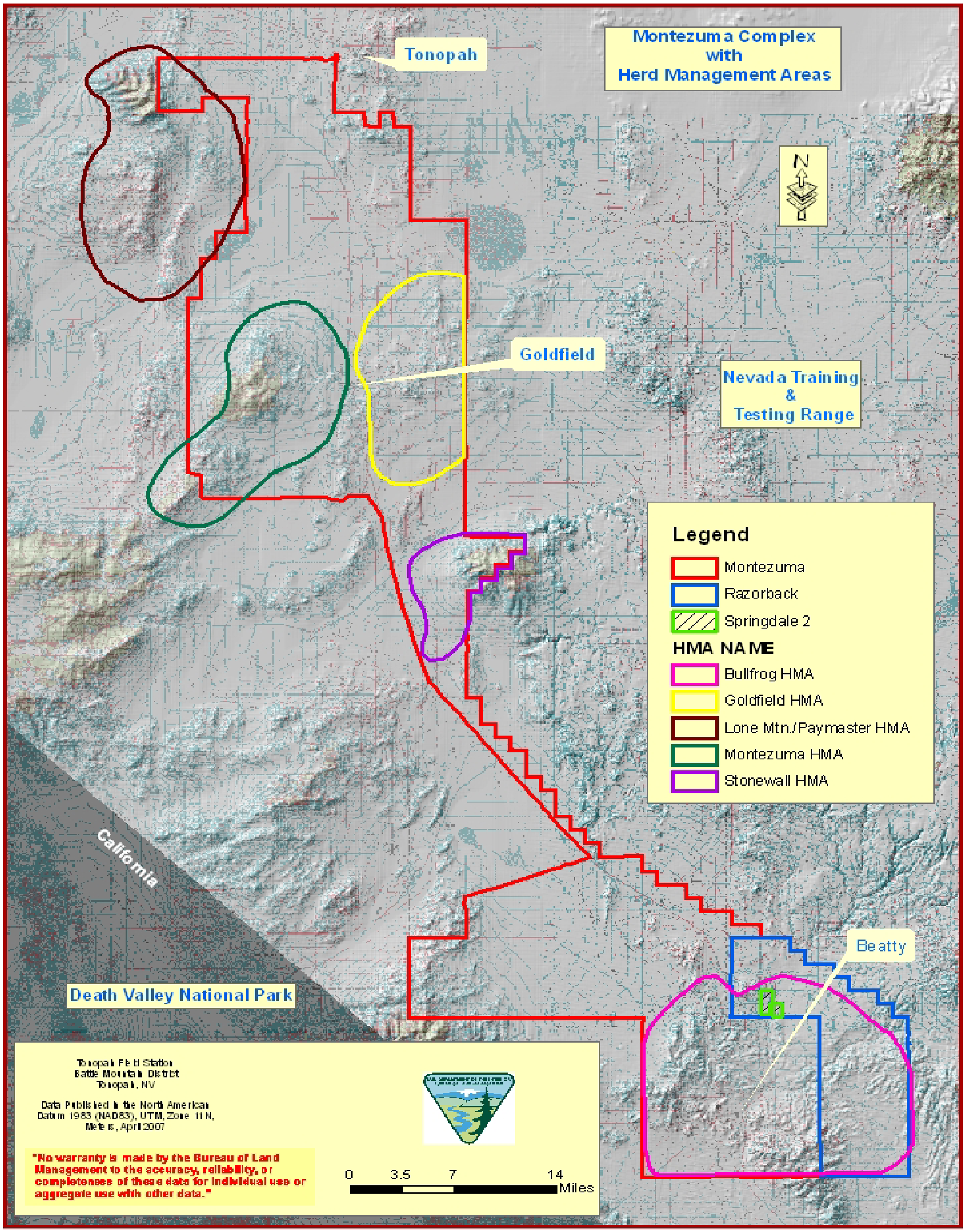
The Montezuma Complex Rangeland Health Assessment concluded that RMP objectives and the Mojave-Southern Great Basin RAC Standards for Rangeland Health and Grazing Management were only being partially met throughout the Complex. Historic and current livestock and wild horse management were determined to be contributing factors to the non-attainment of the standards. Refer to Appendix A and pages 3-5 of this EA for a more detailed discussion. Based on technical recommendations, livestock and wild horse management alternatives would be developed and analyzed in this EA.

The purpose of the proposed action is: 1) to renew two ten-year grazing leases, 2) to offer one new ten-year grazing lease, 3) to establish Forage Reserve pastures, 4) to adjust allotment boundaries in relation to the ten-year grazing leases, 5) to allocate Animal Unit Months (AUMs) for livestock in accordance with carrying capacity and 6) to set new AMLs in order to establish naturally thriving healthy wild horse and burro herds within the Montezuma Complex.

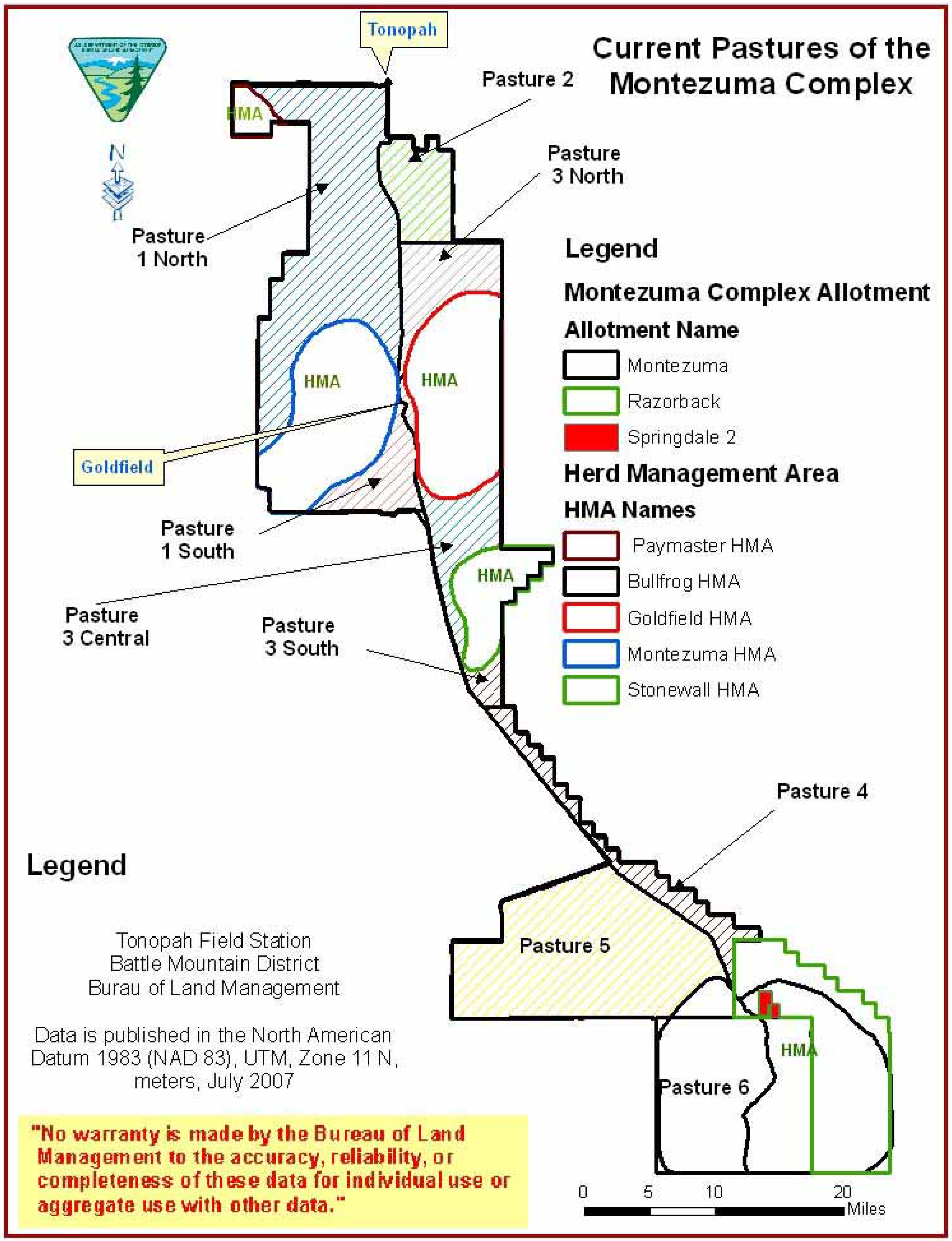
These actions are needed in order to meet or make progress towards attainment of the RAC standards and guidelines and the Tonopah RMP objectives.

The Montezuma Complex Rangeland Health Evaluation is attached to this EA (*Appendix A*) and presents the body of data analysis for the assessment area.

Map 2.0 – Herd Management Areas with the Montezuma Complex



Map 3.0 - Current Pastures of the Montezuma Complex



1.3 Land Use Plan Conformance

The Proposed Action and alternatives described below, except the No Grazing Alternative, are in conformance with the Tonopah Resource Management Plan (RMP) and Record of Decision (ROD) approved October 2, 1997. These actions are provided for under the objectives in the RMP for Wildlife Habitat Management, Special Status Species, Riparian Habitat, Livestock Grazing Management, and Wild Horse and Burros.

1.4 Relationship to Statutes, Regulations, Policies, Plans or Other Environmental Analysis

This EA incorporates the Standards and Guidelines of the Mojave-Southern Great Basin Resource Advisory Council (RAC) and the Tonopah RMP objectives for improving rangeland health in Appendix A. It is in conformance with BLM policies, plans and programs and with the Taylor Grazing Act of 1934, the Federal Land Policy Management Act of 1976, Code of Federal Regulations (CFR) 4180, National Environmental Protection Act of 1969 and the Endangered Species Act of 1973.

The Proposed Action of re-establishing AML for HMAs throughout the Montezuma Complex is in conformance with the Wild Free-Roaming Horses and Burros Act of 1971 (Public Law 92-195, as amended), and the CFR at 43 CFR §4700 and policies. Furthermore, the Proposed Action is consistent with the Standards and Guidelines for Rangeland Health as developed by the Wild Horse Strategy to Achieve Healthy Lands and Healthy Herds (BLM 2001), Wild Horse Revised Nevada Tactical Plan (BLM 2001), and the Strategic Plan for Management of Wild Horses and Burros on Public Lands (BLM 1992).

1.5 Issues Identification

The evaluation period for this EA ranges from 1981 to 2007. During the preparation and review process of the rangeland health evaluation, input was solicited from all interested parties and Inter-disciplinary Team members (ID-Team), Nevada Department of Wildlife (NDOW), US Fish and Wildlife Service, Nevada Natural Heritage Program, Western Regional Climate Center, US Geological Service, Truckee River Ranches, Mr. Jim Berg, Mr. Bud Johns and Beatty Cattle Co. The following issues have been identified:

1.5.1 The Montezuma Allotment is vacant. Forage allocations would be determined for the Montezuma, Razorback and Springdale 2 allotments for wild equids and livestock.

The Montezuma Allotment has had no lessee since 1997. Much of the allotment has been used for TNR grazing authorization since that time. Portions of the allotment would be evaluated for their suitability to become Forage Reserves or Emergency Forage Areas available for displaced ranchers. Forage allocations for livestock and wild equids would also be evaluated.

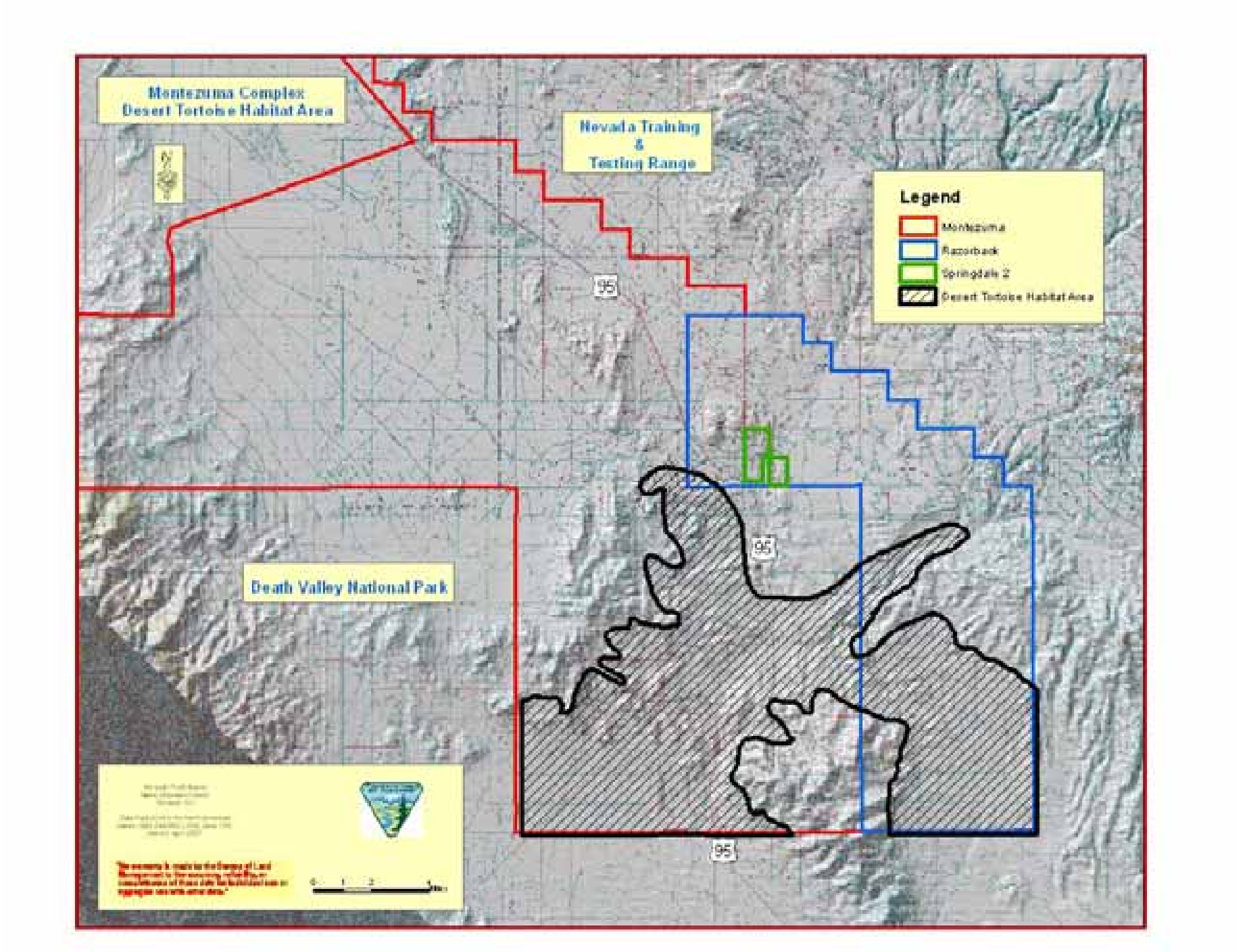
1.5.2 Suitability of vegetation and habitat to support horse, cattle or burro use

Past droughts have severely reduced the amount of forage available for grazing in portions of this assessment area. This caused the starvation and death of wild horses and stress of cattle and burros in 1996. Emergency gathers of horses and burros were conducted to prevent further loss and suffering of horses and to prevent suffering of burros. Because the area has frequent droughts, this evaluation would determine vegetation suitability and availability for horse, cattle and burro use throughout the assessment area. This includes analyzing the current Appropriate Management Levels (AMLs) for horses and burros and allocations for cattle.

1.5.3 Desert Tortoise habitat

A southern portion of the Montezuma and Razorback Allotments are in Non-Intensive Category III desert tortoise (*Gopherus_agassizii)* habitat. Tortoise habitat also occurs within the Bullfrog HMA. Potential impacts to desert tortoise habitat would be assessed.

Map 4.0 – Desert Tortoise Area within the Montezuma Complex



1.5.4 Allotment Boundary Adjustments

Proposed land sales in the Beatty area, desert tortoise habitat, reallocation of AUMs for livestock and changes in management use may make it necessary to change the allotment boundary of the Razorback and Montezuma Allotments.

2.0 PROPOSED ACTION AND ALTERNATIVES

The following recommended actions (Proposed Action and alternative) are the result of the evaluation process. For details that led to these recommendations, refer to Appendix A, Montezuma Complex Rangeland Health Evaluation. These actions are recommended in order to make progress toward meeting the Standards and Guidelines of the Mojave-Southern Great Basin RAC and the Tonopah RMP objectives within the Montezuma Complex.

2.1 Proposed Action

The Bureau of Land Management, Tonopah Field Station proposes:

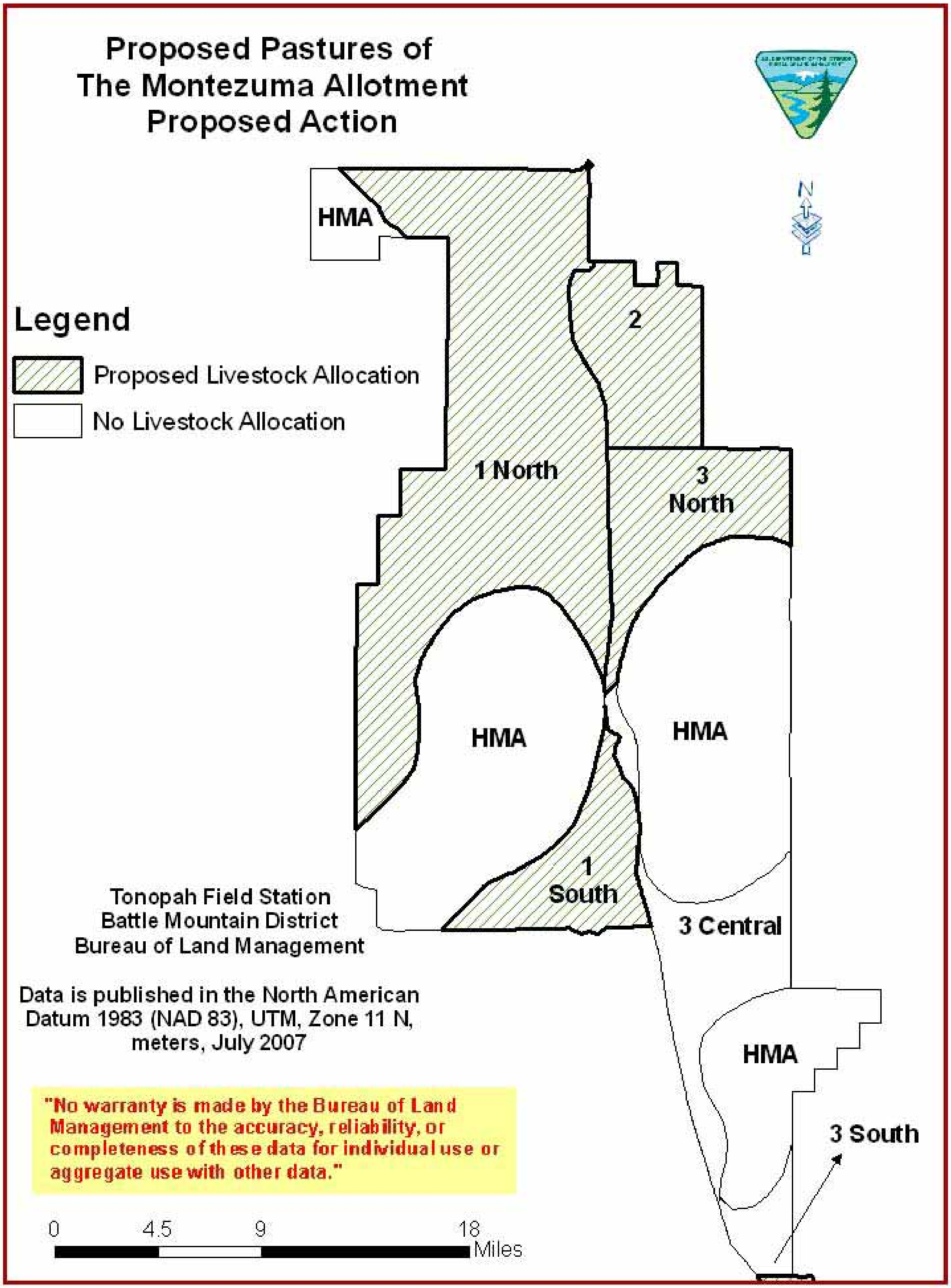
1. **Establish New Allotment Boundaries for the Montezuma, Razorback and Springdale 2 Allotments.**

   The Springdale 2 Allotment would be combined with the East Razorback Pasture in the Razorback Allotment. The southern portion of Montezuma Allotment would become part of the Razorback Allotment. The north portion of the Montezuma Allotment would become the complete Montezuma Allotment.

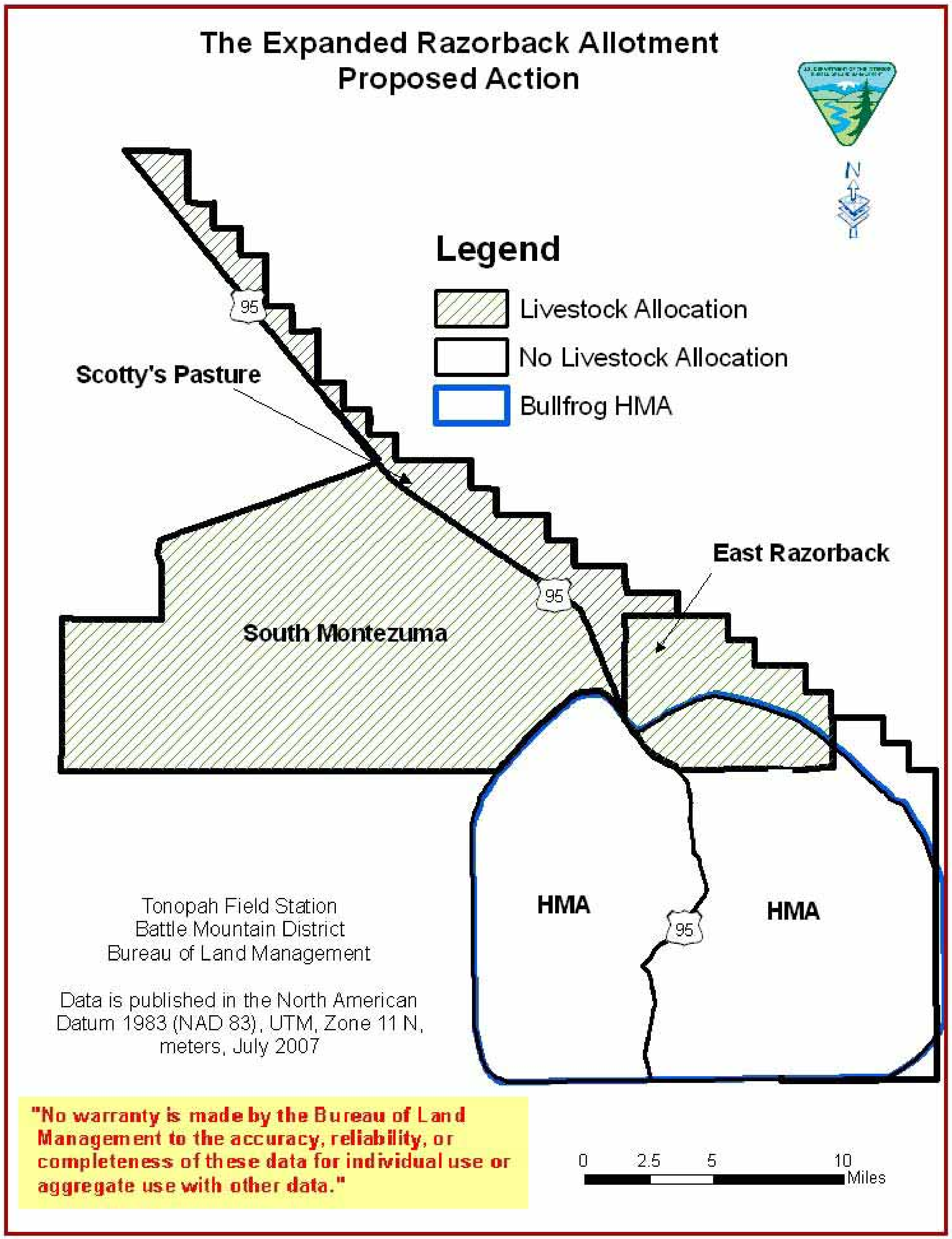
   The maps below (Maps 5.0 and 6.0) display the modified allotment boundaries for the Montezuma and Razorback Allotments. The new Montezuma Allotment would include the active Pastures 1 North, 1 South, 2, and 3 North. It would also include the inactive Pastures 3 Central and 3 South (refer to Map 5.0 below).

   The Razorback Allotment would include the active pastures Scotty's and South Montezuma from the former Montezuma Allotment. It would also include the East Razorback Allotment Pasture.

Map 5.0 – Proposed Pastures of Montezuma Allotment



Map 6.0 – Proposed Razorback Allotment Boundary Modifications – The Expanded Razorback Allotment



2. **Establish new allocations of AUMs for Livestock Grazing in the Montezuma, Razorback and Springdale 2 Allotments.**

   Forage Reserve pastures would be established under this Proposed Action. A Forage Reserve is an area set aside for ranchers other than the lessee to use during unfavorable conditions. These unfavorable conditions include drought, fire, insects or other resource problems. If no other rancher applies to use these pastures during the application period, then the lessee is free to use them. The lessee would administer these Forage Reserve pastures in accordance with the Terms and Conditions of the Forage Reserve listed below

   Three ten-year grazing leases would be offered as follows:

   - The north portion of the Montezuma Allotment would have a ten-year grazing lease for Pasture 1 North. Pastures 1 South, 2 and 3 North would become Forage Reserves and would also become part of this ten-year grazing lease. This grazing lease would be offered to Mr. Bud Johns. Mr. Johns has applied for the vacant Montezuma Allotment in 2005 and has grazed various portions of the allotment under TNR. He has a grazing ten-year grazing lease on the Yellow Hills Allotment adjoining the Montezuma Allotment.

   - The Razorback Allotment would have a ten-year grazing lease for the South Montezuma Pasture (formerly Pasture 5 of the Montezuma Allotment) and the East Razorback Pasture. Scotty's Pasture, (formerly Pasture 4 of the Montezuma Allotment), would become a Forage Reserve and would become part of this grazing lease. This grazing lease would be offered to the Beatty Cattle Company. The Beatty Cattle Company has a ten-year grazing lease on the Razorback Allotment.

   - The Springdale 2 Allotment would be discontinued and become part of the East Razorback Pasture of the expanded Razorback Allotment. The ten-year grazing lease would be offered Mr. & Mrs. Younghans inside only the East Razorback Pasture of the Razorback Allotment.

Table 6.0 – Proposed Permitted AUMs

Allotment	Ten-year Grazing Lease or Forage Reserve	Lease Holder	Pasture	Maximum Permitted AUMs	Permitted Use (Prior to 1997)* AUMs
Montezuma	Ten-Year Grazing Lease	Bud Johns	1 North	2080	5267
	Forage Reserve	Bud Johns	1 South	199	
	Forage Reserve	Bud Johns	2	246	
	Forage Reserve	Bud Johns	3 North	240	
Razorback	Forage Reserve	Beatty Cattle Co.	Scotty’s	241	3660
	Ten-Year Grazing Lease	Beatty Cattle Co.	South Montezuma	1461	
	Ten-Year Grazing Lease	Beatty Cattle Co.	East Razorback	224	962
	Ten-Year Grazing Lease	Younghans	East Razorback	24	24**

*The former lessee on the Montezuma Allotment lost his ten-year grazing lease in 1997.
**The allocation for Springdale 2 before the allotment was put into the Razorback Allotment.

2.2 Proposed Ten-Year Grazing Lease for the Montezuma Allotment Lessee: *Bud Johns*

The carrying capacities in the following tables were derived from the Ecological Site Inventory (ESI) production data (Appendix A). A conservative stocking rate would be allocated because of frequent droughts and the lack of available forage within these pastures.

The stocking rates would be modified on Pasture 1 North due to the damage caused by wild horses when they resided outside the Paymaster HMA in this pasture. These horses were removed in the fall of 2006. There would be no livestock use during the grazing season (March 1 to June 30) on Pasture 1 North until at least February 28, 2010. This would provide a three growing season rest from grazing by cattle. The following levels of use would be implemented on this grazing lease.

Table 7.0 – Ten-Year Grazing Lease and Forage Reserve of the Montezuma Allotment - From February 28, 2008 to February 28, 2010.

Pasture Name	Ten-Year Grazing Lease or Reserve	Season of use	AUMs
Pasture 1 North	Ten-Year Grazing Lease	March 1 – June 30 July 1 – February 28	0 growing season Up to 1347 dormant season
Pasture 1 South	Forage Reserve	When Forage is Available*	Up to 51 growing season Up to 148 dormant season
Pasture 2	Forage Reserve	When Forage is Available*	Up to 46 growing season Up to 200 dormant season
Pasture 3 North	Forage Reserve	When Forage is Available*	Up to 61 growing season Up to 286 dormant season

*Growing season is March 1 to June 30. Dormant season is July 1 to February 28.
**See Term and Conditions for Pasture 1 North below for temporary restrictions.

Prior to March 1, 2010, a field check would be made of the pasture and the three Key Areas to determine if the area has recovered sufficiently to permit grazing during the growing season. This data would be used to determine if the standards of Rangeland Health have been met or if significant progress towards meeting them has been made. The following allocations and seasons of use would then be in effect.

Table 8.0 - Available AUMs, beginning March 1, 2010 to February 28 2018 for the Ten-Year Grazing Lease and Forage Reserve of the Montezuma Allotment

Pasture Name	Ten-Year Grazing Lease or Reserve	Season of use	AUMs
Pasture 1 North –	10 Year Grazing Lease	March 1 – June 30 July 1 – Feb 28	Up to 330 growing season Up to 1750 dormant season
Pasture 1 South –	Forage Reserve	When Forage is Available*	Up to 51 growing season Up to 148 dormant season
Pasture 2 –	Forage Reserve	When Forage is Available*	Up to 46 growing season Up to 200 dormant season
Pasture 3 North -	Forage Reserve	When Forage is Available*	Up to 61 growing season Up to 286 dormant season

*Growing season is March 1 to June 30. Dormant season is July 1 to February 28.

The following table shows the maximum number of cattle that would be permitted in each pasture by season.

Table 9.0 - Proposed Action: Maximum herd size allowed of the Montezuma Allotment ten-year grazing lease.

Pasture Name	AUMs	Average Herd Size	Maximum Herd Size
Pasture 1 North	Up to 330 growing season* Up to 1750 dormant season	82 cattle growing season* 219 cattle dormant season	100 cattle growing season* 250 cattle dormant season
Pasture 1 South Forage Reserve	Up to 51 growing season Up to 148 dormant season	13 cattle growing season 18 cattle dormant season	17 cattle growing season 25 cattle dormant season
Pasture 2 Forage Reserve	Up to 46 growing season Up to 200 dormant season	11 cattle growing season 25 cattle dormant season	15 cattle growing season 30 cattle dormant season
Pasture 3 North Forage Reserve	Up to 61 growing season Up to 286 dormant season	15 cattle growing season 36 cattle dormant season	20 cattle growing season 40 cattle dormant season

* After recovery

a. Terms and Conditions of the Montezuma Allotment from February 28, 2008 to February 28, 2010 are as follows:

- Pasture 1 North will be closed between March 1 to June 30, starting March 1, 2008.
- Temporarily suspend 330 growing season AUMs and 403 dormant season AUMs while the Pasture 1 North would be closed and recovering.
- July 1 to February 28 is the open season of use for Pasture 1 North. Only 1347 AUMs would be available for dormant season use between February 28, 2008 to February 28, 2010. Cattle herd size is not to exceed 200 cattle (168 cows average herd size) from July 1 to February 28.
- A field check would be conducted in February 2010 prior to March 1 to determine if the pasture has recovered. If it has recovered, return the temporarily suspended AUMs (330 growing season AUMs and 403 dormant season AUMs). Total AUMs would be 2080 in Pasture 1 North.

b. Term and Conditions of the Montezuma Allotment from February 28, 2008 to February 28, 2018 are as follows:

- A grazing rotation would be established within each pasture each year.
- The terms and conditions of this grazing authorization would be consistent with the Standards and Guidelines for Healthy Rangelands established by the Mojave Southern Great Basin Area Resource Advisory Council in 1997.
- Livestock would be removed or moved to a new area prior to attaining the maximum allowable utilization level of 35 percent.

c. Terms and Conditions for the Forage Reserve areas are as follows:

- The terms and conditions of this grazing authorization would be consistent with the Standards and Guidelines for Healthy Rangelands established by the Mojave Southern Great Basin Area Resource Advisory Council in 1997.

- Livestock would be removed or moved to a new area prior to attaining the maximum allowable utilization level of 35 percent.

- An on-site inspection by BLM specialists would be completed to determine available forage and grazing season in the Forage Reserve pastures.

2.3 Proposed Ten-Year Grazing Lease and Forage Reserve for the Razorback Allotment Lessee: *Beatty Cattle Company*

The following table shows the AUM allocations for the expanded Razorback Allotment grazing ten-year grazing lease. These carrying capacities were derived from the Ecological Site Inventory (ESI) production data (Appendix A). A conservative stocking rate would be allocated because of frequent droughts and the lack of available forage within these pastures.

Table 10.0 – Proposed Ten-Year Grazing Lease and Forage Reserve for the Razorback Allotment

Pasture Name	Ten-Year Grazing Lease or Reserve	Season of use*	AUMs
Scotty's	Forage Reserve	February 1 – May 31 June 1 – January 31	Up to 22 growing season Up to 218 dormant season
South Montezuma	Ten-Year Grazing Lease	February 1 – May 31 June 1 – January 31	Up to 226 growing season Up to 1235 dormant season
East Razorback	Ten-Year Grazing Lease	May 1 – July 31** August 1 – Jan 31	Up to 79 growing season Up to 155 dormant season

*Growing season is February 1 to May 31. Dormant season is June 1 to March 31.
**See Razorback Allotment Section 2.4 below.

The following table shows the maximum number of cattle that would be permitted in each pasture:

Table 11.0 - Proposed Action: Maximum herd size allowed in the Montezuma Allotment for the ten-year grazing lease.

Pasture Name	AUMs	Average Herd Size	Maximum Herd Size
Scotty's	Up to 22 growing season Up to 218 dormant season	5 – 6 cattle growing season 27 cattle dormant season	10 cattle growing season 40 cattle dormant season
South Montezuma	Up to 226 growing season Up to 1235 dormant season	56 – 57 cattle growing season 154 cattle dormant season	70 cattle growing season 175 cattle dormant season
East Razorback	Up to 69 growing season Up to 155 dormant season	23 cattle growing season 26 cattle dormant season	35 cattle growing season 40 cattle dormant season

*If livestock are run at the maximum herd size, the total AUMs

a. Terms and Conditions for all pastures are as follows:

- A grazing rotation would be established within each pasture each year. For example, if a pasture, an area, or portion of a pasture is grazed during spring/summer one year that same area would be rested during the following spring/summer.

- The terms and conditions of this grazing authorization would be consistent with the Standards and Guidelines for Healthy Rangelands established by the Mojave Southern Great Basin Area Resource Advisory Council in 1997.

- Livestock would be removed or moved to a new area prior to attaining the maximum allowable utilization level of 35 percent.

b. Terms and Conditions for the administration of the Forage Reserve areas are as follows:

- The terms and conditions of this grazing authorization would be consistent with the Standards and Guidelines for Healthy Rangelands established by the Mojave Southern Great Basin Area Resource Advisory Council in 1997.

- Livestock would be removed or moved to a new area prior to attaining the maximum allowable utilization level of 35 percent.

- An on-site inspection by BLM specialists would be completed to determine available forage and grazing season in the Forage Reserve pastures.

2.4 Proposed Ten-Year Grazing Lease for the East Razorback Pasture on the Razorback Allotment Lessee: *Younghans*

Grazing by the Younghans would occur only on the East Razorback Pasture of the Razorback Allotment. Maximum herd size is two heads of cattle.

Table 12.0 – Proposed ten-year grazing lease on the East Razorback Pasture of the Razorback Allotment

Pasture Name	Season of use*	AUMs
East Razorback Pasture	Year-long	24

a. Terms and Conditions for the East Razorback Pasture

- The terms and conditions of this grazing authorization would be consistent with the Standards and Guidelines for Healthy Rangelands established by the Mojave Southern Great Basin Area Resource Advisory Council in 1997.

- Livestock would be removed or moved to a new area prior to attaining the maximum allowable utilization level of 35 percent.

3.0 Establish new Appropriate Management Levels (AMLs) on the Goldfield, Montezuma Peak, Stonewall, Bullfrog and Paymaster HMAs.

An AML range (maximum and minimum AMLs) would be established for wild horses within each HMAs of the Montezuma Complex.

The Proposed Action would not allocate AUMs for cattle on any HMAs within the Montezuma Complex. Except in the northeast portion of Bullfrog HMA because of limited availability of rangeland resources within the HMAs.

The potential and proposed AUMs and AMLs for wild horses and burros were calculated from Ecological Site Inventory production data. A four-mile wide buffer was created around known water sources in each HMA. These buffered areas represent habitat that is accessible to burros within four miles of water and are called the "Watered" portions of the HMA.

"Dry" areas are outside the 4-mile water buffer and are currently unusable by wild equids because of their distance from available water. However, these "dry" portions represent areas that could sustain wild burros if additional water sources would be developed for wild equid use.

Environmental Analysis would be completed in the event that additional water projects would be developed under the range improvement project system.

Table 13.0 - Proposed AMLs for wild equids in the Montezuma Complex HMAs with current water availability.

Herd Management Area	AUMs Burro	AML range** Burro	AUMs Horse
Montezuma Peak HMA*	653	34 - 54	†
Paymaster HMA*	0	0	0
Goldfield HMA	449	24 - 37	0
Stonewall HMA	99	5 - 8	0
Bullfrog HMA west	823	43 - 68	0
Bullfrog HMA east‡	283	15 - 23	0

* At this time, no AUMs would be allocated to the portion of Paymaster HMA that lies within Montezuma allotment. This area has been historically over-allocated, and rest is necessary to achieve Rangeland Health Standards. The 1997 Tonopah RMP does not allot AUMs/AML to burros in the Montezuma Peak or Paymaster HMAs. A revision to the RMP, scheduled for approximately 2009, would address this issue (refer to Appendix A).
**AML range represents the minimum and maximum number of horses or burros for each HMA. The maximum AML equals the AUM / 12 months. The minimum AML equals the maximum AML minus a 14 percent population increase x 4 years. The 4 years represents the time in which a wild equid population can double in size, reach maximum AML, and need to be gathered.
† Horses would temporarily be permitted inside this HMA until the RMP is amended.
‡ Includes parts of Montezuma and Razorback and all of Springdale 2 Allotments.

As water improvement projects are developed beyond the 4-mile buffer in the dry portions of these HMAs, the following AUMs and AML numbers may be added to the AML set at each HMA in Table 13.0 above.

Table 14.0 - Additional available AMLs for wild equids if additional water becomes available in the Montezuma Complex HMAs. *

Herd Management Area	AUMs Burro	AML range Burro	AUMs Horse
Montezuma Peak HMA*	327	17 - 27	0
Paymaster HMA*	0	0	0
Goldfield HMA	584	30 - 48	0
Stonewall HMA	250	14 - 21	0
Bullfrog HMA west	180	10 - 15	0
Bullfrog HMA east‡	870	46- 72	0

*See footnotes for Table 13.0.

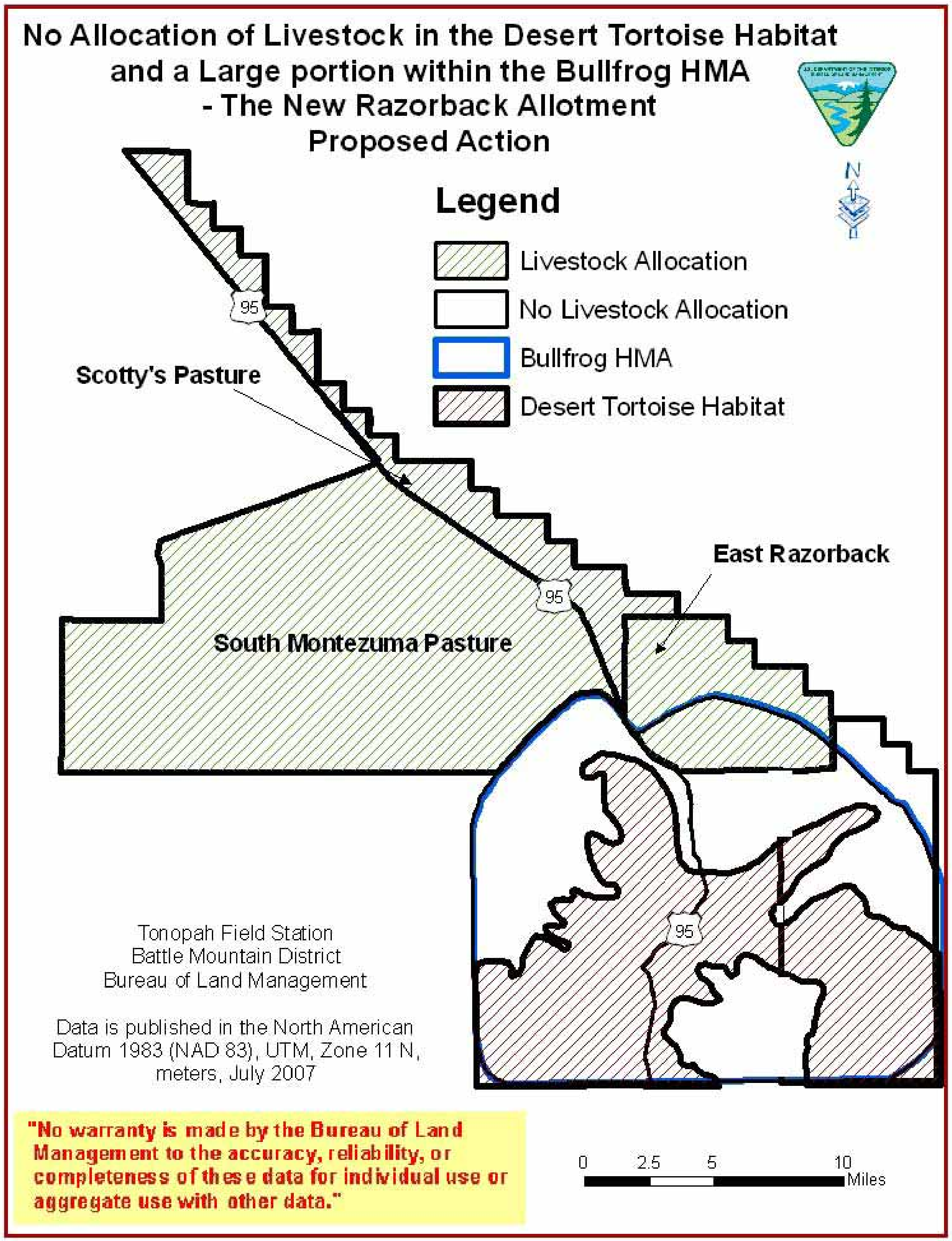
Wild horse and burro herds would continue to be monitored as usual, but in future gathers, horses would be removed from the range and their AUMS would be available for wild burros at the AUM levels listed in Table 13.0.

4.0 **<u>No livestock grazing would be authorized within desert tortoise habitat in the Montezuma and Razorback Allotments.</u>**

The desert tortoise habitat is marginally suitable for livestock grazing because of the limited amount of available forage (refer to Appendix A for a detailed description)

The Razorback Allotment can be divided into a northern portion (approximately 25,000 acres) and a southern portion (approximately 48,000 acres, or 66 percent of the allotment). The southern portion of the allotment contains the only desert tortoise habitat in the allotment, and it is within the Bullfrog HMA.   No AUM allocations for livestock use would be made in desert tortoise habitat in both allotments (refer to Map 7.0).

Map 7.0 – No Allocation of Livestock in the Desert Tortoise Habitat and a Large Portion within the Bullfrog HMA



5. No AUMs would be authorized to livestock inside the HMAs except the northern most portion of the Bullfrog HMA. All other available AUMs in the HMAs would be allocated to wild equids exclusively.

Cattle prefer to make the majority of their use in valleys. Since most of the available forage on the hills and mountains is poorly used by cattle and is often poorer quality forage (fewer grasses) when compared to forage in the valleys, no AUMs would be allocated to livestock on hills to avoid overuse, and avoid competition with wild equids.

Most of the hills in the Montezuma Complex are within HMAs and because forage within the HMAs is limited, these areas would be allocated for wild equid use only. There are two small exceptions in the Bullfrog HMA. The northern edge of the Bullfrog HMA inside the South Montezuma Pasture (formerly Pasture 5 of the Montezuma Allotment) is in the same valley as the livestock use area. It would be difficult to keep cattle outside of this northern sliver of the HMA since there is no topography to restrict cattle or burro movement. A short drift fence may be proposed if cattle continue to drift farther south into the west half of the Bullfrog HMA. The other exception is within the Razorback and Springdale 2 Allotments. The northern edge of the Bullfrog HMA includes the base property for both allotments. AUMs would be allocated to both cattle and burros within this area. No allocations for livestock use would be made inside the southern portion of the Razorback Allotment within the Bullfrog East HMA. An allocation for combined livestock and wild burro use would be made inside the northern portion of Razorback that is inside the Bullfrog HMA.

2.6 Alternative 1 - *No Forage Reserve Alternative*

Under Alternative 1, the following would be proposed:

1. Establish New Allotment Boundaries for Montezuma, Razorback and Springdale 2 Allotments.

The Springdale 2 Allotment would become part of the East Razorback Pasture in the Razorback Allotment. The southern Montezuma portion would become part of the Razorback Allotment. The north portion of the Montezuma Allotment would become the Montezuma Allotment.

The maps below show the new allotment boundaries for the Montezuma and Razorback Allotments. Montezuma would include the active Pastures 1 North, 1 South, 2, and 3 North. It also includes the inactive Pastures 3 Central and 3 South (refer to Map 8.0 below).

The new allotment boundaries under Alternative 1 would be the same as those in the Proposed Action, refer to Section 2.1 above except for the Scotty's Pasture (refer to Map 9.0 below).

2. New Allocation of AUMs for Livestock Grazing in the Montezuma, Razorback and Springdale 2 Allotments.

No Forage Reserve pastures would be established under this alternative. However, Pastures 1 South, 2, 3 North and 4 would be available for TNR authorization. These BLM would administer these pastures.

This alternative would offer three ten-year grazing leases as follows:

- The north portion of the Montezuma Allotment would have a ten-year grazing lease for Pasture 1 North. This grazing lease would be offered to Mr. Bud Johns. Mr. Johns has applied for the vacant Montezuma Allotment in 2005 and has grazed various portions of the allotment under TNR. He has a ten-year grazing lease on the Yellow Hills Allotment adjoining the Montezuma Allotment.

- The expanded Razorback Allotment would have a ten-year grazing lease for the South Montezuma Pasture (formerly Pasture 5 of the Montezuma Allotment, refer to Map 9.0) and the East Razorback Pasture. This grazing lease would be offered to the Beatty Cattle Company. The Beatty Cattle Company has presently a ten-year grazing lease on the Razorback Allotment.

- The Springdale 2 Allotment would be discontinued and become part of the East Razorback Pasture of the expanded Razorback Allotment. The ten-year grazing lease would be offered to Mr. & Mrs. Younghans for the East Razorback Pasture only of the expanded Razorback Allotment.

- Pastures 1 South, 2, 3 North and 4 of the Montezuma Allotment would have no ten-year grazing lease offered but would be open to TNR grazing.

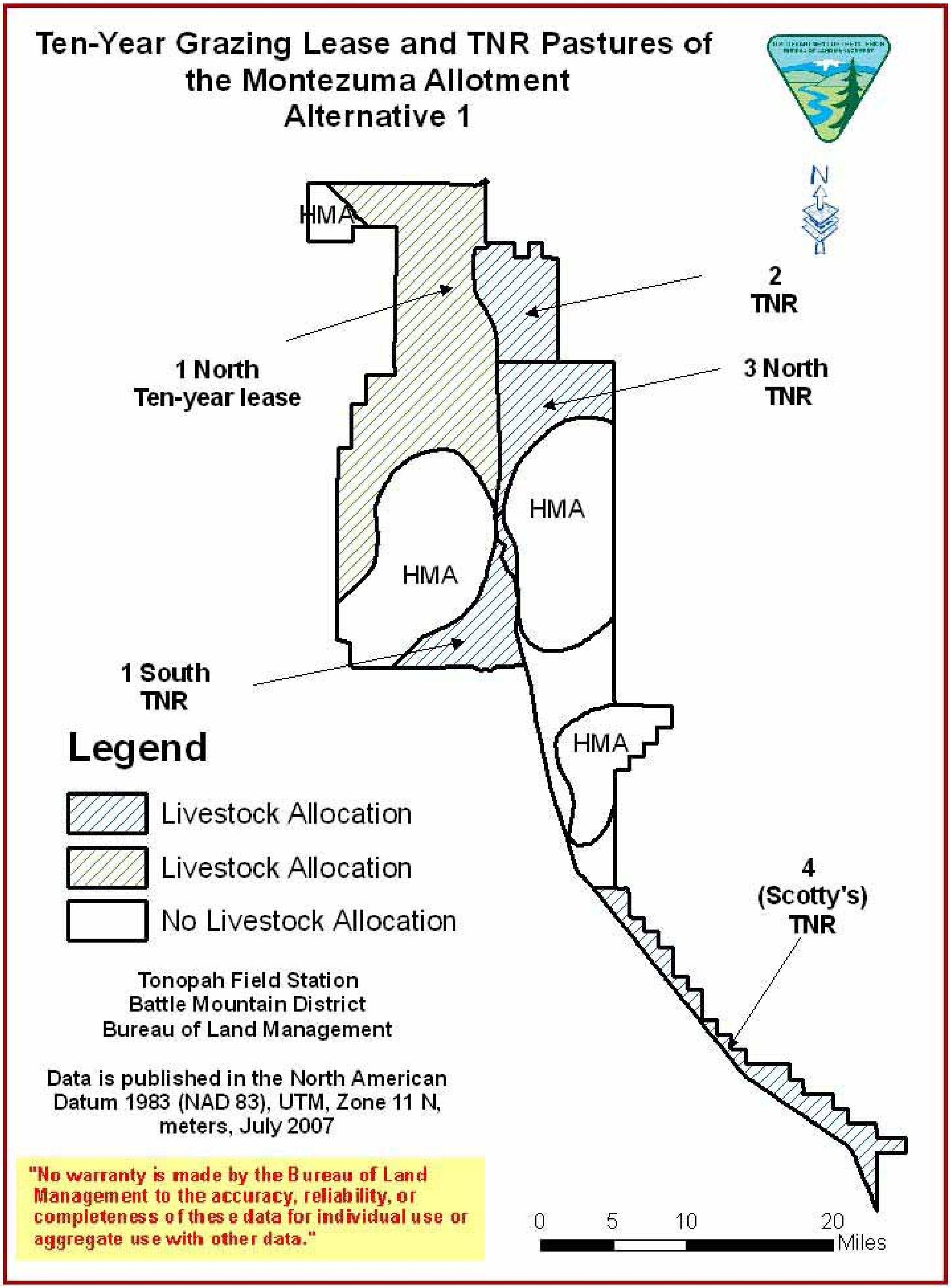
The following table shows the AUMs allocation for Alternative 1 - No Forage Reserve Alternative.

Table 15.0 – Proposed Permitted AUMs

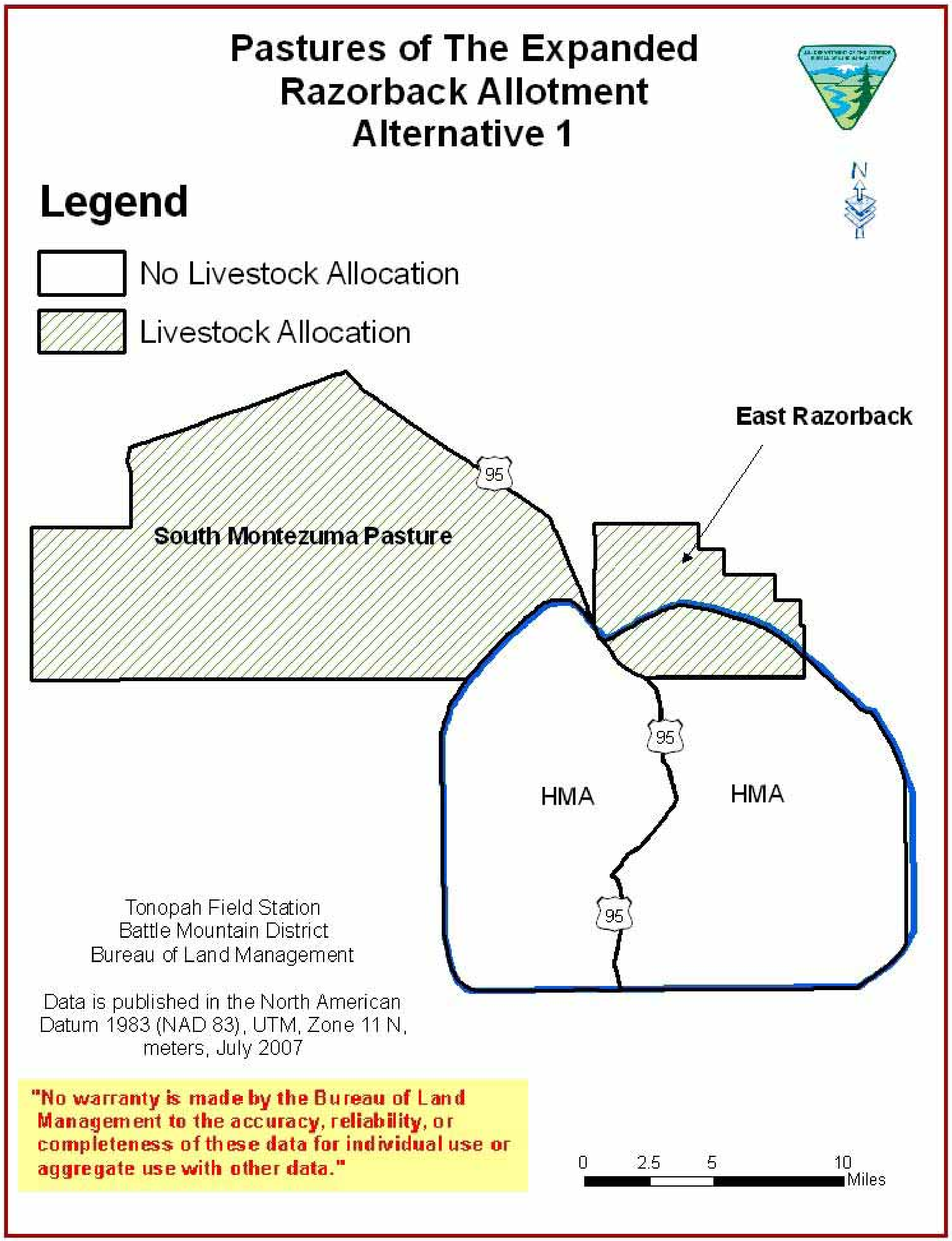
Allotment	Ten-Year Grazing Lease or Forage Reserve	Potential Ten-Year Grazing Lease Holder	Pasture	Maximum Permitted AUMs	Permitted Use (Prior to 1997)* AUMs
Montezuma	Ten-Year Grazing Lease	Bud Johns	1 North	2080	6427
	Temporary Non-Renewable	None	1 South	199	
	Temporary Non-Renewable	None	2	246	
	Temporary Non-Renewable	None	3 North	240	
	Temporary Non-Renewable	None	Scotty's	241	
Razorback	Ten-Year Grazing Lease	Beatty Cattle Co.	South Montezuma	1461	2500
	Ten-Year Grazing Lease	Beatty Cattle Co.	East Razorback	224	962
	Ten-Year Grazing Lease	Younghans	East Razorback	24	24**

*The former lessee on the Montezuma Allotment lost his ten-year grazing lease in 1997.
**This was the allocation for Springdale 2 before the allotment would be put into the Razorback Allotment.

Map 8.0 – Ten-Year Grazing Lease and TNR Pastures of the Montezuma Allotment – Alternative 1.



Map 9.0 – Pastures of the Expanded Razorback Allotment – Alternative 1.



3. Alternative 1 – Ten-Year Grazing Lease for Pasture 1 North of the Montezuma Allotment: *Bud Johns*

The following tables show the carrying capacities for North Montezuma of the Montezuma Allotment by pasture. These carrying capacities were derived from the Ecological Site Inventory (ESI) production data, refer to Appendix A. A conservative stocking rate would be allocated because of frequent droughts and the lack of available forage within these pastures.

These stocking rates would be modified on Pasture 1 North due to the damage caused by wild horses when they resided outside the Paymaster HMA in this pasture. These horses were removed in the fall of 2006. There would be no livestock use during the grazing season (March 1 to June 30) on Pasture 1 North until at least February 28, 2010. This would provide a three growing season rest from grazing by cattle. The following allocation would be implemented on this grazing lease.

Table 16.0 – Ten-Year Grazing Lease Authorization of the Montezuma Allotment - From February 28, 2008 to February 28, 2010.

Pasture Name	Season of use	AUMs	Maximum Herd Size
Pasture 1 North	March 1 – June 30 July 1 – February 28	0 growing season Up to 1347 dormant season	0 growing season Up to 250 cattle dormant season

*Growing season is March 1 to June 30. Dormant season is July 1 to February 28.
**See Terms and Conditions for Pasture 1 North below for temporary restrictions.

Prior to March 1, 2010, a field check would be made of the pasture and the three Key Areas to determine if the area has recovered sufficiently to permit grazing during the growing season. This data would be used to determine if the standards of Rangeland Health have been met or if significant progress towards meeting them has been made. The following allocations and seasons of use would then be in effect.

Table 17.0 - Ten Year Grazing Lease Authorization of the Montezuma Allotment - March 1, 2010 to February 28, 2018.

Pasture Name	Season of use	AUMs	Maximum Herd Size
Pasture 1 North	March 1 – June 30 July 1 – February 28	Up to 330 growing season Up to 1750 dormant season	100 cattle growing season Up to 250 cattle dormant season

*Growing season is March 1 to June 30. Dormant season is July 1 to February 28.

a. Terms and Conditions for the Pasture 1 North of the Montezuma Allotment from February 28, 2008 to February 28, 2010

- Due to drought and excessive wild horse use on Pasture 1 North, this pasture would be rested during the critical growing season (March 1 to June 30) from February 28, 2008 to February 28, 2010 or until the pasture recovers.

- Pasture 1 North closed between March 1 to June 30, starting March 1, 2008.

- Temporarily suspend, 330 Growing season AUMs and 403 dormant season AUMs, while the Pasture 1 North is closed and recovering.

- July 1 to February 28 is the open season of use for Pasture 1 North. Only 1347 AUMs would be available for dormant season use between February 28, 2008 to February 28, 2010. Cattle herd size not to exceed 200 cattle (168 cows average herd size) from July 1 to February 28.

- Field check would conducted on February 2010 prior to March 1 to determine if the pasture has recovered. If it has recovered, return the temporarily suspended AUMs (330 Growing season AUMs and 403 dormant season AUMs). Total AUMs would be 2080 in Pasture 1 North.

b. Terms and Conditions for the Montezuma Allotment from February 28, 2008 to February 28, 2018.

- A grazing rotation would be established within the pasture each year.

- The terms and conditions of this grazing authorization would be consistent with the Standards and Guidelines for Healthy Rangelands established by the Mojave Southern Great Basin Area Resource Advisory Council in 1997.

- Livestock would be removed or moved to a new area prior to attaining the maximum allowable utilization level of 35 percent.

4. Alternative 1 - Temporary Non-Renewable Authorization for the Montezuma Allotment

The following four pastures would not be part of a ten-year grazing lease but would be available for TNR grazing authorization. The following table displays the maximum AUM allocations per TNR pasture.

Table 18.0 – Alternative 1 - Temporary Non-Renewable Authorization of the Montezuma Allotment

Pasture Name	Type of Authorization	Season of use	AUMs by season
Pasture 1 South	Temporary Non-Renewable	When Forage is Available*	Up to 51 growing season Up to 148 dormant season
Pasture 2	Temporary Non-Renewable	When Forage is Available*	Up to 46 growing season Up to 200 dormant season
Pasture 3 North	Temporary Non-Renewable	When Forage is Available*	Up to 61 growing season Up to 286 dormant season
Pasture 4	Temporary Non-Renewable	When Forage is Available**	Up to 22 growing season Up to 218 dormant season

*Growing season is March 1 to June 30. Dormant season is July 1 to February 28.
** Growing season is February 1 – May 31. Dormant season is June 1 – January 31

Table 19.0 - Alternative 1 -Maximum herd size allowed under TNR in the Montezuma Allotment

Pasture Name	AUMs	Average Herd Size	Maximum Herd Size*
Pasture 1 South	51 growing season Up to 148 dormant season	13 cattle growing season 18 cattle dormant season	17 cattle growing season 25 cattle dormant season
Pasture 2	46 growing season Up to 200 dormant season	11 cattle growing season 25 cattle dormant season	15 cattle growing season 30 cattle dormant season
Pasture 3 North	61 growing season Up to 286 dormant season	15 cattle growing season 36 cattle dormant season	20 cattle growing season 40 cattle dormant season
Pasture 4	22 growing season 218 dormant season	5 – 6 cattle growing season 27 cattle dormant season	10 cattle growing season 40 cattle dormant season

*If livestock are run at the maximum herd size, the total AUMs

a. Terms and Conditions for the administration of the Temporary Non-Renewable are as follows:

- A grazing rotation would be established within each pasture each year. For example, if a pasture, an area, or portion of a pasture is grazed during spring/summer one year that same area would be rested during the following spring/summer.

- The terms and conditions of this grazing authorization would be consistent with the Standards and Guidelines for Healthy Rangelands established by the Mojave Southern Great Basin Area Resource Advisory Council in 1997.

- Livestock would be removed or moved to a new area prior to attaining the maximum allowable utilization level of 35 percent.

5. Proposed Ten-Year Grazing Lease for the Razorback Allotment: ***Beatty Cattle Company***

The ten-year grazing lease for the Razorback Allotment would include the South Montezuma Pasture (formerly Pasture 5 of the Montezuma Allotment) and the East Razorback Pasture. The Beatty Cattle Company would be offered a ten-year grazing lease on the South Montezuma Pasture and the East Razorback Pasture. Pasture 4 would be administered for TNR grazing only and remain part of the new Montezuma Allotment.

The carrying capacities for the expanded Razorback Allotment ten-year grazing lease were derived from the Ecological Site Inventory (ESI) production data, refer to Appendix A. A conservative stocking rate would be allocated because of frequent droughts and the lack of available forage within these pastures.

Table 20.0 – Proposed Ten-Year Grazing Lease on the Razorback Allotment

Pasture Name	Season of use	AUMs	Average Herd Size	Maximum Herd Size
South Montezuma	February 1 – May 31 June 1 – January 31	Up to 226 growing season Up to 1235 dormant season	56 cattle growing season 154 cattle dormant season	70 cattle growing season 175 cattle dormant season
East Razorback	May 1 – July 31 August 1 – January 31	Up to 69 growing season Up to 155 dormant season	23 cattle growing season 26 cattle dormant season	35 cattle growing season 40 cattle dormant season

a. Terms and Conditions for all pastures

- A grazing rotation would be established within each pasture each year. For example, if a pasture, an area, or portion of a pasture is grazed during spring/summer one year that same area would be rested during the following spring/summer. growing season

- The terms and conditions of this grazing authorization would be consistent with the Standards and Guidelines for Healthy Rangelands established by the Mojave Southern Great Basin Area Resource Advisory Council in 1997.

- Livestock would be removed or moved to a new area prior to attaining the maximum allowable utilization level of 35 percent.

6. Proposed Ten-Year Grazing Lease for the East Razorback Pasture of the Razorback Allotment: ***Younghans***

- The action and the terms and conditions under Alternative 1 – No Forage Reserve would be the same as the Proposed Action

2.7 No Action Alternative (Existing Use)

Under the No Action Alternative, there would no change to the present condition in the grazing leases, vacant allotment and allotment boundaries. Livestock and wild horse management within the Montezuma Complex would continue with current numbers. There would be no changes in allotment boundaries and no new AUM allocations for livestock grazing within these allotments.

Under the No Action Alternative, AML would not be re-established in the Goldfield, Montezuma Peak, Stonewall, Bullfrog and a small portion of the Paymaster HMAs.

Under the No Action Alternative, AUMs for livestock would still be allocated within these HMAs. Desert tortoise habitat within the Montezuma and Razorback Allotments would continue to be grazed. The proposed management actions identified in the Appendix A would not be implemented.

Refer to the Montezuma Complex Rangeland Health Evaluation (Appendix A), for a detailed discussion of the current grazing and wild horses and burro management within the Montezuma Complex.

2.8 Alternatives Considered but Eliminated from Detailed Analysis

- **No Livestock Grazing Alternative**

  The BLM TFS is required to manage public lands in conformance with the Tonopah RMP as approved in the Record of Decision (ROD) on October 2, 1997. The RMP provides for livestock grazing use, and that livestock grazing use is to be managed so that resource management objectives would be achieved within the Montezuma Complex.

  It is the intent of the Proposed Action to implement a multiple use decision designed to establish and meet allotment specific objectives for livestock management, meet RAC Standards for Rangeland Health and provided habitat for wildlife and wild horses. The Tonopah RMP/ROD established objectives for livestock grazing and provides for the establishment of a rangeland monitoring program to determine if management objectives are being met and to adjust grazing management systems and livestock numbers as required. The "No Grazing" alternative was considered in the 1997 RMP Land Use Planning process and subsequently rejected. This alternative will not be further analyzed in this EA due to this alternative being in conflict with the Tonopah RMP as approved in the ROD. Furthermore, FLPMA and the Taylor Grazing Act recognize grazing as a valid use of the public lands and require BLM to manage livestock grazing in the context of multiple use. It is expected that desired resource conditions, upward trends and management objectives can reasonably be met through the Proposed Action as identified in this document.

- **Removal of all Wild Horses and Burros within the Montezuma Complex Alternative**

  Under this alternative, the removal of all wild horses and burros within the Montezuma Complex was not considered viable because the analysis demonstrated that wild horses and burros could exist within the HMAs. The AMLs need to be readjusted as the carrying capacities indicate that the current conditions cannot support the present population levels. The Montezuma Complex landscape is well suited for burros because the areas are dominated by shrub plant communities. The grass components of these vegetative communities are scarce and therefore less suitable for wild horses. These adjusted AMLs would assure that progress in meeting the RAC Standards and Guidelines and the RMP determination would be achieved.

- **Increasing livestock Numbers**

  Under this alternative, increasing livestock numbers was not considered a viable alternative because the analysis demonstrated that the current allocated AUMs were set too high for the Montezuma Complex landscape. The current AUMs did not take into consideration frequent droughts and the carrying capacities of the vegetation types. Therefore, increasing the livestock numbers would continued to display a lack of progress in meeting the RAC Standards and Guidelines and the RMP. The planning goals would not be achieved under this alternative.

3.0 AFFECTED ENVIRONMENT and ENVIRONMENTAL CONSEQUENCES

3.1 General Setting

The assessment area is located in extreme southwestern Nevada near the Nevada-California border and the Nevada Training and Test Range (Map 1.0) and is in Esmeralda and Nye Counties. This area lies within the orographic rain shadow of the White Mountains along the California-Nevada border. The assessment area covers 612,625 acres varying from hot desert vegetation dominated by creosote bush and white bursage receiving three to five inches of annual precipitation to pinion-juniper communities on the Montezuma Range at 8,373 feet in elevation receiving roughly 14 inches of precipitation.

The boundaries of the assessment area include the Nevada Training and Test Range on the east and the Magruder Mountain, Yellow Hills and Sheep Mountain Allotments on the west, Las Vegas BLM District and Death Valley National Monument on the south. It is bordered on the north by the town of Tonopah and the Ralston and Monte Cristo allotments. Refer to Map 1.0 for general orientation and acreages of the respective allotments.

The Montezuma Complex lies within two deserts, the Great Basin Desert and the Mojave Desert. The northern portion of the Montezuma Allotment is in the Great Basin Desert. Some of the northern and central portions of the Montezuma Allotment vegetation transition between Mojave

and Great Basin Desert. The southern portion of the Montezuma Allotment, and all of the Razorback and Springdale 2 allotments occur in the Mojave Desert.
Precipitation in Esmeralda County and southern Nye County varies greatly from year to year, leading to frequent dry years. Since 1954, nearly one-third of all years have been considered “drought” (years with 75 percent of normal precipitation or less). Annual precipitation in the assessment area averages between 3 – 14 inches. The valleys and the lower hills average between 3 – 8 inches and the mountains between 8 – 14 inches. Temperatures (°F) vary considerably according to elevation, but typical valley floor temperatures average from the mid 90’s in July to the mid 30’s and lower 40’s in January. Extreme temperatures are more than 20° below zero in the dormant season and 110° in the summer. Frost-free periods typically vary from 100 to 170 days in the valleys.

Vegetation varies from hot desert shrub to pinion and juniper woodlands. The following ten vegetation categories exist in the Montezuma Complex: salt desert shrub, hot desert shrub, sagebrush, blackbrush, pinion and juniper woodlands, barren areas, washes, saline meadows & alkaline soils, riparian, and mountain mahogany woodlands. Salt brush is the most dominant vegetation type in the Montezuma Complex. Refer to Appendix A for a detailed description of the Montezuma Complex

3.2 Critical Elements of the Human Environment

To comply with the National Environmental Policy Act (NEPA), the BLM is required to address specific elements of the environment that are subject to requirements specified in state statute, regulation or by executive order (BLM 1988, BLM 1997). The following Table 21.0 outlines the 15 critical elements of the human environment that must be addressed in all environmental assessments, as well as other resources deemed appropriate for evaluation by the BLM, and denotes if the Proposed Action or Alternatives affects those elements.

Table 21.0 – Critical Elements

Critical Element	Present Yes/No	Affected Yes/No	Rationale
Air Quality	Yes	No	Air quality would not be affected by the Proposed Action or Alternatives because very little aeolian displacement would occur by this action. The wind energy and dynamics would the predominate factor in particulate displacement.
ACECs	No	No	There are no ACECs within the vicinity of the Proposed Action or Alternatives.
Cultural Resources	Yes	Yes	See discussion below.
Environmental Justice	No	No	No minority or low-income population would be disproportionately affected by the Proposed Action or Alternatives.
Flood Plains	No	No	There are no Flood Plains within the vicinity of the Proposed Action or Alternatives.
Invasive, Non Native Species	Yes	Yes	See discussion below.
Migratory Birds	Yes	Yes	See discussion below.
Native American Religious Concerns	No	No	There are no know Native American Religious Concerns that would be affected by the Proposed Action or Alternatives.
Prime or Unique Farmlands	No	No	Not present within the vicinity of the Proposed Action or Alternatives.
Threatened and/or Endangered Species (Plants)	Yes	No	See discussion below.
Threatened and/or Endangered (Animals)	Yes	Yes	See discussion below.
Wastes, Hazardous or Solids	No	No	Not present within the vicinity of the Proposed Action or Alternatives.
Water Quality	Yes	Yes	See discussion below.
Wetlands and Riparian Zones	Yes	Yes	See discussion below.
Wild and Scenic Rivers	No	No	There are no rivers within the vicinity of the Proposed Action or Alternatives.
Wilderness	Yes	No	No AUMs would be allocated or authorized in the WSA of the Proposed Action or Alternatives

The following critical elements of the human environment are not present or would not be affected by the Proposed Action or Alternatives and will not be further analyzed in this EA:

Air Quality	Prime or Unique Farmlands
ACECs	Environmental Justice
Wastes, Hazardous or Solids	Flood Plains
Wild and Scenic Rivers	Native American Religious Concerns

3.3 Other Resources

Other resources of the human environment that have been considered for this environmental assessment (EA) are listed in the Table 22.0 below. Elements that may be affected are further analyzed in this EA. Rationale for those elements that would not substantially or adversely be affected by the Proposed Action and Alternative is listed in the table below.

Table 22.0 - Other resources of the human environment

Other Resources	Present Yes/No	Affected Yes/No	Rationale
Forestry	Yes	No	The Proposed Action or the Alternatives would not affect Forestry because there are no changes to forested areas from the Proposed Action or Alternative.
Grazing Management	Yes	Yes	See discussion below.
Land Use Authorization	Yes	No	The Proposed Action or the Alternatives would not affect Land Authorization because there are no changes to the land status from the Proposed or Alternative actions
Minerals	Yes	No	The Proposed Action or the Alternatives would not affect Minerals because there are no changes to the Minerals from the Proposed or Alternative actions
Recreation	Yes	No	The Proposed Action or the Alternative would not affect Recreation because there are no changes to the Recreation from the Proposed or Alternative actions
Socio-Economic Values	Yes	No	See discussion below.
Soils	Yes	No	Proposed Action or Alternatives would not affect soils because no surface disturbing activities are proposed.
Vegetation	Yes	Yes	See discussion below.
Visual Resources	Yes	No	Proposed Action or Alternatives would not affect the visual resources because no impediment activities are proposed.
Wild Horse and Burro	Yes	Yes	See discussion below.
Wildlife	Yes	Yes	See discussion below.

Bureau specialists have further determined that the following resources are not affected by the Proposed Action and would not be further analyzed in this EA:

Forestry	Recreation	Land Use Authorization
Minerals	Soils	Visual Resources

3.3.0 Cultural Resources:

Less than ten percent of the area defined by the Montezuma, Razorback and Springdale 2 allotments has been surveyed for archaeological resources. Prehistoric and historic sites have been identified within this area.

- ***Prehistory***

The areas within these allotments were originally populated by the Paiute and Shoshone groups. Habitation sites were located around springs and creeks. These groups were very nomadic, moving frequently between valleys. They also interacted between family groups. The winter habitation sites were fairly permanent, but were abandoned during the spring and fall when inhabitants made subsistence rounds to collect food. The entire camp would move throughout the area collecting plants and animals to process for storage.

The prehistoric archaeology of the area reflects this ethnographic data. The remains of small camps can be found near springs, plant and seed processing areas are found where edible plants grew, and small hunting camps can be found throughout the area. Known sites consist of small lithic scatters with or without ground stone, rock rings, and petroglyph panels.

- ***History***

The Rush to Washoe occurred in late 1859 and early 1860. This brought more than 10,000 people to the Gold Canyon area of the Utah Territory hoping to file claims and become rich. Most of them found that all of the promising areas had been claimed. More than half of them left after finding there were no prospects for them in the mining camps. Most of them returned to California, but some spread out in search of rich finds of their own. Small mining camps, mining districts, and towns began to spring up across the Utah/Nevada Territory in the early 1860s. Some of these were in the assessment area. Prospectors concentrated on finding precious minerals such as gold and silver, but supplies for the prospectors and fledgling towns had to be transported long distances over the Sierra making them very expensive. Entrepreneurs soon found that there was money to be made producing supplies locally. Ranches were established to provide hay, livestock, and food crops for the prospectors and townspeople.

The archaeology of the historic sites in the area reflects the history of the area. A number of abandoned town sites, mines, and mills can be found in the area.

- ***Historic Settlements in the Montezuma Complex Area***

- **Montezuma** – Late 1800s, Spanish miners settle in Montezuma. The camp is now abandoned.

- **Tonopah** – Water stop until silver was discovered in 1900, rush on by 1902. Peak population was 12,000 but declined to approximately 2000 by 1930.

- **Goldfield** – Initial discovery of gold in late 1902, rush was on in 1903. The population of Goldfield and suburbs boomed to 30,000 in 1907. Current population is between 200 – 300 people. It is currently the Esmeralda County seat.

- **Beatty** – Europeans settled the area in the 1870s. Town laid out in 1904-1905. It was a railroad stop and supply center for outlying mining camps.

- **Klondyke** – Gold and silver discovered during 1899. Gold placer mining, the town had a post office 1901-1903 but never grew large.

- **Rhyolite** – Gold mining camp became a small city with a peak population of 8,000. Decline began in 1908. The town is now abandoned.

- **Divide** – Gold found in 1901. The peak population was 440 people in 1920. The camp is now abandoned.

- **Ralston** – Was established at a water stop along the Las Vegas and Tonopah Railroad. Later used by the Tonopah and Tidewater Railroad. It is now abandoned.

Riparian areas have the highest potential for cultural resource sites and thus sites located in these areas are the most susceptible to the highest amount of impact due to the increased numbers of livestock and wild horses as compared to other non-riparian areas. Cultural resources located near and within riparian areas have an increased probability of being affected by water developments.

Photo 1.0 - Cultural resource within the Tonopah Planning Area

Courtesy of Bryson Code, Wildlife Biologist, BLM, TFS.

- ***Environmental Consequences of the Proposed Action***

No known cultural resources are being damaged by grazing within these allotments. A decrease in the number of animals grazing within an allotment decreases the possibility that unidentified cultural resources could be affected.

The decrease in the AUM allocations would occur within each pasture, livestock grazing would not be allocated in the desert tortoise habitat and in Central and South Pasture of the number 3 complex pastures. In addition, the AMLs would be adjusted and the lotic and lentic riparian habitat would continue to improve throughout the Montezuma Complex. The factors would benefit the cultural resources by reducing the number of livestock and wild equids in some areas, as well as reduce the potential for erosion and weathering as a result of reduced vegetative cover which increases soil disturbance. Indirectly the proposed action would cause the following impacts: allow attainment of the RMP objectives, Standards for rangeland health, multiple use objectives and allotment specific objectives.

Riparian areas have the highest potential for cultural resource sites and thus sites located in these areas are the most susceptible to the highest amount of impact due to the increased numbers of livestock and wild horses as compared to other non-riparian areas.

Future range improvements, such as fencing, water developments and water haul sites would help to assist in decreasing and eliminating impacts to sensitive areas. These projects, at the time they are proposed, would be subject to Class III cultural surveys and potential mitigation measures. Projects would be designed to either avoid impacts to cultural resources or measures would be taken to mitigate potential damage to National Register of Historic Places (NRHP) eligible sites.

During fence construction, spring development or installation of range improvements, if any materials are encountered they are not to be collected, moved, or modified until a qualified cultural resource specialist provides a determination. Cultural and archeological resources are protected under the Archaeological Resources Protection Act (16 U.S.C. 740ii) and the Federal Land Policy and Management Act (43 U.S.C. 1701).

- ***Environmental Consequences of Alternative 1***

Under Alternative 1 the direct and indirect impacts on cultural resources would be the same as those identified for the Proposed Action.

- ***Environmental Consequences of No Action Alternative***

Under the No Action Alternative, it is expected that indirect impacts to cultural resources would continue at the same level as in the past. Currently, no known cultural resources are being affected by grazing within these allotments. When projects or rangeland improvements are proposed, grazing patterns within allotments are evaluated and compared with locations of known cultural resources. Future proposed rangeland projects would be surveyed and evaluated for cultural resources before they are implemented. Cultural resources are long-known to be more frequent near water sources.

A continuation of current management practices within the Complex would not allow for the attainment of the Tonopah RMP objectives or the Standards for Rangeland Health. The non-attainment of these standards and objectives would not provide for improvements in riparian and upland conditions, which would help to protect cultural resources from additional disturbances.

3.3.1 Invasive, Non-native Species

Non-native plant species that are highly competitive, aggressive, and easily spread are considered invasive. One of the more common methods of introduction and the spread of noxious weeds and invasive plants to an area include the movement of contaminated vehicles and equipment across areas of disturbed soil or soil areas that may become disturbed. Known infestations in or within effectual distance to the project site include two weed species from the noxious weed list, salt cedar and puncture vine. It is possible that some Russian knapweed may also occur in the assessment area. A large infestation of Russian knapweed is known to occur just over 30 miles from the assessment area. Small infestations occur in a few spots on the Smoky allotment. All known locations of Russian knapweed have been treated and are being monitored. Any new infestations that may be found on the assessment area would also be treated and monitored.

Salt cedar (Tamarisk) occurs at many of the springs and ephemerally moist areas throughout the assessment area. It dominates portions of the Amargosa River in all three allotments within the Complex. Currently, salt cedar is being treated on public and private lands in the Razorback and Springdale 2 Allotments.

Puncture vine has been found on private land and along roadsides in the town of Goldfield and is also likely to occur within the town of Beatty. It seems to occur mainly on private land and is expected to spread along roadsides and waste places in the valley bottom.

Red brome is considered an invasive annual grass species and is found throughout the Mojave Desert in the Razorback, Springdale 2 and in southern portion of Montezuma. It is not considered a good forage plant because of the short season of growth. It is a very poor erosion control plant, and provides abundant fuel for wildfire. In 2006, there were two fires in red brome-infested areas (refer to Appendix A).

Cheatgrass is also an invasive grass plant, similar to red brome, but is found in the higher elevations of the assessment area. It was found on the higher hills that burned in the Razorback and southern portion of the Montezuma allotments and on the northern portion of the Montezuma Allotment in 2006. In northern Montezuma Allotment cheatgrass is not found in enough abundance to expect any increase in the potential for wildfires.

The spread and increase of invasive plants, noxious weeds, and pests contribute to the decrease and/or quality of many of other renewable resources in the effected environment. For instance, air quality is affected by an increase in pollen which is a primary mechanism for the spread and increase of invasive plant and noxious weed seed. Riparian and wetland zones are affected by the spread and increase of invasive plants and noxious weeds due to their highly competitive nature. These areas are also impacted by the consumption of riparian and wetland vegetation by pests. Rangeland grazing potential is reduced as less palatable invasive plants and noxious weeds increase and pests reduce the available forage through predation. Wildlife loses condition, forage, cover, and habitat as invasive plants, noxious weeds, and pests spread and increase. Ecological condition and functionality is also impacted by the increase and spread of these undesirable species.

Over-utilization of native vegetation by livestock and the accompanying ground disturbance in and around forage and riparian areas can contribute to the increase and spread of invasive plants and noxious weeds.

- ***Environmental Consequences of Proposed Action***

Under the Proposed Action no surface disturbing activities are proposed. The Proposed Action is unlikely to result in new infestations or any increase in the spread of existing populations of invasive non-native plant species or noxious weeds to the affected environment. The stocking rate for livestock and wild equids within the Montezuma Complex would be at lower numbers than the existing situation. The lower wild equids and livestock numbers would potentially reduce the spread of noxious and invasive weeds since the livestock concentration would be lower.

Indirect impacts of Proposed Action would create favorable conditions that would reduce the spread of invasive species in the Montezuma Complex. Upland range sites and riparian/wetland zones would be properly utilized and not overgrazed, making these areas less susceptible to invasion by undesirable species. In addition, by continuing weed treatments and monitoring within the Complex, the TFS would be able to monitor for the proliferation of undesirable species along the project area. The Proposed Action would allow for attainment of the Tonopah RMP objectives, Standards for Rangeland Health, multiple use objectives, and allotment specific objectives.

- ***Environmental Consequences of Alternative 1***

Under Alternative 1 the direct and indirect impacts on invasive, non-native species and noxious weeds would be the same as those identified for the Proposed Action.

- ***Environmental Consequences of No Action Alternative***

The No Action Alternative may slightly increase the spread of existing populations of invasive plants and noxious weeds to the affected environment. Stocking rates for livestock and wild equids would be at a higher number than the Proposed Action which could potentially increase the spread of noxious and invasive plants. The indirect impact of the No Action Alternative would be that the attainment of the Tonopah RMP objectives, Standards for Rangeland Health, multiple use objectives, and allotment specific objectives may be delayed.

3.3.2 Vegetation

Photo 2.0 - Aerial view of a typical salt desert shrub plant community within the Montezuma Allotment.

Courtesy of Andrea Felton, Wild Horse and Burro Specialist (WHBS), Census Flight, BLM, TFS, 2006.

Two wildland fires occurred within the Complex and burned 16,409 acres on public lands during the month of July 2006. These fires occurred in the southern portion of the Montezuma Complex in hot desert and sagebrush vegetation types. Detailed information on the areas burned and the rehabilitation plan are contained in the Wildfire Management Decision document. The Emergency Stabilization (ES) Plans for the two fires have been approved and full force and effect decision were sent to the interested parties. The Rehabilitation Plan for the Sawtooth Fire has been completed and was approved September 14, 2006.

The vegetation in the Montezuma, Razorback and Springdale 2 Allotments provide very little forage for wild horses. Some forage is available for cattle. This forage is found mainly in the valley in the northern portion of the Montezuma Allotment and in pasture 5 in southern Montezuma Allotment. The Goldfield, Montezuma, Stonewall and Bullfrog HMAs provide forage for burros but little forage for horses and cattle.

In extremely dry years like 1996 and 2002, there is little to no grass available. In these extremely dry years perennial bunch grasses die and rhizomatous grasses die back and produce little or no green forage. Almost no nutritious forage is available for horse use. The only forage available is old dry grass with little nutritive value. However, some browse is still available for burro use. Shrubs are deeper rooted than grasses or forbs and fewer shrubs than grasses die in extreme droughts. This leaves more available browse than grass for forage during extreme droughts. There were, however, significant die offs of some saltbrush species, mainly shadscale, during 2002.

During the 1990s, large numbers of horses and burros resided in the Montezuma and Razorback Allotments. These numbers greatly exceeded the AML set in the RMP for both horses and burros. Large numbers of these wild horses and burros left the HMAs in order to find forage. Most of the horses resided outside the Montezuma Peak HMA in the north portion of pasture 1. Large numbers of burros left the east half of the Bullfrog HMA and moved into the north portion of pasture 5. Both of these areas received heavy use by wild equids until they were gathered. This excessive use reduced the amount of forage now available. Burros were removed from pasture 5 in 1996 while horses remained in pasture 1 until 2006. Pasture 1 would initially need a partial rest from livestock rest until it recovers. Pasture 5 has had 11 years of rest from burros and livestock use.

Vegetation types vary within the Complex. Refer to the vegetation section of Appendix A (the Montezuma Complex Rangeland Health Evaluation) for a more detailed discussion of vegetation found within the Montezuma Complex.

- ***Environmental Consequences of the Proposed Action***

The direct impacts of the Proposed Action on vegetation would be the following: Conservative stocking rates as proposed would allow for vegetation conditions to improve within the Complex, new AUM allocations would also help to reduce grazing pressures on certain key forage species. Livestock would not be authorized to graze within the HMAs because the forage resources are limited and the carrying capacity cannot support two large herbivores in the same habitat. Grazing would not be authorized within areas of desert tortoise habitat. The adjusted AMLs within the HMAs would be more in line with the vegetation type carrying capacities for wild equids. This adjustment would have positive impacts on the vegetation resources, which would reduce the potential over-utilization of the forage.

Damage to riparian areas was caused mainly by the excessive numbers of wild horses and burros. The removal of large numbers of wild equids throughout the Complex in 1996 had provided 11 years of rest for these riparian areas. Since 1996, most of the riparian areas have improved. This improvement would continue under the conservative stocking rates proposed for both livestock and wild equids.

The indirect impacts of the Proposed Action would allow for the attainment of the Tonopah RMP objectives, Standards for Rangeland Health, multiple use objectives and allotment specific objectives. The attainment of the standards would allow for improvement in the upland and riparian areas and provide for wildlife, livestock and wild horse habitat requirements throughout the complex. Refer to Appendix A for a further discussion.

- ***Environmental Consequences of Alternative 1***

Under Alternative 1 the direct and indirect impacts on vegetation would be the same as those identified for the Proposed Action.

- ***Environmental Consequences of the No Action Alternative***

The direct impacts of the No Action Alternative would be the following: current livestock and wild horse management practices would continue. The Montezuma allotment would remain vacant and a ten-year grazing lease would not be issued to Mr. Johns. The entire Montezuma Allotment would be available under TNR authorization at the discretion of the BLM. The allotment boundary changes would not occur within this allotment. The potential competition between wild equids and livestock for the limited forage resources would continue to exist within HMAs resulting in the over-utilization of the limited vegetation resources, decrease cover and potentially attaining the threshold levels of the plant communities. The competition between livestock and desert tortoise for the very limited forage resources would continue and potentially restrict the availability of forage on the endangered animal.

The indirect impacts of the No Action Alternative would be that non-attainment of the Tonopah RMP objectives, Standards for Rangeland Health and multiple use objectives would continue. As the numbers of horses within the HMAs reach the current AML, they would leave the HMAs and move into and graze on the important forage species found on the more productive soils. Refer to Appendix A for a more detailed discussion.

3.3.3 Grazing Management

Table 23.0 - Montezuma Complex Allotment Acreages

Allotment	Acres (RMP)
Montezuma	538,297
Razorback	72,880
Springdale 2	1,466

The carrying capacities and forage allocation for the HMAs were determined and calculated in Appendix A – Montezuma Complex Rangeland Health Evaluation.

- **Montezuma Allotment**

The Montezuma Allotment is vacant at present. The grazing season on the Montezuma Allotment was yearlong for the former lessee. In 1990, former lessee reduced the herd size from approximately 750 to approximately 50 cattle. An Area Manager's Final Multiple Use Decision (FMUD) was issued on June 29, 1994, following an allotment evaluation.

Table 24.0 – Past Authorized AUMs on the Montezuma Allotment

Allotment	Operator	Cattle Number	Grazing Begin	Grazing End	AUMs
Montezuma Prior to FMUD, June 29, 1994	Former lessee	889	3/1	2/28	10,668
Montezuma After FMUD, June 29, 1994	Former lessee	992	6/1	2/28	8,927

- ***Environmental Consequences of the Proposed Action***

Under the Proposed Action the acreage of Montezuma would decrease by transferring pasture 5 (South Montezuma Pasture) and pasture 4 (Scotty's Pasture) to the expanded Razorback Allotment, thereby altering the allotment boundaries. The carrying capacity was analyzed (refer to Appendix A) and new AUM allocations would be authorized for Pasture 1 North, Pasture 1 South, Pasture 2, and Pasture 3 North. Pasture 1 South, Pasture 2, and Pasture 3 North would become Forage Reserve pastures. The Central and South pastures of Number 3 pasture complex would not be allocated to livestock AUMs because the vegetation communities have very limited forage resources for livestock grazing. These allocations of the maximum AUMs would be authorized depending on the current conditions of the range as to assure the long-term productivity of the vegetation

Other impacts on grazing management as a result of the Proposed Action would include: keeping livestock from grazing within HMAs. Livestock would not be authorized to graze within the HMAs because the forage resources are limited and the carrying capacity cannot support two large herbivores in the same habitat.

The Pasture 1 North is recovering from drought and over-utilization from wild horses. This pasture would not be available during the critical grazing growing period of the plants until 2010, at which time, the BLM would determine if the pasture has recovered from drought and over-utilization. It is predicted that in some years, the Forage Reserve pastures would not be available because of drought or the availability of forage is limited. Range condition and availability of each pasture would be determined by BLM.

It is expected that the management actions analyzed in this Proposed Action would ensure more uniform utilization throughout the Montezuma Allotment and would provide for the protection and improvement of the rangeland resources. The Proposed Action involves several distinct strategies that would be expected to benefit the grazing management so as not to compromise the vegetation resources. Rest during the critical growing season, rotation of livestock, and carrying capacity allocations are the main features of the Proposed Action that would help to ensure successful grazing management.

Indirect impacts of the Proposed Action would be the following: The proposed action would help to ensure that progress is made towards the attainment of the Tonopah RMP objectives, Standards for Rangeland Health and multiple use objectives throughout the Montezuma Allotment. Refer to Appendix A for a further discussion.

- ***Environmental Consequences of Alternative 1***

The BLM has permitted TNR grazing on the Montezuma Allotment since 2001. The following table displays the TNR authorization for the Montezuma Allotment from 2001 to 2006.

Table 25.0 - Temporary Non-Renewable Authorization for the Montezuma Allotment from 2001 to 2006

Year of Authorization	Pasture**	Season of Use Begin	Season of Use End	Number of Animals*	Animal Unit Months
2001	West & East	11/16/01	05/15/02	200	1200
2003	South	12/23/03	01/31/04	100	358
2003	West	02/01/04	05/15/04	100	342
2003	East	12/23/03	05/15/04	100	700
2004	North, West & East	10/15/04	05/15/05	300	2100
2005	South & East	09/01/05	01/31/06	25	126
2005	South & West	09/01/05	01/31/06	200	1006
2005	East	10/15/05	02/28/06	300	450
2005	West	030106	02/28/07	50	600
2006	East	11/20/06	03/15/07	50	373
2006	West	03/01/07	02/28/08	50	600

*Number of animals may vary throughout the grazing season
** East Pasture is mostly Pasture 2 and 3
West Pasture is mostly Pasture 1 North
South Pasture is mostly Pasture 1 South
North Pasture is Pasture 1 North

Pastures 1 South, 2, 3 North and 4 would remain as TNR pastures under Alternative 1. The Central and South pastures of the number 3 pasture complex would not have AUMs allocated to livestock because the forage resource are very limited for livestock grazing.

The carrying capacities for the pastures were adjusted in accordance to the potential native communities. A conservative approach to the allocation was considered because of frequent droughts and the availability of forage is limited within these pastures. These allocations of the maximum AUMs would be authorized depending on the current conditions as to assure the long-term productivity of the vegetation. Livestock would not be authorized to graze within the HMAs because the forage resources are limited and the carrying capacity cannot support two herbivores in the same habitat.

Alternative 1 is similar to the proposed action with the exception of offering Mr. Bud Johns the ten-year grazing lease to graze on Pasture 1 while making the other pastures available for TNR grazing. However this pasture is recovering from drought and over-utilization from wild horses and would not be available during the critical grazing growing period of the plants until 2010. All other impacts to grazing management within the Montezuma Allotment would be the same as those described above for the Proposed Action.

- ***Environmental Consequences of the No Action Alternative***

The direct impacts of the No Action Alternative would be the following: current livestock and wild horse management practices would continue. The allotment would remain vacant and a ten-year grazing lease would not be issued to Mr. Johns. The entire Montezuma Allotment would be available under TNR authorization at the discretion of the BLM. The allotment boundary changes would not occur within this allotment.

The indirect impacts of the No Action Alternative would be that non-attainment of the Tonopah RMP objectives, Standards for Rangeland Health and multiple use objectives would continue. Refer to Appendix A for a more detailed discussion.

- **Razorback Allotment**

In 2005, Beatty Cattle Co., L.L.C., who is currently the only lessee on the Razorback Allotment, bought the base property attached to the ten-year grazing lease.

The season of use ranges from May 1 to January 15.

Table 26.0 - Current Permitted AUMs on the Razorback Allotment

Allotment	Operator	Cattle Number	Grazing Begin	Grazing End	AUMs
Razorback	Beatty Cattle Co., LLC	106	1 May	31 January	962

Table 27.0 - History of Grazing Use in the Razorback Allotment

History of Grazing Use in the Razorback Allotment								
Year	**# of Cattle**	**AUMS**	**Year**	**# of Cattle**	**AUMs**	**Year**	**# of Cattle**	**AUMs**
			2002	0	0	1996	24	207
2007	106	962	2001(3)	38	37	1995	24	207
2006	106	962	2000	0	0	1994	350	876
2005	179	959	1999	0	0	1993	112	1348
2004 (1)	192	959	1998	0	0	1992	112	1348
2003	0	0	1997	21	218	1991	112	1348

(1) Pasturing agreement with former lessee did not exceed the permitted AUMs.

- ***Environmental Consequences of the Proposed Action***

The Springdale 2 Allotment boundary would be combined with the East Razorback Pasture and become part of the expanded Razorback Allotment.

The Razorback Allotment boundary acreage in the southern portion would decrease and the acreage to the north and west would increase. Livestock would not be allocated in desert tortoise habitat. The vegetation types and availability of forage for cattle in the desert tortoise habitat is minimally suitable for grazing. Removal of livestock would assure that the desert tortoise has adequate resources throughout the year, and competition between cattle and desert tortoise would be eliminated. The remaining portion of the current Razorback Allotment would be known as the East Razorback Pasture and would become part of the expanded Razorback Allotment.

The reduction in AUMs is due to the reduction in the Razorback Allotment acreage and the carrying capacity of the potential native communities. These reductions are necessary to assure the long-term productivity of the vegetative resources.

Pasture 5 (South Montezuma Pasture, located west of U.S. Highway 95) and the East Razorback Pasture would be combined under a ten-year grazing lease and incorporated into the expanded Razorback Allotment. A portion of the pasture 5 would be rested from January 1 to February 28 with the same number of livestock, during the critical growing season. This grazing rotation would be for the length of the ten-year grazing lease. Livestock may need to be removed during drought period(s) to prevent damage to the vegetative resources, as directed by BLM. This level of grazing management would be necessary to assure the long-term productivity of the vegetative resources. The ten-year grazing lease would be offered to the Beatty Cattle Co., which has an adjoining allotment.

Pasture 4 (Scotty's pasture), is located east of U.S. Highway 95 and north of the East Razorback pasture. This pasture would become a Forage Reserve pasture and would be available as needed based upon carrying capacity and favorable precipitation conditions. The East Razorback pasture, and both Pasture 4 (Scotty's Pasture) and Pasture 5 (South Montezuma Pasture) would be combined and would become part of the expanded Razorback Allotment.

It is expected that the management actions analyzed in this Proposed Action would ensure more uniform utilization throughout the Razorback Allotment and would provide for the protection and improvement of the rangeland resources. The Proposed Action involves several distinct strategies that would be expected to benefit the grazing management so as not to compromise the vegetation resources. Rest during the critical growing season, rotation of livestock, and carrying capacity allocations are the main features of the Proposed Action that would help to ensure successful grazing management.

Indirect impacts of the Proposed Action would be the following: The proposed action would help to ensure that progress is made towards the attainment of the Tonopah RMP objectives, Standards for Rangeland Health and multiple use objectives throughout the Razorback Allotment. Refer to Appendix A for a further discussion.

- ***Environmental Consequences of Alternative 1***

The impacts of Alternative 1 would be the same as those described for the Proposed Action (above) with the exception of the Forest Reserves being established in Pasture 4 (Scotty's pasture). Pasture 4 of the Razorback Allotment would be available under TNR authorization at the discretion of the BLM.

- ***Environmental Consequences of the No Action Alternative***

The direct impacts of the No Action Alternative would be the following: current livestock and wild horse management practices would continue and the Beatty Cattle Company would keep their ten-year grazing lease on the Razorback Allotment. The Razorback Allotment boundary would remain the same. Livestock would continue to graze in desert tortoise habitat and a reduction in livestock AUMs would not occur.

The indirect impacts of the No Action Alternative would be that non-attainment of the Tonopah RMP objectives, Standards for Rangeland Health and multiple use objectives would continue. Refer to Appendix A for a more detailed discussion.

- **Springdale 2**

The Springdale 2 Allotment is the smallest of the three allotments within the Montezuma Complex and it is unfenced. George and Larene Younghans is the only lessee on the Springdale 2 Allotment. Their current ten-year grazing lease is as follows:

Table 28.0 - Current Permitted Use for Razorback Allotment

Allotment	Operator	Cattle Number	Season of Use	AUMs
Springdale 2	Younghans	2	Yearlong	24

- ***Environmental Consequences of the Proposed Action***

Under the Proposed Action, the allotment boundary would be combined with the East Razorback Pasture and the acres would become part of the Razorback Allotment. The carrying capacity and season of use of the allotment would no longer be an issue because livestock would not be confined to the small area of 1,466 acres. The plant communities would be minimally affected because the livestock allocated to this lessee would have unlimited access to the East Razorback of the expanded Razorback Allotment. This would also relieve the BLM from performing trespass checks and reduce administrative workloads. A ten-year grazing lease would be offered to the Younghans.

- ***Environmental Consequences of Alternative 1***

The impacts to the Springdale 2 Allotment would be the same as those described for the Proposed Action.

- ***Environmental Consequences of the No Action Alternative***

Under the No Action Alternative current livestock and wild horse management practices would continue. Livestock grazing would continue under the current ten-year grazing lease permitted to George and Larene Younghans. The Springdale 2 Allotment would not become part of the Razorback Allotment, but would remain a separate allotment.

3.3.4 Socioeconomics

The Montezuma Complex is located within Nye and Esmeralda counties in Nevada. The Montezuma Complex includes the Montezuma, Razorback and Springdale 2 Allotments.

- **Nye County**

Nye County is the third largest county in the United States and totals 11,558,408 acres. It is located in the south-central portion of the State of Nevada. Tonopah is the county seat and is located 239 miles southeast of Reno/Sparks, and 207 miles northwest of Las Vegas on U.S. Highway 95/ 6 and State Route 376.

The total population of Nye County in 2000 was 32,485, which represents an increase of 83 percent since 1990. The age group that has grown the fastest is the 70 – 74 year old group. Projections show the county to grow to 40,334 persons by 2006. From 1970 to 2000, Nye County has grown at a population rate faster than both the state and the nation.

In terms of employment, the majority of jobs are in the services, professional, government and mining sectors. Mining is the main economic activity in this portion of Nye County. Over the past 30 years, job growth in the county has been slow; the unemployment rate is estimated at 6.6 percent – higher than both the state and the nation. Most residents (60 percent) earn less than $30,000 annually, with about 1 percent earning more than $100,000. Per capita annual income is about $18,000. Average earnings per job in the county are lower than the state and the nation. Farming is limited in the county and grazing mostly occurs mostly on public lands managed by the BLM.

- **Esmeralda County**

The main economic activities of Esmeralda County, Nevada, are livestock grazing on public and private lands, farming, mining and recreation. These are the principal source revenues for the county and employment opportunities for the residents of the county. Esmeralda County is located in the southwestern portion of Nevada and is bordered by California to the west. The county also borders and contains part of Death Valley National Monument and is 3,588 square miles in size. Goldfield is the county seat.

About 98 percent of the county's total area is managed by the federal government. Of these federally managed lands, the Bureau of Land Management manages approximately 2.2 million acres.

- ***Environmental Consequences of the Proposed Action***

The economic benefits to Mr. Bud Johns (Montezuma Allotment in both Nye and Esmeralda Counties) and to the Beatty Cattle Co. (Razorback Allotment in Nye County) would increase only slightly as a result of the Proposed Action. The reasons for this are that the allotments are subject to cyclical drought and availability of forage is limited due to the vegetation types found on these allotments. Refer to Appendix A for a more detailed discussion of vegetation. Both permittees would benefit by having a grazing ten-year grazing lease offered to them as this would provide a more stable economic base for their livestock operation. Nye and Esmeralda counties would benefit from their increased purchasing power.

The Forage Reserve pastures would benefit Mr. Johns and the Beatty Cattle Company because they would be able to establish a pasturing agreement with qualified applicants for a minimal profit. The BLM AUMs rate, plus a surcharge for the pasturing agreement, would be applicable. These permittees would benefit from the residual payments made to them, after BLM fees. This Proposed Action would raise the economic benefit both the permittees and the counties.

The Younghans' livestock operation on the Springdale 2 Allotment would be not affected by the Proposed Action because there would not be any reduction in the AUMs. The Springdale 2 Allotment would be integrated into the expanded Razorback Allotment. The economic benefits to the Younghans would remain the same.

The indirect impacts of the Proposed Action would provide for the attainment of the Tonopah RMP objectives, the Standards for Rangeland Health, multiple use objectives and allotment specific objectives. The attainment of the standards would provide for improved vegetative conditions throughout the allotments. The improvement in rangeland health may result in increases to permitted use, which would improve potential revenues of the permittees.

- ***Environmental Consequences of Alternative 1***

This alternative would provide limited benefits to Mr. Johns and the Beatty Cattle Co. because the TNR does not guarantee that grazing authorization would be granted to the applicant. The benefits would be temporary because TNR does not provide a secure and stable economic base. The availability of TNR may provide an impetus for other applicants to submit grazing applications, which could indirectly benefit the counties.

The loss of acreages in the south of the Razorback Allotment would be compensated for increased acres in the west which would have a positive impact on the functioning economy of the Beatty Cattle Co. The impacts on social and economic values for the Springdale 2 allotment would be the same as those described above under the Proposed Action.

- ***Environmental Consequences of the No Action Alternative***

The Montezuma allotment would remain vacant and the potential for economic development would be limited as the allotment would only be available under TNR authorization at the discretion of the BLM. Benefits to Mr. Johns would be limited and his economic basis would not be secure. Under the No Action Alternative, the economic impacts to the Beatty Cattle Co. and the Younghans would remain the same.

3.3.5 Wetlands and Riparian Zones

Riparian wetland areas are the most productive and most valuable resources found on public lands. They are critically important to wildlife in Central Nevada due to the presence of water and lush vegetation, which are missing from the dry, less productive environments that typically cover the adjacent landscape. This habitat supports a disproportionate number and diversity of aquatic and terrestrial wildlife in comparison with upland sites. At least 80 percent of the vertebrates occurring regularly in Nevada use riparian areas at some stage of their lives, and more than half are riparian obligates. Riparian areas support a higher breeding diversity of birds than all other western habitats combined.

In addition, riparian areas are highly prized for economic values and other uses such as livestock production, agriculture, and recreation. However, riparian areas in the Montezuma Complex are not common and are mainly developed seeps. At least 20 seeps and springs occur in the Montezuma Allotment. The majority was developed for livestock water and occurs mainly in the hills and mountains in the allotment. The Razorback Allotment has one developed spring. The Amargosa River is an intermittent stream that runs mainly on private land. However, short reaches of the Amargosa River are on public land in the Montezuma and Springdale 2 Allotments.

The riparian habitats along the Amargosa River that occur throughout the Oasis Valley in the Montezuma and Springdale 2 Allotments are unique for the Tonopah Planning Area and are crucial for a variety of sensitive, non-game, game, wild equids and migratory species.
Managing for proper functioning condition on all riparian areas is the minimum standard that is supported by RAC Standards and Guidelines and the RMP Riparian Determination. The riparian habitats were evaluated to determine functional condition in 1994-1995, 1999 and 2005. A total of 20 seeps and springs and 13 separate riparian habitats along the Amargosa River were appraised. Some of the habitats were not assessed every evaluation period. Of the 20 springs examined, 8 were evaluated at least twice, and all 8 improved between their first and the last reading in 2005. Two of the reaches on the Amargosa improved between readings, one remained unchanged. No riparian sites declined. See detailed data on riparian areas in the RHE.

Table 29.0 – Riparian Habitat Rating

Ratings on Springs and Seeps* (lentic sites)	Proper Functioning Condition	Functioning at Risk	Non-Functioning	Total number of Springs or Seeps Evaluated
1995-1999	3	6	7	16
2005-2006	8	5	0	13

* In 1995-1999, 1 was functioning at risk with downward trend, 3 were upward and 2 had no apparent trend.
** In 2005-2006, 1 was functioning at risk with downward trend, 1 was upward and 3 had no apparent trend.

Table 30.0 – Riparian Habitat Rating

Rating on the Amargosa River (lotic sites)	Proper Functioning Condition	Functioning at Risk	Non-Functioning	Total number of Reaches Evaluated***
1995-1999	6	1*	2	9
2005-2006	7	2**	0	9

* In 1995-1999, 1 was functioning at risk with upward trend.
** In 2005-2006, 2 were functioning at risk with an upward trend.
*** Total reaches evaluated along the Amargosa River was 13, some of which covered different areas in 1995-1999 and 2005-2006.

Following the 1996 removal of all livestock and over 900 wild burros and horses from the Razorback and Montezuma Allotments, the majority of the riparian habitats have been able to recover from excessive utilization and have improved in condition. The lentic sites that rated Functional-At-Risk and Nonfunctional in 1999 and 2005 were primarily due to poorly developed and poorly maintained range improvements.

- ***Environmental Consequences of the Proposed Action***

Under the Proposed Action, the lentic and lotic riparian habitat would continue to improve and maintain PFC because the potential lessees would not use the riparian to water their livestock. In addition, the potential readjustment in AMLs would reduce the potential negative impacts on the riparian habitat by reduce the number of wild equids in the HMAs.

- ***Environmental Consequences of the Alternative 1***

Under Alternative 1 the direct and indirect impacts on wetlands and riparian zones would be the same as those identified for the Proposed Action.

- ***Environmental Consequences of the No Action Alternative***

Under the No Action Alternative, those springs and seeps that have been damaged by wild equid use in the past would begin to decline in condition as wild horse and/or burros populations reached the current AML. The wild horses and burros would be permitted to increase in population to the present AML, which is beyond the capacity of the habitat to provide water and forage. Heavy and severe use of vegetation resources by wild horses would continue and increase, resulting in further degradation of plant communities at riparian areas and on the few productive soils in the Montezuma Complex. Reduced production of key forage species would result in reduced forage availability to wildlife, livestock and wild horses and burros. Many of the RAC Standards for Rangeland Health would continue to not be met or achieved.

3.3.6 Wild Horses and Burros:

The Goldfield, Montezuma Peak, Stonewall, Bullfrog and a small portion of the Paymaster Herd Management Areas (HMAs) exist within the evaluation area. The wild horse and/or burro interim herd sizes (IHS) for these HMAs were proposed in the Esmeralda/Southern Nye Resource Management Plan (RMP) issued October 4, 1985. These recommendations were updated and carried forward into the Tonopah RMP, signed October 2, 1997. AMLs were set in the 1994 FMUD for the Montezuma Allotment, in the 1994 FMUD for the Razorback Allotment, and in 2005 for the Springdale 2 Allotment.

A highway fence extends along both sides of U.S. Highway 95, which runs north-south through the Montezuma Allotment, separating the Goldfield HMA from the Montezuma Peak HMA, and dividing the Bullfrog HMA in half. A boundary fence separates the Montezuma and Magruder Mountain allotments. This fence isolates a small portion of the Montezuma Peak HMA within the Magruder Mountain Allotment just south of the majority of the HMA in the Montezuma Allotment. A partial fence separates the Montezuma Allotment from the Nevada Training and Test Range, but there is some movement of wild horses and burros back and forth across that boundary in the Stonewall and Goldfield HMAs. There is no fence between the Nevada Training and Test Range and the Bullfrog HMA on the east side of the highway and between the Battle Mountain District and Las Vegas District of the BLM in the Bullfrog HMA. Refer to Map 11.0 below for the relationship between the HMAs and the allotments. For details regarding the historic census and gather populations, please refer to the Appendix A.

Due to the droughts in 1996 and 2003, these AMLs are being re-evaluated based on current range monitoring data and would be established as *ranges* (maximum and minimum AML) to ensure the maintenance of thriving, self-sustaining herds and healthy rangelands based upon carrying capacities. Table 31.0 presents the present appropriate management levels (AML) for the HMAs. The carrying capacities and forage allocation for the HMAs were determined and calculated in Appendix A – Montezuma Complex Rangeland Health Evaluation.

Table 31.0 - Present Appropriate Management Levels (AML) for Herd Management Areas within the Montezuma Complex.

HMA Name	Allotment	AML	Total AML	AML Set
Bullfrog	Montezuma	12 h*, 130 b	12 h, 185 b	1994 FMUD
	Razorback	53 b		1994 FMUD
	Springdale 2	2 b		2005 Decision
Goldfield	Montezuma	125 h, 50 b	125 h, 50 b	1994 FMUD
Montezuma Peak	Montezuma	142 h	146 h, 10 b	1994 FMUD
	Magruder Mt.	2 h, 10 b		2004 FMUD
	Yellow Hills	2 h		2000 FMUD
Stonewall	Montezuma	50 h, 25 b	50 h, 25 b	1994 FMUD
Paymaster	Montezuma	5 h	43 h	1994 FMUD
	Monte Cristo	8 h		2002 FMUD
	Sheep Mt.	28 h		2003 FMUD
	Yellow Hills	1		2003 FMUD
	Unallocated	1		2003 FMUD

(*h = horse, b = burro)

Photo 3.0 – A wild stallion in the Montezuma Allotment, with the Paymaster HMA in the background.

Courtesy of Sheri Jay, Tonopah resident, 2004.

Map 11.0 - Herd Management Areas (HMAs) of the Montezuma Complex.

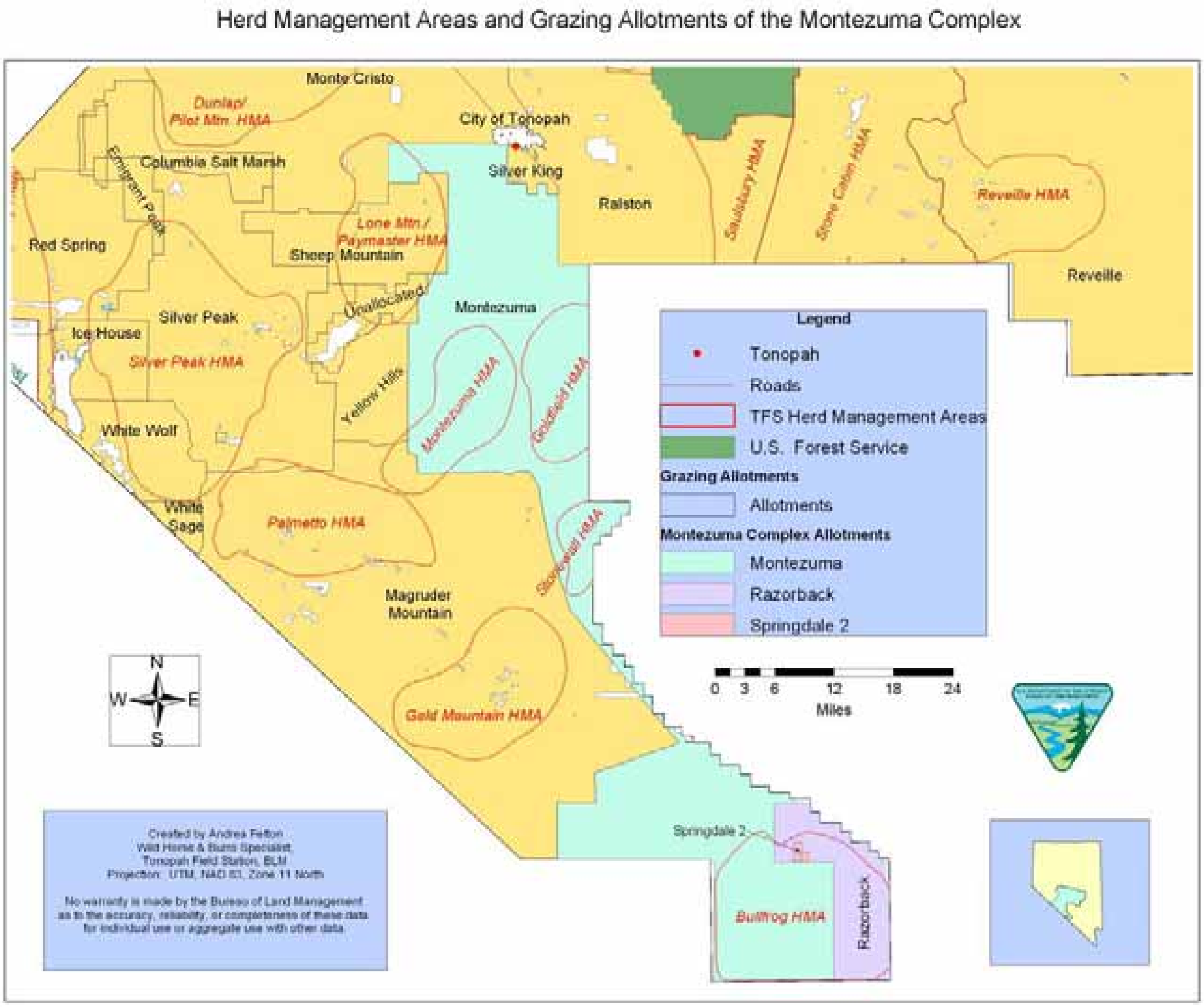


Photo 4.0 - Burros in the Bullfrog HMA

Courtesy of Andrea Felton, WH&B Specialist, BLM, TFS, Bullfrog HMA, Montezuma Allotment, Beatty, Nevada.

<u>The Montezuma Complex HMAs</u>

General discussion related to the Montezuma Complex HMAs are elaborated below and apply to the Complex as a whole. Specific issues relating to each of the HMAs are detailed in Appendix A.

- ***Lack of forage***

The Montezuma Complex is in a very arid climate with highly variable precipitation levels from year to year and season to season. Yearly average precipitation in the Montezuma Complex is 5.24” in Tonopah, 4.17” in Magruder Mountain Allotment, and 6.2” in Beatty. This precipitation data indicates frequent droughts across the Montezuma Complex. There have been numerous dry periods, such as when a drought lasted from 1956 to 1961, or another severely existed between June 1995 and April 1996, when total precipitation in Goldfield was a mere 2.22 inches, or 42 percent of normal precipitation. The most recent dry period started in December 2001 and ended April 2003. For this reason, stocking rates for livestock and wild equids should be conservative to avoid damaging vegetation and unnecessary stress on the animals due to lack of forage.

The shrub plants dominate the Montezuma Complex due to the extremely arid climate and the poorly developed soils. In extremely dry years like 1996 and 2002, there is little to no grass available; perennial bunch grasses die and rhizomatous grasses die back and produce little or no green forage. Because horses are mainly grazers, almost no nutritious forage is available for horse use. The only forage available is old, dry grass with little nutritive value or shrubs. Burros are adaptable, browse when no grass is available, and are better suited to this shrub-dominated habitat.

Current AMLs exceed the carrying capacity of the range. There is not enough grass throughout the Montezuma Complex to sustain viable wild horse populations. Historically large numbers of wild equids caused excessive damage to rangeland resources (both forage and water sources) until most were removed in an emergency drought gather of 1996. Many of these horses had to leave the HMAs to find feed. It became evident that the rangeland of the Montezuma Complex could not sustain the large numbers of animals on the range prior to 1996. Since then, rangeland monitoring has proven that the range cannot even sustain present AML, as evidenced by continued existence of very thin horses seen throughout the Montezuma Complex even though numbers are below AML and almost no cattle are utilizing the allotments.

- ***Drought***

A drought is defined as 75 percent or less than normal precipitation. The Tonopah weather station shows 30 percent, or almost one third, of the years between 1955 and 2005 received below normal precipitation. The majority of these dry years (9 out of the 15) received below 60 percent of normal precipitation. Five of these years, 1956, 1959, 1986, and 2002, received less than 50 percent of normal precipitation. During dry periods, horses in the Goldfield, Montezuma, Stonewall and other HMAs starved.

The Montezuma Complex has a history of drought, necessitating emergency wild horse and burro gathers to prevent starvation of the animals in the area. Goldfield HMA alone was gathered in 1990, 1994, and twice in 1996 due to drought and starvation. The 1996 drought threatened the existence of wild horses and burros in both Esmeralda and Nye counties. Almost no growth occurred on vegetation in the spring of 1996, and horses were consuming dried grasses with little remaining food value. Grass became so scarce that horses were in very poor condition. Burros were thin, but in fair condition. Moreover, neither the horses nor the burros had shed their winter coats, an indication of poor nutrition. Most domestic cattle were removed and placed on their owners' base properties. A combined total of 305 horses, 594 burros and 1 mule were removed from the five HMAs of the Montezuma Complex in 1996.

Another dry period occurred in late 2001 and early 2002 that were similar to the 1995- 1996 situation. However, there were no issues with starving animals in the assessment area during 2002 because the majority of horses and burros had been removed from the assessment area in 1996 and few cattle have grazed the area since 1990.

It became starkly apparent in 1996 that the number of wild horses and burros on the Montezuma Complex far exceeded the carrying capacity of the resources, especially during times of drought. Continued rangeland monitoring and evaluation has determined that present AMLs still exceed the carrying capacity of the range and has led to deterioration of rangeland resources and poor health of the horses, as evidenced by continued existence of very thin horses seen throughout the Montezuma Complex. Over the past 10 years since the 1996 emergency horse gather, the range has not fully recovered, and rangeland health continues to not meet RAC standards. Wild equid numbers at the present AML are not sustainable on this rangeland, and horse health is frequently jeopardized during drought. Essentially the current appropriate management level is no longer appropriate for the Montezuma Complex HMAs, and under RAC Standard and Guideline 4.2, must therefore be re-evaluated and re-established based upon the carrying capacity of the range.

Photo 5.0 -Emaciated Wild Horse on the Montezuma Complex during the drought of 1996.

Courtesy of David Layton, BLM.

The very high numbers of horses and burros inside and outside the HMAs during normal to dry years caused extreme stress to both the animals and to the vegetation in the Montezuma Complex. Very conservative stocking rates for livestock and wild equids need to be established to avoid damaging vegetation and unnecessary stress on the animals due to lack of forage. The majority of the Montezuma Complex is unsuitable habitat for horses. The two pictures below taken during the 1996 emergency gather show the contrast between horse and burro condition due to differing forage preferences. The burros were in much better condition than the horses. Both the horses and burros pictured below were gathered in 1996 from the northern half of the Montezuma Allotment (Montezuma Peak, Goldfield and Stonewall HMAs). Refer to Appendix A for more details on the drought conditions and herd management in 1996.

Photo 6.0 - Starving horses gathered from the Goldfield and Montezuma Peak HMAs during the August 1996 Emergency Gather.

Photo 7.0 - Burros gathered from Goldfield and Montezuma Peak HMAs during the August 1996 Emergency Gather. Due to different diets and foraging patterns, burros were in much better health and body condition than horses gathered from the same area (compare with Photo 6).

- ***Lack of water***

Throughout all of the Montezuma Complex, a severe shortage of water creates a constant concern for the well-being of the wild equids and wildlife in the area, especially during years of drought when many water sources dry up. There are few natural waters in the majority of the HMAs in the Montezuma Complex. Wild horse and burro distribution is limited to a few miles around water sources, and if any source dries up, horses can die before finding an alternate source. Burros appear to be able to withstand the distance between water sources in these instances. In 1996, carcasses of wild horses and wildlife were found at dried-up springs in Goldfield, Stonewall, and neighboring Silver Peak HMAs.

Water developments have improved many springs throughout the Montezuma Complex. However, many of these range improvement projects are in need of repair to function properly. Details of these water sources are found in the Montezuma Complex Rangeland Health Evaluation, Appendix A.

Table 32.0 -AUMs unavailable for wild equid use due to lack of water in large areas of the HMAs.

HMA Name	Percent of AUMs * Unavailable
Montezuma Peak HMA	33%
Goldfield HMA	56%
Stonewall HMA	73%
Bullfrog HMA west	18%
Bullfrog HMA east	77%
Paymaster	0%

*Based on burro AUMs available within four miles from water.

- ***Genetic diversity of the wild horse and burro populations***

During the 2003 gather of Silver Peak HMA, which neighbors Paymaster and Montezuma Peak HMAs, blood samples were drawn from 57 horses. Genetic analysis was conducted and a variety of genetic variability measures were analyzed from the gene marker data. Results of the 2003 genetic analysis indicated that the genetic variability of the Silver Peak herd was low and that the herd was in danger of inbreeding.

There is concern that similar inbreeding issues may also be occurring in the Montezuma Peak and Paymaster herds. During the Paymaster HMA gather in September 2006, genetic blood samples were taken from 27 horses released back onto the Paymaster HMA. Results are pending and should be available in 2008.

The wild horses and burros can readily move between the Montezuma Peak HMA and the Paymaster HMA. There is no fence between the Montezuma and Sheep Mountain Allotments blocking this movement. This exchange of animals allows some genetic diversity of the smaller populations of these two individual HMAs. However, these herds have been fairly isolated from other herds since the 1970s, and emergency gathers have subsequently reduced genetic variability throughout the region.

As long as the area between Paymaster and Montezuma Peak is unfenced, horses and burros would not be isolated from each other. However, research indicates that at least 150 or more horses make a genetically viable population without the need for further management. The combined number of horses the Montezuma Peak and Paymaster HMAs habitat can sustain is between 46 and 55 horses. Therefore, if wild horses were removed entirely from Montezuma Peak HMA, they would also need to be removed from Paymaster HMA or risk certain inbreeding.

Following the analysis of the Paymaster genetic information, genetic variability of the herd would be identified and determinations made for future management needed to ensure genetic health of the herd. The high incidence of club-foot in the Paymaster HMA in 2007 indicates a possible problem with genetics within this herd. If it is found that the Paymaster horses are showing signs of inbreeding, it is probable that future management would include complete removal of horse herds from both the Paymaster and the Montezuma Peak HMAs. The Montezuma Peak and Paymaster HMAs are suitable burro habitat, and grazing AUMs could be transferred to those wild equids instead.

Furthermore, future management may involve the introduction of female burros from neighboring HMAs in the Las Vegas district and California to add to the genetic diversity of the burro herds throughout the Montezuma Complex.

- ***Environmental Consequences of the Proposed Action***

Re-establishment of AML is necessary for the health of both the rangeland and the wild horse and burro herds and would create a means of managing minimum and maximum herd sizes for each HMA within the natural ecological balance of their habitat. A reduction in AML would decrease competition between wild equids and wildlife that utilize the same limited resources. The Proposed Action would improve overall habitat quality for both wild horses and burros. This would lead to improved body condition, healthier foals, and ensure herd sustainability through drought years. Furthermore, when the Tonopah RMP is amended to allow burros onto Montezuma Peak and Paymaster HMAs, burros would benefit from increased habitat space and resources, as well as increased genetic viability with neighboring burro herds.

The Proposed Action would re-establish AML for the Paymaster, Goldfield, Montezuma Peak, Stonewall and Bullfrog Herd Management Areas (HMAs) as described in Table 33.0. These numbers represent only habitat that is currently available, without the additional acreage possible if water sources are developed in areas currently without water. For the number of animals possible if water sources are developed, refer to Table 14.0 of this EA. These proposed AMLs would be established as a range between minimum and maximum AML.

Table 33.0 - Proposed AUMs and AMLs for wild horses or burros in the Montezuma Complex HMAs.

Herd Management Area	AUMs Burro*	AML range Burro*	AUMs Horse	AML range Horse
Montezuma Peak HMA**	653	34 - 54***	†	0
Paymaster HMA**	0**	0**	0**	0**
Goldfield HMA	449	24 - 37	0	0
Stonewall HMA	99	5 - 8	0	0
Bullfrog HMA west	823	43 - 68	0	0
Bullfrog HMA east‡	283	15 - 23	0	0

* Due to variable precipitation, frequent droughts, and low potential of the vegetation community to produce quality forage, this evaluation calculated AUMs based on 1 burro per AUM, as per 43 CFR 4130.8-1c.

** At this time, no AUMs would be allocated to the small portion of Paymaster HMA that lies within Montezuma Allotment. This area has been historically over-allocated and overgrazed, and rest is necessary to achieve RAC standards. The 1997 Tonopah RMP does not allot AUMs/AML to burros in the Montezuma Peak or Paymaster HMAs. A revision to the RMP, scheduled for approximately 2009 would address this issue and amend it to allow for burros in both of these HMAs. The proposed AML above is subject to change per the RMP amendment.

***AML range represents the minimum and maximum number of horses or burros for each HMA. The maximum AML equals the AUM / 12 months. The minimum AML equals the maximum AML minus a 14 percent population increase x 4 years. The 4 years represents the time in which a wild equid population can double in size, reach maximum AML, and need to be gathered.

† Horses would temporarily be permitted inside this HMA until the RMP is amended in the small portion of Montezuma Allotment.

‡ Includes parts of Montezuma and Razorback; and all of Springdale 2 Allotments.

Impacts of the Proposed Action would include improved overall health and condition of wild horses and burros throughout the Montezuma Complex due to more available forage and water. It also results in meeting, or working towards meeting, RAC standards for rangeland resources. Livestock would not be authorized to graze within the HMAs because the forage resources are limited and the carrying capacity cannot support two large herbivores in the same habitat. Under such management, key forage species could increase, and springs and riparian areas would continue their upward functional trends.

The Proposed Action would reduce the number of wild horses in the assessment area. The reasons for this Proposed Action are discussed in detail throughout this EA and in Appendix A. Such a reduction in population could impact genetic diversity among the wild horse herds throughout the Montezuma Complex and in neighboring HMAs. Genetic baseline data have been collected from the Paymaster HMA in 2006 and results would be carefully examined to determine future management of the Paymaster and Montezuma horse herds. Genetic variability of wild burros is not likely a problem due to movement across the Nevada Testing and Training Range, the Las Vegas District, and California. However, during future gathers of Montezuma Complex burros, baseline genetic data would be sampled and examined for future management, as well.

Indirect impacts of the Proposed Action would result in meeting, or working towards meeting, RAC standards for rangeland resources. Key forage species could increase, and springs and riparian areas would continue their upward functional trends, which would benefit wild horses within the area.

- ***Environmental Consequences of Alternative 1***

Under Alternative 1, the direct and indirect impacts on wild horses and burros would the same as those identified for the Proposed Action.

- ***Environmental Consequences of No Action Alternative***

Current AMLs exceed the carrying capacity of the range. If wild equids were allowed to eventually reach and exceed current AML, there would continue to be a shortage of forage, especially in dry years. Direct impacts of the No Action Alternative would also include further deterioration of the range and increase the risk of starvation of horses during times of drought, subsequently requiring emergency horse gathers. The horses assigned to the Paymaster HMA would continue to drink out of the Tonopah sewer ponds. Wild equids would continue to reside in horse-free areas, over-utilizing the rangeland forage and damaging vital water sources.

Some people advocate to "let nature take its course." However, if the wild equid population is allowed to increase under the No Action Alternative, the population would be put at risk of starvation. There are few natural predators in the Montezuma Complex large enough to prey on wild horses or burros, and present laws prohibit the taking of any wild horses or burros off the range by the public. Therefore, the only means for nature to intervene would be through starvation and/or thirst, an option that is unacceptable by the BLM and most members of the public.

The no action alternative would violate the Wild Free Roaming Horse and Burro Act, Federal Regulations, BLM Policy and RAC Standards and Guidelines.

The indirect impacts of the No Action Alternative would be that non-attainment of the Tonopah RMP objectives, Standards for Rangeland Health and multiple use objectives would continue. The non-attainment of the standards would not provide for wildlife, wild horse and livestock habitat requirements throughout the allotment. Refer to Appendix A for a more detailed discussion.

3.3.7 Wildlife

The Montezuma Complex provides habitat for a host of wildlife species. The Mojave Desert within the assessment area is the most diverse animal community in the Tonopah Planning Area. There are federally listed species, such as the threatened Mojave population of desert tortoise (*gopherus agassizii*). There are BLM sensitive species, such as the Amargosa toad (*Bufo nelsoni*), chuckwalla (*Sauromalus obesus*), and Oasis Valley speckled dace (*Rhinichthys osculus ssp* .). The desert tortoise, chuckwalla, Amargosa toad and Oasis Valley speckled dace are found only in the southernmost portion of Montezuma and Razorback Allotments within the Mojave Desert.

Big game species include desert bighorn sheep (*Ovis canadensis nelsoni*), mule deer (*Odocoileus hemionus*), and pronghorn antelope (*Antilocapra americana*). Small game species occur, such as chukar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), and desert cottontail (*Sylvilagus audoboni*). Predators include the mountain lion (*Felis concolor*), bobcat (*Links rufus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), and kit fox (*Vulpes macrotus*).

There is also the basic component of non-game species of lizards, birds, and rodents. These species are found throughout the Montezuma Complex in Mojave, Mojave transition, and southern Great Basin vegetation zones.

There is an existing draft of the "Bullfrog Habitat Management Plan" (HMP) for the southern portion of the Montezuma Complex that includes all public lands north of the Death Valley National Monument, east of the California state line, southeast of Nevada State Highway 267, and west of the Nevada Training and Test Range. It includes all of the Razorback and Springdale 2 allotments, as well as most of the southern portion of the Montezuma Allotment. A letter was sent to interested parties soliciting comment in November of 1991, but there is no signed final draft on file in the Tonopah BLM office. This document contains a significant amount of monitoring data gathered and would be referenced throughout this section. The Tonopah RMP (1997) contains directions to complete a Wildlife HMP for the area. The HMP would be achieved through the Rangeland Health Assessment, the technical recommendations, this EA, and Multiple Use Decision. Please refer to Appendix A – Montezuma Complex Range Health Evaluation for wildlife species listing and their corresponding habitat descriptions.

Photo 8.0 - Desert Bighorn Sheep in the Stonewall Mountain Range

Courtesy of Bryson Code, Wildlife Biologist, BLM, TFS.

- ***Environmental Consequences of the Proposed Action***

The direct impacts of the Proposed Action are the following: 1) new AUM allocations for livestock, 2) readjustment of AMLs for wild horses and burros, and 3) no AUMs for livestock would be authorized inside HMAs (with the exception of the Northern portion of the Bullfrog HMA). The factors would have a positive impact on the wildlife habitat by reducing and preventing the potential effects of over-utilization on the forage resources. The carrying capacities were developed based on a conservative approach, which took into consideration the frequent cyclical droughts, the availability or the lack of forage and the quantity of forage. These features would also have positive impacts on the wildlife habitat by assuring adequate cover and forage for the wildlife species and their corresponding habitats.

Livestock AUMs would not be allocated in the desert tortoise habitat so that competition between the two animals would be eliminated. The desert tortoise diet overlaps with that of cattle diet, the very limited forage resources and the vegetation types in the Complex does not lend itself to favorable cattle grazing conditions.

The Proposed Action is expected to improve the vegetative community by enhancing soil site stability through limiting the redistribution of and loss of soil resources by wind and water. The expected improvements in upland and riparian habitats as a result of the decreased AUM allocations for livestock and for horses and burros would be beneficial for many wildlife species. Habitats for wildlife are expected to improve throughout the allotment as a result of the proposed action. Key forage plants would be provided rest during critical growing periods and utilization of these resources would be limited. The Proposed Action would be beneficial to various habitat conditions by providing key forage plants with rest from use during critical growing periods and by limiting utilization. There would be less competition for the forage resources as new AUMs and AMLs are established for the Complex. Refer to the RHE for detailed descriptions of each wildlife species and their habitats.

The indirect impact to wildlife would be that the management actions would ensure that progress towards the attainment of the multiple use objectives, allotment specific objectives and the Standards for Rangeland Health throughout the Montezuma Complex would occur.

- ***Environmental Consequences of Alternative 1***

Under Alternative 1, the impacts on wildlife species would be the same as those described in the Proposed Action.

- ***Environmental Consequences of the No Action Alternative***

Under the No Action Alternative, the current grazing management practices would continue. Direct impacts to wildlife and their habitats would be: that the health of wildlife habitat would continue to decline as a result of periodic excessive use by wild horses and burros at riparian areas. There would also be continued competition for forage resources and habitats by the many species that utilize the rangeland resources.

Indirect impacts of the No Action Alternative on wildlife would include decreased rangeland health conditions which would result in non-attainment of the multiple use objectives, allotment specific objectives and the Standards for Rangeland Health throughout the Montezuma Complex.

3.3.8 Migratory Birds

A large number of migratory birds could be expected to nest in the evaluation area. Salt desert scrub nesting migrants such as the lesser nighthawk, loggerhead shrike, burrowing owl, horned lark, Brewer's sparrow, black-throated sparrow, lark sparrow, and rock wren could be found throughout the valleys and lower hills in the assessment area. Sagebrush nesting migrants such as the prairie falcon, sage sparrow, sage thrasher, vesper sparrow, western meadowlark, and green-tailed towhee may be found in the lower hills of the Montezuma Range, the Bullfrog Hills and Bare Mountain. Pinion-juniper nesting migrants such as pinion jay, scrub jay, black-billed magpie, Clark's nutcracker, mountain chickadee, gray vireo, black chinned sparrow, Cassin's kingbird, spotted towhee, blue-gray gnatcatcher, common bushtit, chipping sparrow, ferruginous hawk, gray flycatcher, juniper titmouse, mountain bluebird, western bluebird, Virginia's warbler, black-throated gray warbler, and Scott's oriole may also be found in the higher elevations of the Montezuma Range and Stonewall Mountain.

Migratory birds are given special status because of their recognized ecological and economic value to the United States and other countries. There are a number of laws that exist to protect migratory birds and their habitats. These laws include the Bald Eagle Protection Act, Migratory Bird Conservation Act, Fish and Wildlife Coordination Act, Executive Order 13186 for the conservation of Migratory Birds, but perhaps the most relevant current law is the Migratory Bird Treaty Act (MBTA). The MBTA outlines the protections afforded to every species of migratory bird and the penalties for violations. The regulations under the MBTA cover every native species of bird in the United States except for gallinaceous upland game birds. Please refer to Appendix A – Montezuma Complex Range Health Evaluation for wildlife species listing and their corresponding habitat descriptions.

- **Raptors**

The raptors likely to occur in the Montezuma Complex are American kestrels, great-horned owls, red-tailed hawks, prairie falcons, ferruginous hawks, Swainson's hawks, and golden eagles. Of the 33 bird species identified as BLM Sensitive species, ten of them can be considered raptor species. The potential for these species to occur and the possible impacts to these species will be discussed in the BLM Sensitive Species section.

- **Shorebirds**

Playas and ponds in the Montezuma Complex provide some marsh habitat in wet years.

- ***Environmental Consequences of the Proposed Action***

Under the Proposed Action direct impacts would include a reduced potential for over-utilization of the evaluation area by livestock and wild equids due to a reduction of AUM's and AML. The potential cause for over-use is by the periodic overpopulation of the area by wild horses and burros. The Proposed Action would decrease this potential by establishing new AML ranges for the HMAs and by limiting livestock grazing within these HMAs.

Indirect impacts as a result of the Proposed Action would be that there would be an improvement of a vast majority of the migratory bird nesting habitat within the Montezuma Complex. These proposed management actions would ensure that progress towards the attainment of the multiple use objectives, allotment specific objectives and the Standards for Rangeland Health throughout the Montezuma Complex would occur.

- ***Environmental Consequences of Alternative 1***

Under Alternative 1 impacts to migratory birds would be the same as those described for the Proposed Action

- ***Environmental Consequences of the No Action Alternative***

Under the No Action alternative, current grazing management practices would continue. The potential for impacts to the migratory bird nesting habitat, such as reduced habitat quality and quantity, within the evaluation area would continue to exist. The evaluation area would have the potential to be over allocated to livestock and wild equids and there would continue to be an elevated potential for impacts caused by over grazing. Under the No Action alternative there would continue to be periodic overuse by wild equids as the current AMLs number are too high for the carrying capacities of the habitats

Indirect impacts of the No Action Alternative on migratory birds would include decreased rangeland health and migratory bird habitat conditions which would result in non-attainment of the multiple use objectives, allotment specific objectives and the Standards for Rangeland Health throughout the Montezuma Complex.

3.3.9 Threatened, Endangered and Candidate Species

There are no Threatened, Endangered, or Candidate plant species in the Montezuma Complex. Three threatened or endangered animals that are found within the Complex include the bald eagle, the desert tortoise, and the southwest willow flycatcher. One candidate animal species, the yellow-billed cuckoo, can also be found within the Complex.

The Tonopah Resource Management Plan (RMP), dated October 2, 1997, contains the following determination for the specific management of the desert tortoise habitat in resource the area: Determination No.2 provides for the management of desert tortoise Non-Intensive Category III habitat to maintain current population levels.

There are historic records of the bald eagle in the Montezuma Complex. However, there is no critical habitat or nesting habitat for the eagle in the Complex. The desert tortoise occurs on the southernmost part of the Montezuma and Razorback Allotments (refer to Map 3.0). Both the southwest willow flycatcher and the yellow-billed cuckoo have been seen in Oasis Valley, but no breeding pairs have been found. There is no critical habitat for any of these four animals found on the Tonopah Planning Area.

Migrant southwestern willow flycatchers have been recently observed on private land located within the Oasis Valley, Nevada, just north of Beatty. There is the potential for the willow flycatchers observed in Oasis Valley to be of the Rocky Mountain/Great Basin variety (*E. t. adastus)* or the Western variety (*E. t. brewsteri).* Oasis Valley lies on the fringe of these varieties habitats, and there is overlap between the varieties. Variety *brewsteri* has been observed in Ash Meadows. Please refer to Appendix A – Montezuma Complex Rangeland Health Evaluation for wildlife species listing and their corresponding habitat descriptions.

- *Environmental Consequences of the Proposed Action*

Under the Proposed Action there would be potential improvements to the threatened or endangered and candidate species habitat within the Montezuma Complex. Direct impacts would include: reduced impacts to the habitat from wild equid utilization as well as domestic livestock utilization as a result of the new AUM allocations and new AMLs that would be established. The improvement in riparian habitat would continue under the conservative stocking rate proposed for both wild equids and livestock.

Under the Proposed Action there would be no change or positive change to the impacts of the Federally Threatened desert tortoise. This is because there would be no livestock grazing within current established category III habitat for the tortoise, within the evaluation area. Furthermore, there would be no wild horses or livestock allowed in desert tortoise habitat within the evaluation area, and a small reduction in the number of wild burros.

Under the Proposed Action there would be no change to the impacts of the Federally Threatened bald eagle. This is because there is no critical habitat or nesting habitat for the eagle within the evaluation area.

Indirect impacts of the Proposed Action would be that there would be an improvement of habitats for Threatened, Endangered and Candidate Species within the Montezuma Complex. These proposed management actions would ensure that progress towards the attainment of the multiple use objectives, allotment specific objectives and the Standards for Rangeland Health throughout the Montezuma Complex would occur.

- *Environmental Consequences of Alternative 1*

Under Alternative 1, impacts on Threatened, Endangered and Candidate species would be the same as those described above for the Proposed Action.

- *Environmental Consequences of No Action Alternative*

Under the No Action Alternative the current grazing management practices would continue. As wild equid numbers increase in the future towards the current AML, there would be adverse impacts to the threatened or endangered and candidate species habitat throughout the Complex from the periodic excessive use by wild horses. This impact would be primarily at riparian areas where over-use by wild horses reduces the habitat

Because there is no critical nesting habitat for the bald eagle, there would be no impacts expected to the species under the current management.

Indirect impacts of the No Action Alternative on Threatened, Endangered and Candidate species would include decreased rangeland health and habitat conditions which would result in the non-attainment of the multiple use objectives, allotment specific objectives and the Standards for Rangeland Health throughout the Montezuma Complex.

3.3.10 Special Status Species

A review of the current Nevada BLM Sensitive Species list shows that there are 31 mammals; 33 birds; 6 reptiles; 3 amphibians; 26 fishes; 26 snails; 1 clam or mussel; 2 Ants, Wasps, or Bees; 1 true bug, 14 beetles, and 28 butterflies within the state. A designation of "BLM sensitive" affords these species the same level of protection as is provided for candidate species under BLM manual 6840.06 C. After a thorough review of data from the Great Basin Bird Observatory, Audubon Society, Partners In Flight, Nevada Natural Heritage Program, NDOW, BLM, and USFS, two effects analysis tables were compiled and warranted more analysis and that analysis is presented in this section in narrative form. For a species to receive further consideration, it must have exhibited at least low potential to exist on the allotment and have at least one probable conflict with either livestock or wild equids. Please refer to Appendix A – Montezuma Complex Range Health Evaluation for wildlife species listing and their corresponding habitat descriptions.

- ***Environmental Consequences of the Proposed Action***

Under the Proposed Action, there would be potential improvements to the BLM Sensitive Species habitat within the evaluation area. There would be a reduced impact to the habitat from wild equid utilization as well as domestic livestock utilization. The improvement in riparian habitat would continue under the conservative stocking rate of both wild equids and livestock.

- ***Environmental Consequences of Alternative 1***

Under Alternative 1, impacts on Special Status and BLM Sensitive Species would be the same as those described above for the Proposed Action.

- ***Environmental Consequences of the No Action Alternative***

Under the No Action Alternative, the current grazing management practices would continue. As wild equid numbers increase in the future towards the current AML, there would be adverse impacts to the sensitive species habitat throughout the Complex from the periodic excessive use by wild horses. This impact would be primarily at riparian areas where over-use by wild horses reduces the habitat.

Indirect impacts of the No Action Alternative on BLM sensitive species would include decreased rangeland health and habitat conditions, which would result in the non-attainment of the multiple use objectives, allotment specific objectives and the Standards for Rangeland Health throughout the Montezuma Complex.

3.3.11 Water Quality

There is no water quality data for the riparian areas in the assessment area. Prior history has demonstrated that where wild horses, cattle and burros have access to the spring sources, the state water quality criteria may not be met. Cattle are not at this time causing any impact on riparian areas in this assessment area because they have had limited access to the spring sources since 2001.

- ***Environmental Consequences of the Proposed Action***

Under the Proposed Action, there would be a reduction in both wild equid AML and livestock AUMs. Subsequently, there would be a potential improvement in the water quality of the springs. This Proposed Action may currently be impacted by these animals because the animals would be reduced or fenced out.

- ***Environmental Consequences of Alternative 1***

The impacts on the water quality would the same as the Proposed Action.

- ***Environmental Consequences of the No Action Alternative***

Under the No Action Alternative the current wild equid numbers and livestock AUMs would continue. There would continue to be impacts to the spring sources that are currently being negatively impacted by these classes of animal.

The RMP objectives would continue not to be met if current management continues.

4.0 Cumulative Impacts

The Council of Environmental Quality (CEQ) regulations implementing NEPA defines cumulative impacts as "…The impact on the environment which results from incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectivity significant actions taking place over time" (40 CFR.1508- 7)."

Impacts of the Proposed Action and Alternatives presented in this EA are assessed for cumulative impacts with other actions conducted in the region. The Montezuma Complex consists of the Montezuma, Razorback and Springdale II Allotments. Unless otherwise specified, the Cumulative Effects Study Area (CESA) for all resources in this EA is the Montezuma Complex.

This analysis considers the effects of the Proposed Action and Alternatives as evaluated in detail in Chapter 4, when combined with the effects of other past, present, and reasonably foreseeable future actions in the affected region. Since the Proposed Action is the issuance of renewed and new grazing authorization and the readjustment in AMLs and as well as the Alternative involves no ground-disturbing activities, no direct impacts would occur that would; contribute to cumulative conditions in the affected area. Past, present and reasonably foreseeable future actions that have been identified are described below.

The Montezuma Complex consists of the Montezuma, Razorback and Springdale 2 Allotments. This Complex has been determined to be the geographic boundary for the cumulative impacts associated with the Proposed Action and past, present, and reasonably foreseeable future actions.

Past, Present, and Reasonably Foreseeable Actions

Table 35.0 - The Past, Present, and Reasonably Foreseeable Future Actions applicable to the assessment area are identified as the following:

Project Name or Description	Status (x)		
	Past	Present	Future
Issuance of multiple use decisions and grazing permits for ranching operations through the allotment evaluation process and the reassessment of the Montezuma, Razorback and Springdale 2 Allotments.	x		x
Wild horse and burro gathers and decisions	x	x	x
Off Highway Vehicle (OHV) races		x	x
Construction of exclosures around springs	x	x	x
Water development	x	x	x
Fence construction	x		x
Mineral exploration	x	x	x
Abandoned mine lands reclamation			x
Woodcutting, pine nut and other desert plant harvesting	x	x	x
Invasive weed inventory/treatments	x	x	x
Vegetation rehabilitation treatments		x	x
Electrical transmission lines and communications sites construction	x		x
Wildlife guzzler development	x		x

Any future proposed projects within the Montezuma Allotment would be analyzed in an appropriate environmental document following site specific planning. Future project planning would also include public involvement.

4.1 Effect of Past, Present, and Reasonably Foreseeable Future Actions of the Proposed Action.

4.1.0 Cultural Resources

The effects of past and present actions were discussed in the Environmental Consequences section of this document. The effects of the reasonable and foreseeable future actions for the Complex are as follows: reduced AMLs and revised AUM allocations would be expected to have a positive impact on cultural resources. Riparian exclosures, fencing, and wild horse and burro gathers could be expected to occur in the area in the future. Future projects may be implemented to provide for protection of sensitive riparian areas and lead to the attainment of the Standards for Rangeland Health for all springs in the assessment area. The reduction of wild horses, burros, and livestock use and trampling would, in the foreseeable future, reduce the impact to cultural sites in the assessment area.

Cattle and horses tend to make trails along fence lines. This behavior can impact cultural resources located along fence lines. However, proposed fence lines are surveyed for cultural resources before installation and NEPA analysis is completed on all fence projects.

Additional water haul sites may also be approved to improve the distribution of livestock. These sites would also be approved only in areas with no cultural impacts. This lessens the trampling impact on cultural sites, in the foreseeable future.

A cultural resources inventory would be completed prior to any future surface disturbing activities that may be proposed for this site, followed by site-specific planning and NEPA analysis.

4.1.1 Migratory Birds

There is no data available on historic numbers or distribution of migratory birds within the analysis area. However, it can be reasonably assumed that if a historic (recent or far removed) actions reduced the amount or quality of nesting habitat for a particular species within the analysis area, there would have been a reduction in the population or distribution of that species. Historically (mid 1800's) there was more livestock use in the area then there is currently. However, during that same period there was much less use by wild equids. Livestock use and wild equid use since approximately 1971 has been leading to a reversal of the situation with more wild equid use and less livestock use. It is unclear what balance was struck in the past between the levels of use by the classes of animals and how that relates to the current conditions. So therefore, it is unclear how that may have impacted the migratory bird populations in the past. The proposed reductions in livestock AUMs and wild equid AML are necessary for the health of the rangeland in general and therefore the reasonably foreseeable future health of the migratory bird habitat.

4.1.2 Threatened or Endangered (plants and animals)

There are no Threatened or Endangered plants found within the assessment area. The desert tortoise and bald eagle are the only animal species identified to be possibly found within. No impacts are expected to the bald eagle because there is no critical habitat found in the assessment area. No impacts to the desert tortoise are expected due to the 50% reduction in AUMs allocated for wild burros use within the desert tortoise habitat. In addition, livestock AUMs would not be allocated in the desert tortoise habitat. For a more detailed discussion on the bald eagle for each allotment, refer to Appendix A, Montezuma Complex Rangeland Health Evaluation.

The removal of the sensitive riparian habitat into private ownership would be an issue. Other federal actions that may affect the flycatcher habitat include: ACEC plan amendment, Rights-of-way, R&PP Lease actions, wind towers, utility lines, weed control - saltcedar and Russian olive invasion, activities that affect riparian habitat condition, water developments and/or diversions, and river corridor flood control, and vegetation.

State sensitive species may be positively impacted with the decrease in wild horse numbers. The positive impacts would be increased cover, reduce competition between wild equids, wildlife for forage resources and decrease competition for water and maintaining and improving the riparian conditions.

4.1.3 Water Quality

No threats have been identified to the quality of water in the assessment area. It is expected that decreases in livestock and wild horse use and fencing water sources would help to improve water quality in the future as previously discussed in the Environmental Consequences section of this EA.

4.1.4 Wetlands and Riparian Zones

Many of the small springs and seeps have been developed for livestock water purposes in the Montezuma Complex. Some springs no longer have surface water (some seeps may not have had surface water before development). Riparian areas comprise less than 1% of the assessment area. Some springs do not provide reliable perennial flow during drought cycles. Most of the range improvements on the springs are currently in a nonfunctional condition. Despite the defunct condition of many of the improvements, the majority of riparian acreage is currently rated at PFC.

Construction of exclosures around springs has been considered in the past and present but never implemented. It is anticipated that in the foreseeable future such activities could be initiated to further promote and maintain proper functioning condition of the lentic and lotic riparian habitats. This cumulative impacts of the Proposed Action would benefit from this action by protecting wetlands and riparian zones. However, these actions would have to be analyzed in separate environmental analysis in accordance with the NEPA as they are proposed

Future range management activities would require all of these range improvement projects to be repaired and/or riparian areas brought to PFC, or made significant improvement toward PFC.

The increase of wild horse or burro numbers over the years would cause a decline in riparian condition. The increase in wild equids would warrant gathers to maintain AMLs.

4.1.5 Grazing Management

The reduction of permitted livestock AUMs would reduce the potential size of the livestock operation. However, the issuance of a ten-year grazing lease would provide a more stable economic base of the potential users in the foreseeable future.

The effects of the reasonable and foreseeable future actions within the Complex are as follows: Invasive weed treatments (as weeds are found) and water developments would benefit grazing management by improving rangeland and increasing the amount of available forage for livestock use. Fencing riparian areas would limit the amount of forage available to livestock use by a very small amount. The small size of these riparian areas limits the effect the loss of this forage would have on livestock operations.

4.1.6 Socioeconomics

The economic benefits of the Proposed Action would provide some benefits to the authorized user, and Esmeralda and Nye Counties. The benefits would remain the same or increase the disposal income of the users and provide limited revenue to the counties. The Proposed Action would provide a stable economic basis to the user by assuring the availability of grazing leases to the authorized users.

4.1.7 Vegetation

Building projects such as, fences, water hauls, riparian exclosures, would damage or remove a small amount of vegetation. These types of projects would be analyzed in a separate environmental analysis in accordance with the NEPA as they are proposed.

Reducing the number of livestock and wild horses that can be stocked in the assessment area would ensure the vegetation types can progress toward an increase in overall desirable plant production. This improvement would occur on more productive sandy sites. The less productive soils have little potential to change.

With the removal of burros in 1996 and the conservative stocking rate in the Proposed Action, white bursage and other important forage species would continue to increase.

Eliminating livestock and wild horses in these areas and stocking burros conservatively in these sites would ensure this vegetation type can progress toward an increase in overall desirable plant production

The acreage of riparian areas at PFC would increase under a lighter stocking rate for livestock and wild equids.

Vegetation rehabilitation treatments would not likely occur given the site limitations of the Montezuma Complex except for the protection of life and property. It is not anticipated in the foreseeable future that any such treatment would be considered. Rather, vegetation management would be the key to assure the health of the rangeland resources.

4.1.8 Wild Horses and Burros

Future management of the Montezuma Complex wild horse and burro populations must account for the impacts from past and future gathers, little forage and water, genetic issues, and the threat of drought. Cumulatively, these issues create challenges for future management of the health and welfare of horse and burro herds, as well as maintaining healthy rangeland resources.

The gathers of 1995 and 1996 caused enormous impacts on the Montezuma Complex wild horse and burro herds. Between the summer of 1995 and the autumn of 1996, nearly 1400 wild equids were removed from the area (refer to Appendix A, Wild Horse and Burro Section). It was assumed at the time that many burros had been missed during the gathers, so very few animals were returned to the range at that time. However, subsequent monitoring (road counts and census flights) indicate that few animals remained on the HMA to reproduce. Therefore, future management of a self-sustaining population of burros depends upon allowing the present populations to increase to AML and disperse across the HMAs. Future gathers must focus on genetic viability and phenotypes of the wild equid populations of the Montezuma Peak herds.

Foreseeable Future Action would be in which wild horse and burro removals would adhere to the selective removal policy in place at the time of the gather. Future gather plans would address the relevant issues at the time, as well as follow guidelines and management actions addressed in the forthcoming RMP revision and Herd Management Area Plans. All gather plans would require appropriate NEPA coordination. All of the HMAs in the Montezuma Complex are currently well below AML and none are scheduled to be gathered until 2010 or later, unless emergency situations warrant removal of some starving horses and/or burros. Currently populations are at a level that only the most severe drought or otherwise adverse conditions would warrant a gather before 2010.

The Montezuma Complex wild horse and burro population sizes would need to be closely monitored for recurrent starvation issues and for any signs of inbreeding. Aerial censuses would need to be conducted every 3-4 years as the budget allows monitoring of wild horses and burros health and condition across the HMA.

Habitat can be severely damaged before a major impact on wild horse and burro growth rates is seen. Therefore, utilization and trend studies would be necessary to be conducted in conjunction with herd population and condition monitoring. Foreseeable Future Action would be to determine if wild equids are responsible for damaging range improvement projects, such as water sources, guzzlers, exclosures, etc., these areas may have to be fenced off to prevent further damage.

Distribution would be improved if additional water sources in areas currently void of water. Moreover, it is assumed that burros would disperse throughout the allotment, particularly if horses are removed and the niche opens for burro use. Future RMP amendments would permit and even promote this burro dispersal.

Foreseeable Future Action would be for wild horses and burros to be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat. This would entail close monitoring of wild horse and burro herds throughout the Montezuma Complex to ensure inbreeding does not occur. Results of the Paymaster genetic sampling conducted in 2006 would provide information on the timeliness needed to gather wild horses from the Paymaster and Montezuma Peak HMAs. For example, if inbreeding is evident, a gather may be scheduled sooner than normal population increases dictate. However, if inbreeding is not apparent, a gather would be planned as usual based upon herd growth rates and a four-year gather schedule. Moreover, genetic samples would be taken from all burros gathered from across the Montezuma Complex in future gathers to ascertain baseline genetic variation and composition.

Some of the burro herds within the Montezuma Complex are rather small and isolated, while others share boundaries with other HMAs and have adequate genetic variability. The conservation goal for small, isolated herds suggests management that allows for a 90 percent probability that 90 percent of the existing genetic diversity within a herd is conserved over a 200-year period. To achieve this, management options for the Complex herds may include introducing 1-2 mares or jennies every generation to promote genetic diversity (mares and jennies would always be picked up by a male, whereas males may not always influence the gene pool). For the Montezuma Complex, the TFS may bring in jennies from nearby gathers, particularly the Nevada Wild Horse Range or Death Valley National Park, for genetic variability.

Foreseeable Future Action would monitor if the herd size is small and isolated, and feasible methods of mitigating genetic concerns are not possible, then serious consideration should be given as to whether the herd would ever represent a healthy, self-sustaining population.

Details of these management strategies would be addressed in future Herd Management Area Plans.

4.1.9 Wildlife

Past human actions that have had an effect on the wildlife habitat in the assessment area are wild horse and burro management, mining, livestock management, agricultural development, urban development, and various recreation activities. This EA analyzes the environmental effects of continued livestock and wild equid grazing only, which is the relation to the past actions. The Proposed Action is to continue livestock grazing and wild horse and burro management, but at reduced levels compared to recent history. The livestock and wild equid management has an effect on the renewable resources in the assessment area, such as the direct use/removal of vegetation, and water consumption/degradation, and thereby has an impact on the wildlife habitat. Reducing the amount of livestock and wild equid use on the assessment area would allow the renewable resources to recover, benefiting the wildlife habitat on the allotment. In the recent past, wild equids have had more detrimental effects on the wildlife habitat than have livestock. Therefore, subsequent to the reduction in wild equid AML there would be a reasonably foreseeable future impact to the wildlife habitat in the form of reduced riparian utilization, reduced upland grass utilization, and reduced potential for direct competition between the introduced and native ungulates. This would likely increase the frequency, distribution, and vigor of the upland grasses, as well as the extent, functionality, and vigor of the riparian areas.

The effects of the reasonably and foreseeable future actions within the Montezuma Complex are as follows: Establishment of riparian exclosures, vegetation rehabilitation treatments, sage grouse habitat improvement projects, wildlife guzzlers, reclamation of abandoned mine lines, and invasive weed treatment would be beneficial to wildlife throughout the Montezuma, Razorback, and Springdale 2 allotments. These projects would provide for the long-term sustainability and health of wildlife due to increased forage production and water availability, which would lead to the attainment of the Standards for Rangeland Health. Fences would be constructed with white-topped posts in order to make fences more conspicuous. Flagging may also be placed on fences in order for further increase the conspicuousness to wildlife, particularly sage grouse. Fences would be constructed to BLM specifications to facilitate the movement of mule deer and pronghorn.

Following a wildfire, rehabilitation of the area would occur, which is expected to improve wildlife habitat by preventing or limiting the occurrence of cheatgrass and other invasive species in the burn area. Mineral and geothermal exploration may temporarily displace wildlife species and may result in the loss of accessibility to historical use areas in the allotment depending on the size and location of the exploration projects. Geothermal utilization stage operations may result in increased acreage of disturbance, which would increase the number of acres disturbed from exploration activities. Wildlife may be displaced and habitat may be lost, at least temporarily, from these mining related activities. Future wild horse and burro gathers may also result in the temporary displacement of wildlife species.

4.2 <u>Effect of Past, Present, and Reasonably Foreseeable Future Actions of Alternative 1.</u>

The cumulative impacts on all resources but grazing management would be the same as those described for the Proposed Action. Alternative 1 is similar to the proposed action with the exception of offering Mr. Bud Johns the ten-year grazing lease to graze on Pasture 1 North while making the other pastures available for TNR grazing. However, this pasture is recovering from drought and over-utilization from wild horses and would not be available during the critical grazing growing period of the plants until 2010.

Cumulative impacts as a result of the Proposed Action would be positive in nature and are considered negligible. Any actions proposed in the future in the CESA would be analyzed at the time they are proposed under a separate environmental analysis.

4.3 Effect of Past, Present, and Reasonably Foreseeable Future Actions of the No Action Alternative.

4.3.0 Cultural Resources

Under the No Action Alternative, cumulative impacts expected include the continuation of wild equids, as they approach current AML, to trample or expose cultural sites at current levels. Wild equid gathers may threaten or expose cultural sites. Gathers and other proposals on public lands are analyzed and mitigated under separate site-specific Environmental Analysis and impacts, including cumulative, are analyzed.

4.3.1 Migratory Birds

Under the No Action Alternative, cumulative impacts on migratory birds would include the continuation of grazing and potentially result in the over-utilization by livestock and wild equid (if livestock are run at full preference in the foreseeable future). This could reduce habitat for the migratory birds within the analysis area.

4.3.2 Threatened, Endangered and Candidate Plants and Animals

Wild horse and burro numbers in the past were over AMLs and may have caused a decline in habitat quality and quantity for some special status animal species. In the past, wild equids and livestock may have contributed to deterioration of the desert tortoise habitat by exceeding the carrying capacity of the vegetation types, decrease the available forage and cover.

4.3.3 Water Quality

The increase of wild equid numbers over the years would cause a decline in water quality because the carrying capacity would be exceeded. The demand for water would increase with increasing numbers, which would result in more animals concentrating at riparian areas. Therefore, cumulatively the water quality would be affected because of increasing disturbance of the riparian area and available water.

4.3.4 Wetlands and Riparian Zones

The increase of wild equids numbers over the years and the lack of adjustment in accordance of the carrying capacities of the vegetation types would cumulatively result in a decline in riparian condition. The concentration of wild equids on riparian habitat brought about a an increase in soil compaction and trampling of vegetation.

4.3.5 Grazing Management

A ten-year lease would not be offered up for authorization in the Montezuma Allotment. Grazing in Razorback and Springdale 2 Allotment would continue as it has in the past but the carrying capacities would continue to be exceeded given the limited forage availability and abundance.

4.3.6 Socioeconomics

The No Action Alternative would further limit the economic benefits to the authorized user and the counties. The economic base would be uncertain because the TNR would be available on a first come first serve basis.

4.3.7 Vegetation

As wild horse numbers increase and eventually exceed their AML, they would leave the HMAs and graze throughout the rest of the Montezuma Complex. Vegetation with little forage potential would remain unchanged. However, the increased numbers of horses would reside on areas with good quality forage and would incrementally cause a loss of highly palatable and important forage species. This would cause a decline in ecological status and an overall loss of forage.

4.3.7 Wild Horse and Burro

Wild horses and burros would continue to increase in numbers inappropriate for the resources available. They would leave the HMAs in search of more forage and water, and periodically die of starvation. Gathers would need to be conducted when populations over-utilize available resources, especially during dry years. Genetic variability of the horse and burro herds would continue to be threatened because numbers of each are not enough to promote healthy genetics.

4.3.8 Wildlife

Under the Cumulative Impacts of the No Action Alternative on wildlife would continue with the current wild equid and livestock management in the area. This would continue to have detrimental effects on the wildlife habitat in the form of periodic over utilization of the area by wild horses (population growth followed by emergency gathers), and potentially additive future effects of livestock grazing. The level of livestock grazing currently allowed by the existing Allotment Management Plan in combination with the current allowable wild equid numbers is much more than the rangeland can handle. However, the recent livestock grazing practice in the area has been not to use full preference and thereby mostly the wild horses have impacted the wildlife habitat. The No Action alternative has reasonably foreseeable potentially negative effects to the wildlife habitat such as reducing cover, diminishing and increasing the competition of the forage resources and causing the plant community to reach threshold levels.

In addition to the effects discussed in Chapter IV, the effects of past and present actions include the temporary displacement of wildlife species due to the construction of range improvement projects, wildfire and the related suppression activities, mineral exploration and mining, wild horse gather activities for the Callaghan HMA, and construction of transmission lines and roads.

The effects of the reasonable and foreseeable future actions to the Complex are as follows: Establishment of riparian exclosures, vegetation rehabilitation treatments, sage grouse habitat improvement projects, wildlife guzzlers, reclamation of abandoned mine lands, and invasive weed treatment would be beneficial to wildlife throughout the Montezuma, Razorback, and Springdale 2 allotments. These projects would provide for the long-term sustainability and health of wildlife due to increased forage production and water availability, which would lead to the attainment of the Standards for Rangeland Health. Fences would be constructed with white-topped posts in order to make fences more conspicuous. Flagging may also be placed on fences in order for further increase the conspicuousness to wildlife, particularly sage grouse. Fences would be constructed to BLM specifications to facilitate the movement of mule deer and pronghorn.

Following a wildfire, rehabilitation of the area would occur, which is expected to improve wildlife habitat by preventing or limiting the occurrence of cheatgrass and other invasive species in the burn area. Mineral and geothermal exploration may temporarily displace wildlife species and may result in the loss of accessibility to historical use areas in the allotment depending on the size and location of the exploration projects. Geothermal utilization stage operations may result in increased acreage of disturbance, which would increase the number of acres disturbed from exploration activities. Wildlife may be displaced and habitat may be lost, at least temporarily, from these mining related activities. Future wild horse and burro gathers may also result in the temporary displacement of wildlife species.

4.4 Cumulative Impacts of all resources

All resource values have been evaluated for cumulative impacts. It has been determined that cumulative impacts would be negligible as a result of the Proposed Action or alternatives.

5.0 PERSONS OR AGENCIES CONSULTED

Tonopah Planning Area

Craig Drake	- Assistant Field Manager, Tonopah
Valerie Metscher	- Rangeland Management Specialist, Team Lead
Marc Pointel	- Rangeland Management Specialist
Andrea Felton	- Wild Horse and Burro Specialist
Bryson Code	- Wildlife Biologist
Susan Rigby	- Archaeologist
Wendy Seley	- Realty Specialist

Battle Mountain District

Doug Furtado	- Assistant Field Manager, Renewable Resources
Michele McDaniel	- Range Management Specialist District Lead
Shawna Richardson	- Wild Horse and Burro Specialist
Angelica Ordaz	- Planning and Environmental Coordinator

Agencies

National Oceanographic and Atmospheric Administration
Natural Heritage Program
Nevada Department of Wildlife
U.S. Fish and Wildlife Service
U.S Geological Service
Western Regional Climate Center

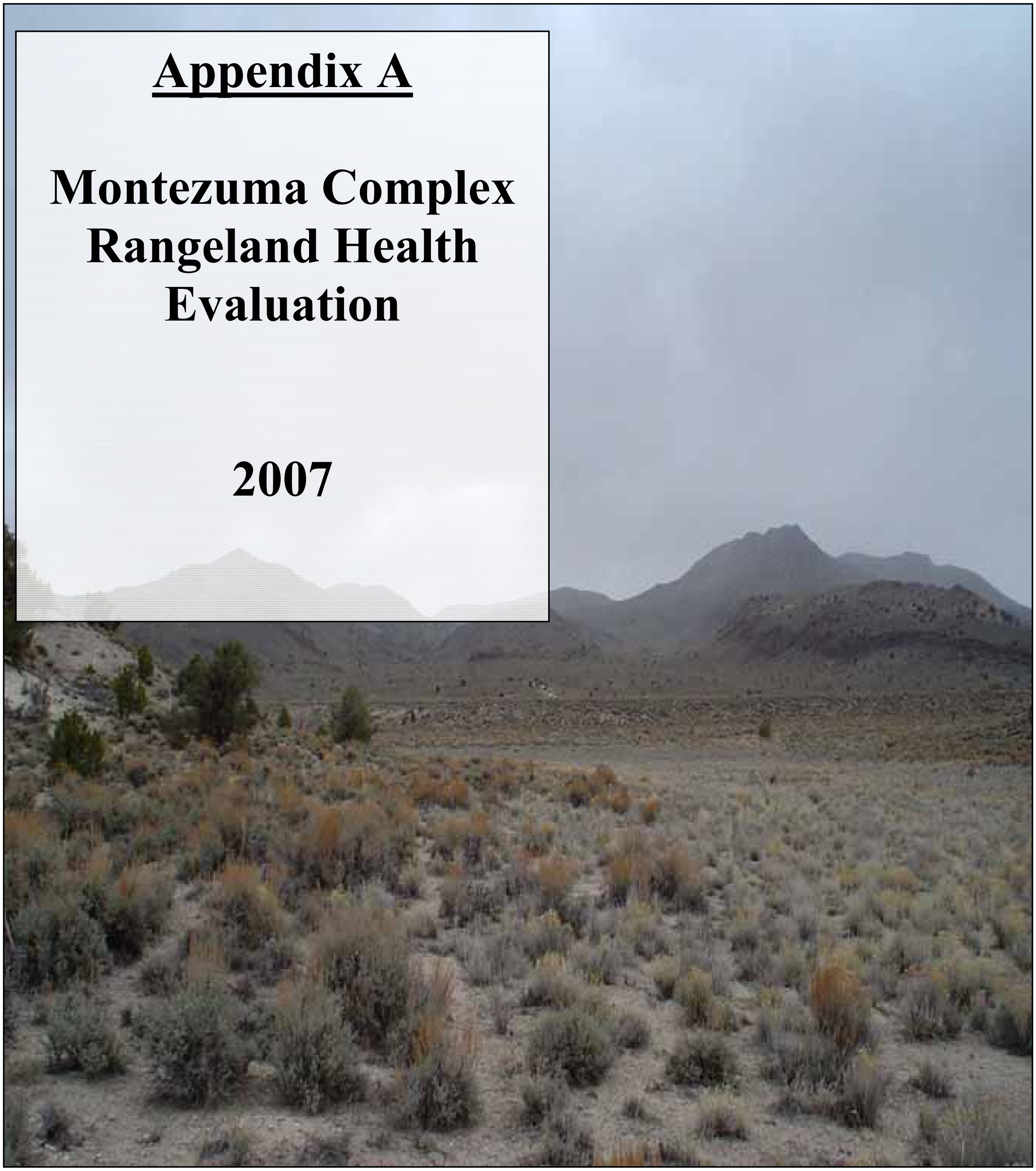
Lessees

Beatty Cattle Company
Russell Berg
Truckee River Ranch
The Younghans

Appendix A

Montezuma Complex Rangeland Health Evaluation

2007



Montezuma Range, South View, Montezuma Allotment, near Key Area 6. Courtesy of the Bureau of Land Management (BLM), Tonopah Field Station (TF), April, 2006.

Appendix A
Montezuma Complex Rangeland Health Evaluation

General Table of Contents

Montezuma Complex Evaluation
and
Rangeland Health Evaluation

I. Introduction

The evaluation area known as the Montezuma Complex consists of the Montezuma, Razorback and Springdale 2 allotments, and the Bullfrog, Stonewall, Goldfield, most of Montezuma Peak and a small portion of Paymaster wild horse and burro Herd Management Areas (HMAs).

A. Purpose

The purpose of this evaluation is to assess whether current management practices are meeting or progressing toward attainment of the standards and guidelines established by the Mojave-Southern Great Basin Resource Advisory Council (RAC), 1997, and the Tonopah Resource Management Plan (RMP) 1997 objectives. The current version of the RAC Standards and Guidelines is located in Appendix B If standards and guidelines and RMP objectives are not being met, or significant progress is not being made toward meeting them, this evaluation will identify the causal factors and identify recommendations for management changes to move towards meeting them. This document provides background information, existing grazing use, and analyzes the data collected to evaluate the evaluation area and make determinations for future management.

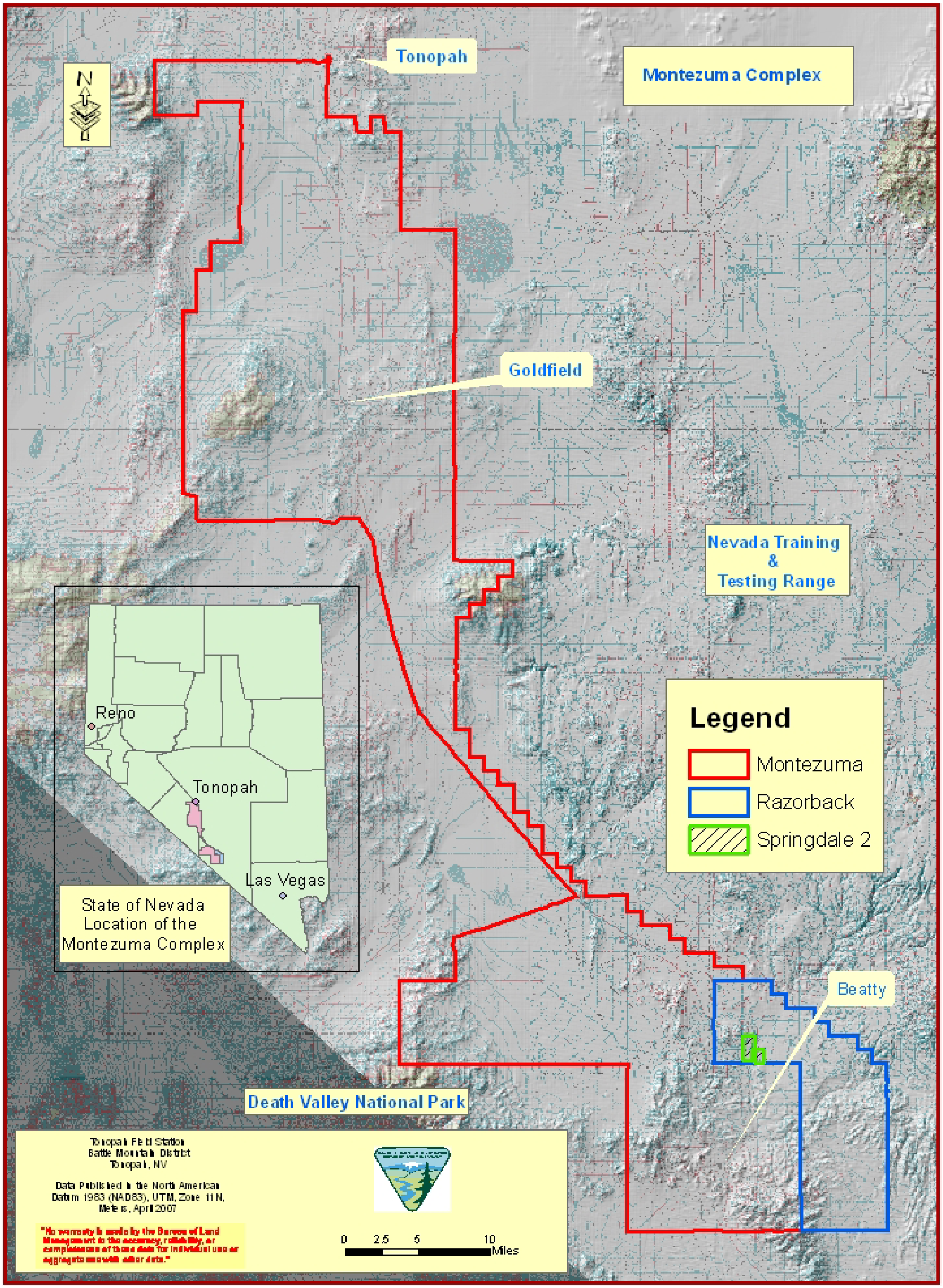
B. Montezuma Complex Description

The Montezuma Complex is comprised of the Montezuma, Razorback and Springdale 2 Allotments. The Montezuma Allotment is a vacant grazing allotment and all three allotments fall under a Section 15 authorization in the Taylor Grazing Act. Section 15 authorizes grazing on public land outside a grazing district with a ten-year grazing lease. The Montezuma Allotment is the largest allotment of the three allotments. The only livestock permitted on public lands in these allotments is cattle. The BLM has not permitted domestic horses, burros or sheep on these allotments. All references in the document to horses and burros in this document are to *wild* horses and *wild* burros.

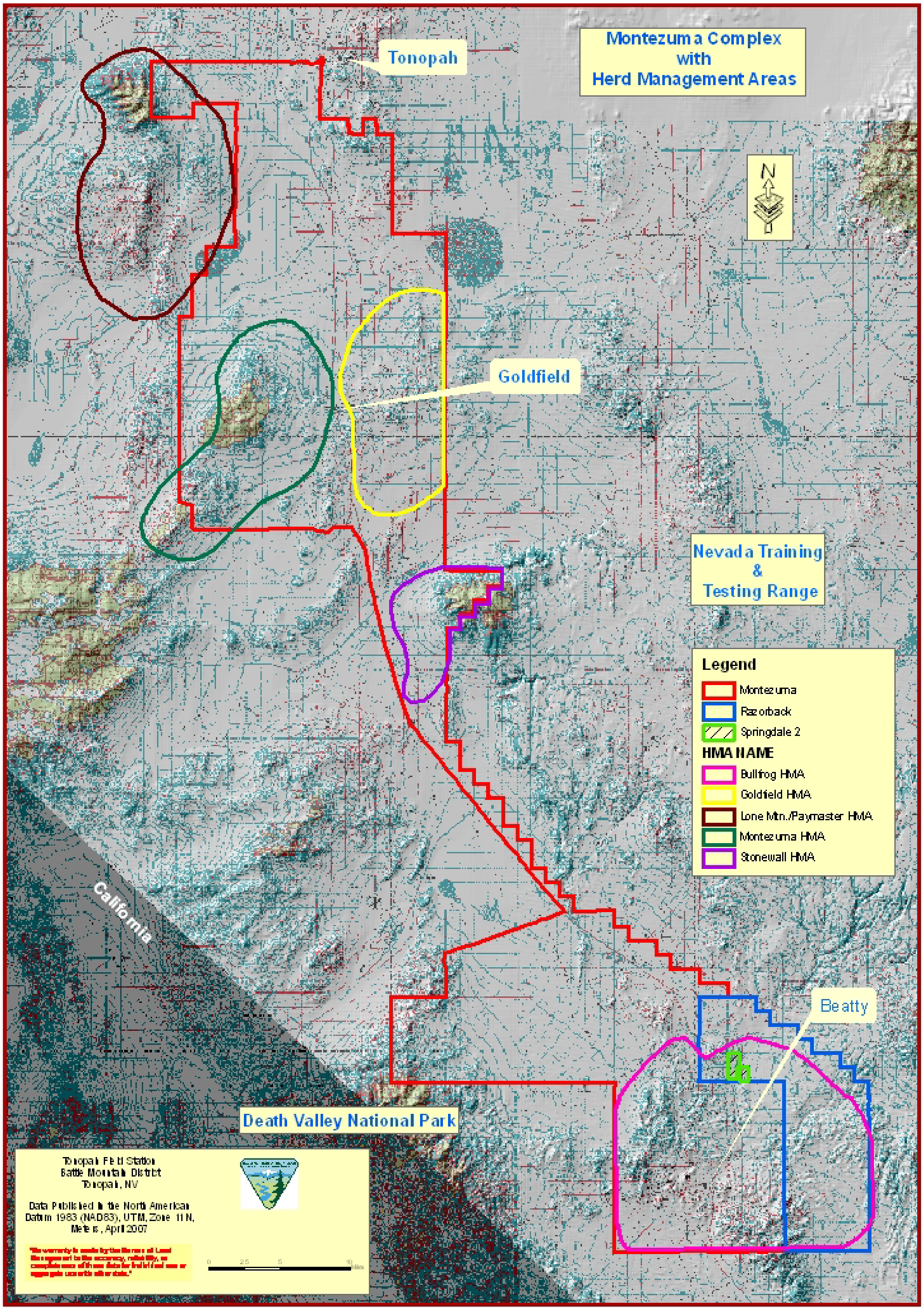
Table 1.0 –Acreages of allotments within the Montezuma Complex, as per the Tonopah Resource Management Plan, 1997.

Allotment	Acres (RMP)
Montezuma	538,297
Razorback	72,880
Springdale 2	1,466

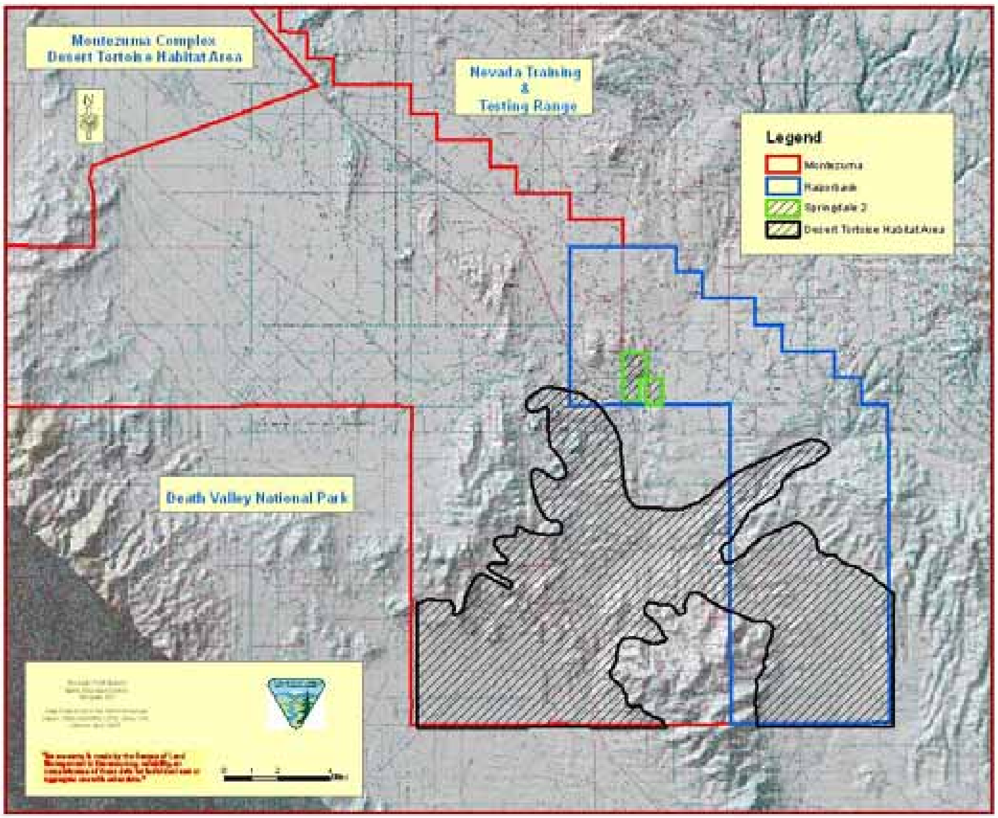
Map 1.0   Montezuma Complex



Map 2.0 - Herd Management Areas and Allotment Boundaries of the Montezuma Complex



Map 3.0 - Desert Tortoise Area within the Montezuma Complex



There are five wild horse and burro Herd Management Areas within the Complex. These include the Bullfrog, Stonewall, Goldfield, most of the Montezuma Peak HMAs, and a small portion of the Paymaster HMA.

Table 2.0 –Herd Management Area acres within the Complex

HMA	Acres	Percentage within the Complex
Bullfrog East*	84,459	100
Bullfrog West*	67,323	100
Stonewall	25,790	100
Goldfield	61,519	100
Montezuma Peak	73,251	94
Paymaster	7,041	7

* The Bullfrog HMA is divided into east and west sections by U.S. Highway 95, which is fenced.

Desert tortoise (*Gopherus_agassizii)* habitat occurs in the extreme southern portion of the Montezuma Complex within the Montezuma and Razorback Allotments. Desert bighorn sheep (*Ovis canadensis nelsoni*) habitat is located in the mountainous areas of the Complex (refer to Map 3.0).

The evaluation area is located in Esmeralda and Nye Counties of extreme southwestern Nevada near the Nevada-California border and the Nevada Training and Testing Range (refer to Map 1.0). This area lies within the orographic rain shadow of the California Sierra. The evaluation area covers over 600,000 acres varying from playas and saltbrush plant communities receiving less than four inches of annual precipitation to pinyon-juniper and low sagebrush communities on Montezuma Peak (altitude 8,373 feet) receiving roughly 16 inches of precipitation. The Montezuma Complex is within both the Great Basin Desert, which is a cold desert, and the Mojave Deserts, a hot desert. Much of the narrow central portion of the Montezuma Allotment transitions between these two deserts. The southern portion of the Montezuma Allotment, and all of the Razorback and Springdale 2 allotments occur in the Mojave Desert. The northern portion of the Montezuma Allotment is within the Great Basin Desert.

Photo 1.0 – On the Summit of Montezuma Peak, Montezuma Allotment – Elevation 8,373 feet

Courtesy of Marc Pointel, Rangeland Management Specialist (RMS), BLM, TFS, 2006.

The Grapevine Wilderness Study Area (WSA) (NV-060-355) is in southeastern portion of the Montezuma Allotment. There are no wilderness areas or other WSAs which, exist within the Complex (refer to Map 4.0).

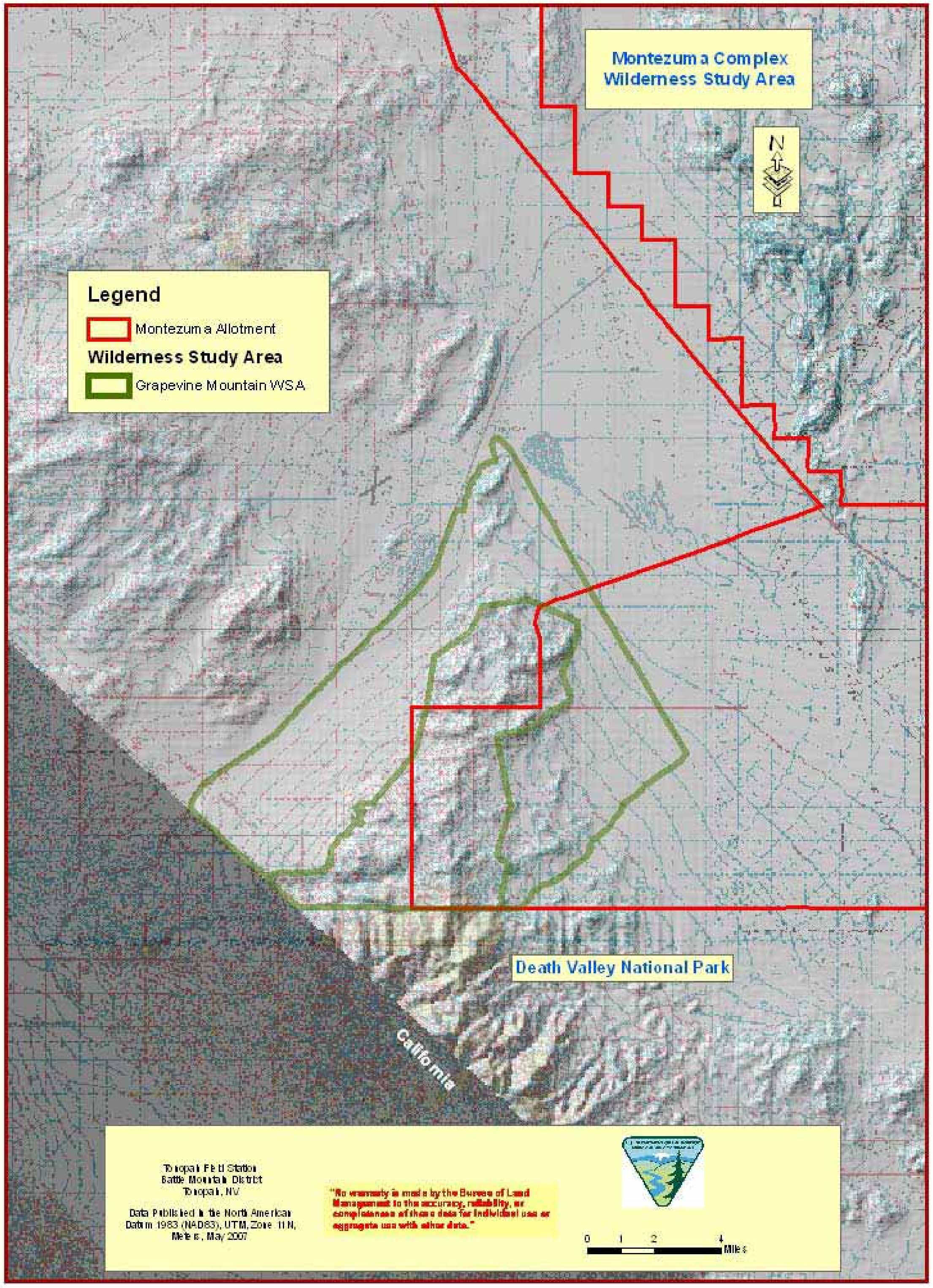
The time period for the evaluation of the Montezuma Complex ranges from 1987 to 2007.

The allotment categorization from the Tonopah Resource Management Plan, dated October 1997, for the Montezuma and Razorback Allotments is Category I: "Improve the current resource." The categorization for Springdale 2 is Category C: "Custodial, manage the existing resource."

Photo 2.0 - Northern Portion of Grapevine Mountain Wilderness Study Area

Courtesy of M. Pointel, RMS, BLM, TFS, 2004.

Map 4.0 – Grapevine Mountain Wilderness Study Area



II. Management Objectives and Resource Advisory Council Standards and Guidelines

Through this evaluation process, monitoring data and baseline information has been analyzed, interpreted and evaluated to determine whether Tonopah Resource Management Plan objectives and the Standards for Rangeland Health are being achieved. At the conclusion of this process, it will be further determined if modifications to allotment-specific objectives will be needed in order to achieve desired plant community objectives and the Standards for Rangeland Health. See Appendix B for the Standards and Guidelines of the Mojave and Southern Great Basin Area for Grazing and Wild Horses and Burros.

A. Standards, Guideline & Land Use Plan Assessment

A standards, guideline and land use plan assessment will be completed for the Complex at the end of this document, refer to section VI. However, an abbreviated assessment of the indicators for the first three standards for livestock and wild horses on upland sites will be made at each key area. The results of the assessment of these standards and indicators at each key area will be placed into a table in section V.

The following standards, guidelines and indicators will be used in the Monitoring Evaluation in each allotment. See the complete current version of the Mojave-Southern Great Basin RAC Standards and Guidelines in Appendix B.

Mojave-Southern Great Basin RAC Standards and Guidelines RAC Standard 1--Upland Sites

Standard 1 - Soils

Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity, and sustain the hydrologic cycle.

As indicated by: Ground Cover.

Standard 2 - Ecosystem Components

Watersheds should possess the necessary ecological components to achieve State water quality criteria, maintain ecological processes, and sustain appropriate uses.

As indicated by: Ground Cover;

Standard 3 - Habitat and Biota

Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses.

As indicated by: Vegetation composition (relative abundance of species);
Vegetation structure (life forms, cover, height, and age classes);
Vegetation distribution (patchiness, corridors);
Vegetation productivity;
Vegetation nutritional value.

Indicators

The following indicators of ecological processes that apply to the standards will be brought forward to sections F – Montezuma Allotment Data Analysis, Key Area Assessment and G – Razorback Allotment Data Analysis, Key Area Assessment analyzed at each key area with the monitoring data.

Ground Cover;
Vegetation composition (relative abundance of species);
Vegetation structure (life forms, cover, height, and age classes);
Vegetation productivity;
Vegetation nutritional value.

III. Resource Issues

- *The vacant allotment, Montezuma, will be assessed and the potential to establish forage reserves will be included in the Assessment.*
- *Suitability of vegetation to support wild horses, cattle or wild burros use.*
- *Desert tortoise habitat.*
- *Allotment boundary adjustments.*

See Page 9 of the Environmental Assessment (EA # NV065-2005-042) for full descriptions of these issues.

IV. Resources

A. Grazing Management

1. Montezuma Allotment

The Montezuma Allotment is within both the southern Great Basin and Mojave deserts. The Montezuma Allotment currently is vacant of grazing cattle. The grazing season on the Montezuma Allotment was yearlong for the former lessee, Colvin Cattle Company. In 1990, Colvin Cattle Company voluntarily reduced the herd size for personal reasons from approximately 750 to approximately 50 cattle.

An Allotment Evaluation was completed and an Area Manager's Final Multiple Use Decision was issued on June 29, 1994. Colvin Cattle Company appealed this decision. This appeal (N6-94-25) was dismissed August 24, 2006 by the Office of Hearings and Appeals. In 1995, the Colvin Cattle Company stopped paying grazing bills but continued to run livestock in trespass on public lands on the Montezuma Allotment. These livestock were impounded by the BLM in 2001. Colvin Cattle Company lost its grazing lease to run livestock on public lands on July 24, 1997 due to non-payment of grazing fees. They then appealed the decision cancelling the grazing lease, and on July 28, 2003, the Office of Hearings and Appeals affirmed the BLM's decision (N6-97-04).

The BLM has permitted Temporary Non-Renewable (TNR) grazing on the Montezuma Allotment since 2001.

Table 3.0 – Permitted AUMs on the Montezuma Allotment

Allotment	Operator	Cattle Number	Grazing Begin	Grazing End	AUMs
Montezuma prior to FMUD, June 29, 1994	Former lessee	889	3/1	2/28	10,668
Montezuma after FMUD, June 29, 1994	Former lessee	992	6/1	2/28	8,927

2. Razorback

The Razorback Allotment lies within the Mojave Desert. Beatty Cattle Co., L.L.C. is the only lessee on the Razorback Allotment. The season of use runs from May 1 to January 15. Beatty Cattle Co., L.L.C. acquired the ten-year grazing lease from Fleur de Lis Ranch in 2005. In 1994, the former lessee started to decrease the number of cattle turned out in the allotment. The following tables show the history of authorized use.

Cattle from Springdale 2 cross the unfenced boundary between Razorback and Springdale 2 Allotments. There is no topography to separate the two allotments to stop cattle from both allotments from trespassing into the other allotment.

Table 4.0 - Current Permitted AUMs on the Razorback Allotment

Allotment	Operator	Cattle Number	Grazing Begin	Grazing End	AUMs
Razorback	Beatty Cattle Co., LLC	106	1 May	31 January	962

Table 5.0 - History of Grazing Use in the Razorback Allotment

History of Grazing Use in the Razorback Allotment								
Year	**# of Cattle**	**AUMS**	**Year**	**# of Cattle**	**AUMs**	**Year**	**# of Cattle**	**AUMs**
2007	106	962	2001(3)	38	37	1995	24	207
2006	106	962	2000	0	0	1994	350	876
2005	179	959	1999	0	0	1993	112	1348
2004 (1)	192	959	1998	0	0	1992	112	1348
2003	0	0	1997	21	218	1991	112	1348
2002	0	0	1996	24	207	-	-	-

(1) Pasturing agreement with former lessee did not exceed the permitted AUMs.

3. Springdale 2

The Springdale 2 Allotment lies within the Mojave Desert. George and Larene Younghans is the only lessee on the Springdale 2 Allotment. They have a yearlong ten-year grazing lease for 2 cows equaling 24 AUMs per year.

Cattle from Razorback often cross the unfenced boundary between Razorback and Springdale 2 Allotments. There is no topography to separate the two allotments to stop cattle from both allotments from trespassing into the other allotment.

B. Wild Horses and Burros

1. Wild Horses and Burros

The Proposed Action for wild horse and burro management discussed in the Montezuma Complex Environmental Assessment calls for the re-evaluation and re-establishment of Appropriate Management Levels (AMLs) for the five Herd Management Areas (HMAs) of the Montezuma Complex. These HMAs are Bullfrog (NV-629), Goldfield (NV-626), Montezuma Peak (NV-625), Stonewall (NV-627) and Paymaster (NV-621). A major component of this allotment evaluation is the current status and future management of these HMAs.

Although these HMAs are similar in habitat condition and management needs, each HMA has it own issues and opportunities for individual management. The Environmental Assessment (EA) addresses general issues of the HMAs within the Complex. This Evaluation focuses on issues concerning each HMA individually.

It is essential to understand the differences between wild horses and wild burros in order to understand their ability to survive in this area. Burros evolved in arid regions of Africa and Europe in habitat similar to the Montezuma Complex. Their generalized food habits gave them the ability to survive on poor quality forage and very little water. Burros are exceptionally tolerant of dehydration, being able to withstand a water loss of 30 percent of the body weight (Douglas and Hurst 1993). After suffering a water loss of 30 percent of body weight, the burro can drink enough water in 2-5 minutes to restore its deficit (Maloiy 1970). Horses evolved in a wetter climate in grasslands and are grazers without the ability to survive during droughts on very arid shrub dominated sites with little grass. The climate, vegetation, soils, and precipitation on the Complex all combine to make an extremely harsh, arid high desert landscape in the driest state in the Nation. Because horses are grazing animals, they often suffer in this environment, but burros, being browsers, can thrive in it.

The BLM determines general horse health and body condition using the Henneke Body Condition Score. The Henneke Score is based upon a 9 point scale, with 1 being "poor" or extremely emaciated, to 9 or "extremely fat" (Table 6.0). This body condition score is used during gathers and routine monitoring, and can assist in evaluation of wild equid habitat and rangeland condition.

Table 6.0 - The Henneke Body Condition Score worksheet.

H-4760-1 - CONDUCTING COMPLIANCE CHECKS FOR BLM'S WILD HORSE AND BURRO ADOPTION PROGRAM - (Public) Illustration 8

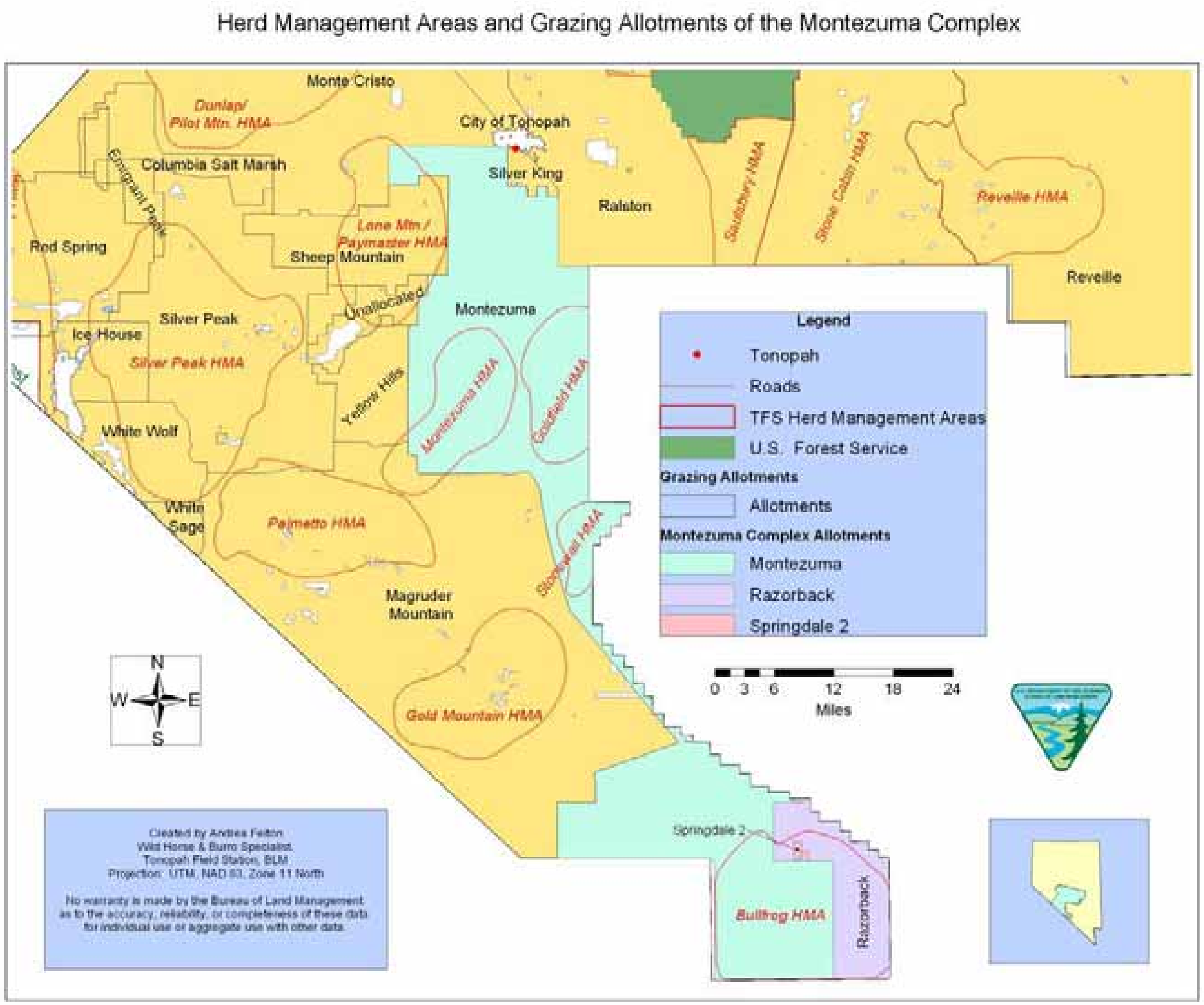
CONDITION	NECK	WITHERS	LOIN	TAILHEAD	RIBS	SHOULDER
1 POOR	Bone structure easily noticeable	Bone structure easily noticeable	Spinous processes project prominently	Tailhead (pinbones) and hook bones projecting prominently	Ribs projecting prominently	Bone structure easily noticeable
	Animal extremely emaciated; no fatty tissue can be felt					
2 VERY THIN	Faintly discernible	Faintly discernible	Slight fat covering overbase of spinous processes. Transverse processes of lumbar vertebrae feel rounded. Spinous processes prominent.	Tailhead prominent	Ribs prominent	Faintly discernible
	Animal emaciated					
3 THIN	Neck accentuated	Withers accentuated	Fat buildup halfway on spinous processes but easily discernible. Transverse processes cannot be felt.	Tailhead prominent but individual vertebrae cannot be visually identified. Hook bones appear rounded, but still easily discernible. Pin bones not distinguishable.	Slight fat cover over ribs. Ribs easily discernible.	Shoulder accentuated
4 Moderately THIN	Neck not obviously thin	Withers not obviously thin	Negative crease along back	Prominence depends on conformation. Fat can be felt. Hook bones not discernible.	Faint outline discernible	Shoulder not obviously thin
5 MODERATE	Neck blends smoothly into body	Withers rounded over spinous-processes	Back level	Fat around tailhead beginning to feel spongy	Ribs cannot be visually distinguished but can be easily felt	Shoulder blends smoothly into body
6 Moderately FLESHY	Fat beginning to be deposited	Fat beginning to be deposited	May have slight positive crease down back	Fat around tailhead feels soft	Fat over ribs feels spongy	Fat beginning to be deposited
7 FLESHY	Fat deposited along neck	Fat deposited along withers	May have positive crease down back	Fat around tailhead is soft	Individual ribs can be felt, but noticeable fat fills between ribs	Fat deposited behind shoulder
8 FAT	Noticeable thickening of neck	Area along withers filled with fat	Positive crease down back	Tailhead fat very soft	Difficult to feel ribs	Area behind shoulder filled in flush with body
			Fat deposited along inner buttocks			
9 Extremely FAT	Bulging fat	Bulging fat	Obvious positive crease down back	Building fat around tailhead	Patchy fat appearing over ribs	Bulging fat
			Fat along inner buttocks may rub together. Flank filled in flush.			

Hoof Condition:

BLM MANUAL

Rel. 4-108
6/17/04

Map 5.0 – Herd Management Area of the Montezuma Complex



In addition to the scarcity of forage across most of the Montezuma Complex, available water, too, is rare. The following table shows the percentage of the AUMs in each HMA with or without water for wild equids. These proposed AMLs were calculated in a GIS by creating a four-mile-wide buffer around known water sources in each HMA. These buffered areas represent habitat that is accessible to wild equids within four miles of water. However, these "dry" portions represent areas that could sustain wild horses or burros if additional water sources are developed. For more details about available water sources, refer to Section V of this Appendix A and Section 3.10 of the EA.

Historical census and gather data is located in *Section D, Actual Use, Census and Gather Data* of this Appendix.

Table 7.0 –Herd Management Area acres within the Complex

HMA	Acres	Percentage within Complex
Bullfrog East	84,459	100 %
Bullfrog West	67,323	100 %
Bullfrog Total	151,782	100 %
Stonewall	25,790	100 %
Goldfield	61,519	100 %
Montezuma Peak	73,251	94%
Paymaster	7,041	7%

Table 8.0 - Percent of AUMs in HMA with and without available water and Proposed AML for Equids in Watered and Dry portions of HMAs

HMA	Watered Portion of HMA	Dry Portion of HMA	AML* Watered Portion of HMA	AML* Dry Portion of HMA
Montezuma HMA	73%	27%	34 - 54	17 - 27**
Paymaster**	100%	0*	0	0
Goldfield HMA	48%	52%	24 - 37	30 - 48
Stonewall HMA	52%	48%	5 - 8	14 - 21
Bullfrog West HMA	83%	17%	43 - 68	10 - 15
Bullfrog East HMA	30%	70%	15 - 23	46- 72

* AML range shown extends only to burros because of available forage types (shrubs).

**This calculation encompasses only the 7% of Paymaster HMA within the Montezuma Allotment. Large areas of the HMA in neighboring allotments are "dry." At this time, an AML of 0 would be allocated to the portion of Paymaster HMA within Montezuma. This area has historically been over-allocated and overgrazed, and rest is necessary to achieve RAC standards. Paymaster HMA AML will be re-evaluated in the forthcoming RMP revision.

2. Wild Horse and Burro Management Issues of the Montezuma Complex

General issues related to the HMAs within the Montezuma Complex are discussed at length in the EA. These include 1) lack of forage, 2) lack of water, 3) drought, and 4) genetic variability of herds. The issues of each individual HMA follows.

3. Montezuma Peak HMA

The Montezuma Peak HMA is located just to the west of the town of Goldfield, 26 miles south of Tonopah, west of U.S. Highway 95 and is approximately 78,000 acres in size. Approximately 94 percent of the Montezuma Peak HMA lies in the Montezuma Allotment, with the remainder in the Magruder Mountain and Yellow Hills allotments. The area is characterized by Great Basin vegetation with a small influence from Mojave Desert vegetation. The majority of the HMA is dominated by shrubs with little grass, particularly in dry years. The climate is relatively dry. Elevations range from 5,600 feet to 8,100 feet across the HMA. Habitat in the Montezuma Peak HMA is well suited for burro use, but contains little forage suitable for horse use.

The AML for the Montezuma allotment is currently 142 wild horses, the Magruder Mountain allotment AML is currently two wild horses and ten burros, and the Yellow Hills allotment AML is two horses, for a total AML for the Montezuma Peak HMA of 146 wild horses and ten burros (see Table 31.0 in the EA). There is a fence line separating the Magruder Mountain Allotment from the Montezuma and Yellow Hills Allotments. This fence is in adequate condition to prevent movement of horses or burros between the two allotments.

The AML for the Montezuma Peak HMA was established at 146 horses and 10 burros (the 10 burros were allotted for the Magruder Mountain allotment). The highest number of horses counted in the HMA was 235 horses in 1988. The HMA was never gathered until the drought in 1996 when 101 horses and one burro were removed. Due to the drought, an attempt was made to remove all animals from the HMA because they were extremely thin due to lack of forage. It appears that the 146 horse AML greatly exceeds the amount of forage available in the Montezuma Peak HMA. Furthermore, many of the horses from the Montezuma Peak HMA reside outside the HMA even though their numbers are below the AML. This is due to the lack of good quality forage inside the HMA.

a. Issues of the Montezuma Peak HMA:

1. Due to an oversight in writing the 1997 Tonopah Resource Management Plan (RMP), burros were not allotted AUMs in the Montezuma Peak HMA.

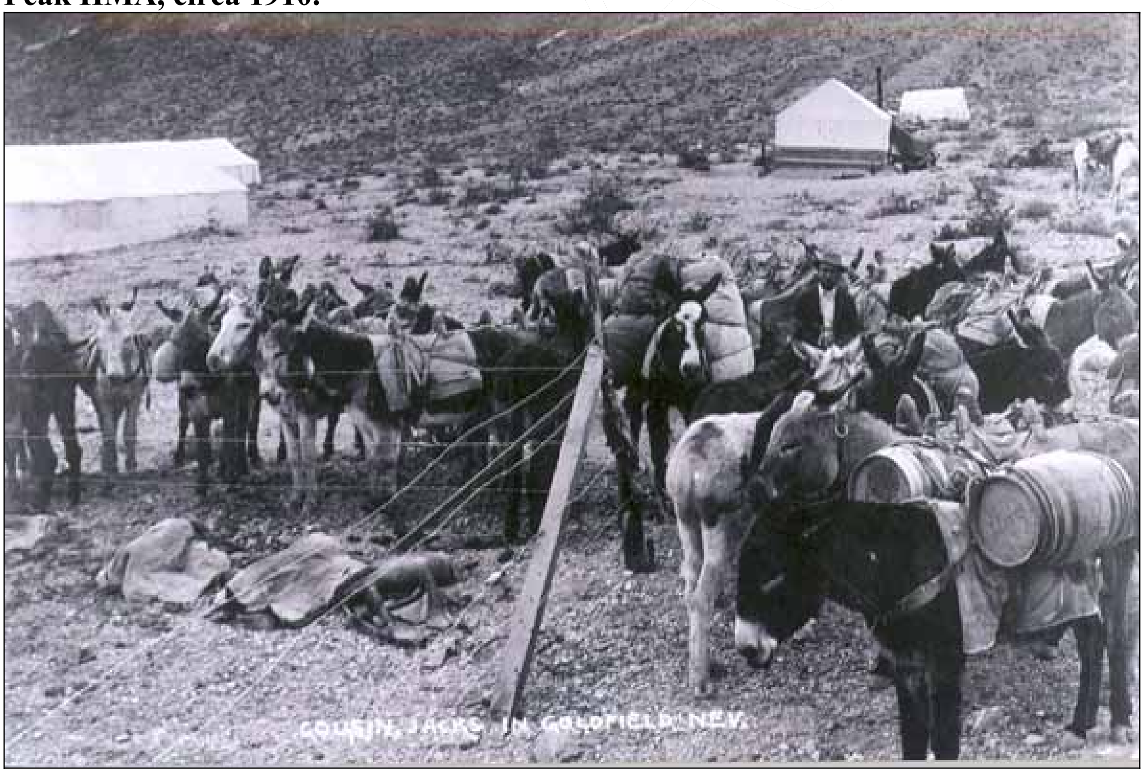
2. There is inadequate forage and water for wild horse populations.

3. Genetic viability of the wild horse and burro herds in the Montezuma Peak HMA is questionable.

Issue 1. Due to an oversight in writing the 1997 Tonopah Resource Management Plan (RMP), burros were not allotted AUMs in the Montezuma allotment.

The initial determination as to whether or not burros existed in the HMA was based on a census flight conducted by the Las Vegas District on June 8, 1974. This was a one-day fixed-wing flight that covered much of 2,787,244 acres of Esmeralda and Southern Nye Counties now administered by the Tonopah BLM. It appears that a one-day census flight covering such a vast area would likely miss many burros and wild horses. Research from decades of census and distribution flights indicates a sighting rate for burros from a helicopter at only 50 percent (Oyler, personal communication). The 1973 flight that established HMA boundaries and the wild horse and burro populations present in Esmeralda County occurred from a fixed-wing aircraft at a higher altitude and faster speeds than a helicopter. It is highly probable that burros were present throughout each of the Montezuma Complex HMAs, but were not sighted or documented. Typically, when aircraft fly over wild horses and big game species, the animals are easily spooked and will run, making them easier to spot from the air. But burros will stand quite still, making it much more difficult to spot them from the air. Therefore, only wild horses were identified in the Montezuma Peak HMA. However, it is very likely that burros have resided in the HMA since the early days of the town of Goldfield to the present. It is most likely the black burros currently found in the Montezuma Peak HMA descended from burros that were fenced into the Montezuma Peak HMA in the 1970s.

Photo 3.0 - Burros prepared for work the town of Goldfield, in what is now the Montezuma Peak HMA, circa 1910.



Photograph courtesy of the Central Nevada Museum, Tonopah, Nevada.

History of Burros in the Montezuma Peak HMA

The town of Goldfield was founded in 1902 with the discovery of gold, and with the miners came burros.

> "Roaming the desert near Goldfield were hundreds of burros. The young boys and a few of the braver girls would start out on Thursday night after school in search of their favorite burros in order to have it corralled so that they could spend Saturday and Sunday riding them. Many a mother was scared petrified upon entering her woodshed to be greeted with the braying of a burro" (Cline 1970).

Goldfield has had stray burros inside the city limits from the early 1900s up until the border of the town of Goldfield was fenced in 1967. The agreement for the town fence drawn up by Esmeralda County, dated 28 April, 1966, states: "WHEREAS, for a number of years a very serious problem has existed in the town of Goldfield, Nevada, due to the running at large of certain livestock, consisting of cattle, wild horses, burros, etc. . ."1 From the time the town was fenced in 1967, cattle, wild horses and burros have been excluded from roaming through the town of Goldfield.

The following information provides evidence that burros resided in the Montezuma Peak HMA during 1971 when the Wild Horse and Burro Act was passed:

- Burros were documented from the early 1900s up to 1967 when the town was fenced, roaming freely through the town of Goldfield, which lies between the Montezuma and Goldfield HMAs. The boundaries of the Montezuma Peak and Goldfield HMAs are very close together (between a half a mile and 2 miles apart) at the town of Goldfield, the burro's source.
- Both HMAs have springs that could support wild horses and burros close to the town of Goldfield and outside the town fence. After the town was fenced, wild horses and burros would have most likely resided in both the Montezuma Peak and Goldfield HMAs.
- Many springs in the Montezuma Peak HMA are closer to the town of Goldfield (less than a mile) than the Goldfield HMA springs. Springs in Montezuma Peak HMA available for wild burro use include West Spring, Slaughter House Spring and other waters on the eastern edge of the HMA. These waters are less than a mile from the town center. Waters in the Goldfield HMA include Tognani and Willow Springs at 5 and 7 miles respectively from town, making it more likely that burros were residing in the Montezuma Peak HMA after the 1967 town fence was built.

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1 The "Goldfield Townsite Fence," Range Improvement file number 3566.

- The nearest HMA to the Montezuma Peak HMA with burros is the Bullfrog HMA, approximately 50 to 60 miles south of the Montezuma Peak HMA. The two allotment boundary fences (Magruder and Montezuma Allotments) between the Bullfrog and Montezuma Peak HMAs on the west side of the U.S. Highway 95 were fenced in 1972 and 1983. 2[,3] Both fences tie into the U.S. Highway 95 fence on the east and mountains on the west blocking livestock, wild horse or burro movement northward. There may have also been some emigration from California until the 10-mile long Lida Wash Allotment Fence was built in 1974 [4] and the Sarcobatus Flat Fence was built in 1978.[5]
- Burros currently reside in the Montezuma Peak HMA.
- Until 1968, there was free movement of cattle, wild horses, and burros between both the Montezuma Peak and Goldfield HMAs. There was access for burros and wild horses across U.S. Highway 95 between Tonopah and Goldfield up until the summer of 1968 when both sides of the U.S. Highway 95 were fenced. This fence ends at the town of Goldfield. The Draft Esmeralda-Southern Nye Resource Management Plan (Esmeralda-Southern Nye RMP) signed November 16, 1984, states under Montezuma Allotment, on page 165: "Livestock, wild horses and burros compete for forage and water in the Montezuma's" (the name of the mountains contained within the Montezuma Peak HMA). Burros were apparently residing in the Montezuma Range earlier than November 1984, when the document was signed.
- During the drought gathers, gather notes state that at the close of the gather in 1996, "no burros remained on the Goldfield, Montezuma Peak or Stonewall HMAs," yet burros are still to be found within these HMAs today. Helicopter census fights in 2000 and 2006 found burros in the Montezuma Peak HMA. These burros most likely did not come from the Bullfrog HMA or from California, but were missed by the gathers in 1996 and 1997.

The above facts make it very likely that burros resided in the Montezuma Peak HMA in 1967 and burros were most likely still there in 1971 when the Wild Horse and Burro Act was passed. Burros were documented in close proximity of the Montezuma Peak HMA in 1967 and in the HMA in the early 1980s (Esmeralda Southern Nye RMP), in 1993 and 1997 censuses, and observations from 1998 to the present. Additionally, there is a group of approximately 10-15 black burros that historically reside just north of Goldfield on the west side of U.S. Highway 95 in the Montezuma Peak HMA. For additional information on the history of burros in the area, contact the Tonopah Field Station.

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[2] The "Montezuma Division Fence and Cattleguard," Range Improvement file number 3666.
[3] The "Montezuma/Magruder Allotment Fence," 13 miles long, Range Improvement file number 3684.
[4] The "Lida Wash Allotment Fence," Range Improvement file number 3754.
[5] The "Sarcobatus Flat Fence," Range Improvement file number 3697.

Issue 2. There is inadequate forage and water for wild horse populations.

Appropriate habitat for horses and burros depends upon available food, water, cover, and space. Two of these habitat variables, food and water, are scarce in Montezuma Peak HMA. Wild horse populations have historically endured long periods of hardship on the vegetation and water there. A history of droughts and emergency gathers causes the HMA to be unsuitable for wild horses, but highly suitable for burros. Burros, however, have survived quite well in the existing habitat. Horses cannot and will not consume these shrub species, and must rely on grasses, which are very scarce.

Photo 4.0 - A few of descendents of original resident burros of the town of Goldfield, now located in Montezuma Peak HMA.

Courtesy of Andrea Felton, Wild Horse and Burro Specialist (WHBS), BLM, TFS, 2006.

In late September, 1996, after the first emergency gather of Montezuma HMA, a rangeland specialist and a wildlife biologist monitored the late spring and summer period. They found that outside the Paymaster HMA between Tonopah and Lone Mountain, “there seemed to be enough forage to maintain these horses throughout the winter.” However, west of Montezuma Peak inside the HMA, of all the horses they saw,

> "all of the ribs showed, the butts were flat, the necks and legs were thin and the backbones showed. . . . These horses looked as bad as the horses gathered out of the Goldfield HMA this summer [August 1996]. . . . Old cured forage . . .must not be providing enough nutrition for horses. It seems likely that other horses in the Montezuma Peak HMA may be starving. These horses need to be removed." (Valerie Metscher, BLM, Tonopah Field Station, Rangeland Management Specialist, Tonopah, NV, 1996).

Subsequently, in November 1996, another 56 wild horses were removed from Montezuma Peak HMA. No wild horses were left in the HMA after the gathers in 1996. Today, several small bands of wild horses reside in the HMA. These horses most likely came from the Paymaster HMA, though some small bands may be Montezuma Peak horses that were not located during the 1996 gathers.

Several water sources are available to wild horses and burros on the northern end of the HMA. Approximately 73 percent of the total available Animal Unit Months (AUMs) for burros in the HMA are available because of the existence and distribution of these waters. Many of the water sources available to wild horses and burros have been improved by Range Improvement Projects (RIPs). These projects typically include improvements such as fenced exclosures to protect the spring itself from trampling and degradation, and a pipeline leading from the spring to a water trough outside the exclosure for use. Many of these range improvements are in poor condition and need to be repaired to function properly.

Issue 3: Genetic viability of the wild horse and burro herds in the Montezuma Peak HMA is questionable.

In 2003, due to drought conditions the neighboring Silver Peak HMA was gathered. Silver Peak lies approximately 15 miles northwest of the Montezuma Peak HMA and nearly abuts the Paymaster HMA. It is likely that some genetic mixing between these three HMAs has occurred in the past. During the 2003 gather, blood samples were drawn from 57 wild horses. Genetic analysis was conducted by Dr. E. Gus Cothran of the Department of Veterinary Science, University of Kentucky, Lexington, KY (Dr. Cothran is now conducting research through Texas A&M University, College Station, Texas.) A variety of genetic variability measures were analyzed from the gene marker data. Among the measures observed were heterozygosity (*Ho*), expected (predicted) heterozygosity (*He*), effective number of alleles (*Ae*), total number of variants (*TNV*), and estimated inbreeding level (*FIS*). Additionally, genetic markers can provide information about ancestry in some cases.

Results of the 2003 genetic analysis indicated that the Silver Peak wild horses were most likely derived from North American Gaited breeds and some Spanish ancestry, with the highest genetic markers showing Thoroughbred, American Saddlebred, and Peruvian Paso, respectively. There were also strong indications of Andalusian and Arabian bloodlines, and suggestions of Belgian Draft, Shetland Pony and Welsh Pony ancestry. However, blood results also indicated that the genetic variability of the Silver Peak herd was low. The *Ho* value was at a level considered to be critically low, which suggests inbreeding within the herd may have been occurring.

In 2006, a decision was made that all wild horses were to be removed from the Silver Peak HMA during the October gather. Rationale for this decision was that removing all wild horses from the Silver Peak HMA would not only resolve the recurrent issues with starvation and lack of suitable horse habitat, it would also curtail any further inbreeding problems.

There is concern that similar inbreeding issues may be occurring in the Montezuma Peak and Paymaster herds. Horses currently residing in the HMA readily move between the Montezuma Peak HMA and the area just outside the Paymaster HMA. There is no fence between the Montezuma and Sheep Mountain Allotments blocking this movement. Some of the movement out of the HMA is to unfenced private property at Alkali Hot Springs, a water source on the edge of the HMA. From Alkali, wild horses move to Tonopah, just outside the Paymaster HMA. This exchange of animals allows some genetic diversity of the smaller populations of these two individual HMAs. However, these herds have been fairly isolated from other herds since the 1970's, and emergency gathers have subsequently reduced genetic variability throughout the region.

During the Paymaster HMA gather in September 2006, genetic blood samples were taken from 27 wild horses released back onto the Paymaster HMA. Results are pending and should be available in 2008. If it is found that the Paymaster wild horses are showing signs of inbreeding, it is probable that future management will include complete removal of horse herds from both the Paymaster and the Montezuma Peak HMAs.

As long as the area between Paymaster and Montezuma Peak is unfenced, horses and burros will not be isolated from each other. However, to maintain heterozygosity (*He*) in these two herds would require a combined wild horse population to be in excess of 139-185 wild horses to make a genetically viable population. However, the combined number of wild horses the habitat on the Montezuma Peak and Paymaster HMAs can sustain is between 46 and 55 wild horses. It is possible that inbreeding would occur with 46 to 55 animals. Therefore, if the wild horse population of Montezuma Peak were ever completely removed, the wild horses in Paymaster HMA would also have to be removed because inbreeding within the Paymaster herd could occur.

However, the Montezuma Peak and Paymaster HMAs are suitable burro habitat, and horse AUMs would be converted to wild burro AUMs in an upcoming RMP revision. There is over two and half times as much forage available for burros than for wild horses in the Montezuma Peak HMA.

4. <u>Goldfield HMA</u>

The Goldfield HMA is located 26 miles south of Tonopah, east of U.S. Highway 6/95 and east of the town of Goldfield. It is approximately 61,500 acres in size. The entire HMA lies within the boundaries of the Montezuma Allotment. Like the Montezuma Peak HMA, the Goldfield HMA is characterized by Great Basin vegetation with a small influence from Mojave Desert vegetation dominated by shrubs with little grass, particularly in dry years. Precipitation across the HMA averages between 3 - 8 inches per year. Habitat in the Goldfield HMA is well suited for burro use, but contains little forage suitable for horse use.

The burros of the town of Goldfield are legendary to the area. Historical accounts relate many stories of miners and their burros, children's races and games on their pet burros, and the pranks of youths from Goldfield and Tonopah sneaking over to each other's towns and stealing burros back and forth. The March 16, 1907 issue of the *Goldfield Gossip* proudly announced that the first baby born in Goldfield was a burro foal. Miners relied on burros, and the railroad companies that sprang up in the area relied on mules for construction and maintenance. For additional information on the history of burros in the area, contact the Tonopah Field Station.

Photo 5.0 - "A group of youngsters and their burros, 1927."

Photograph courtesy of the book <u>Nevada "The Silver State"</u> Volume II, published by Western States Historical Publisher, Inc. 1970, Carson City, Nevada.

Photo 6.0 - Residents of Columbia (a former suburb of Goldfield), Nevada, within what is now the Goldfield HMA, circa 1910.

Courtesy of Allen Metscher, Goldfield, NV.

The AML for the Goldfield HMA was set at 125 horses and 25 burros. A census in 1988 counted 597 horses and 52 burros. In 1990, 428 horses and 87 burros were counted. This HMA is adjacent to the Nevada Training and Test Range and although the boundary is fenced, many horses and burros freely move between the Nevada Training and Test Range and the Goldfield HMA. This movement may account for the high numbers of animals found in some years. In 1990, 308 horses were removed, and in 1994, 147 horses and 46 burros were removed. During the 1996 gathers, 182 horses and 170 burros were removed. The majority of the horses were extremely thin and starving due to lack of forage prior to these gathers of 1990 and 1996. The burros were in better health due to their ability to browse shrubs. See Photos 6.0 and 7.0 below. The AML of 125 horses exceeds the amount of available forage in the Goldfield HMA.

The eastern edge of the Goldfield HMA borders the Nevada Training and Testing Range. For security reasons, a fence was constructed along that boundary in 1985. Prior to fence construction, wild horses and burros had free range between Nevada Training and Testing Range and Goldfield. However, Burros and horses still cross the Nevada Training and Testing Range boundary into the Goldfield HMA. The 1968 construction of the fence along U.S. Highway 95 effectively cut off equid movement to other HMAs across the highway. After the fences were erected, wild horses and burros were confined to an area that could no longer support their numbers. Gathers were necessary to prevent over-utilization of the range resources and imminent starvation.

a. Issues of the Goldfield HMA:

Issue 1. There is a critical lack of available forage and water within the Goldfield HMA.

The Goldfield HMA has a history of emergency horse removals due to lack of water. In fact, all gathers conducted on the Goldfield HMA have occurred due to emergency conditions of starvation and lack of water for the large numbers of wild equids in the HMA.

A 1988 aerial census indicated a population of approximately 597 wild horses and 52 burros in the Goldfield HMA. The AML at the time was 227 wild horses and 71 burros. A 1990 gather removed a total of 308 animals from the HMA. In 1994, 147 wild horses and 46 burros were captured, and 99 wild horses and 44 burros were removed at that time. The remaining animals were released back into the wild.

Then in 1996, a severe drought threatened the existence of wild horses and burros in the area. Very little forage was available, and horses were beginning to starve to death. Two emergency gathers were conducted that year to remove starving wild horses. In August, 165 burros and 159 wild horses were captured and removed from the Goldfield HMA. Most wild horses were in very poor condition. Burros were in fair condition; however, neither the horses nor the burros had shed their winter's coat, an indication of poor nutrition. Then in November, when range conditions had further declined, another emergency gather removed 5 burros and 23 wild horses.

The following is an excerpt from a narrative of the August 1996 emergency gather:

> "The horses in the pins [sic] were in very poor condition. . . .Two horses were so poor they got down. One got up on its own . . .[the other] got down and could not get up . . .[and] the crew helped it up to it feet. . . . Some of the burros looked in fair condition. One or two of the younger studs looked in poor to fair [condition]. Everything else looked what I would call very poor. *I would have said for the most part they would have died within the month* (emphasis added). . . .Several animals showed back bone and sunken loins so that the back bone showed all the way to the rib joint and hips and shoulders protruded against the skin" (Mark A. Swinney, Supervisory Range Conservationist, Tonopah Field Station, regarding conditions of the horses at the 1996 Goldfield HMA Emergency gather.)

The HMA contains 3 springs, all within 5 miles of each other and all privately owned and not well maintained. Access to these waters is limited. Furthermore, wild horses or burros cannot use the northern or southern portions of the HMA due to lack of water in those areas, which also hinders them from leaving the HMA and moving north or south. In the Goldfield HMA, 52 percent of the AUMs available for wild horses or burros cannot be used due to lack of water.

The Goldfield HMA is much more suitable for wild burros than wild horses. Due to past excessive use by wild horses, burros and livestock, poor quality soils, the available grass for wild horses in this HMA is very limited. The "watered" portion of the HMA can support 8 wild horses. If water becomes available through any range improvements/water developments, 7 more wild horses could be sustained. However, the HMA could support many more burros than wild horses; 37 burros could reside on the "watered" portion and 48 more on the dry portion if water is made available. This is a total of 15 wild horses versus 85 burros (for methods of determination for these calculations, please refer to vegetation sections in this Appendix A and the EA). These numbers are much lower than the numbers of wild horses and burros that formerly resided in the HMA, but history has proven that this rangeland cannot sustain healthy horse populations at past numbers. In 1996, with similar restrictions of water and forage on Nevada Training and Testing Range, it is possible that many of these horses crossed the test site boundary to use the Goldfield HMA and consequently starved there, as well. However, the burros faired much better and can sustain healthy populations in these arid environments. See the Montezuma Complex EA for more details on vegetation and water sources in this HMA.

There is no current data on the genetic variability of the wild horses and burros in Goldfield HMA. However, due to the ease and frequency of movement between Goldfield and the Nevada Wild Horse Range (Nevada Training and Testing Range), it is unlikely that inbreeding is occurring in either horse or burro populations.

5. <u>Bullfrog HMA</u>

The Bullfrog HMA is located in the southernmost portion of the assessment area. It is 95 miles south of Tonopah, and is approximately 150,000 acres in size. Sixty-six percent of the HMA is within the Montezuma Allotment, with the rest encompassing the Razorback and Springdale 2 Allotments. The eastern edge of the HMA borders the Nevada Training and Testing Range and burros range easily across both areas. The U.S. Highway 95 fence divides the HMA in half, and the town of Beatty, with a population of about 1,000, lies almost directly in the center of the HMA. The area is characterized by Mojave Desert vegetation and provides habitat for the threatened desert tortoise and the Amargosa toad. The climate and habitat of the HMA has historically been only suitable for burros, and very few wild horses have ever resided there. Several aerial census flights have been conducted of the area. See Tables 10.0 and 11.0 in Section V. D. for a history of the burro populations and gather operations that have occurred in the Bullfrog HMA.

The AML for the Bullfrog HMA was set at 185 burros and 12 horses. However, in 1994, 432 burros, 2 horses, and 1 mule were counted inside the HMA. At the same time, cattle also used portions of the HMA, but at numbers below their preference. Between 1995 and 1996, 917 burros were removed from inside and outside the HMA, including throughout Pasture 5 of the Montezuma Allotment. In 1996, range resources were being over-utilized by wild burros and they were beginning to suffer from lack of forage.

The Bullfrog HMA has very little available grass, except for some annual grasses, that make it unsuitable horse habitat. In fact, very few wild horses have ever been sighted in the Bullfrog HMA, and those seen may have been transients from neighboring HMAs. Burros, however, prosper on the habitat available in Bullfrog HMA, as they are capable of foraging on many of the shrub species found throughout the Complex. Furthermore, there is little overlap of forage use between cattle and burros. Cattle have not grazed the southern Montezuma Allotment since prior to 1995. Cattle currently use the portion of the Razorback Allotment in the Bullfrog HMA. The Springdale 2 Allotment has only a 2 head of cattle ten-year grazing lease.

a. Issues of the Bullfrog HMA:

1. Extremely high burro numbers in the past led to emergency gathers.

2. There are few available sources of water, especially on the east side of the HMA.

3. Inadequate fencing around Beatty has led to burro-human interactions ("Nuisance burros").

4. Bullfrog HMA contains habitat for the threatened Desert Tortoise

5. Appropriate management levels (AMLs) need to be re-established for both the east and west sides individually.

6. Fire Emergency Stabilization and Rehabilitation is currently being conducted on both the eastern and western sides of Bullfrog HMA.

Issue 1. Extremely high burro numbers in the past led to emergency gathers.

In 1994, a census flight located 432 burros within the HMA, 244 over AML. During a 1995 gather, 500 burros were captured. Eight were released back onto the HMA with the knowledge that many burros had eluded capture, and many more remained on the Nevada Training and Testing Range adjacent to the HMA, with the ability to move across the unfenced boundary.

A drought occurred in 1996, and HMA and rangeland monitoring indicated severe utilization of rangeland resources and a dramatic lack of available water. The Bullfrog HMA was included in these gathers, and 417 burros were removed from the area. None were returned to the range at that time because it was believed that several had remained elusive and uncaptured. Burros faired better than horses in these drought conditions, but signs of poor condition did exist among burros gathered, and the rangeland vegetation and water sources would not have recovered if large numbers of burros had been permitted to remain on the range at that time. Populations of wild burros are now well within AML and rangeland resources are improving.

Issue 2. There are few available sources of water, especially on the east side of the HMA.

Bullfrog HMA is located in the Mojave and Mojave/ Great Basin desert transition zone. There are very few water sources for wild horses and burros. Although the Amargosa River runs through the center of the HMA, nearly all of its course is privately owned and unavailable to wild equids. There is a small portion of the river south of Beatty that the burros on the east side of Bullfrog HMA utilize regularly.

The BLM has water rights to some of the water sources on the western side of the HMA. These include Lower Indian Spring, Crystal Springs (a small collection of 4 springs), and Wild Burro Seep. At each of these sites an exclosure has been built to protect Amargosa toad habitat from wild burros and cattle. Water is piped to troughs outside of the exclosures, but the troughs or the pipelines often do not work properly and need repair. Burros have access to water run-off from broken pipelines and/or troughs.

A few other waters exist on the western side of the Bullfrog HMA, including Mud Spring and Goldbar Spring, but these springs are mostly dried up, with only green vegetation to verify their existence. It may be possible to develop these springs in the future for better burro distribution.

Specie Spring is a reliable water source on the east side of U.S. Highway 95. It is vital habitat to wildlife, such as chuckar, bighorn sheep, and wild burros. It was in Proper Functioning Condition in 2006. There is little evidence of trampling by wild burros, and it is unclear if burros use it regularly.

Issue 3. Inadequate fencing around Beatty has led to burro-human interactions ("Nuisance burros").

The HMA contains several water sources, but most are privately owned and fenced off. Few water sources outside of town limits and easy access to town water sources has, at times, caused the Bullfrog burros on the west side of the HMA to become nuisances to the residents of Beatty. Over the last 20 years, the TFS has received numerous letters and phone calls from frustrated citizens stating that burros come into town at night and wreak havoc, such as causing traffic hazards, turning over garbage cans, destroying fences, yards, shrubs, grapevines, and fruit trees, leaving manure in yards, and aggravating dogs. Burros had also been found shot and killed or hit by vehicles on the highway.

In 1990, the BLM met with the Beatty Town Advisory Board and stated that the long-term solution for citizens was to fence personal property. Thus far, several of the residents of Beatty have done this, but "nuisance burros" remain an issue in town. In 1990, the BLM agreed to remove stray burros within the city limits and gathered 63 "nuisance burros."

In 1996, 416 burros were removed in the emergency gather detailed above. In 2000, the BLM attempted to water-trap 10 nuisance burros from Beatty but was unsuccessful. There have been no burros gathered from the Bullfrog HMA since 1996.

However, burros continue to be nuisances to Beatty residents. Even some residents who have fenced their properties state that the burros have learned how to open the latches on their gates and still trespass. Most of these cases occur on the western side of the U.S. Highway 95. Therefore, it has become necessary again for the BLM and the town of Beatty to coordinate efforts and funds to relocate the nuisance burros to other locations on the HMA and build a suitable fence around the west side of Beatty in order to prevent the burros from re-entering town.

Issue 4. Bullfrog HMA contains habitat for the threatened Desert Tortoise

Much of the southern portion of the Montezuma and Razorback Allotments are in Non-Intensive Category III desert tortoise habitat. Potential impacts of burros to desert tortoise habitat will be monitored and assessed during periodic surveys. To avoid impacts from grazing animals on desert tortoise, it should be proposed to permit only burros inside desert tortoise habitat, not cattle. Forage inside desert tortoise habitat is better suited for burro. This will reduce the number of AUMs used in desert tortoise habitat by half. Details regarding the desert tortoise (and the Amargosa toad, a sensitive species) are located in the Montezuma Allotment Evaluation EA.

Issue 5. Appropriate Management Levels (AMLs) need to be re-established for both the east and west sides individually.

Because Bullfrog HMA is divided down the center by U.S. Highway 95 which is fenced, it is necessary to establish AML ranges for both sides of the HMA individually. This will facilitate more appropriate management of each side, especially when taking into account Razorback and Springdale 2 allotments with their individual cattle permits and accounting for the lack of water on the east side of the HMA. Refer to the Montezuma Complex EA for the AML ranges proposed for each side of Bullfrog HMA.

Issue 6: Fire Emergency Stabilization and Rehabilitation is currently being conducted on both the eastern and western sides of the Bullfrog HMA.

Two wildfires burned portions of the Bullfrog HMA in July 2006. Approximately 20,735 acres burned on the east side of the U.S. Highway 95, 7,918 of which burned on Nevada Training and Testing Range and 12,817 burned on BLM land. Burn severity on the east side was only moderate, with more than 50 percent of the vegetation left unburned. Some of the burned areas affected two drainages, the Beatty Wash and Tate’s Wash, but severity of the burn does not require stabilization or rehabilitation, and the area will be monitored for vegetation regrowth and soil stability. Additionally, about 3,674 acres burned on the west side of U.S. Highway 95.

Although the area of the Sawtooth Fire (west side) was much smaller than the Beatty Fire (east side), the burn severity was much more intense, and in some areas, the vegetation was completely consumed by the fire. The Emergency Stabilization and Rehabilitation (ESR) projects have been completed. The ES project involved the slope stabilization of the upper part of the watershed on the

Sawtooth Fire to reduce the effects of potential soil erosion and debris displacement on the lower part of the watershed. The ESR project involved the seeding of 400 acres with crested wheatgrass and four-wing shadscale species. The burned area is being closely monitored by the BLM to ensure that the ESR projects are performing as planned.

6. Stonewall HMA

The Stonewall HMA is located 20 miles south of Goldfield and is approximately 25,790 acres in size. The area is characterized by three major vegetation types: pinyon-juniper in the high mountains, various sagebrush species on the lower mountains, and spiny menodora, shadscale, winterfat, and Bailey's greasewood on the alluvial fan. Grass species comprise only about five percent of the vegetation in the HMA. Habitat in the Stonewall HMA is well suited for burro use, but contains little forage suitable for horse use.

The AML for the Stonewall HMA was established at 50 horses and 25 burros. This HMA also borders on the Nevada Training and Test Range and both burros and horses cross the fenced boundary. A 1981 census located 530 horses and 42 burros in the HMA, but these numbers fluctuate greatly because of the movement across the Nevada Training and Test Range. Only 24 horses and 5 burros were found and removed in the 1996 emergency gather. The AML of 50 horses and 25 burros has been found to exceed greatly the carrying capacity of the range in the Stonewall HMA.

The Stonewall HMA is located on the east central boundary of the Montezuma Allotment, with its eastern edge adjacent to the Nevada Training and Testing Range. The boundary with the Testing Range is partially fenced and wild horses and burros frequently cross the boundary causing horse numbers to fluctuate seasonally. The HMA is not fenced on the north, south, and western boundaries, however the U.S. Highway 95 just to the west of the HMA is fenced.

a. Issue of the Stonewall HMA:

Issue 1. The habitat of the HMA is more suitable for burros than wild horses.

The Stonewall HMA is noted for its mountainous and rugged terrain. There is inadequate water throughout the HMA for wild horses. Only two reliable water sources exist. These are Stonewall Falls and a small unnamed spring on Stonewall Mountain. Little water is available north of the HMA and none is available south of the HMA, keeping these animals within the HMA on the north, west and south, with dispersal only available to the east. These few available water sources in this mountainous terrain cause some competition between burros and bighorn sheep. Details of the waters and vegetation of the Stonewall HMA are in the EA and RHE.

Lastly, there is a severe shortage of forage for wild horses. Ecological Site Inventory data determined that only five percent of the vegetation is comprised of grass species. The vast majority of the vegetation is various shrub species, some of which are palatable to burros. There is not enough forage to support both burros and cattle.

During the 1996 drought, BLM rangeland specialists and wildlife biologists conducted monitoring of rangeland resources to determine the extent of the drought and effects on vegetation, water sources, wild horses and burros, and wildlife. They found "no grasses in the woodlands, and utilization on remaining grasses throughout the HMA was severe. Grasses were not observed in the HMA in zones under 8" precipitation." They observed 14 wild horses and 1 burro in the HMA at Stonewall Falls. All the horses had "all their ribs and hipbones showing, quite thin." Six mules seen later were thin, but in better condition than the horses. At Stonewall Falls, 6 wild horses, 1 mule, and 3 bighorn sheep were found dead and partially eaten, as mountain lions use the area to hunt. The team concluded that "likely grasses left in the area do not contain enough substance and nutrition to sustain life. . . .[There does not appear to be] enough forage to sustain wild horses. [We] recommend only managing for burros" (Valerie Metscher, Rangeland Management Specialist, Tonopah Field Station, 30 September 1996).

Because of these stark conditions in 1996, a drought emergency wild horse and burro gather was conducted. Twenty-four head, including 1 burro and 1 mule, all in poor condition, were removed. No wild horses, burros or mules remained in the HMA after this gather, though emigration from Nevada Training and Testing Range is common. During a 1997 wild horse and burro gather of Nevada Wild Horse Range, the Las Vegas Field Office removed 4 wild horses and 10 mules from along the fence line between Stonewall HMA and Nevada Training and Testing Range. There have been no gathers of the Stonewall HMA since 1996.

7. Paymaster HMA

The Paymaster HMA lies 7 miles west of Tonopah, and comprises approximately 100,500 acres. Only about seven percent, or 7,000 acres, of the HMA exists within the Montezuma Allotment (refer to Map 5.0), with a current AML of five wild horses. The remainder of the HMA includes portions of the Monte Cristo Allotment with an AML of eight wild horses, Sheep Mountain allotment with 28 wild horses allocated, Yellow Hills with an AML of only 1 horse, and an unallocated portion of land with an AML of 1 horse. With these allotments combined, Paymaster HMA currently has a total maximum AML of 43 wild horses.

Because most of the area of the Paymaster HMA is not within the Montezuma allotment, the issues of the HMA will be addressed herein, but an extensive evaluation will not be completed at this time.

Few fences exist across much of the area, which allow the wild horses unrestricted movement areas outside the HMA boundaries as well as the adjacent HMAs of Silver Peak and Montezuma Peak. Because of steep terrain, limited forage, and few accessible perennial waters, the Paymaster HMA itself receives little actual use by wild horses, but resides in the Montezuma allotment outside the boundaries of the HMA. The Montezuma/ Magruder Mountain fence is in disrepair in some places. It appears to restrict movement of the few cows in the area, but horses and burros are likely to be able to get through or over it. Burros have been observed in the adjacent Silver Peak and Montezuma Peak HMAs. This accounts for the mules that are sometimes observed outside the Paymaster HMA.

There have only been two gathers of the Paymaster HMA. The first was in 1992 in which 396 animals (including 5 mules) were captured, 290 were removed, and 100 (50 mares and 50 studs) were released back into the HMA.

During the 1996 drought, it was not necessary to gather Paymaster. In 1996, horses were permanently residing outside the HMA in the Montezuma Allotment between Lone Mountain and the town of Tonopah. The 1996 gather was conducted for emergency purposes only, no horses were removed since Paymaster horses were in fair condition at that time and adequate forage and water remained available in the northern end of the Montezuma Allotment.

A gather was conducted in September 2006 to reduce the number of wild horses to AML in the Paymaster HMA. (At the time, the HMA was 448 percent above AML.) A total of 178 horses were gathered from an area. Most were residing outside the HMA boundaries. Horses gathered in 2006 were generally in poor condition (average Henneke Condition Class Score of 3). Some of the animals were in such poor condition, they needed to be euthanized. In all, 150 wild horses were removed from the range, leaving approximately 28 wild horses post-gather (so as not to exceed AML within 4 years) within the boundaries of the HMA. Most of these wild horses have since been observed living outside the HMA once again.

a. Issues of the Paymaster HMA:

1. Wild horses have left the Paymaster HMA for better habitat in the Montezuma Allotment and reside in areas not designated for horse use,

2. Wild horses utilize the Tonopah sewer ponds as a major water source,

3. Genetic variability of wild horse populations is uncertain.

Issue 1. Wild horses have left the Paymaster HMA for better habitat in the Montezuma Allotment and reside in areas not designated for horse use.

In the 1970s, wild horses (and probably wild burros) resided in the mountain ranges around Lone Mountain about 7 miles west of Tonopah. Although there is adequate water in the Montezuma Allotment portion of the HMA, there is rarely adequate forage for large numbers of horses within the boundaries of the HMA. In the mid-1980's, the lessee of the Montezuma Allotment to the east of Paymaster HMA developed a new water source in a formerly ungrazed area, either by horses or cattle. This area was a very productive source of quality forage and surpassed the HMA forage values in quality and quantity. When the horses discovered this water and forage, they left the HMA and have not returned. In the mid-1990's, the lessee removed his cattle from the area and turned off the water. Cattle have not used this portion of the allotment since 1996. However, wild horses have continued to forage on this area outside the Paymaster HMA. Heavy utilization by horses has occurred for 10 years in this portion of the Montezuma Allotment outside the boundaries of the HMA. Impacts of such over-utilization have led to deterioration of the range and loss of key forage species. Currently, very few wild horses reside within the Paymaster HMA boundaries. Instead, they remain in the valley bottom between Lone Mountain (Paymaster) and U.S. Highway 95/6 (Montezuma Allotment). For this reason, the Environmental Assessment proposes that no AUMs would be allocated to the small portion (7%) of Paymaster HMA that lies within Montezuma allotment. Because this area has been historically over-allocated, rest is necessary to achieve Rangeland Health Standards. See the Final Multiple Use Decision for Monte Cristo Allotment (2002), the Area Manager's Final Multiple Use Decision for Montezuma Allotment (1994), and the Yellow Hills/ Sheep Mountain Allotment Evaluations (2003), for additional details.

There are several water sources available to Paymaster wild horses, but few of them are located within the boundaries of the HMA. This fact, combined with little forage on the HMA, makes managing for horses within the boundaries very difficult, and makes future management of the herd questionable.

Photo 7.0 - The general condition of the mares captured from Paymaster HMA, 2006. Most showed ribs; hipbones and backbone (average Henneke Body Condition Score of 3). Mares without foals were healthier than mares with foals.

Courtesy of Andrea Felton, WHBS, BLM, TFS, 2006.

Issue 2. Wild horses utilize the Tonopah sewer ponds as a major water source. There is a history of unhealthy wild horses and the presence of club foot.

When the lessee of the Montezuma allotment turned off the water in the valley in the mid 1990s, wild horses found an alternate water source in the run-off of the Tonopah Sewer Ponds, farther to the east and even farther from the HMA. Continued use of the Tonopah Sewer Ponds as a main water source for wild horses from the Paymaster HMA has potential to impact horse health through contamination by bacteria, trace quantities of toxic materials, heavy metals, and salts.

Several wild horses gathered from the Paymaster HMA in 2006 exhibited signs of illness and weakness. There is a history of unhealthy wild horses and the presence of club foot. Five percent of the Paymaster wild horses suffered from club foot and were in very poor condition

(Henneke Score 1 or 2). This defect cripples the horse and limits its movement across the landscape in search of food and water. All club-footed wild horses gathered from Paymaster in 2006 were in extremely poor health. It is still unknown if clubfoot is a genetic defect, a result of incorrect hoof wear over years, sustained nutritional deficiency, or a combination of all of them.

Photo 8.0 - This is a 12-year old stud in very poor body condition and health. A stud this age should still be in his prime and be in excellent health. This horse was not club-footed, and the cause of his poor condition was unknown.

Courtesy of Andrea Felton, WHBS, BLM, TFS, 2006.

Photo 9.0 – A clubfoot of a horse from the Paymaster HMA.

Courtesy of Andrea Felton, WHBS, BLM, TFS, 2006.

Issue 3. Genetic variability of wild horse populations is uncertain.

Paymaster HMA has similar genetic diversity issues as the Montezuma Peak HMA. Management of one of these HMAs would directly affect the other. Therefore, refer to Montezuma Peak HMA issues for more details regarding the genetics issue and possible management of these HMAs.

C. Wildlife

Introduction

The Montezuma Complex provides habitat for a host of wildlife species. The Mojave Desert within the assessment area is the most diverse animal community in the Tonopah Planning Area. There are federally listed species, such as the threatened Mojave population of desert tortoise (*gopherus agassizii*). There are BLM sensitive species, such as the Amargosa toad (*Bufo nelsoni*), chuckwalla (*Sauromalus obesus*), and Oasis Valley speckled dace (*Rhinichthys osculus ssp* .). The desert tortoise, chuckwalla, Amargosa toad and Oasis Valley speckled dace are found only in the southernmost portion of Montezuma and Razorback Allotments within the Mojave Desert.

Big game species include desert bighorn sheep (*Ovis canadensis nelsoni*), mule deer (*Odocoileus hemionus*), and pronghorn antelope (*Antilocapra americana*). Small game species occur, such as chuckar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), and desert cottontail (*Sylvilagus audoboni*). Predators include the mountain lion (*Felis concolor*), bobcat (*Links rufus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), and kit fox (*Vulpes macrotus*).

There is also the basic component of non-game species of lizards, birds, and rodents. These species are found throughout the Montezuma Complex in Mojave, Mojave transition, and southern Great Basin vegetation zones.

There is an existing draft of the "Bullfrog Habitat Management Plan" (HMP) for the southern portion of the Montezuma Complex that includes all public lands north of the Death Valley National Monument, east of the California state line, southeast of Nevada Highway 267, and west of the Nevada Training and Test Range. It includes all of the Razorback and Springdale 2 allotments, as well as most of the southern portion of the Montezuma Allotment. A letter was sent to interested parties soliciting comment in November of 1991, but there is no signed final draft on file in the Tonopah BLM office. This document contains a significant amount of monitoring data gathered and would be referenced throughout this section. The Tonopah RMP (1997) contains directions to complete a Wildlife HMP for the area. The HMP would be achieved through the this Rangeland Health Evaluation, the technical recommendations, this EA, and Multiple Use Decision.

1. Big Game

a. Pronghorn Antelope

- ***Population***

The Tonopah RMP does not identify pronghorn population goals for the Montezuma Complex, and states that wildlife would be managed on a monitoring basis. Nevada Department of Wildlife (NDOW) does not conduct pronghorn surveys in the area because of the low density and low priority based on hunter interest. Pronghorn have been increasingly observed in the area north of Goldfield along the foothills of the Montezuma Range. The 2004-2005 NDOW Big Game Status book does not give population estimates for the assessment area. The pronghorn that do occur are likely immigrants from the Nevada Testing and Training Range. The Montezuma Complex encompasses portions of NDOW hunt unit 212, and units 251-253. This NDOW Hunt Unit has an estimated population of 180 adult animals. However, the majority of hunt unit 251 is outside of the assessment area.

- ***Habitat***

The Tonopah RMP identifies pronghorn habitat in the Mud Lake area and south, on the east side of Hwy 95 and the Goldfield Hills, to Stonewall Mountain in the Montezuma Allotment. This area consists of greasewood, and salt desert shrub plant communities. The habitat in the Montezuma Allotment is mainly late winter early spring habitat for the pronghorn and is not prime habitat for antelope. A recent GIS layer obtained from NDOW indicates that the potential pronghorn habitat in the assessment area consists of a much larger area than is identified in the RMP. This habitat is used yearlong habitat. According to the RMP, the pronghorn habitat is to be managed "for the best possible condition within the site potential." There is also direction to develop additional water sources when and where identified. There has been no pronghorn habitat condition studies performed on the Montezuma allotment. The limiting factor in most of the pronghorn habitat is the lack of drinking water.

b. <u>Mule Deer</u>

- ***Population***

The Tonopah RMP does not identify deer population goals for any portion of the Montezuma Complex, and states that the mule deer in the area would be managed on a monitoring basis. That is, if through monitoring it is determined that mule deer are over- utilizing an area, the Nevada Department of Wildlife (NDOW) would be requested to make adjustments so that the herd would no longer cause resource damage. NDOW conducts annual census and classification flights on selected mule deer herds within the Tonopah Planning Area, but none of those selected areas occurs within the Montezuma Complex. This is due to the low population densities of mule deer in the area and low priority based on hunter interest. The Montezuma Complex encompasses portions of NDOW hunt unit 212, and units 251-253. According to the NDOW "*2004-2005 Big Game Status Book,*" there are approximately 300 mule deer within hunt units 211 and 212, which encompass all of Esmeralda County. Very little of the occupied deer habitat within these two hunt units is actually within this assessment area. There is an apparent stable trend in the mule deer population of hunt area 21. The current population estimate for Management Area 25 (Units 251, 252, and 253) is approximately 350 adult animals.

- ***Habitat***

Mule deer occur on the Montezuma Range, Stonewall Mountain, Bullfrog Range and in the Goldfield Hills in low densities. Mule deer are found primarily in areas that provide water throughout a large portion of the year. Mule deer habitat in the assessment area is limited by water availability. The habitat that falls within the assessment area is considered year-round habitat and is not delineated into summer or winter habitat. Optimal summer habitat for mule deer is considered to be 8,000 ft and above in elevation, with slopes greater than 30 percent, and plant communities rich in forbs. Optimal winter range consists of south- and west-facing slopes without regard to steepness, but having less than 18-20 inches of snow. Primary fall and winter forage plants are bitterbrush, serviceberry, snowberry, sagebrush, winterfat, and willow.

There are 11 deer winter range habitat study sites on the assessment area. There have been no recent studies conducted at these sites. However, the data that exists for the sites from prior studies indicated that the habitat was in "Good" condition, at 7 out of 11, studies (refer to wildlife section of Appendix A). Only two were in fair however, two studies were in excellent condition. There has been little to no use by livestock in mule deer habitat since approximately 1995. This may be due to the lack of cattle use in mule deer and bighorn sheep habitat.

Photo 10.0 - Desert bighorn sheep in the Stonewall Mountains

Courtesy of Bryson Code, Wildlife Biologist, BLM, TFS, Stonewall Mountains, Nevada.

c. <u>Bighorn Sheep</u>

- **General Information**

Desert Bighorn Sheep are both a trophy big game species and a BLM Sensitive species in the state of Nevada. Please refer to the BLM Sensitive species section above for detailed population and habitat information on the sheep.

d. Mountain Lions

- ***Population***

Lions are limited to areas with a sufficient prey base, so densities are not high. They prey on wild horses and burros and several wildlife species.

- ***Habitat***

Lions exist on the Montezuma Range and Stonewall Mountain.

e. Furbearers

- ***Population***

These species rely primarily on a variety of small mammals, birds, and upland game resources for prey. They can be affected by fluctuations in these prey species due to drought, fire, grazing, disease, etc.

2. Small Game

a. Sage Grouse

Sage grouse are both an upland game species in the state of Nevada as well as a designated BLM sensitive species. For detailed habitat requirements and population information please refer to the BLM sensitive species section.

b. Chuckar

- ***Population***

Chuckar were first introduced into the Montezuma Complex in 1947. Since that time, chuckar populations in the Montezuma Complex have been augmented with more releases, and have done well by expanding in distribution and population. They occur in all three allotments in the Complex. In the summer of 2004, chuckar were observed at nearly every surface water source that was visited during the Proper Functioning Condition (PFC) assessments of the riparian areas on the Montezuma Complex. There was little recruitment in 2005 as indicated by the small numbers of juvenile chuckar noted during the PFC assessments. This was primarily due to drought at the time of the assessments. However, the overall numbers indicated that there were adequate numbers of adults present for the population to persist through the dry times. The winter of 2004-2005 has brought above average precipitation, which has likely increased recent recruitment rates of chuckar.

- ***Habitat***

The Montezuma Complex has extensive suitable chuckar habitat. Optimal year-round chuckar habitat is described as areas in proximity to slopes greater than 25 percent with a substantial rock outcrop component. Areas with a shrub cover of 30-80 percent and an understory of annual grass (like cheatgrass and red brome) and forbs are preferred habitat. A primary component of good chuckar habitat is a reliable source of perennial water. By most accounts chuckar are rarely, documented more than two miles from perennial water source. Some springs and seeps exist in the Montezuma range, Bare Mountain range and on Stonewall Mountain. Another important component to sustain thriving populations of chuckar is a readily available crop of annual grass, such as cheat grass or red brome. It is well known that chuckar can subsist almost entirely on cheat grass shoots when they are available. Both chuckar and cheat grass evolved in the same area in Asia and chuckar likely adapted to take advantage of the annual growth characteristics of cheat grass. However, little cheat grass or red brome grows in dry years. Therefore, given that there are substantial amounts of the other habitat characteristics in the area, it is likely that the general lack of cheat grass and red brome in some years limits the chuckar populations in the assessment area.

c. <u>Pygmy Rabbits</u>

Pygmy rabbits are both an upland game species and BLM sensitive species in Nevada. For detailed habitat and population information, please refer to the BLM sensitive species section of the Appendix A.

d. <u>Cottontail</u>

- ***Population***

Currently there are no population goals for cottontails on the Montezuma Complex. Cottontails are widespread throughout the Complex and appear to be in sustainable numbers. The two recognized subspecies of cottontails that may inhabit the Montezuma Complex are the desert cottontail *(Sylvilagus audubonii)* and the mountain cottontail *(S. nuttallii)*.

- ***Habitat***

As their respective names imply, the desert cottontail can be found at lower elevations in the Montezuma Complex and the mountain cottontail in the higher elevations. However, both species are adaptable and habitat overlap is recognized. Cottontails are plant generalists, but prefer grasses and forbs to shrubs.

e. <u>Black-tailed jackrabbit</u>

- ***Population regulation information and factors***

Black-tailed jackrabbits are one of the most important prey species in the desert ecosystem. Nearly all of the carnivores that are found on the Montezuma Complex prey upon the jackrabbits. Black-tailed jackrabbits experience localized cyclic populations, with peak numbers occurring anywhere from 6-12 years apart. Many documented potential factors may have an effect on jackrabbit populations. These factors include predation, precipitation, available forage, and disease. However, there have been no definitive answers as to what drives the cycles.

Both the Ferruginous hawk and the Golden Eagle have been shown to depend heavily on the jackrabbit as a prey item, and correlations have been shown between localized jackrabbit populations and local Ferruginous hawk populations. Black-tailed jackrabbits were abundant in 2005 and it was likely a peak in local populations. There are adequate populations to support the area predators, including the two raptors mentioned above.

- ***Habitat***

As indicated by their wide distribution, black-tailed jackrabbits are extremely adaptable animals. They would thrive in agricultural land or arid deserts, at elevations below sea level to nearly 12,000 feet.

In general, when rangeland is converted from late seral states to mid or early seral states with high weed components and annual species, jackrabbit populations increase. However, complete monocultures of cheatgrass appear to have an adverse impact on black-tailed jackrabbit populations in the immediate area of the annual grassland. The Montezuma Complex has not had the cheatgrass infestation and fire cycle problems of northern Nevada. However, in 2006, two fires on red brome infested areas in the southern portion of the Montezuma and Razorback Allotments burned. All of the available data indicates that the populations of black-tailed jackrabbits in the Montezuma Complex are healthy and undergoing natural population cy

Photo 11.0 - Typical dominance of red brome in the Mojave Desert after favorable precipitation events

Courtesy of M. Pointel, RMS, BLM, TFS, 2006.

3. Migratory Birds

A large number of migratory birds could be expected to nest in the evaluation area. Salt desert scrub nesting migrants such as the lesser nighthawk, loggerhead shrike, burrowing owl, horned lark, Brewer's sparrow, black-throated sparrow, lark sparrow, and rock wren could be found throughout the valleys and lower hills in the assessment area. Sagebrush nesting migrants such as the prairie falcon, sage sparrow, sage thrasher, vesper sparrow, western meadowlark, and green-tailed towhee may be found in the lower hills of the Montezuma Range, the Bullfrog Hills and Bare Mountain. Pinyon-juniper nesting migrants such as pinyon jay, scrub jay, black-billed magpie, Clark's nutcracker, mountain chickadee, gray vireo, black chinned sparrow, Cassin's kingbird, spotted towhee, blue-gray gnatcatcher, common bushtit, chipping sparrow, ferruginous hawk, gray flycatcher, juniper titmouse, mountain bluebird, western bluebird, Virginia's warbler, black-throated gray warbler, and Scott's oriole may also be found in the higher elevations of the Montezuma Range and Stonewall Mountain.

Migratory birds are given special status because of their recognized ecological and economic value to the United States and other countries. There are a number of laws that exist to protect migratory birds and their habitats. These laws include the Bald Eagle Protection Act, Migratory Bird Conservation Act, Fish and Wildlife Coordination Act, Executive Order 13186 for the conservation of Migratory Birds, but perhaps the mostrelevant current law is the Migratory Bird Treaty Act (MBTA). The MBTA outlines the protections afforded to every species of migratory bird and the penalties for violations. The regulations under the MBTA cover every native species of bird in the United States except for gallinaceous upland game birds.

a. Raptors

The raptors likely to occur in the Montezuma Complex are American kestrels, great-horned owls, red-tailed hawks, prairie falcons, ferruginous hawks, Swainson's hawks, and golden eagles. Of the 33 bird species identified as BLM Sensitive species, ten of them can be considered raptor species. The potential for these species to occur and the possible impacts to these species will be discussed in the BLM Sensitive Species section.

b. Shorebirds

Playas and ponds in the Montezuma Complex provide some marsh habitat in wet years.

D. Threatened, Endangered and Candidate Species

There are no Threatened, Endangered, or Candidate plant species in the Montezuma Complex. Three threatened or endangered animals that are found within the Complex include the bald eagle, the desert tortoise, and the southwest willow flycatcher. One candidate animal species, the yellow-billed cuckoo, can also be found within the Complex.

The Tonopah Resource Management Plan (RMP), dated October 2, 1997, contains the following determination for the specific management of the desert tortoise habitat in resource the area: Determination No.2 provides for the management of desert tortoise Non-Intensive Category III habitat to maintain current population levels.

There are historic records of the bald eagle in the Montezuma Complex. However, there is no critical habitat or nesting habitat for the eagle in the Complex. The desert tortoise occurs on the southernmost part of the Montezuma and Razorback Allotments (refer to Map 3.0). Both the southwest willow flycatcher and the yellow-billed cuckoo have been seen in Oasis Valley, but no breeding pairs have been found. There is no critical habitat for any of these four animals found on the Tonopah Planning Area.

1. Southwest Willow Flycatcher

Status: Endangered
Petition for listing dates: January 25, 1992
Petition for de-listing dates: none
Proposed Rule or Final Rule Date: Feb 27, 1995
Recovery Plan Complete for Tonopah Planning Area (TPA): 2002, Range-wide from USFWS
Existing Biological Opinions for TPA: None
Positive ID on TPA: Yes, in Oasis Valley
Positive ID on Breeding Pair: No
Associated Allotments: Razorback, Springdale
Critical Habitat on TPA: None

The southwestern willow flycatcher was federally listed as Endangered under the Endangered Species Act in March of 1995 with Critical Habitat designated in July of 1997. It has been observed in the Oasis Valley area. However, there have been no documented breeding, and there have been very few observations. NDOW has committed to conducting flycatcher surveys with approved USFWS protocol in the Oasis Valley from 2001 and continuing through 2006. It is unlikely that there would be a need for "Formal section-7 Consultation" on this species within the assessment area. However, there is a responsibility to consider this species in regard to actions in the area. There is the potential for "Informal Consultation" for this species.

- ***Population***

Migrant southwestern willow flycatchers have been recently observed on private land located within the Oasis Valley, Nevada, just north of Beatty. The valley is approximately 12 miles long with intermixed private and pubic land parcels.

With the federal listing of the flycatcher, substantial effort was expanded since 1999 on identifying the bird's status and distribution in southern Nevada, including the Oasis Valley. A single southwestern willow flycatcher was observed by NDOW on June 8, 1999, in the Narrows south of Beatty using the approved USFWS protocol. Two follow-up visits did not locate any flycatchers. The Nature Conservancy conducted bird surveys on their newly acquired Torrence Ranch and found an unpaired southwestern willow flycatcher on May 15, 2001. For the 2001 survey season, NDOW conducted southwestern willow flycatcher surveys at the Narrows (mostly public land) and at Springdale (private land) using an updated USFWS protocol requiring 5 visits instead of 3 visits that were required the previous survey years. However, the minimum of 5 survey visits during the three defined periods for each survey site were not completed (3 visits for the Narrows and 2 visits for Springdale). The Springdale site had one migratory southwestern willow flycatcher during the June 14, 2001 survey. NDOW has committed to conducting flycatcher surveys with approved USFWS protocol in the Oasis Valley for summer 2002.

There is the potential for the willow flycatchers observed in Oasis Valley to be of the Rocky Mountain/Great Basin variety (*E. t. adastus)* or the Western variety (*E. t. brewsteri).* Oasis Valley lies on the fringe of these varieties habitats, and there is overlap between the varieties. Variety *brewsteri* has been observed in Ash Meadows.

- ***Habitat***

Habitat in the Oasis Valley was not identified as Critical Habitat or occupied habitat. NDOW's current study has shown that southwestern willow flycatchers prefer dense stands of coyote willow for nesting. NDOW has found southwestern willow flycatchers nesting within an area as small as 1/10th acre of coyote willow patches. Most of this habitat type in the assessment area occurs on private lands. A component of cottonwood/willow stands occur on public lands at the Narrows south of town, north of Stage Coach Hotel and Casino at Jim's Spring, and one upland spring outside of the Amargosa River corridor - Lower Indian Spring.

The removal of the sensitive riparian habitat into private ownership would be an issue. Other federal actions that may affect the flycatcher habitat include: ACEC plan amendment, Rights-of-way, R&PP Lease actions, wind towers, utility lines, weed control - saltcedar and Russian olive, activities that affect riparian habitat condition, water developments and/or diversions, and river corridor flood control, and vegetation.

2. <u>Bald Eagle</u>

Status: Threatened
Petition for listing dates: see below
Petition for de-listing dates: July 6, 1999 Proposed rule to de-list.
Proposed Rule or Final Rule Date: 1967 – Endangered; 1976 – Endangered lower 48, except considered Threatened in WA, OR, MN, WI, MI; 1995 – Threatened throughout lower 48;
Recovery Plan Complete: Yes, TPA Covered by “The Recovery Plan for the Pacific Bald Eagle”-1986
Existing Biological Opinions: None
Positive ID on TPA: Yes
Positive ID on Breeding Pair: No
Associated Allotments: Montezuma, Springdale and Razorback
Critical Habitat on TPA: No

The bald eagle is federally listed as Threatened under ESA. It has not been observed in the Montezuma Complex and no nesting sites have been identified.

*3. **Desert Tortoise***

Status: Threatened
Petition for listing dates: Irrelevant
Petition for de-listing dates: none
Proposed Rule or Final Rule Date: April 2, 1990
Recovery Plan Complete: Yes, "Desert Tortoise (Mojave Population) Recovery Plan June, 1994".
Existing Biological Opinions: Appendix 15 of Tonopah RMP-ROD: "Biological Opinion on the Implementation of the Proposed Tonopah RMP"- August 12, 1994. In addition, the "Final Programmatic Biological Opinion for the Implementation of Proposed Actions within Desert Tortoise Habitat Administered by the Tonopah Field Station, Nye County, NV"- March 14, 2003 is in existence.
Positive ID on TPA: Yes
Positive ID on Breeding Pair: Yes
Associated Allotments: Montezuma, Springdale and Razorback.
Critical Habitat on TPA: No

- ***Population***

Desert tortoise (*Gopherus agassizii*) surveys conducted on the Tonopah Planning Area in 1981 found only three tortoise and three burrows in the area. This supported the BLM designation of low-density habitat for the Tonopah Planning Area.

- ***Habitat***

Approximately 70,600 acres of Category III Mojave desert tortoise habitat occurs at the southernmost portion of the Bureau's Tonopah Field Station Planning Area in the Beatty, Nevada area of Nye County (See Map 3.0). No Category I or II habitat occurs in the planning area. Desert tortoise habitat is split between the Montezuma and the Razorback Allotments. Approximately 47,302 acres or 67 percent of the identified desert tortoise habitat in the Tonopah Field Station planning area is located within the Montezuma Allotment. The remaining 23,298 acres are in the Razorback Allotment. The range of the Mojave population of the desert tortoise in Nevada is generally restricted to Clark County and those portions of Nye, and Lincoln, south of the 38th parallel and below approximately 4,000 feet (1,330 meters) elevation.

The desert tortoise is most commonly found within the desert scrub vegetation type, primarily in creosote bush scrub vegetation, but also in succulent scrub, cheesebush scrub, blackbush scrub, hopsage scrub, shadscale scrub, wash and Mojave saltbush scrub (Fish and Wildlife Service 1994). Within these vegetation types, desert tortoises potentially can survive and reproduce where their basic habitat requirements are met. Throughout most of the Mojave Region, tortoises occur most commonly on gently sloping terrain, with soils ranging from sand to sandy-gravel and with scattered shrubs where there is abundant inter-shrub space for growth of herbaceous plants. Throughout their range, however, tortoises can be found in steeper, rockier areas. In Nevada, tortoises are considered to be active from approximately March 1 through October 31.

Annual species of plants are very important to the desert tortoise. In a study area typical of the western Mojave Desert, Jennings (1997) noted that about 70 percent of the bites taken from annuals were by tortoise. Desert tortoises are most active when annual plants are most common. When winter precipitation is sufficient, desert annuals produce the greatest amount of grass and forb biomass in the Mojave Desert (Oldemeyer 1994). With adequate precipitation in the winter, annuals may have a life cycle of up to eight months; when precipitation does not occur until late winter, the life cycle may be as short as 6-10 weeks (Beatley 1967).

The planning area was designated by the Bureau of Land Management as low density, Category III habitat, which is described as having the following criteria:

1. The habitat area is not essential to the maintenance of viable populations of desert tortoise.
2. Most conflicts are not resolvable.
3. Habitat area population is low to medium density not contiguous with medium or high density.
4. The population is stable or decreasing.

On April 2, 1990, the Fish and Wildlife Service determined the Mojave population of the desert tortoise to be threatened (55 FR 12178). On February 8, 1994, the Fish and Wildlife Service designated approximately 6.4 million acres of critical habitat for the Mojave population of the desert tortoise (59 FR 45748), which became effective on March 10, 1994. Approximately 1.2 million acres were designated as critical habitat in Nevada (Service 1994). None of the designated critical habitat occurs in the Tonopah Planning Area.

On June 28, 1994, the Fish and Wildlife Service approved the final *Desert Tortoise (Mojave Population) Recovery Plan* (Service 1994). The Recovery Plan divided the range of the desert tortoise into 6 distinct population segments or recovery units and recommended establishment of 14 Desert Wildlife Management Areas throughout the recovery units. The Planning Area does not include any recovery areas for the desert tortoise.

The Recovery Plan states that desert tortoises and habitat outside recovery areas, such as in the southern portion of the Montezuma Complex, may be important in recovery of the tortoise. Healthy, isolated tortoise populations outside recovery areas may have a better chance of surviving catastrophic effects such as disease, than large, contiguous populations (Fish and Wildlife Service 1994).

The 2006 Final Programmatic Biological Opinion established the following requirements to minimize potential impact to desert tortoise:

Wild Horse and Burro Stipulations

- Grazing will be permitted as long as forage utilization does not exceed 35 percent on key perennial grasses, forbs, and shrubs.
- The HMA will be visited by a qualified BLM specialist to ensure compliance with the utilization standard. Any items in non-compliance shall be rectified by BLM no later than the beginning of the following growing season, and reported to the Service.
- Trap sites for wild burro removal should be located in previous trap sites or in previously disturbed areas, if at all possible.
- Holding facilities for gather operations should be placed either in previously disturbed areas or outside of desert tortoise habitat.
- Trap sites or holding sites will be cleared by a qualified biologist before being set up or designated. The site will be surveyed for desert tortoise using survey techniques which provide 100 percent coverage.
- All vehicle use in desert tortoise habitat shall be restricted to existing roads and trails; vehicle speed should not exceed 25 miles-per-hour (mph).
- Trash and garbage shall be removed from each trap and holding site and disposed of in an off-site designated facility. No trash or garbage shall be buried at the sites.
- Use of hay or grains as enticements into the traps will not be authorized within desert tortoise habitat to avoid introduction of non-native plant species. The feeding of hay or grains to animals shall be avoided in holding facilities within desert tortoise habitat when possible, with the exception of weed-free hay.
- BLM will provide desert tortoise information to all contractors about desert tortoise. This will be in the form of a fact sheet on the life history of the desert tortoise, legal protection for desert tortoises, the definition of take, penalties for violations of Federal and State laws, general tortoise activity patterns, reporting requirements, measures to protect tortoises, and personal measures employees can take to promote the conservation of desert tortoises. The fact sheet will include the pertinent terms and conditions of the biological opinion. The contractor will ensure that all employees working on the gather are knowledgeable of the terms and conditions of the biological opinion.
- The discharge of firearms will be prohibited at all trap and holding facilities except in the case of euthanasia of a captured animal by an authorized BLM employee or contractor.
- If the HMA includes grazing allotments, combined usage shall not exceed the limits set above.

Livestock Grazing Management Stipulations

- Grazing will be permitted as long as forage utilization does not exceed 35 percent on key perennial grasses, forbs, and shrubs.

- Trash and garbage associated with livestock grazing operations (i.e., branding, roundups, etc.) shall be removed from each camp site or work location and disposed of in a designated facility. No trash or garbage shall be buried at the work locations within desert tortoise habitat.

- Use of hay or grains as feeding supplement shall be prohibited in desert tortoise habitat to avoid the introduction of non-native plant species. Mineral, protein and salt blocks are authorized subject to 43 CFR section 4130.3-2© and shall be placed a minimum of one mile from water developments.

- BLM will provide desert tortoise information to all permittees about desert tortoise. This will be in the form of a fact sheet on the life history of the desert tortoise, legal protection for desert tortoises, the definition of take, penalties for violations of Federal and State laws, general tortoise activity patterns, reporting requirements, measures to protect tortoises, and personal measures employees can take to promote the conservation of desert tortoises. The fact sheet will include the pertinent terms and conditions of the biological opinion. The contractor will ensure that all employees working on the allotment are knowledgeable of the terms and conditions of the biological opinion.

- The allotment shall be visited by a qualified BLM specialist to ensure compliance with the utilization standards and the stipulations of the grazing lease/permit. Conditions of non-compliance shall be rectified by BLM no later than the beginning of the following growing season, and reported to the Service.

- In grazing allotments that include HMAs, combined usage shall not exceed the limits set above.

4. <u>Yellow-billed Cuckoo</u>

Status: Candidate (Endangered)
Petition for listing dates: Feb. 2nd, 1998
Petition for de-listing dates: none
Proposed Rule or Final Rule Date: none, but designated “C” on Feb. 17, 2000
Recovery Plan Complete: No
Existing Biological Opinions: None
Positive ID on TPA: Yes, in Oasis Valley
Positive ID on Breeding Pair: Not on public lands.
Associated Allotments: Montezuma, Springdale

The yellow-billed cuckoo was petitioned for listing as an Endangered Species in February 1998. The U.S. Fish and Wildlife Service found the petition to be warranted, but precluded by higher priority listing actions. Consequently, the cuckoo was added to the Candidate species list in July of 2001. There may be a future need to consult on the Yellow-billed Cuckoo. In addition, at present, the species is considered "Candidate." Therefore, the species is afforded no protection under the ESA. However, the species is protected by BLM manual 6840, which mandates that actions taken should not contribute to the need to list the species. There is very little evidence to indicate that any actions taken on the Tonopah Planning Area have the potential to impact adversely the species. The observations of these species in the Oasis Valley are rare. However, NDOW has committed to conducting cuckoo surveys in the Oasis Valley from 2001 to 2006.

- ***Population***

Nevada Division of Wildlife has conducted cuckoo surveys in the Oasis Valley in 2000, 2001, and 2002. A single adult cuckoo was seen near the Narrows in mid-June. Surveys for 2001 found two paired cuckoos at Springdale and two paired cuckoo's in the river corridor near the Narrows. No nests were detected.

- ***Habitat***

The cuckoo is a riparian obligate species that requires a dense cottonwood-willow forested lowland river floodplains that needs to be at least 100 meters wide. Most foraging occurs within the cottonwood canopy, but nests are mostly found within willows, suggesting a multistoried vegetation structure is required for nesting habitat. Loss of both migratory and breeding habitat is thought to be the reason for population declines. A component of cottonwood with willow understory occurs on public lands at the Narrows south of town, north of Stage Coach Hotel and Casino at Jim's Spring, all other potential habitat occurs on private lands throughout the valley. The cottonwood/willow habitat condition has improved considerably in the past 8 years by increasing their distribution and density, thus improving stand structure that is important for foraging and nesting habitat.

E. Special Status Species

A review of the current Nevada BLM Sensitive Species list shows that there are 31 mammals; 33 birds; 6 reptiles; 3 amphibians; 26 fishes; 26 snails; 1 clam or mussel; 2 Ants, Wasps, or Bees; 1 true bug, 14 beetles, and 28 butterflies within the state. A designation of "BLM sensitive" affords these species the same level of protection as is provided for candidate species under BLM manual 6840.06 C. After a thorough review of data from the Great Basin Bird Observatory, Audubon Society, Partners In Flight, Nevada Natural Heritage Program, NDOW, BLM, and USFS, two effects analysis tables were compiled and warranted more analysis and that analysis is presented in this section in narrative form. For a species to receive further consideration, it must have exhibited at least low potential to exist on the allotment and have at least one probable conflict with either livestock or wild equids.

1. Mammals

a. Pygmy Rabbit

- ***Population***

There are no current population goals set for pygmy rabbits on the Montezuma Complex and there are no records of the rabbit occurring on the allotment. No surveys have been completed in these allotments for pygmy rabbits.

- ***Habitat***

The pygmy rabbit is the only rabbit species in North America known to dig its own burrows. The rabbit depends on relatively deep, soft, loosely compacted soils in which to build its burrows. Another requirement is the presence of tall, relatively dense stands of sagebrush. Species like Wyoming Big Sagebrush (*Artemisia tridentata wyomingensis)* and Basin Big Sagebrush (*Artemisia tridentata tridentata*) provide suitable habitat for the rabbit. Often occupied pygmy rabbit sites that were identified in a survey of NW Nye County were closely associated with water. There is little potential habitat for pygmy rabbits in the Montezuma Complex.

b. Desert Bighorn Sheep

- ***Population***

The Tonopah RMP does not identify bighorn population goals for the Montezuma Complex, and states that the bighorns in the area would be managed on a monitoring basis. That is, if through monitoring it is determined that bighorns are over utilizing an area then NDOW would be requested to make adjustments so that the herd would no longer cause resource damage. Hunt Units 252 Stonewall Mountain, 253 Bare Mountain and a small portion of 212 Lone Mountain occur in the Montezuma Complex. NDOW conducted a census in Hunt Unit 252, Stonewall Mountain, in 2003. A total of 131 animals were observed. The herd is increasing slightly. A critical water source, Stonewall Spring, is on public land. Hunt Unit 253, Bare Mountain has approximately 97 adult bighorn sheep. One hundred bighorn sheep were counted on the test range in Thirsty Canyon in early 2006.

- ***Habitat***

There are approximately 145,472 acres of desert bighorn sheep (bighorn) habitat on the Montezuma Complex in the Montezuma Range, Stonewall Mountain, Bullfrog Hills, and Bare Mountain (RMP Map 10.0). The bighorn habitat and the deer habitat on these allotments coincide. However the habitat is much better suited to bighorn than deer, because this habitat is dominated by both sagebrush and saltbrush species. Preferred mule deer habitat is primarily dominated by sagebrush, bighorn habitat includes both sagebrush and salt brush dominated hills and mountains. There is an abundance of open rocky cliffs used for escape, thermal, and lambing cover by the bighorns. There is also grass available in the habitat, which is the primary yearlong food for the bighorn. Optimal habitat for bighorns consists of rugged, steep, canyon country with greater than 80 percent slopes, and 4 to 8 inches or more of annual precipitation. Optimal habitat would also have available water sources less than 4 miles apart, generally 2 miles is considered a maximum.

Bighorn sheep travel from Bare Mountain through Beatty Wash and Thirsty Canyon onto the test range and up to Paiute Meas. They appear to move between Stonewall Mountain and Bare Mountain. The Montezuma Range has been identified by NDOW as having potential for a bighorn sheep release. If sheep were released in the Montezuma Range, waters would need to be developed. Bighorn sheep are endemic to Lone Mountain and have been reintroduced on Stonewall Mountain in 1975 and on Bare Mountain in 1991.

There are 10 bighorn sheep habitat study sites on the Montezuma Complex. There have been no recent studies conducted at these sites. However, the data that exists for the sites from prior studies indicated that the habitat was in “Fair to Good” or “Good” condition. No sites were in poor condition (refer to Wildlife section, Appendix A in the Montezuma Complex Rangeland Health Evaluation). Livestock have not been run in the Bare Mountains, Lone Mountain, and Stonewall since 1995. Little to no use by livestock has occurred in the Montezuma Allotment since 1995. This indicates that the bighorn sheep habitat on the allotment most likely meets the management needs of sheep within the Montezuma Complex. No new waters are needed at this time for Bare Mountain.

2. <u>Bats</u>

- ***Populations***

There are 21 BLM sensitive bat species for the state of Nevada. Of these 21 species the Big brown bat, Brazilian free-tailed bat, California myotis, Fringed myotis, Hoary bat, Little brown myotis, Long-eared myotis, Long-legged myotis, Pallid bat, Silver-haired bat, Small-footed myotis, Spotted bat, Townsend’s big-eared bat, Western pipistrelle, Western red bat, and Yuma myotis have some potential to occur on springs in the Complex. The bat populations on the Complex have had very little study.

- ***Habitat***

The bat species that can be found on the Montezuma Complex are all highly dependent on riparian areas for forage and water resources. They roost in various habitats from cliffs, to adits, to caves, to trees. Bats are insectivores. A high percentage of insects utilized are produced in riparian areas, making them the most important habitat component for bats on the allotment. A proper functioning condition assessment of the allotments riparian habitat was conducted in 1995 – 1999 and in 2005 – 2006. In 1995 – 1999 there were 9 non-functioning and only 9 properly functioning riparian areas. By 2005 – 2006 all non-functioning sites had improved and the properly functioning sites had further improved. However, the overall number and distribution of springs at PFC, and with surface water, may be more important for bat ecology than the overall acres of riparian area at PFC.

3. <u>Birds</u>

a. <u>Bobolink</u>

- ***Population***

There are no records of the Bobolink existing on the Montezuma Complex. However, given that there is a small amount of montane Riparian habitat high in the Montezuma Range, there is a minimal likelihood that the birds might be found nesting in the complex.

- ***Habitat***

In Nevada, the Bobolink is primarily found associated with agricultural lands in the northern part of the state. However, this species can also be found in lowland riparian habitat and montane riparian habitat. There is very little potential Bobolink habitat in the Montezuma Complex.

b. <u>Burrowing Owl</u>

- ***Population***

There are no records of Burrowing owls on the Montezuma Complex. However, suitable habitat does exist on the Complex and burrowing owls have been found in adjacent allotments. Therefore, it is likely that small numbers of burrowing owls nest in the Montezuma Complex.

- ***Habitat***

Burrowing owls can be found in a variety of habitats from salt desert shrub to montane parklands. This is because the owls do not dig their own burrows but rather utilize existing burrows as their nest and shelter sites. Therefore, one necessary component of burrowing owl habitat is another burrowing animal such as prairie dogs, ground squirrels, kit foxes, or badgers.

c. <u>Ferruginous Hawk</u>

- ***Population***

There are no records of Ferruginous Hawks inhabiting the Montezuma Complex. However, the hawks have been observed on adjacent allotments and it is likely that they nest on the Complex. There are no population goals for Ferruginous Hawks in the Montezuma Complex.

- ***Habitat***

Ferruginous hawks can be found foraging in a wide variety of habitats in Nevada, but prefer to nest in Juniper trees and on cliffs. One apparently necessary component of Ferruginous hawk habitat is be an abundance of prey items such as rodents and jackrabbits. Studies have shown a direct relationship between the number of specific prey items and the number of hawks in a local area.

d. <u>Golden Eagle</u>

- ***Population***

Golden eagles were observed on a number of occasions while conducting field work in the Montezuma Complex. There are no population goals for the eagle on the Complex and there are no known nesting pairs on the allotment. However, given the life history and preferred nesting habitat for the eagle it is likely that the bird does nest in the Montezuma Complex.

- ***Habitat***

The golden eagles preferred nesting habitat is a barren cliff overlooking an expanse of country. This type of habitat is in abundance on the assessment area. The raptor would forage in a variety of habitats and can be seen throughout Nevada. This large raptor also concentrates on rabbits, hares, and rodents for the bulk of its food. Therefore, similar prey requirements apply for the ferruginous hawk, as for the golden eagle. However, the eagles are more general in their in their prey selection than the hawk and as such are less directly tied to rabbits populations.

e. <u>Gray Vireo</u>

- ***Population***

There are no records of the gray vireo on the Montezuma Complex, and no population goals exist for the gray vireo for the allotment. There have been sighting just to the east and north of the Complex that indicate it might occur here.

- ***Habitat***

The gray vireo is closely associated with open stands of mature pinyon pine or juniper forest. This type of habitat occurs in the Montezuma Range and on Stonewall Mountain. The bird prefers to nest in pinyon-juniper at the head of canyons. Gray vireos are generalist insect eaters that glean (pick it off branches) their prey from shrubs and trees.

f. Juniper Titmouse

- ***Population***

There are no records of the juniper titmouse existing on the Montezuma Complex. The juniper titmouse is a relatively newly classified bird species that was formerly con-specific with the plain titmouse and/or oak titmouse. The life history of the bird indicates that it can likely be found nesting in the Montezuma Range.

- ***Habitat***

The juniper titmouse, as its name implies, is a bird of pinyon-juniper woodlands. It is a tree cavity/hole nester, and primarily an insect eater, though it is also known to eat seeds, nuts and berries.

g. LeConte's Thrasher

- ***Population***

There are no known populations of the LeConte's thrasher on the Montezuma Complex. The life history and distribution data of the thrasher indicate that the bird may nest in the Complex in small numbers.

- ***Habitat***

In Nevada, the LeConte's thrasher is found primarily in the southern portion of the state. The bird is strongly associated with the Mojave shrub habitat type in which it nests. However, it also utilizes salt desert habitat and as such may be found on the Montezuma Complex. Both Mojave shrub habitat and salt desert habitat occurs throughout the valleys and lower hills in the Complex. The bird prefers open ground, in order to forage for ground dwelling insects and larvae.

h. Lewis's Woodpecker

- ***Population***

There are no records of the Lewis's woodpecker on the Montezuma Complex. In Nevada, the woodpecker is primarily a resident of the northern half of the state. Given the life history of the bird there is a low likelihood that it may nest in the Complex.

- ***Habitat***

In Nevada, the Lewis's woodpecker prefers open pine forests including pinyon pine and juniper woodlands, as well as aspen stands and cottonwood stands. The allotment has pinyon pine forests in the Montezuma Range and on Stonewall Mountain, but the only suitable cottonwood habitat exists at the Cottonwood springs Montezuma Complex. This Cottonwood stand has recently burned making it more attractive to the woodpeckers. They prefer to nest in burned snags. These birds are generalist foragers utilizing nuts and seeds during the winter and hawking (capturing prey in flight) insects when they are available.

i. <u>Loggerhead Shrike</u>

- ***Population***

There are occasional sightings of loggerhead shrikes on the Montezuma Complex. Recently, shrikes have been observed several times in Indian Springs Canyon of the Montezuma Range and near Gemfield in the fall of 2005 (Stevenson) and one bird seen near Alkali (Goldfield to Silver Peak road) on May 29, 2006 (Stevenson). Another shrike was seen on May 29, 2006 near Gold Point (Stevenson). They are relatively common in open areas and are often overlooked. There are no current population goals for the shrike on the Montezuma Complex.

- ***Habitat***

The loggerhead shrike is a small bird of prey that forages on small rodents, insects, other birds, and lizards. The loggerhead shrike is a bird of open arid lands like mesquite-catclaw, Mojave shrub, and salt desert shrub. In Nevada, the shrike prefers to nest in mesquite-catclaw and salt desert shrub habitats. The Montezuma Complex does contain a fair amount of salt-desert shrub habitat in the northern half of the Montezuma Allotment. Mojave shrub occurs in the southern portion of the Montezuma Allotment and in both the Razorback and Springdale 2 Allotments.

j. <u>Long-eared Owl</u>

- ***Population***

The long-eared owl does occur on the Complex at least in small numbers. One owl was observed at Fred Spring #3 during the summer of 2004. There are no population goals for the owl on the Complex. The owl nests a high likelihood on the Montezuma Complex.

- ***Habitat***

In Nevada, the long-eared owl tends to inhabit pinyon-juniper woodlands, which occur mainly in the Montezuma Range and on Stonewall Mountain. There is enough habitat in the Montezuma Complex to support a substantial breeding population of the birds in the Montezuma Range and on Stonewall Mountain. The owl primarily roosts and nests in pinyon-juniper, but tends to hunt in more open areas like montane parklands and lowland riparian. The owl primarily preys on small mammals like various rodents and rabbits, and some studies indicate that they prey only on a single species in a given area.

k. <u>Peregrine falcon</u>

- ***Population***

There are no records of the peregrine falcon on the Montezuma Complex. There are no population goals for the falcon on the Complex. In 1970, the bird was listed as endangered due to its inability to cope with pesticide use. In 1999, following 29 years of conservation, the bird was removed from the endangered species list and had met the recovery criteria. However, it is still a Species of Conservation Priority in the NDOW *Wildlife Action Plan*. Considering the migratory nature of the falcon, the foraging habitat, and the increased range-wide population, there is some likelihood that the bird may nest in the Montezuma Complex on an infrequent basis.

- ***Habitat***

The peregrine falcon prefers to nest in shallow scrapes on cliffs usually overlooking bodies of water. In Nevada, due to its arid climate, the falcon is considered to be a rare nesting resident. The falcon is an opportunistic bird eater, and most species of its prey exhibit no adverse impacts from livestock or wild equid grazing.

l. <u>Pinyon Jay</u>

- ***Population***

The pinyon jay was regularly observed during the 2004 field season on the Montezuma Complex. There are no population goals for the pinyon jay on the Montezuma Complex. Overall, populations appear to be thriving. It is highly likely that the jay nests on the Complex. This is a Species of Conservation Priority in NDOW's *Wildlife Action Plan.*

- ***Habitat***

The pinyon jay is a bird strongly associated with pinyon pine and juniper forests, which mainly occur in the Montezuma Range and on Stonewall Mountain. It is because of this obligate association that the jay receives the BLM sensitive species designation. The jays are thought to be the primary seed disseminators of pinyon pine seeds and also rely heavily on pinyon pine nuts for food.

m. Prairie Falcon

- ***Population***

The Prairie falcon is widespread in Nevada and has been recorded on the Montezuma Complex. Nearly all of Esmeralda County is identified as having relatively high nesting density. There are no population goals for the falcon on the Complex. This is a Species of Conservation Priority in NDOW's *Wildlife Action Plan.*

- ***Habitat***

The Prairie falcon forages in nearly all habitat types found within Nevada. It nests on cliff faces overlooking arid valleys or agricultural lands and in close proximity to an abundance of prey species. The falcon is an opportunistic forager preying mostly on small mammals, birds, and reptiles.

n. Sage Grouse

- ***Population***

The nearest known populations of sage grouse are the 35 miles west in the White Mountains or 45 miles northeast in the Monitor Valley.

- ***Habitat***

Both Razorback and Springdale 2 Allotments and the southern half of the Montezuma Allotment are in the Mojave Desert. No sage grouse habitat occurs in these areas. The northern half of Montezuma Allotment has some sagebrush and pinyon pine, juniper vegetation in the Montezuma Range. No sage grouse habitat has been identified in the northern half of Montezuma Allotment for the following reasons:

1. Generally, optimal Sage grouse habitat can be characterized as a sagebrush-grass steppe. It would have expansive sagebrush communities with good compositions of forbs and grass. Sagebrush communities in the northern part of the Montezuma Allotment are not expansive and are limited to higher elevations on the Montezuma Range and to a small degree, on Stonewall Mountain. Much of northern Montezuma is too dry to support sagebrush vegetation and is dominated by salt brush.

2. Critical spring habitat consists of open areas on flat or gently sloping side-hills or ridges, with good visibility for breeding activity. "Gently sloping side-hills" in Montezuma are too dry to support sagebrush but are dominated instead by salt brush.

3. Critical summer habitat is brood rearing habitat. This consists of sagebrush areas near waterways and adjacent to nesting areas. There are no waterways in northern Montezuma. All riparian areas in northern Montezuma are small springs generally with much less than a third of an acre of riparian habitat.

4. In some instances, sage grouse would move down in elevation to cultivated lands. There are no cultivated lands in the Montezuma Complex.

o. <u>Short-eared Owl</u>

- **Population**

The Short-eared owl is a widespread and abundant species. There have been very few records of the owl breeding in the state of Nevada. This could be due to the difficulty in finding their nests. There is one record of the Short-eared owl on the Montezuma Complex. Upon a review of the life history, and nesting habitat preferences of the Short-eared owl, there is a low likelihood of the owl nesting on the Complex. This is a Species of Conservation Priority in NDOW's *Wildlife Action Plan.*

- ***Habitat***

The Short-eared owl can be considered a migratory riparian species. Primarily this bird-of-prey would be found in agricultural, wetland, or montane parkland habitats, all of which are uncommon on the Montezuma Complex. An essential habitat component is tall grass or reeds in which the owl nests. During migration, short-eared owls would use Mojave shrub habitats and possibly salt desert shrub. The owl is a small mammal-hunting specialist. Voles and mice make up the majority of its diet.

p. <u>Vesper Sparrow</u>

- ***Population***

There are no records of the vesper sparrow on the Montezuma Complex. There are no population goals for the sparrow on the Complex. There are apparent declines in vesper sparrow populations in the Basin and Range physiographic regions throughout their distribution. There is a moderate likelihood of the sparrow nesting on the Montezuma Complex.

- ***Habitat***

The vesper sparrow is a bird of open areas such as agricultural fields, fallow fields, and grasslands. In Nevada, the bird occupies the sagebrush-grass habitat type as well. There are some sagebrush habitat in the Montezuma Range, Bare Mountain and Bullfrog Hills. However, much of the sagebrush habitat on the Complex is generally low in perennial grass understory component. This is due largely to the natural climatic conditions, past grazing practices, and current composition of perennial grass species. There is limited habitat for the vesper sparrow in the Montezuma Complex. The sparrow is a ground nester that prefers a canopy of big sagebrush for cover in Nevada. An understory of perennial grasses is highly desirable for the management of this bird species. The sparrow is both a seed and insect eater.

4. Amphibians

a. Amargosa toad

The total range of the Amargosa toad (*Bufo nelsoni*) is limited to a 12-mile stretch of the Amargosa River and associated upland springs in the Oasis Valley.

- ***Population***

A 1994 survey finding only 30 adult toads led to a petition to list the toad as an endangered species. On March 1, 1996 the Fish and Wildlife Service announced the toad did not warrant listing as a threatened or endangered species based on further survey information showing the toad was more widely distributed and abundant than had been stated in the petition. It is a BLM Nevada Sensitive Species and is state protected.

On October 14, 2000, a conservation agreement was signed, the various parties agreeing to work together to manage the land and other resources to protect the toad and other species depending on the riparian wetland habitat in the Oasis Valley.

- ***Habitat***

A five-year intensive population study was initiated in 1998 with assistance from multiple federal, state, non-profit and private land owners. Monitoring information has indicated that the toads are very adaptive to changing physical and environmental conditions. The toads have an ability to travel long distances across the desert during spring and summer precipitation events to disperse, possibly to other suitable habitat sites. Toads require riparian habitat for breeding and early life. Additionally, the toads utilize the upland habitats (brush/tree cover and rodent burrows) surrounding the riparian areas for daytime and winter hibernation. A final monitoring report would be prepared in the near future and should provide insight into toad population size, preferred breeding habitat, habitat use and preference, longevity, and movements within sub-populations.

Saltcedar has been identified as a risk to the Amargosa toad habitat under the approved Conservation Agreement and Strategy dated October 14, 2000. A saltcedar control program is currently under development with minor work completed near the Narrows and working with two private landowners.

5. Reptile

a. Chuckwalla

- ***Population***

The Chuckwalla (*Sauromalus obesus*) is a large rock dwelling herbivorous lizard widely distributed in the desert, but are heavily collected by commercial collectors. This specie is not regulated but is Species of Conservation Priority in the NDOW *Wildlife Action Plan*.

- ***Habitat***

Creosote bush occurs throughout most of the chuckwalla's range. They prefer lava flows, rocky hillsides and rock outcrops. Rocks provide shelter and basking sites. They occur in Clark, southern Lincoln and Nye counties as far north as Railroad Valley. Potential habitat occurs in the Razorback, Springdale 2 Allotments and the southern portion of the Montezuma Allotment.

6. <u>Fish</u>

a. <u>Oasis Valley speckled dace</u>

Oasis Valley speckled dace (*Rhinichthys osculus* ssp .) occurs on private land in Oasis Valley. The species that occurs only on private land would not be mentioned further in the EA.

7. <u>Mollusk</u>

a. <u>Oasis Valley Springsnail</u>

Oasis Valley Springsnail (*Pyrgulopsis micrococcus*.) occurs on private land in Oasis Valley. The species that occurs only on private land would not be mentioned further in the EA.

F. <u>Vegetation</u>

Two wildland fires occurred within the complex and burned 16,409 acres on public lands during the month of July 2006. These fires occurred in the southern portion of the Montezuma Complex in hot desert and sagebrush vegetation types. Detailed information on the areas burned and the rehabilitation plan are contained in the Wildfire Management Decision document. The Emergency Stabilization (ES) Plans for the two fires have been approved and full force and effect decision were sent to the interested parties. The Rehabilitation Plan for the Sawtooth Fire has been completed and was approved September 14, 2006.

1. <u>Montezuma Allotment</u>

Vegetation in the allotment varies from pinyon pine and juniper woodlands to hot desert shrub. The following ten vegetation categories exist in the allotment: saltbrush, hot desert shrub, sagebrush, blackbrush, pinyon pine and juniper woodlands, barren areas, washes, saline meadows & sodic soils, riparian, and mountain mahogany woodlands. Saltbrush is the most dominant vegetation type in the allotment.

Photo 12.0 - Aerial view of a typical salt desert shrub plant community within the Montezuma Allotment.

Courtesy of Andrea Felton, WHBS, BLM, TFS. Census Flight, BLM, TFS, 2006.

Salt desert shrub ecological sites are dominated by shadscale (*Atriplex confertifolia*), Bailey greasewood (*Sarcobatus vermiculatus baileyii*) and spiny menodora (*Menodora spinescens*). Associated species are wolfberry (*Lycium* spp.), cheeseweed (*Hymenoclea salsola*), ephedra (*Ephedra nevadensis*), bud sagebrush (*Picrothamnus desertorum*), winterfat (*Krascheninnikovia lanata*), Nevada dalea (*Psorothamus polydenius*), fourwing saltbush (*Atriplex canescens*), Joshua tree (*Yucca brevifolia*), and Indian ricegrass (*Achnatherum hymenoides*).

a. <u>Saltbrush vegetation can be divided into four categories</u>:

- Saltbrush plant communities growing on valleys and alluvial fans in the 3 – 5 and 5 – 8 inch precipitation zones. Mainly dominated by shadscale or Bailey greasewood with bud sagebrush, and some grasses (mainly Indian ricegrass and galleta grass). Associated species may include Douglas rabbitbrush, spiny menodora, winterfat, gray molly and Nevada ephedra. These sites provide some forage for cattle, mainly less palatable winter forage species, such as shadscale and bud sagebrush. Some grass is available for spring and summer use. There is some grass suitable for horse use. However, the majority of these vegetation types occur outside of the HMAs.

- Saltbrush plant communities growing on hillsides with very poorly developed soils are dominated mainly by shadscale in the 3 – 5 and 5 – 8 inch precipitation zones. These soils have very little grass and less bud sagebrush than the shadscale ecological sites on the more productive alluvial fans and valleys. The one exception to the lack of grass is a few hillsides dominated mainly by galleta grass. These grassy sites are not common. These areas provide little forage for wild horses and cattle. Some forage (browse) is available for burros use and a very limited amount is available for winter use by cattle, if the site is not too steep to access.

- Saltbrush growing on sandy soils are the most productive sites in the allotment. These soils mainly occur in valleys in the 3 – 5 and 5 – 8 inch precipitation zones. They support fourwing saltbush, winterfat and Indian ricegrass, the most palatable and nutritious forage species in the allotment. Both fourwing saltbush and winterfat are very palatable winter forage species for cattle and burro use. Wild horses may browse winterfat in winter but make little use of fourwing saltbrush. Indian ricegrass is most common on soils with a sandy surface and deeper sandy soils. Sandy soils are most common in the northern portion of Pasture 1 outside of the HMA.

- Most of the spiny menodora dominated area in the northern portion of the allotment is included in the salt desert shrub category because the majority of the associated species are Great Basin species. It has been separated from the salt desert shrub category in the following section,

- Spiny menodora, a member of the olive family, is a Mojave Desert and Mojave transition zone plant found in the 5 – 8 inch precipitation zones. It has no forage value for livestock or wild horses. However, it is browsed by lagomorphs (rabbits and hares). The ecological sites menodora dominates are very similar to salt desert sites dominated by shadscale in the 5-8 inch precipitation zone. These ecological sites also have the same associated species as saltbrush plant communities. See a. and b. under Salt Desert Shrub above. Menodora sites also occupy the same landforms as saltbrush, such as hill sides, valleys and alluvial fans throughout the allotment. Menodora ecological sites are managed similarly to shadscale ecological sites. They also provide some of the same forage species. These sites produce less winter forage than plant communities dominated by shadscale since spiny menodora is not browsed by cattle. They provide a limited amount of grass for spring and summer use by cattle and yearlong use by wild horses. These sites occur inside and outside of the HMAs.

- In the southern portion of the allotment, plant species associated with spiny menodora are typically hot desert species, such as white bursage, various wolfberry species and blackbrush. These sites provide little grass for horse or cattle use. They do occur within the Bullfrog HMA and provide some forage for burros.

b. Hot Desert Vegetation (Precipitation zone 3-5", 5-8")

Hot Desert Shrub sites occur in the southern portion of the allotment and along the narrow strip of the allotment that connects the north and south portions of the allotment. They cover 27 percent of the southern portion of the allotment in the valleys and lower hills. Wild burros use these ecological sites. They graze a variety of shrubs and grasses but prefer white bursage.

These areas are dominated by Creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), shadscale, and spiny menodora. Associated species are wolfberry, ephedra, cheeseweed, spiny hopsage (*Grayia spinosa*), fourwing saltbush, cattle saltbush (*Atriplex polycarpa*), Fremont dalea (*Psorothamnus fremontii*), range ratney (*Krameria parvifolia*) and Joshua tree.

c. Sagebrush (Precipitation zone 8-12")

Sagebrush sites are not common in the allotment, covering only 12 percent of the allotment. They mainly grow on higher cooler areas in the 8 – 12 inch and above precipitation zones. They are more common in the northern portion of the allotment. In the southern portion of the allotment they grow mainly on north-facing slopes of higher hills and high elevation alluvial fans in the Bullfrog Hills. Spiny menodora often occupies the south facing slopes.

Sagebrush is common on hills and mountains such as Malapais Mesa, Stonewall Mountain and Montezuma Peak in the northern portion of the allotment. Wild horses and some livestock have grazed in these higher elevation sites. In sagebrush plant communities, wild horses and burros, and cattle prefer the grasses. Sagebrush plant communities are important mule deer habitat.

Sagebrush ecological sites are dominated by either black sagebrush (*Artemisia nova*) or Wyoming big sagebrush (*Artemisia tridentata wyomingensis*). Associated species are green ephedra (*Ephedra viridis*), rabbitbrush (*Chrysothamnus* spp.), cliffrose (*Purshia mexicana*), Indian ricegrass (*Achnatherum hymenoides*), and bottlebrush squirreltail (*Elymus elymoides elymoides*).

Sagebrush plant communities can be divided into two main categories:

- Black sagebrush grows on less productive soils on hillsides. Since black sagebrush is not browsed by cattle or burros, there is less available forage on these sites. Some grass grows on these soils which is suitable for cattle or horse use, but is limited and would not support a large number of either cattle or wild horses. These soils are often on higher and steeper ground than the surrounding valleys and receive less use by cattle than valleys.

- Big sagebrush grows on deeper soils in the Montezuma Range. These soils produce more grass than the black sagebrush sites. They are suitable for horse and cattle use (during the growing season). There is little available browse for cattle or burros. Mule deer prefer cliffrose and bitterbrush plants for forage.

d. Barren Areas

Barren areas occur on rock outcrops, playas or other areas such as mine dumps, and cover six percent of the allotment. Vegetation does not grow on these areas.

e. Washes (Precipitation zone 3-12")

Washes cover five percent of the allotment. The vegetation on washes is highly variable. The washes in the northern portion of the allotment are dominated by rubber rabbitbrush, cheeseweed, and often contain some fourwing saltbush and various bunch grasses. Washes often provide good quality winter, spring and summer forage. Washes in the hot desert are often dominated by cheese weed and rabbitbrush with some paper-bag bush, white bursage, wolfberry, creosote bush, and cattle saltbush. Wash vegetation and soil is often swept away during heavy rains. Washes have very young soils and are dominated by early seral stage vegetation.

f. Saline Meadows and Alkaline Soils (Precipitation zone 3-8")

Saline meadows and alkaline soils occur on soils with a high water table no deeper than 50 feet from the soil surface, and dominate the valley bottoms. They occur on two percent of the allotment. There is no grass in saline and alkaline soils in pasture 1, north Montezuma Allotment. These sites have limited value as forage beyond providing some browse. Black greasewood (*Sarcobatus vermiculatus*) dominates. Other important species are shadscale (*Atriplex confertifolia*), Perry saltbrush (*Atriplex perryii*), seepweed (Suaeda spp.), and Shockley wolfberry (*Lycium shockleyii*).

The alkaline soils and saline meadows in the southern portion of the allotment are dominated by the same shrubs however some grass, alkali sacaton (*Sporobolus airoides*) and inland saltgrass (*Distichlis spicata stricta*) occurs. There are a few alkaline meadows dominated by both alkali sacaton and inland saltgrass. Both grasses are marginal forage and have food value when they are green in summer. They are very poor forage during dormancy.

g. Pinyon Pine & Juniper Woodlands (Precipitation zone 10-16")

Pinyon pine and juniper woodlands grow on high precipitation areas in the mountains within a 12 – 16 inch precipitation zone and cover two percent of the allotment. These areas are on the highest mountain tops in the allotment. They occur in the Montezuma Range, Stonewall Mountain and the Bare Mountains. The woodlands in the allotment are dominated by pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) with an understory of black sagebrush or Wyoming big sagebrush with associated species. Understory species are various sagebrush species, rabbitbrush and bunchgrasses.

These sites provide some spring and summer range for wild horses and to a limited extent cattle. Much of these areas are inaccessible for cattle use due to steep slopes. Cliffrose and bitterbrush grow in open areas in woodlands. Both are important mule deer browse.

Photo 13.0 - Typical Pinyon Pine & Juniper Forest of Central Nevada

Courtesy of M. Pointel, RMS, BLM, TFS, 2006.

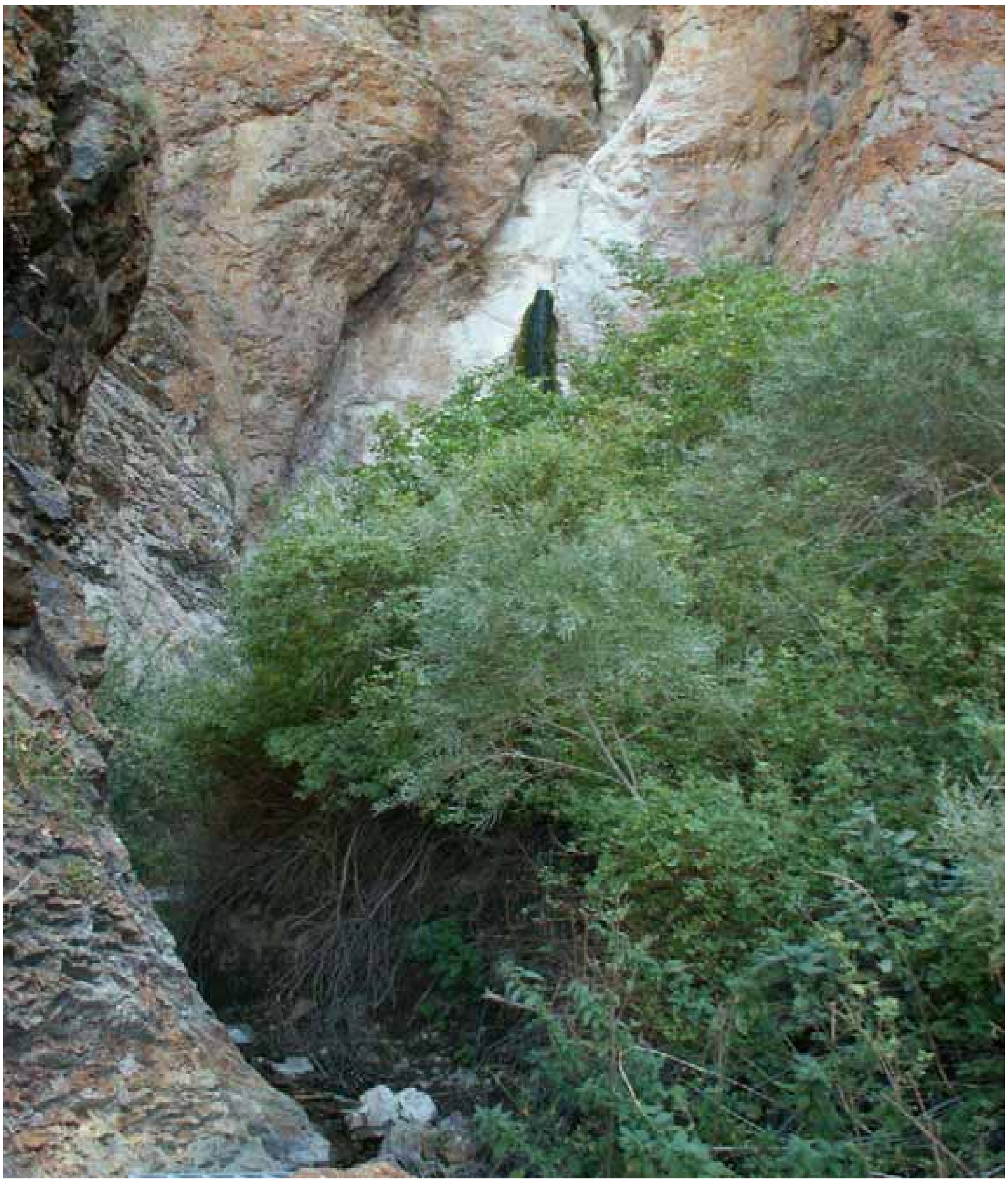
h. <u>Blackbrush</u> (Precipitation zones 5-8", 8-10")

Blackbrush is a hot desert plant community that covers one percent of the allotment. It occurs on hills and upper alluvial fans in the southern portion of the allotment just above the hot desert plant communities and below sagebrush communities. The majority of blackbrush grows on the Bare Mountains east of U.S. Highway 95. In the lower and drier portion of its range, it is associated with shadscale, creosote bush, white bursage, spiny menodora, Anderson wolfberry, Nevada ephedra, spiny hopsage and other shrubs in the Salt Desert and Hot Desert vegetation types. On the higher, wetter part of its range, blackbrush is associated with sagebrush. Often blackbrush dominates the site. Blackbrush has no value as browse. Occasionally, a small amount of Indian ricegrass or desert needlegrass grows on the sandier soils. Otherwise, these sites provide very little forage.

i. <u>Riparian</u> (Precipitation zone 10" +)

Riparian areas occur on 75 acres in small areas usually less than an acre in size. The majority are found in higher precipitation zones throughout the mountains in the allotment. They usually consist of a small patch of wet soils at seeps and springs, which is dominated by grasses, sedges and rushes. Livestock, wild horses and wild burros prefer riparian vegetation

Photo 14.0 - One of the rare riparian areas of the Montezuma Complex



Courtesy of Bryson Code, Wildlife Biologist, BLM, TFS, 2006.

j. Mountain mahogany

Mountain mahogany occurs at a few locations high in the Montezuma Range in and above the pinyon pine and juniper vegetation zones in >10 inch precipitation zone. Littleleaf mountain mahogany dominates the site with some sagebrush, ephedra, and bunchgrasses. These sites provide a limited amount of spring and summer forage. These areas are generally inaccessible to cattle, burros and wild horses due to the high elevation and steep slopes.

2. Razorback Allotment

Vegetation in the Razorback Allotment varies from pinyon pine and blackbrush to saltbrush. The following five vegetation categories exist in the allotment: blackbrush, saltbrush, hot desert, washes, and saline meadows & riparian. Blackbrush is the most dominant vegetation type in the allotment.

a. Blackbrush (Precipitation zones 5-8", 8-10")

Blackbrush is the most common vegetation type in the Razorback allotment, covering 61 percent of the area. It occurs on the higher elevations of the hills in the center and southern portion of the allotment. In the lower and drier portion of its range, blackbrush is associated with shadscale, creosote bush, white bursage, spiny menodora, Nevada ephedra, spiny hopsage, Anderson wolfberry and other shrubs in the Salt Desert and Hot Desert vegetation types. On the higher, wetter part of its range, blackbrush is associated with sagebrush. Often blackbrush dominates the site. Blackbrush has no value as browse. Occasionally, a small amount of Indian ricegrass or desert needlegrass grows on the sandier soils. Otherwise, these sites provide very little forage.

b. Saltbrush (Precipitation zones 3-5, 5-8")

Saltbrush covers 15 percent of the allotment. Saltbrush grows in mainly in the valley in the northern portion of the allotment. These sites are dominated by shadscale and spiny menodora. Associated species are wolfberry, cheeseweed, Nevada ephedra, bud sagebrush, winterfat and fourwing saltbush. Saltbrush growing on sandy soils are the most productive sites in the allotment. Three percent of the allotment has sandy soils which are included in this category. These sandy soils mainly occur in valleys in the 3 – 5 and 5 – 8 inch precipitation zones. They support fourwing saltbush, winterfat and Indian ricegrass, the most palatable and nutritious forage species in the allotment. Both fourwing saltbush and winterfat are very palatable winter forage species for cattle and burros. Less productive saltbush sites provide little forage for cattle and almost no forage for wild horses.

c. Hot Desert (Precipitation zone 3-5", 5-8")

Hot Desert vegetation makes up 14 percent of the allotment and occurs in the valleys and lower hills in lower elevations of the allotment. Wild burros use these ecological sites. They graze and browse a variety of shrubs and grasses, but prefer white bursage. These areas are dominated by

Creosote bush, white bursage, shadscale, and spiny menodora. Associated species are wolfberry, ephedra, cheeseweed, spiny hopsage, fourwing saltbush, cattle saltbush, Fremont dalea and range ratney.

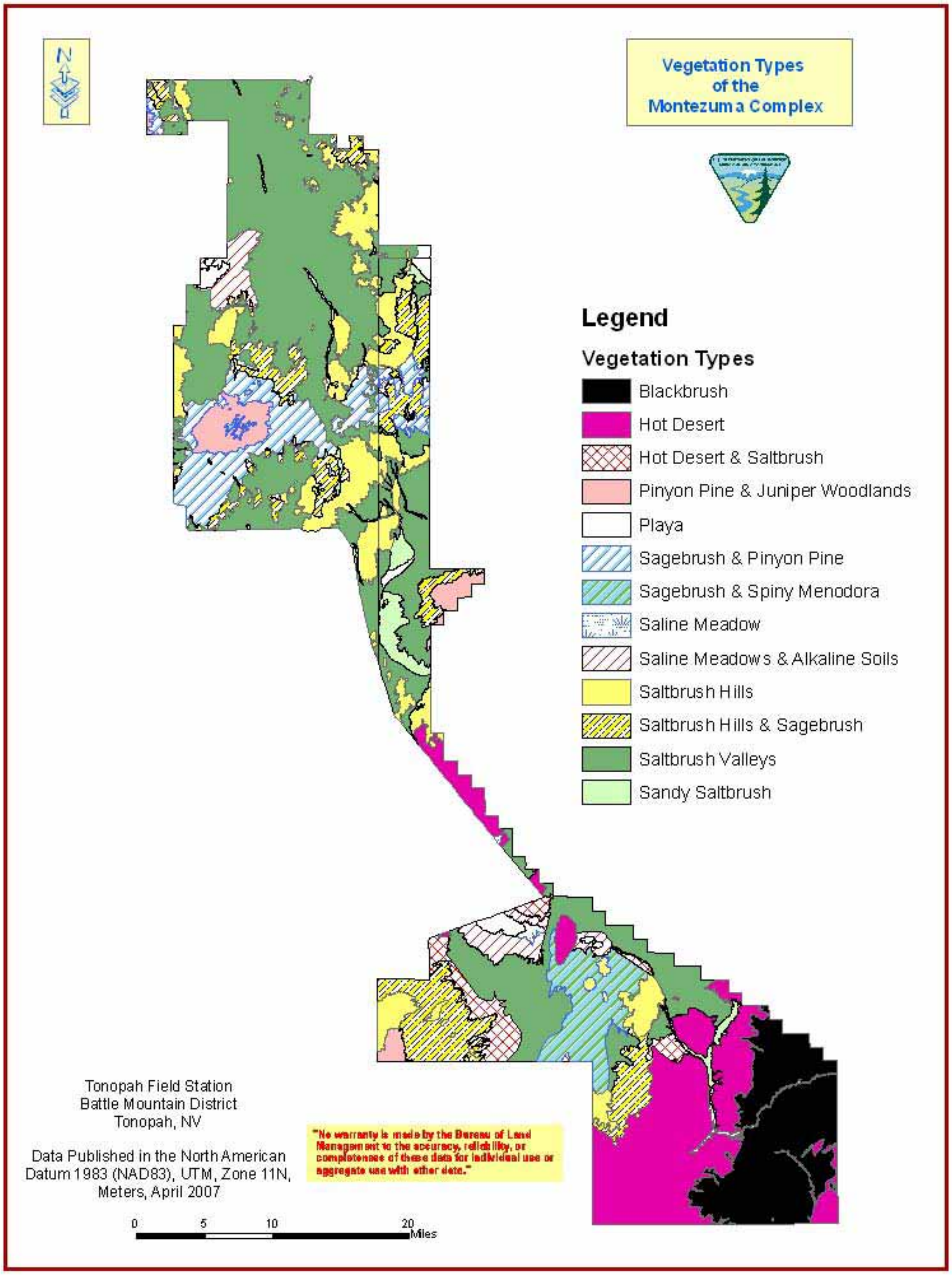
d. <u>Washes</u> (Precipitation zone 3-12")

Washes cover ten percent of the allotment. Washes are dominated by cheese weed and rabbitbrush with some paper-bag bush, white bursage, wolfberry, creosote bush, and cattle saltbush. Wash vegetation and soil is often swept away during heavy rains. Washes have very young soils and are dominated by early seral stage vegetation. Some forage is available on wash sites for cattle and burros.

e. <u>Saline Meadows and Riparian</u>

These sites cover approximately ½ percent of the allotment, and occur only along the Amargosa River in the northern portion of the allotment. The saline meadows and riparian areas intermingle at the Amargosa River and are difficult to divide. Saline meadows and riparian areas occur on soils with a high water table, no deeper than 50 feet from the soil surface, and dominate the valley bottoms along the Amargosa River. It is dominated by inland saltgrass and Baltic rush which are marginal forage and have food value when they are green in summer. They are very poor forage during dormancy. Other important species are shadscale, Perry saltbrush, seepweed. These areas are suitable as summer range for cattle.

Map 6.0 – The Vegetation of the Montezuma Complex



3. Springdale 2 Allotment

Vegetation in the Springdale 2 Allotment varies from hot desert to riparian areas. The following six vegetation categories exist in the allotment: hot desert, saltbrush, barren, saline meadows & riparian, sodic soils and washes. Hot desert is the most dominant vegetation type in the allotment.

a. Hot Desert (Precipitation zone 3-5”, 5-8”)

Hot Desert vegetation makes up 48 percent of the Springdale 2 Allotment in the valleys and lower hills in lower elevations of the allotment. See Razorback above for a description of vegetation for this and all following vegetation.

b. Saltbrush (Precipitation zones 3-5, 5-8”)

Saltbrush covers 40 percent of the allotment. Three percent of the allotment has sandy soils which are included in this category. These sandy soils mainly occur in the valley on the eastern side of the small hill included in the allotment. This soil supports fourwing saltbush, winterfat and some Indian ricegrass, the most palatable and nutritious forage species in the allotment. Both fourwing saltbush and winterfat are very palatable winter forage species for cattle and burros.

c. Barren (Rock Outcrops)

Barren areas, mainly rock outcrops, cover seven percent of the allotment in the hills. Almost no vegetation grows on these areas.

d. Saline Meadows and Riparian

This vegetation type covers approximately three percent of the allotment which occurs along the Amargosa River. The saline meadows and riparian areas intermingle at the Amargosa River and are difficult to divide.

e. Sodic Soils (Precipitation zone 3-8”)

Sodic soils occur on valley floors with a high water table, often at the soil surface. They are dominated by black greasewood and other salt tolerant shrubs and may have a small amount of alkali sacaton and inland saltgrass. They cover approximately one percent of the allotment.

f. Washes (Precipitation zone 3-12”)

Washes cover one percent of the Springdale 2 Allotment. The vegetation on washes is highly variable. Washes in the hot desert are often dominated by cheese weed and rabbitbrush with some paper-bag bush, white bursage, wolfberry, creosote bush, and cattle saltbush. Wash vegetation and soil is often swept away during heavy rains. Washes have very young soils and are dominated by early seral stage vegetation. However, washes can often provide good quality winter, spring and summer forage.

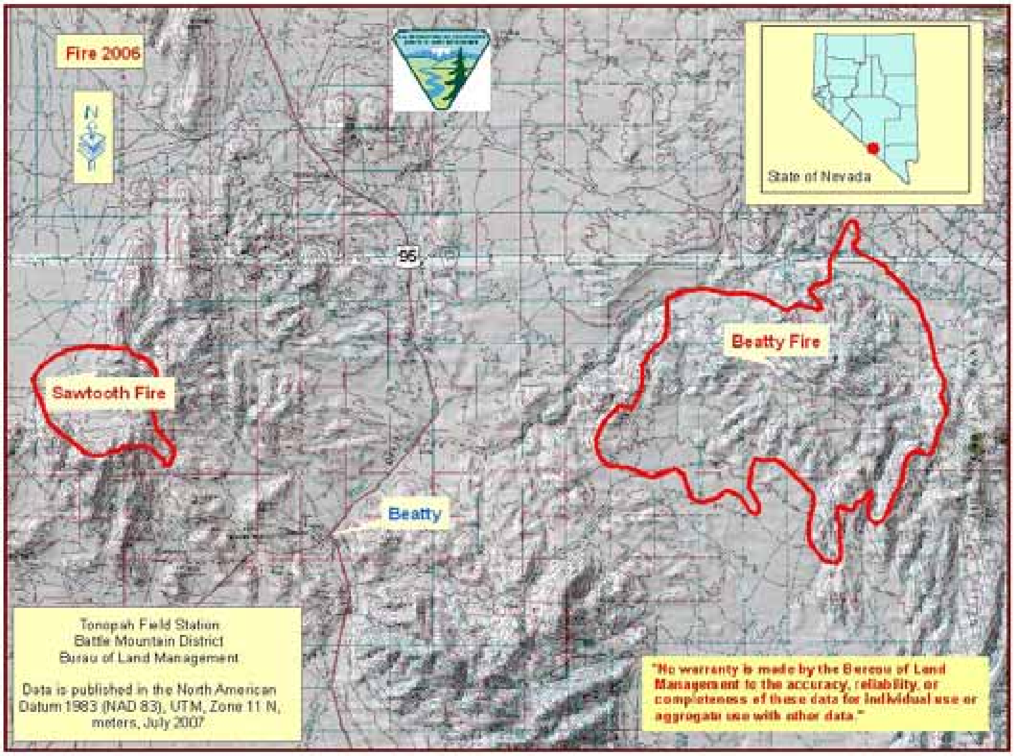
G. Riparian

The riparian areas within the Complex identified 21 lentic sites (springs and seeps) and 13 lotic sites (moving water) along the Amargosa River. The Armargosa River is intermittent and is the only lotic system within the Complex. Most of the river segments are on private land with small sections on public land. See discussions of riparian areas in the Environmental Assessment NV065-2005-037 and Riparian in this Appendix A for riparian Proper Functioning Condition data and in Appendix F for graph analysis of the lentic riparian data for the Montezuma Allotment.

H. Fire

In July 2007, two wildland fires occurred within the southern end of the Complex and burned 16,409 acres on public lands. The Emergency Stabilization and Rehabilitation (ESR) Plans for the Sawtooth Fire was approved on September 14, 2006. The emergency stabilization project included erecting straw dams to reduce erosion and debris displacement in the upper part of the watershed. The rehabilitation seeded approximately 400 acres within the fire in the lower part of the fire.

Map 7.0 - Beatty and Sawtooth Fire Perimeters, 2006



1. <u>Beatty Fire</u>

The Beatty Fire, located on the east side of U.S. Highway 95, burned 12,817 acres of public land on the Razorback Allotment, and 7,918 acres on Nevada Training and Testing Range, for a total of 20,735 acres. The burned areas on public land were all within the Bullfrog HMA, and within some areas of known desert tortoise habitat. However, the burn severity of the Beatty Fire was low to moderate (less than 50 percent of the vegetation burned within the fire perimeter), and it is not expected to affect either the present burros or the desert tortoise. Natural vegetation recovery will be monitored for the long-term.

Photo 15.0 - Beatty Fire, July 2006, Southern Perimeter

2. Sawtooth Fire

The Sawtooth Fire occurred in the Bullfrog Hills approximately four miles northwest of the town of Beatty, NV. The fire burned 3,591 acres of public land within the Montezuma Allotment. The burn severity of the Sawtooth Fire was varied throughout the burned area and approximately 60 percent of the vegetation remained unburned within the fire perimeter. However, some areas were severely burned and required rehabilitation to prevent erosion. The burned areas on public land were within the Bullfrog HMA, and desert bighorn sheep habitat. However, the fire is not expected to affect either the current burro or desert bighorn sheep population because of the animal's mobility and range. The natural vegetation recovery will be monitored long-term.

Photo 16.0 - Sawtooth Fire, July 2006, Western Perimeter

I. Watershed

The Montezuma Complex occurs in the Tonopah Planning Area and within the Great Basin. The Complex includes five hydrological units. The hydrological units were developed and designated by the U.S. Dept. of the Interior, United States Geological Survey.

1. Hydrological Units

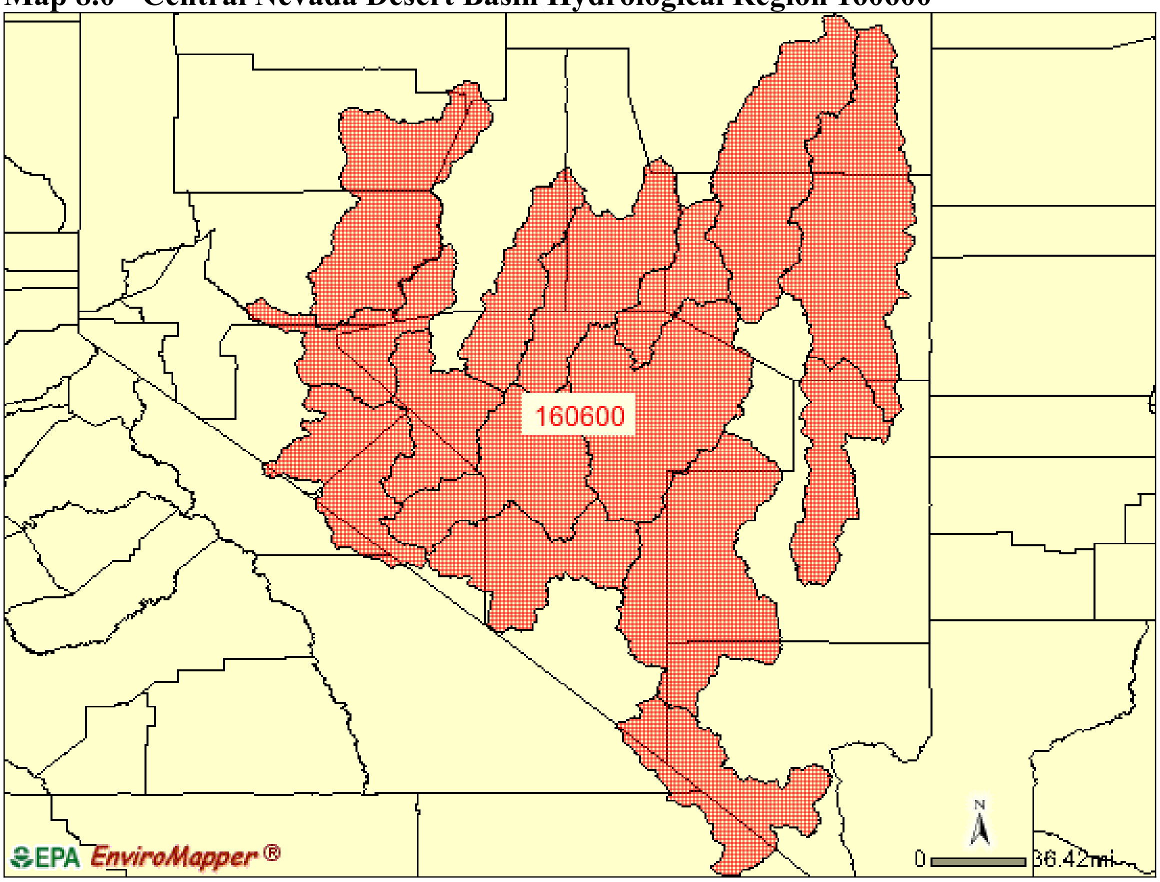
The Geographic Information Retrieval and Analysis System (GIRAS) was developed in the mid-1970s to put into digital form a number of data layers which were of interest to the USGS. One of these data layers was the Hydrologic Units. The map is based on the Hydrologic Unit Maps published by the U.S. Geological Survey Office of Water Data Coordination. It includes the list descriptions, name of region, sub region, accounting units, and cataloging unit. The hydrologic units are encoded with an eight- digit number that indicates the hydrologic region (first two digits), hydrologic sub region (second two digits), accounting unit (third two digits), and cataloging unit (fourth two digits).

Table 9.0 - Hydrological Information of the Watershed Assessment Area

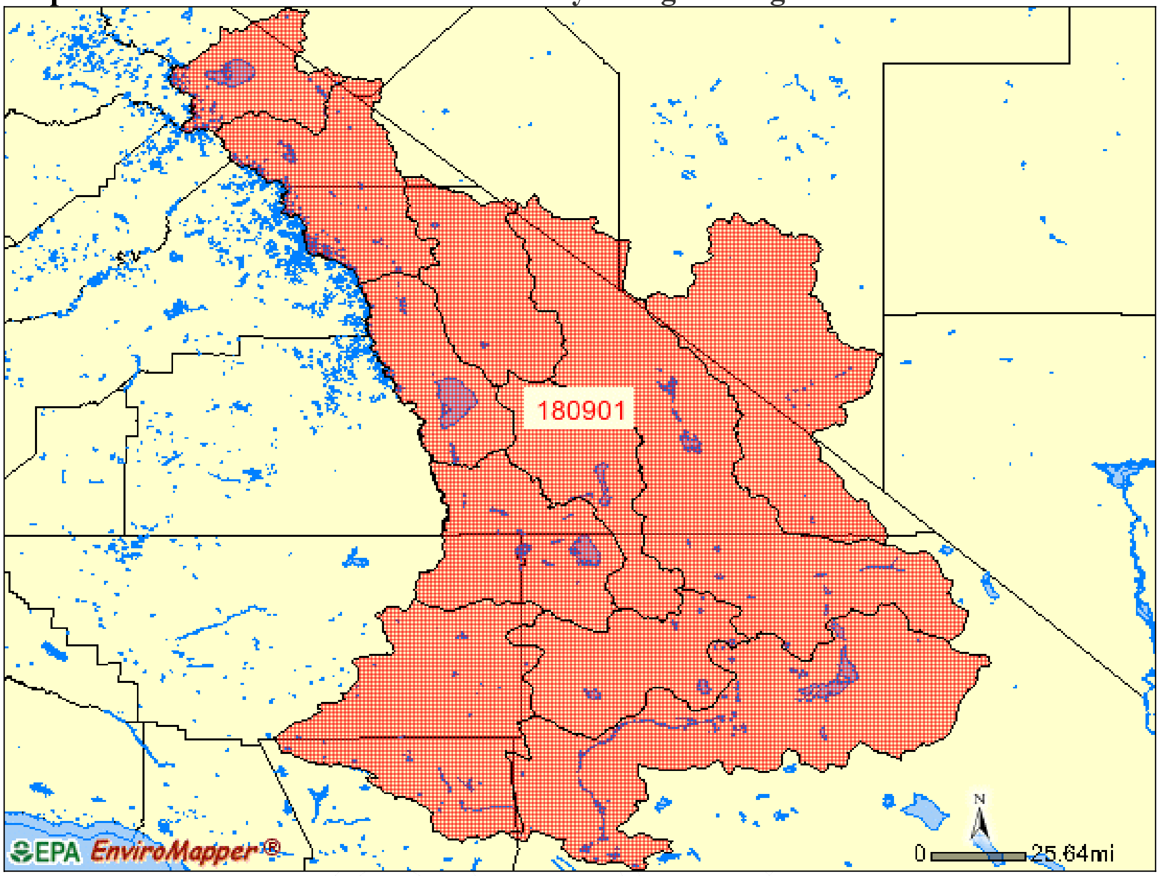
Hydrological Catalog Units	Hydrological Unit Reference Number	Acres of each Hydrological Unit within the watershed assessment area (acres)	Percent of each Hydrological Unit within the watershed assessment area
Ralston-Stone Cabin Valleys	16060011	217,753	48.50%
Cactus-Sarcobatus Flat	16060013	285,782	29.16%
Death Valley-Lower Amargosa	18090203	5,049	0.68%
Upper Amargosa	18090202		11.87%
Southern Big Smoky Valley	16060003	401	9.77%

The environmental information for each of the watersheds is available at www.epa.gov; thereafter go to "enviromapper" for watershed data. Data on the watersheds is limited.

Map 8.0 - Central Nevada Desert Basin Hydrological Region 160600



Map 9.0 - Central Nevada Desert Basin Hydrological Region 180901



J. Forest and Plant Products

Forest products are very limited on the Montezuma Allotment and occur mainly in the Montezuma Peak area. There are no forest products available on the Razorback and Springdale 2 Allotments.

1. Firewood and Fence Posts

The watershed assessment area has several selected forest harvest and plant products collection areas. Limitations for consumptive use on a sustained yield basis are set forth in the Tonopah RMP, October 1997. The quantities of harvest may be adjusted through monitoring and evaluation of forest products. Permits for harvest and further information may be obtained from the BLM, Tonopah Office.

2. Deadwood Area

Pinyon pine and Utah juniper deadwood may be harvested in all accessible woodland acreage outside Wilderness Study Areas (WSAs). The only area in the Montezuma Complex that deadwood can be harvested is in the Montezuma Range in the northern portion of the Montezuma Allotment. Harvesting deadwood in WSAs is not authorized because these areas have been designated for potential wilderness areas (refer to RMP, October, 1997, page 11).

Permits and further information may be obtained from the BLM, Tonopah Office. The removal of dead mahogany, cottonwood (*Populus* spp.) or aspen (*Populus tremuloides*) are prohibited in order to maintain suitable wildlife habitat. Deadwood harvest is prohibited on private land or Indian Reservation Land.

3. Christmas Tree Harvest

Christmas tree permits are issued from November to December 24 each year and are valid until December 25. The only area in the Montezuma Complex that Christmas trees can be cut is in the Montezuma Range in the northern portion of the Montezuma Allotment. Christmas tree permits may be issued for personal use and are not available for commercial harvest. The harvest location within the watershed area is limited to exclude the WSA. Harvesting Christmas trees in WSAs is not authorized because these areas have been designated for potential wilderness areas (refer to RMP, October, 1997, page 11). Permits and further information may be obtained from the BLM, Tonopah Office. The limit authorization is set by the RMP, October 1997 to a 1,000 trees per year for the entire Tonopah Planning Area. Christmas trees harvesting is prohibited on private land or Indian Reservation Land (refer to RMP, October, 1997, page 12).

4. Other Wildlings

A permit may be issued on limited basis for transplanting pinyon pine, Utah juniper, cholla (*Opuntia bigelovii*) and prickly pear (*Opuntia* spp.), excluding the WSA. Cactus occurs mainly in the southern portion of the assessment area in Razorback and southern portion of Montezuma and possibly in the Springdale 2 allotments. However cactus may be found throughout to assessment area. Harvesting wildlings in WSAs is not authorized because these areas have been designated for potential wilderness areas. Caution must be taken in harvesting succulents because some of the cacti are rare and protected under the Threatened and Endangered Species Act of 1973, as amended. The sale of live desert plants which will reduce the existing canopy cover greater than ten percent will be prohibited (refer to RMP, October, 1997, page 12). Wildlings harvest is prohibited on private land or Indian Reservation Land. Permits for harvest and further information may be obtained from the BLM, Tonopah Office.

V. Montezuma Complex Evaluation

A. Key Forage Species

List of Key Forage Species by Allotment

Montezuma	Razorback	Springdale 2
Indian ricegrass	Desert needlegrass	Indian ricegrass
Winterfat	Nevada ephedra	Inland saltgrass
Galleta grass	Winterfat	Winterfat
Desert needlegrass	Fourwing saltbush	
Fourwing saltbush	Indian ricegrass	

1. Indian ricegrass

Indian ricegrass, a cool season grass, is highly palatable and nutritious to grazing and browsing animals in both green and cured condition (Blaisdell et al. 1984, Hassell et al. 1986). This plant is found mainly on sandy soils in the assessment area. Indian ricegrass starts growth earlier in the spring than galleta grass and is often grazed through winter, unlike galleta grass which loses nutrition during winter (Holmgren et al. 1972). It has high drought tolerance and low tolerance to salinity. However, portions of the Montezuma Complex are marginal habitat for Indian ricegrass due to the extremely low precipitation in drought years. For this reason, Indian ricegrass frequently dies out of the plant community, sometimes in spite of the lack of grazing pressure.

Photo 17.0 - Indian ricegrass growing in a rock outcrop

(Credit:USDA, NRCS. 2004. The PLANTS Database, Version 3.5 [http://plants.usda.gov]. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. All rights reserved.)

2. Galleta grass

Galleta grass occurs only in the northern portion of the Complex in the Great Basin. It is a warm season, low-growing rhizomatous grass that is very resistant to grazing use. It tends to increase as more palatable grasses, such as Indian ricegrass, decrease. Galleta grass is less productive, less palatable, has lower forage value and later green up in spring than Indian ricegrass or other cool season grasses. Unlike Indian ricegrass, it has little forage value when cured. "The palatability and quality of galleta are best during the periods of active growth and decline substantially when cured (Gay and Dwyer 1965; Judd 1962; U.S. Forest Service, 1937; Valentine 1961). "After curing the forage is relatively low in carotene, phosphorus and protein. . . .During the winter, the cured forage is also quite coarse and not readily consumed if other feed is available." "It has high drought tolerance and medium tolerance to salinity.

Photo 18.0 - An un-grazed cured galleta plant that has completed its life cycle

Courtesy of M. Pointel, RMS, BLM, TFS, 2004.

3. Winterfat

Winterfat is a very palatable, very nutritious and important salt desert shrub. It is not common in the assessment area, but is more common in the north portion of the Complex than in the south. Winterfat is quite resistant to grazing use during dormancy. However, it is extremely sensitive to growing season use. Winterfat initiates growth during the spring and actively grows during summer (Stevens et al. 1977). The plant has a high drought tolerance level and a low tolerance to salinity.

Photo 19.0 - A Winterfat plant growing on a rocky substratum

Courtesy of M. Pointel, RMS, BLM, TFS, 2004.

4. Fourwing saltbrush

"Because of its abundance, evergreen habit, palatability, nutritive value, and rapid growth rate, fourwing is one of the most valuable forage shrubs in arid rangelands" (Blaisdell et al 1984). Fourwing saltbrush prefers sandy soils and occurs in both the northern and southern portions of the assessment area but is not abundant. Fourwing saltbrush has an active growth period during spring and summer. The plant has a high drought tolerance level and a high tolerance to salinity.

Photo 20.0 - Close-up of fourwing saltbrush

5. Nevada ephedra

This plant is common throughout the evaluation area but does not dominate the plant communities in which it grows. Nevada ephedra's active growth period is spring and fall. It has a high drought tolerance level and a low tolerance to salinity. It is not palatable to cattle or wild horses but is highly palatable to deer. Cattle will browse this plant when little other forage is available. .

6. Desert needlegrass

Desert needlegrass occurs in the southern portion of the Complex. The palatability of the plant is moderate for grazers and browsers. It tends to have high level of resistance to fire, but a slow regrowth rate after harvest. It is drought tolerant.

Photo 21.0 - Desert needlegrass with inflorescence

7. Inland saltgrass

This rhizomatous grass grows on highly alkaline and saline soils. It can tolerate a maximum pH level of 10.5. Both cattle and wild horses graze the plant while it is green but it has little nutrition or palatability when cured. It remains green when most other grasses are dry during summer and droughts periods and, it is resistant to grazing and trampling.

B. Forage Requirements

1. Cattle

Cattle are mainly grazers with a small dietary component of browse (shrubs) and forbs. Livestock browse mostly during winter when grass is unavailable, but prefer grass during the growing season. During droughts or on range with little grass, cattle will browse shrubs species they normally would not consume. Cattle are better adapted to shrub-dominated rangelands than wild horses, but less well adapted than burros.

Important forage species for cattle are winterfat, fourwing saltbush, Indian ricegrass, bottlebrush squirreltail, and other perennial grasses.

Salt desert shrub (shadscale, fourwing saltbush or winterfat dominated sites), sagebrush, washes, saline and alkaline soils, and riparian vegetation types are suitable for livestock grazing. The hot desert vegetation type dominated by creosote bush, white bursage and wolfberry is less suitable for cattle grazing. Very dense pinyon pine and juniper vegetation is unsuitable for livestock grazing due to the lack of forage and the steep terrain. Refer to the vegetation section of the EA for a more detailed description of each vegetation type.

2. Wild Horses

Wild horses are primarily grazers; however, they will utilize some shrub species, such as winterfat, and annual forbs, depending on availability. In a study of wild horses in Wyoming's Red Desert, the horses preferred grass species that included Indian ricegrass, Sandberg bluegrass, bottlebrush squirreltail, and needle-and-thread grass (Krysl, et al., 1984b). Horses preferred shrub species included winterfat (Krysl, et al., 1984b). In another Wyoming study, greater than 70 percent of the horses' diet was composed of grasses, greater than 18 percent were shrubs, and approximately three percent were forbs (Krsyl, et al.1984a). The primary preferred shrub was winterfat (Krysl, et al., 1984a). Wild horses require a predominance of grass within plant communities to be suitable for grazing.

During droughts when little grass is available, wild horses do not browse shrubs they otherwise avoid. In extreme drought situations on shrub-dominated range such as this, they suffer starvation before cattle or burros.

In general, wild horses are more efficient at utilizing feed than their domestic counterparts, and may therefore be able to better survive on lower quantities of high quality forage than a domestic horse of similar size. However, on the range, the protein levels of forage are not as high as domestic feedstuffs and the protein levels vary throughout the year. Wild horses may need to consume high quantities of forage to fulfill their nutritional needs, especially during the winter when forage protein levels are low.

3. Burros

The wild burro, *Equus asinus*, originated in the North African deserts. Burros have easily adapted to conditions in the Great Basin and Mojave Desert communities found in the Tonopah Planning Area. Burros are highly adaptable and will browse shrubs and graze grasses, depending on what forages are available and the nutrition level of the forage. In a Death Valley study, burros consumed browse, then grasses, then forbs (Ginnett, 1982). The Death Valley study is comparable to burros in the southern Tonopah district since Death Valley and the southern Montezuma Complex are in the Mojave Desert and have the similar vegetation. In fact, the Bullfrog HMA borders on Death Valley.

C. Monitoring and Inventory Methodology

Rangeland monitoring studies were conducted throughout the evaluation period to monitor the effects of livestock, wild horse and burro use within the Complex. Data collected are analyzed and evaluated to determine whether current management practices are meeting or progressing toward attainment of the standards and guidelines established by the Mojave-Great Basin Resource Advisory Council (RAC), 1997, and the Tonopah RMP (1997) objectives.

Precipitation, actual use, use pattern mapping, ecological status inventory, riparian proper functioning condition, and key area monitoring information was used to assess the rangeland health of the allotment. Data gathered at key areas includes production, utilization and quadrat frequency (details below). Key areas were established throughout the Complex to monitor vegetative condition and the impacts of past and current management of livestock, wild horses and burros. The monitoring studies were conducted in accordance with the Nevada Rangeland Monitoring Handbook and other BLM technical references.

A key area is a relatively small portion of a unit selected because of its location, use or grazing value as a monitoring point for measuring changes in vegetation and the impacts of grazing. Key areas reflect the current grazing management over similar areas in the unit and serve as representative samples of range condition, trend, use and production.

1. Utilization

"Utilization data . . . are important in evaluating the effects of grazing and browsing on rangeland. Utilization measures the percentage of available forage that has been consumed or destroyed" in the current year (Utilization Studies and Residual Measurements, Interagency Technical Reference, 1996). Utilization is conducted after the growing season or immediately after the grazing season.

Key Species Method (Utilization)

(Formerly the Modified Key Forage Plant Method) (Utilization Studies and Residual Measurements, Interagency Technical Reference 1996.)

This method is based on an ocular estimate of the amount of forage removed by weight on individual key species. Observations are recorded in one of seven use classes:

- 0-5%- The key species shows no evidence of grazing use or negligible use. (For use pattern mapping we have divided this category into areas with "no forage" and areas with forage, called "negligible use".)

- 6-20% -The key species has the appearance of very slight grazing. Plants may be topped or slightly used. Current seed stalks and young plants are little disturbed.

- 21-40% - The key species may be topped, skimmed, or grazed in patches. Between 60 and 80 percent of current seed stalks remain intact. Most young plants are undamaged.

- 41-60% - Half of the available forage (by weight) on key species appears to have been utilized. Fifteen to 25 percent of current seed stalks remain intact.

- 61-80% - More than half of the available forage on key species appears to have utilized. Less than ten percent of the current seed stalks remain. Shoots of rhizomatous grasses are missing.

- 81-94% - The key species appears to have been heavily utilized and there are indications of repeated use. There is no evidence of reproduction or current seed stalks.

- 95-100% - The key species appears to have been completely utilized. The remaining stubble is utilized to the soil surface.

2. <u>Use Pattern</u>

Use patterns are mapped for cattle, sheep and other domestic livestock, wild horses, wild burros and wildlife grazing use. The use pattern data is collected using the seven categories of the Key Species Method. This method is used to record grazing use level on key species in a designated area, usually an allotment or pasture. The gathered data is assembled and plotted on maps. Data points having the same use levels are linked together to form polygons. Each use category is assigned a distinct color.

The largest two allotments in the Complex, Montezuma and Razorback, received little to no use by livestock between 1991 and 2007. For this reason, no recent use pattern map data were collected or analyzed on these two allotments. Use Pattern Maps were assembled from field data for the Springdale 2 allotment to analyze livestock and burro grazing use.

3. Trend

Trend studies measure the direction of change, in a plant community, toward or away from a desired plant community or the potential natural community. Trend is measured in this allotment using the Quadrat Frequency study method.
Quadrat Frequency

This method measures the frequency in which a plant species occurs in 200 quadrats or plots at a study location. This data is compared to data collected previously to determine changes in the plant community. An increase in desirable plant species and decrease in undesirable plant species indicates an upward or improving trend. A decrease in desirable plant species and an increase in undesirable plant species indicate a downward or declining trend.

4. Frequency Analysis

a. Analysis of Variance

The frequency data was subjected to analysis of variance (ANOVA) using the General Linear Model (GLM) with a 90 percent confidence interval. ANOVA is used to investigate and model the relationship between a response variable and one or more independent variables. The independent variables are qualitative (categorical), and no assumption is made about the relationship (that is, the model does not include the coefficients for variables). In effect, analysis of variance extends the two-sample t-test for testing the equality of two population means to a more general null hypothesis of comparisons the equality of more than two means, versus them all being equal. The GLM is used to perform univariate analysis of variance with balanced and unbalanced designs, analysis of covariance, and regression, for each response variable.

b. P-value

The p-value is the probability of obtaining samples as different (or more different) if there really is no difference between the level means in the population. The use of the p-value is to decide if the means are different. If the p is less or equal to the α level selected then the conclusion is that the means are different. If p is greater than the α level selected then the conclusion are not different.

c. Adjusted P-value

The adjusted p-value associated with the difference between the indicated means. The *p*-value is adjusted for the number of other comparisons being made simultaneously, so that the desired family error rate for the entire set of comparisons is achieved. Plants which had an adjusted *p*-value of > 0.50 were not considered in the analysis.

d. Guidelines

Plants with a percent frequency < 10 percent were not considered for analysis except as noted. Plants in this percent category play a minor role in the overall significance of the plant community. Annual forbs were not analyzed because they have highly variable numbers year to year due to the highly variable precipitation.

Quadrat Frequency and production data were collected at most key areas on the Montezuma and Razorback Allotments. Trend data is used with production data, to determine which direction the plant community is moving, towards the Desired Plant Community or away. Procedures for these studies are found in the BLM Technical Reference 4400-4, "Trend Studies" and "Sampling Vegetation Attributes Interagency Technical Reference" (1996).

5. Ecological Site Inventory

Ecological Site Inventory (ESI) is an inventory of the production and species composition by weight on the various plant species that make up a plant community or Ecological Site. This information is recorded as the total pounds of production of the above ground portions of the plant community produced on one acre in a year. Total production is air-dry weight.

The National Range and Pasture Handbook states, "An Ecological Site is a distinctive kind of land with specific physical characteristics that differs from others kinds of land in its ability to produce a distinctive kind and amount of vegetation."

Ecological sites have soil characteristics that have developed over time. The development of soil is dependant on parent material, climate, living organisms, topography and time. Soils with similar characteristics support and produce a distinctive kind and amount of vegetation and are grouped into the same ecological site.

The vegetative community has an association of species that differs from other ecological sites in kind and proportion of species and annual production.

Potential Natural Community (PNC) is defined as the biotic community that would become established on an ecological site if all successional sequences were completed without interference under the present environmental conditions. PNC recognizes past influences by man including past use and introduced exotic species of animals and plants. The concept of PNC refers to a relatively stable community resulting from secondary succession after disturbance.

The present plant community within an ecological site can be compared to a reference community by the calculation of a similarity index. The reference community is the historic climax plant community or potential natural community. These descriptions are found in the Natural Resources Conservation Service's Major Land Resource Area (MLRA) descriptions for MLRA 29 and MLRA 30. The similarity index is the comparison of the present state of vegetation on an ecological site in relation to the kinds, proportions and amounts of vegetation with other vegetative communities the site is capable of producing. The similarity index determines how closely the current plant community resembles the potential natural community or some other reference community. The Tonopah Resource Management Plan, dated 1997, requires management of the vegetation resource for Desired Plant Communities not the Potential Natural Community.

Technical Reference 1734-7 states, "Since December 1982, ecological site inventory (ESI) has been the Bureau of Land Management's (BLM) standard vegetation inventory technique. The ecological site inventory method involves the use of soils information to map ecological sites and plant communities and the collection of natural resource and vegetation attributes." Ecological Site Inventory (ESI) is beneficial to use when collecting monitoring data on a large scale.

b. <u>Production</u>

Production is determined for each key area by clipping and weighing using the NRCS Double Sampling Method. A transect with 10 plots are estimated and two of these are clipped. The plant material is dried and production is determined in pounds of vegetation produced by species per acre, air dry weight. Production is compared to the ecological site description to determine the ecological status of the key area. The same data is collected at each key area as is collected for Ecological Site Inventory as stated above.

c. <u>Desired Plant Community</u>

The Desired Plant Community (DPC) is the plant community which best meets management objectives for that particular site. Potential Natural Community (PNC) is the stage the plant community would achieve without human interference. DPC may be a seral stage below the PNC, if that plant community better meets livestock, wildlife, watershed, and other management objectives. DPC is based on production data and is listed in pounds per acre by species. It was determined for all key areas with production data. DPC is listed in the evaluation of each key area below.

d. <u>Age Class</u>

The age class data reflects the establishment, survival and decadent of plants within a plant community. Age class reveals the dynamics and distribution of plants within a plant community. This monitoring technique gives us the understanding of the "what and the why" influences on the plant community. A fairly evenly distributed plant community composed of seedling, young, mature and decadent plant signals a healthy plant population dynamic. As uneven distribution, suggests an unbalance distribution in the plant population vibrancy.

D. Actual Use, Census and Gather Data

Actual use data for livestock operations include the species of livestock (only cattle are permitted in the Montezuma Complex), the number of animals, and the length of time the animals are in the allotment. Actual use data are expressed in Animal Unit Months (AUM). One AUM is the amount of forage a cow or horse or burro consume in a month. Livestock actual use data were obtained by using actual use records that were submitted by lessees. The livestock grazing year runs from March 1st – February 28th annually. Data for livestock numbers are in this section, V. Montezuma Complex Evaluation under F. 1. for Montezuma, G. 1. for Razorback, and H. 1. for Springdale 2 allotments.

Actual use by wild horses and burros is based on census data and estimates. The wild horse actual use shows the average AUMs for wild horses over the twelve-month year. These figures are estimates due to wild horse movement caused by changes in climate, and forage and water availability.

1. Livestock Actual Use

Livestock numbers will be included in the individual allotment data sections below. Refer livestock actual use section of this document

2. Wild Horse and Burro Actual Use

Actual use by wild horses and burros is based on census data and annual rate of increase estimates. The wild horse actual use shows the average AUMs for wild horses over the twelve month year. These figures are estimates due to wild horse movement caused by changes in climate, forage and water availability.

3. Historical Census and Gather Data

The BLM has collected aerial census data at irregular intervals since 1974 on the HMAs in the Montezuma Complex area. Census data is collected using either fixed-wing aircraft or helicopters. Grid patterns are flown to cover all of the terrain. Within the past several years, Global Position System (GPS) coordinates are collected at each wild horses or burro sighting, as well, and downloaded into a Geographic Information System (GIS). The latest census flight of the Montezuma Complex occurred in September 2006. Results of all census flights are depicted in Table 10.0.

Because census flights are not feasible or desirable every year, population growth is also estimated by using historical annual rates of increase for the area. These recruitment rates make it possible to estimate herd size per year and help wild horse and burro specialists determine when horse populations are approaching or exceeding AML and in need of a gather. Census flights are often flown prior to scheduled gathers in order to establish the most current and accurate herd size and distribution of the horses and burros in the HMA. This data confirms the need for gathers and assists the gather contract crews identify where to locate the wild equids during each gather.

Table 10.0 - Historical Census Data for the Herd Management Areas of the Montezuma Complex.

HMA Name	Census Date	Animals Observed		
		horse	burro	mule
Bullfrog	1974	10	63	0
NV-629	1982	12	218	0
	1986	0	47	0
	1988	0	256	0
	1989	8	61	0
	1990	0	204	0
	1993	1	227	1
	1993	0	0	0
	1994	2	432	1
	2000	0	17	1
	2006	0	32	0
Goldfield	1974	12	30	0
NV-626	1986	223	19	0
	1988	597	52	0
	1989	579	71	0
	1990	428	87	0
	1990	194	87	0
	1993	94	32	0
	1994	172	73	0
	2000	0	7	0
	2006	6	0	0
Montezuma	1974	96	0	0
Peak	1975	96	0	0
NV-625	1986	106	1	0
	1988	235	0	0
	1989	118	0	0
	1990	165	1	0
	1993	68	5	0
	2000	9	10	0
	2006	58	18	3
Stonewall	1974	42	0	0
NV-627	1981	530	42	0
	1986	241	65	0
	1988	85	18	0
	1989	109	17	0
	1990	80	11	2
	1993	19	0	0
	2000	0	3	0
	2006		17**	

Table 10.0 - Historical Census Data for the Herd Management Areas of the Montezuma Complex (con't)

HMA Name	Census Date	Animals Observed		
		horse	burro	mule
Paymaster	1974	45	0	0
NV-621	1975	45	0	0
	1988	196	0	0
	1990	304	0	3
	1993	24	0	1
	2000	84	1	1
	2006	125	0	0

Table 11.0 - Historical Gather Data for Herd Management Areas of Montezuma Complex.

HMA Name	Gather Date	Animals Captured			Animals Removed			Animals Released		
		horse	burro	mule	Horse	burro	mule	horse	burro	mule
Bullfrog	1990	0	63	0	0	63	0	0	0	0
	1995	0	500	0	0	489	0	8	0	0
	1996	0	417	0	0	417	0	0	0	0
Goldfield	1990	308	0	0	305	0	0	3	0	0
	1994	147	46	0	99	44	0	48	0	0
	Aug-96	159	165	0	159	165	0	0	0	0
	Nov-96	23	5	0	23	5	0	0	0	0
Montezuma Peak	Aug-96	45	1	0	45	1	0	0	0	0
	Nov-96	56	0	0	56	0	0	0	0	0
Stonewall	Aug-96	24*	0	0	24	0	0	0	0	0
	Nov-96	0	5	0	0	5	0	0	0	0
Paymaster	1992	396	0	0	290	0	0	100	0	0
	2006	178	0	0	150	0	0	28	0	0
Totals:		**1312**	**1202**	**0**	**1151**	**1190**	**0**	**187**	**0**	**0**

*20 out of 24 head captured in 1996 at Stonewall were on the Nevada Training and Testing Range just east of Stonewall HMA. All Goldfield gathers were conducted on emergency bases due to issues of starvation and lack of water.

E. Climate

Extremes in precipitation from year to year tend to be more pronounced in Esmeralda County than in northern Nevada or southern Nevada because this region is influenced equally by the Continental Tropical and the Maritime Polar weather patterns. During years of strong maritime (winter/spring precipitation) patterns, upper elevations of the region tend to receive above normal precipitation while the valleys seldom exceed normal precipitation. Likewise, during years of strong continental influence, summer thunderstorms occur with little respect to elevation. The effect of drought on this area can be pronounced when both weather patterns are weak for their respective traditional season. For instance, it is not uncommon to have a very dry winter pattern immediately followed by a very dry summer pattern. Occasionally these dry-dry patterns will last more than one year. This occurred in central Nevada in 2001 and 2002. Likewise, rainfall well in excess of “normal” can result from a strong winter (maritime) pattern followed by a strong summer (continental) pattern, such as in 1982-1983 and 2005. This results in a wet year.

Drought is a recurrent feature of arid central Nevada. Drought should not be confused with aridity. Drought has been defined as a period when precipitation is less than 75 percent of the average amount (Society for Range Management 1989) while aridity refers to areas of low rainfall that are a permanent feature of climate. Using this definition, from 1944 to 1984 drought occurred in 17 out of 40 years in the southwestern United States (Holecheck et al. 1995). Klages (1942) concluded that “even slight reductions from normal precipitation can cause severe reductions in plant yield in areas below 300 mm (≈11.81 inches) of precipitation Two or more consecutive years of drought have far more impact on vegetation than one year of drought followed by normal or above-normal precipitation.”

For this evaluation, we will define a wet year as precipitation at 125 percent and above and a dry year at 75 percent and below normal precipitation.

The next photo illustrates the variability in the precipitation patterns of the Montezuma Complex. The depth of the snow was up to four inches in certain parts of the landscape. One week later, the snow had dissipated and none of the benefits of the precipitation had significantly contributed to the soil moisture regime. Ninety-nine percent of the snow had evaporated before the water content supplemented the soils.

Photo 22.0 - A rare weather event in the southern part of the Sarcobatus Flat, Montezuma Allotment.

Courtesy of M. Pointel, RMS, BLM, TFS, 2006.

The assessment area is approximately 95 miles long from north to south and can be divided into a large northern section that is represented by the Tonopah Airport weather station called North Montezuma Complex, and the southern section which is represented by the two Beatty weather stations called South Montezuma Complex. A BLM rain gauge is located within the Magruder Mountain Allotment and represents the long, narrow neck of land, called Central Montezuma Complex, which joins both the northern and southern sections of the assessment area.

1. Climate Data in North Montezuma Complex

The following precipitation data was obtained from the Western Regional Climate Center (http://www.wrcc.dri.edu/). Some of the years were not included due to missing data.

Tonopah Airport Weather Station

Table 12.0 – Precipitation Data – Tonopah Airport Nevada Weather Station

Year	Total Annual Precipitation (inches)	Mean (Inches)	75% of the mean	Average Drought Threshold Index 3.93 inches 75% or below of Mean	Normal Annual Precipitation Range 3.93-6.55 inches	Above Normal Precipitation >6.55 Inches 125% of the mean
1955	4.13	5.24	78.8%		X	
1956	2.51	5.24	47.9%	X		
1957	5.10	5.24	97.3%		X	
1958	3.38	5.24	64.5%	X		
1959	2.37	5.24	45.2%	X		
1960	3.69	5.24	70.4%	X		
1961	2.90	5.24	55.3%	X		
1962	5.84	5.24	111.5%		X	
1963	6.03	5.24	115.1%		X	
1964	3.88	5.24	74.0%	X		
1965	5.58	5.24	106.5%		X	
1966	3.00	5.24	57.3%	X		
1967	7.68	5.24	146.6%			X
1968	6.56	5.24	125.2%			X
1969	5.16	5.24	98.5%		X	
1970	3.11	5.24	59.4%	X		
1971	3.36	5.24	64.1%	X		
1972	5.59	5.24	106.7%		X	
1973	5.11	5.24	97.5%		X	
1974	4.43	5.24	84.5%		X	
1975	4.38	5.24	83.6%		X	
1976	7.14	5.24	136.3%			X
1977	7.34	5.24	140.1%			X
1978	10.64	5.24	203.1%			X
1979	5.94	5.24	113.4%		X	
1980	4.18	5.24	79.8%		X	
1981	9.21	5.24	175.8%			X
1982	6.19	5.24	118.1%		X	
1983	9.64	5.24	184.0%			X
1984	6.95	5.24	132.6%			X
1985	5.96	5.24	113.7%		X	
1986	2.53	5.24	48.3%	X		
1987	8.33	5.24	159.0%			X
1988	5.67	5.24	108.2%		X	
1989	3.00	5.24	57.3%	X		
1990	5.18	5.24	98.9%		X	
1991	5.79	5.24	110.5%		X	
1992	3.30	5.24	63.0%	X		
1993	4.45	5.24	84.9%		X	

Table 12.0 – Precipitation Data – Tonopah Airport Nevada Weather Station (con't)

Year	Total Annual Precipitation (inches)	Mean (Inches)	75% of the mean	Average Drought Threshold Index 3.93 inches 75% or below of Mean	Normal Annual Precipitation Range 3.93-6.55 inches	Above Normal Precipitation >6.55 Inches 125% of the mean
1994	4.10	5.24	78.2%		X	
1995	6.75	5.24	128.8%			X
1996	3.83	5.24	73.1%	X		
1997	4.58	5.24	87.4%		X	
1998	9.42	5.24	179.8%			X
1999	4.53	5.24	86.5%		X	
2000	6.93	5.24	132.3%			X
2001	4.46	5.24	85.1%		X	
2002	1.42	5.24	27.1%	X		
2003	3.34	5.24	63.7%	X		
2004	4.49	5.24	85.7%		X	
2005	5.96	5.24	113.7%		X	

Graph 1.0 – Tonopah Airport Monthly Average Total Precipitation Distribution

TONOPAH AIRPORT, NEVADA

Monthly Average Total Precipitation

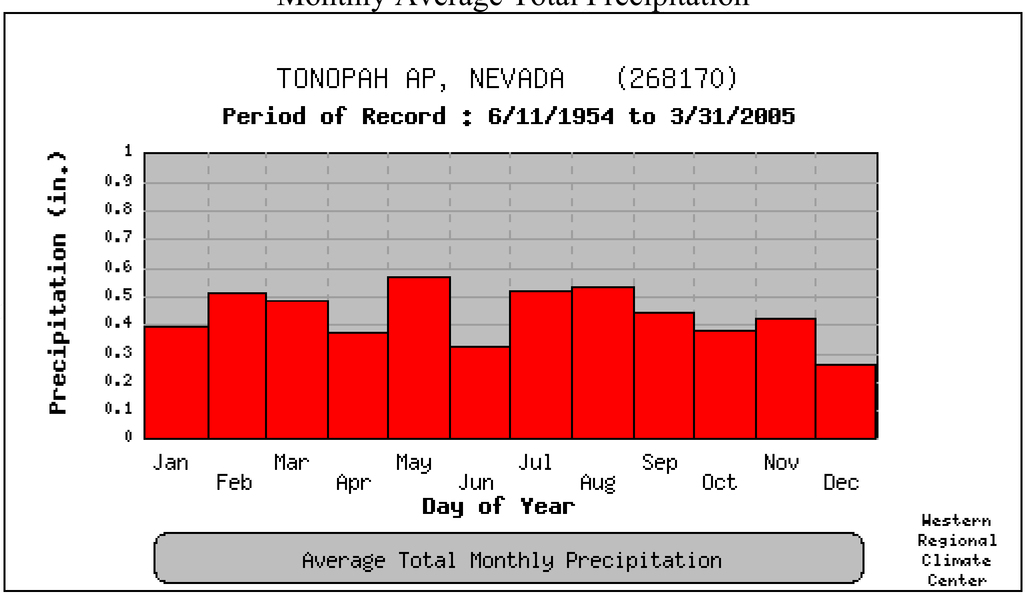


Table 13.0 - Percentage Distribution of Below Normal to Above Normal Precipitation Tonopah Airport Weather Station for years 1954 - 2006.

Below Normal Precipitation	Normal Precipitation	Above Normal Precipitation
30%	47%	23%

Precipitation in the Tonopah area is erratic. The monthly average for Tonopah shows little difference between the months due to the highly variable precipitation year-to-year and season-to-season.

A drought is defined as 75 percent or less than normal precipitation. The Tonopah Weather Station shows 30 percent, or almost one third, of the years between 1955 and 2005 receiving below normal precipitation. There have been numerous dry periods in Tonopah, the longest lasting from 1956 to 1961. Recently, 1986 was dry most of the year, followed by a wet year in 1987. The year 1989 was dry except in May. This was followed by two normal years and in 1992 a year with an extremely dry spring and summer. The majority of these dry years (9 out of the 15 dry years) were below 60 percent of normal precipitation. Five of these years, 1956, 1959, 1986, and 2002, received less than 50 percent of normal precipitation. Recent data from the Goldfield Weather Station (Western Regional Climate Center, http://www.wrcc.dri.edu) shows an extremely dry period starting July 1995 ending Early June 1996. Total precipitation during this period was 2.22 inches, 42 percent of normal precipitation of 5.24. Most of this precipitation fell in February with 0.38 inches and March with 0.53 inches. During this dry period, almost no growth occurred on vegetation.

Another dry period started in December 2001 and ended April 2003 and was similar to the 1995 and 1996 situation.

2. Climate in Central Montezuma Complex

Table 14.0 – BLM – Magruder Mountain Rain Gauge Precipitation Data

Fiscal Year (FY)	FY85	FY86	FY87	FY88	FY89	FY91	FY92
June to June Data	2.55	1.76	6.03	6.12	3.93	1.22	6.13
Ave. 1985-2006	4.17	4.17	4.17	4.17	4.17	4.17	4.17
Drought Index Average	3.13	3.13	3.13	3.13	3.13	3.13	3.13

Fiscal Year (FY)	FY93	FY94	FY95	FY96	FY97	FY98	FY99
June to June Data	4.76	3.70	7.18	1.81	2.11	10.26	4.39
Ave. 1985-2006	4.17	4.17	4.17	4.17	4.17	4.17	4.17
Drought Index Average	3.13	3.13	3.13	3.13	3.13	3.13	3.13

Fiscal Year (FY)	FY00	FY02	FY03	FY04
June to June Data	5.01	1.30	3.26	4.56
Ave. 1985-2006	4.17	4.17	4.17	4.17
Drought Index Average	3.13	3.13	3.13	3.13

Some years were omitted due to missing data
Drought Index Average = 3.13 inches of yearly precipitation and below = 75% of normal precipitation (dry year).
Average precipitation from 1985 – 2006 = 4.17 inches.
Wet year = 5.21 inches of yearly precipitation and above = 125% of normal precipitation.

Table 15.0 – Wet, Dry and Normal Precipitation by Year, Magruder Mountain Rain Gauge

	Years	Number of Years	Type of Year Precipitation Percent
Dry Years	85, 86, 91, 96, 97, 02	6	33%
Normal	89, 93, 94, 99, 00, 03, 04	7	39%
Wet Years	87, 88, 92, 95, 98	5	28%

Precipitation in the Central Montezuma Complex area is erratic. Drought occurs about one in every three years in the central portion of the Complex. Precipitation varies year to year and season to season. There have been numerous dry periods. Recently, 1985 and 1986 were dry followed by two wet years 1987 and 1988. Dry years included 1991, 1996-1997, and 2002. These weather patterns are similar to the Tonopah weather patterns.

3. <u>Climate in South Montezuma Complex</u>

Table 16.0 - Annual Precipitation Data for Beatty 8 N, Nevada from 1973 to 2005

Year	Total Annual Precipitation (inches)	Mean (Inches)	75% of the mean	Average Drought Threshold Index 4.65 inches 75% or below of Mean	Normal Annual Precipitation Range 4.65-7.55* inches	Above Normal Precipitation >7.55* Inches 125% of the mean
1973	6.72	6.20	108.4%		X	
1974	5.8	6.20	93.5%		X	
1975	4.84	6.20	78.1%		X	
1976	7.82	6.20	126.1%			X
1977	6.44	6.20	103.9%		X	
1978	10.8	6.20	174.2%			X
1979	4.71	6.20	76.0%		X	
1980	6.01	6.20	96.9%		X	
1981	3.73	6.20	60.2%	X		
1982	6.07	6.20	97.9%		X	
1983	11.49	6.20	185.3%			X
1985	2.79	6.20	45.0%	X		
1986	5.22	6.20	84.2%		X	
1987	7.38	6.20	119.0%		X	
1988	6.21	6.20	100.2%		X	
1989	2.43	6.20	39.2%	X		
1990	4.92	6.20	79.4%		X	
1991	5.15	6.20	83.1%		X	
1992	7.37	6.20	118.9%		X	
1993	5.71	6.20	92.1%		X	

Table 16.0 - Annual Precipitation Data for Beatty 8 N, Nevada from 1973 to 2005 (con't)

Year	Total Annual Precipitation (inches)	Mean (Inches)	75% of the mean	Average Drought Threshold Index 4.65 inches 75% or below of Mean	Normal Annual Precipitation Range 4.65-7.55* inches	Above Normal Precipitation >7.55* Inches 125% of the mean
1994	3.44	6.20	55.5%	X		
1995	8.45	6.20	136.3%			X
1996	5.6	6.20	90.3%		X	
1997	6.64	6.20	107.1%		X	
1998	12.62	6.20	203.5%			X
1999	4.69	6.20	75.6%		X	
2000	7.18	6.20	115.8%		X	
2001	7.3	6.20	117.7%			
2002	0.46	6.20	7.4%	X		
2003	5.8	6.20	93.5%		X	
2004	7.46	6.20	120.3%		X	
2005	8.96	6.20	144.5%			X

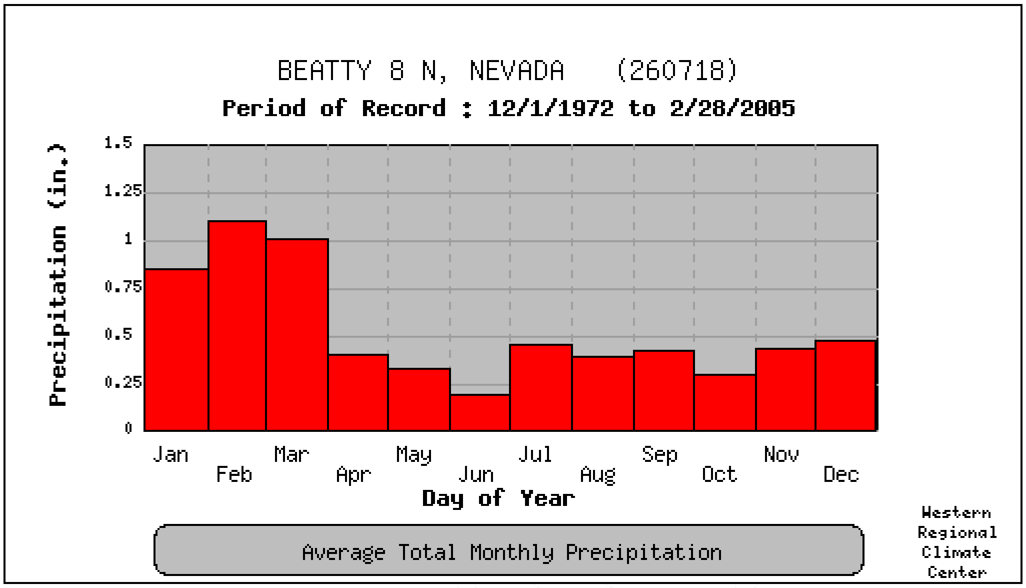
Table 17.0 – Beatty Percentage Distribution of Below Normal to Above Normal Precipitation

Below Normal Precipitation	Normal Precipitation	Above Normal Precipitation
16%	66%	19%

Graph 2.0 – Beatty 8N Monthly Average Total Precipitation Distribution

BEATTY 8 N, NEVADA

Monthly Average Total Precipitation



The southern portion of Montezuma Allotment, and the Razorback and Springdale 2 Allotments are located in the Mojave Desert. The Beatty weather data shows only 16 percent of the years between 1973 and 2005 are drought years. The majority of years, 66 percent, received normal levels of precipitation. Major precipitation events tend to occur during the winter months. Average precipitation was 6.1 inches between 1973 and 2005. However the period between June 1995 and May 1996 was also extremely dry, when only 2.47 inches fell. Another dry period occurred in late 2001 and early 2002, and was much dryer than 1995 and 1996.

The monthly average for Beatty shows January to March as wetter than the rest of the year. There is less variation in precipitation year to year and season to season in the Beatty area than there is in Tonopah and the southern Great Basin area.

4. <u>Summary of Climate Data</u>

Precipitation data indicates frequent droughts in the northern and central portions of the Montezuma Complex evaluation area. For this reason, stocking rates for livestock and wild equids should be conservative to avoid damaging vegetation and unnecessary stress on the animals due to lack of forage.

F. Montezuma Allotment Data Analysis

1. Actual Use and HMA Census

a. Livestock

The following table displays the TNR Authorization for the Montezuma Allotment from 2001 to 2006.

Table 18.0 - Temporary Non-Renewable Authorization for the Montezuma Allotment from 2001 to 2006

Year of Authorization	Pasture	Season of Use Begin	Season of Use End	Number of Animals	Animal Unit Months
2001	West & East	11/16/01	05/15/02	200	1200
2003	South	12/23/03	01/31/04	100	358
2003	West	02/01/04	05/15/04	100	342
2003	East	12/23/03	05/15/04	100	700
2004	North, West & East	10/15/04	05/15/05	300	2100
2005	South & East	09/01/05	01/31/06	25	126
2005	South & West	09/01/05	01/31/06	200	1006
2005	East	10/15/05	02/28/06	300	450
2005	West	03/01/06	02/28/07	50	600
2006	East	11/20/06	03/15/07	50	373
2006	West	03/01/07	02/28/08	50	600

b. **Wild Horse and Burro**

Table 19.0 – Number of Wild Horses and Burro within the Montezuma Allotment

HMA	Type of Animal	Number of Animals	AUMS
Bullfrog	Horse	12	144
	Burro	140	1680
Goldfield	Horse	227	2724
	Burro	71	852
Montezuma	Horse	138	1656
	Burro	0	0
Stonewall	Horse	13	156
	Burro	34	408
Paymaster/Lone Mountain	Horse	3	36
		Total AUMs	**7,656**

Species that have a value of 'T' or trace, are present at the site, at less than one percent.

2. Key Area Assessments

The analysis of trend is based on the analysis of the variance (ANOVA). The statistical analysis is located in Appendix D.

Key Areas 1, 2 & 3 are in the same ecological site, have the same changes in trend. All three key areas represent the same very productive area in the northern portion of the allotment, between Tonopah and Lone Mountain. All three key areas will be analyzed together after the section showing information gathered at Key Area 3.

Key Area 1

Ecological Site: 029XY017NV Loamy 5-8" Precipitation Zone (p.z.) (Soil Itme, fan skirts)
Production: 594 lbs (all perennial species)
Dominant Vegetation: Shadscale, winterfat and Indian ricegrass

Percent Utilization Data

Table 20.0 - Key Area 1 - Percent Utilization – Montezuma Allotment

Species	Feb 1990	Jan 1991	Dec 1991	Dec 1993	Jun 2002	Mar 2004
Indian ricegrass	66	65	24	62	12	29
Winterfat	60	18	12	50	3	13
Bud sagebrush	-	-	-	-		4
Shadscale	-	-	-	-	3	-

- No data collected.

Desired Plant Community

Table 21.0 - Key Area 1 – Desired Plant Community - Montezuma Allotment

Species	2004 Pounds/Acre	*PNC	Desired Plant Community Pounds/acre
Indian ricegrass	12	113-203	70
Shadscale	346	90-158	280
Bud sagebrush	42	23-68	42
Winterfat	193	23-113	193

* Potential Natural Community

Trend Data

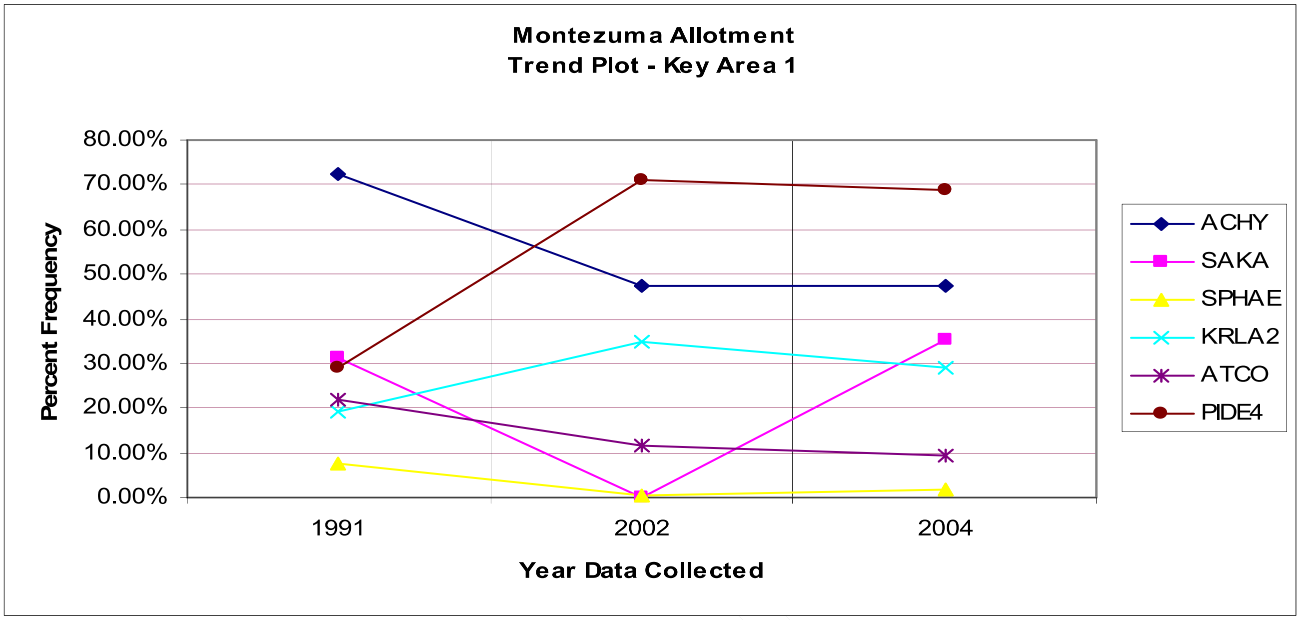
Table 22.0 - Key Area 1 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 1 – Percent Frequency		
Common Name	Scientific Name	Plant Symbol	1991	2002	2004
Indian ricegrass	*Achnatherum hymenoides*	ACHY	72.5%	47.5%	47.5%
Russian thistle	*Salsola Kali*	SAKA	31.5%	0.0%	35.5%
Globemallow	*Sphaeralcea spp*	SPHAE	7.5%	0.5%	2.0%
Winterfat	*Krascheninnikovia lanata*	KRLA2	19.0%	35.0%	29.0%
Shadscale	*Atriplex confertifolia*	ATCO	22.0%	11.5%	9.5%
Bud sagebrush	*Picrothamnus desertorum*	PIDE4	29.0%	71.0%	69.0%

Table 23.0 - Key Area 1 - Analysis of Trend

Plant Species	Trend 1991 - 2002	Trend 2002 - 2004	Trend 1991 - 2004
Indian ricegrass	Decrease	Static	Decrease
winterfat	Increase	Decrease	Increase
Shadscale	Decrease	Static	Decrease
Bud sagebrush	Increase	Static	Increase

Graph 6.0 - Key Area 1 - Trend Data Plot - Montezuma Allotment



Key Area 2

Ecological Site: 029XY017NV Loamy 5-8" p.z. (Soil Wardenot, inset fans) **(Note:** production was not collected at this site. This site is close to Key Areas 3 & 1 and is the same ecological site.
Dominant Vegetation: Shadscale, winterfat and Indian ricegrass

Percent Utilization Data

Table 24.0 - Key Area 2 - Percent Utilization –Montezuma Allotment

Species	Percent Utilization					
	Feb 1990	Jan 1991	Dec 1991	Dec 1993	Jun 2002	Mar 2004
Indian ricegrass	72	80	58	68	12	37
Winterfat	38	14	20	40	7	9

Trend Data

Table 25.0 - Key Area 2 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 2 – Percent Frequency		
Common Name	**Scientific Name**	**Plant Symbol**	**1991**	**2002**	**2006**
Indian ricegrass	*Achnatherum hymenoides*	ACHY	51.0%	29.5%	35.0%
Galleta grass	*Pleuraphis jamesii*	PLJA	0.5%	1.0%	0.5%
Globemallow	*Sphaeralcea spp*	SPHAE	4.5%	0.5%	0.0%
Russian thistle	*Salsola Kali*	SAKA	34.5%	0.5%	7.5%
Winterfat	*Krascheninnikovia lanata*	KRLA2	21.0%	37.0%	35.5%
Bud sagebrush	*Picrothamnus desertorum*	PIDE4	28.0%	38.5%	35.5%
Shadscale saltbush	*Atriplex confertifolia*	ATCO	45.0%	20.5%	14.5%
Bailey greasewood	*Sarcobatus vermiculatus baileyi*	SAVEB	0.5%	0.0%	0.0%

Table 26.0 - Key Area 2 - Analysis of Trend

Plant Species	Trend 1991 - 2002	Trend 2002 - 2004	Trend 1991 - 2004
Indian ricegrass	Decrease	Static	Decrease
winterfat	Increase	Static	Increase
Shadscale	Increase	Static	Increase
Bud sagebrush	Decrease	Decrease	Decrease

Graph 4.0 - Key Area 2 - Trend Data Plot - Montezuma Allotment

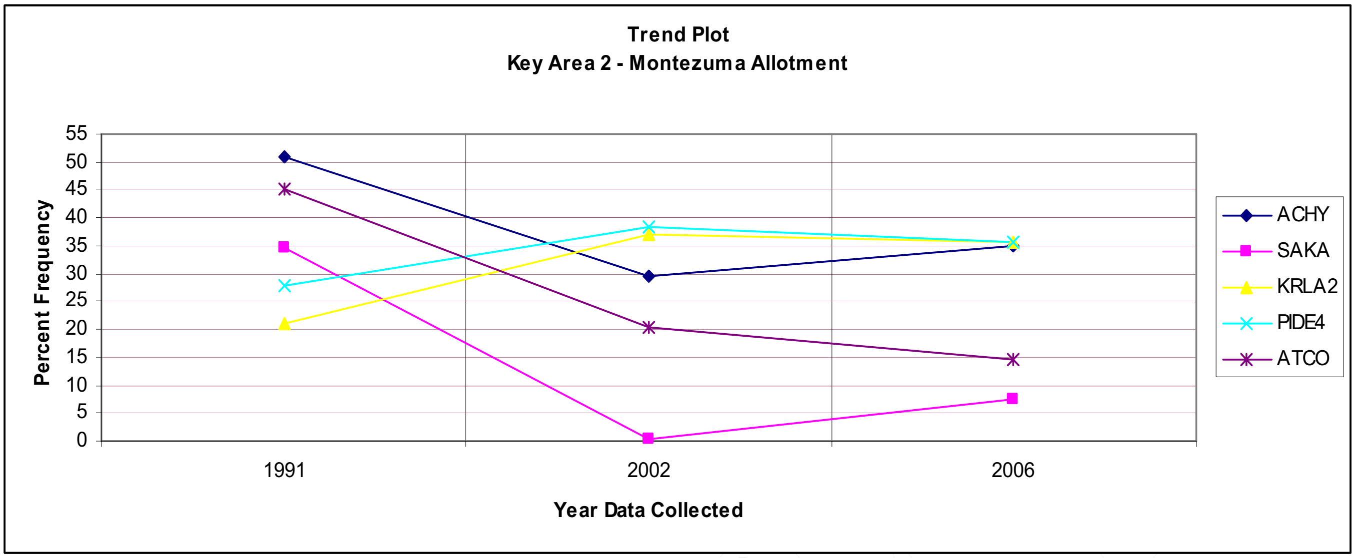


Table 27.0 – Key Area 2 – Percent Age Class Distribution in 2006 by Species - Montezuma Allotment

Species	Age Structure	
	Seedling	Young Plant
Indian ricegrass	2.0%	0.0%
Winterfat	3.0%	0.5%
Bud sagebrush	5.0%	3.5%

Analysis

Key Area 2 is 5 miles south of Key Area 1, has the same ecological site and the trend is almost identical. Use was excessive at the key area in 1990, 1991 and 1993 prior to the removal of livestock by the lessee. Wild horses continued to graze the area. Age Class and Cover were also read at this key area. See Analysis of Key Areas 1, 2 & 3 below.

Key Area 3

Ecological Site: 029XY017NV Loamy 5-8" p.z. (Soil Wardenot, inset fans)
Production: 532 lbs (503 lbs perennial species)
Dominant Vegetation: Shadscale, winterfat and Indian ricegrass

Percent Utilization Data

Table 28.0 - Key Area 3 - Percent Utilization – Montezuma Allotment

Species	Percent Utilization					
	Feb 1990	Jan 1991	Dec 1991	Dec 1993	Jun 2002	Mar 2004
Indian ricegrass	66	51	52	59	3	15

Desired Plant Community

Table 29.0 - Key Area 3 –Desired Plant Community - Montezuma Allotment

Species	2004 Pounds/Acre	*PNC	Desired Plant Community Pounds/acre
Indian ricegrass	56	113-203	100
Russian thistle	27	0	Varies with precipitation
Annual forbs	2	T-23	Varies with precipitation
Shadscale saltbush	126	90-158	126
Bud sagebrush	67	23-68	67
Winterfat	254	23-113	254

Analysis

Key Area 3 and Key Area 2 are in the same ecological site as Key Area 1. Key Area 3 is located near Key Area 2. Study plot location may have been used as a temporary water haul site. Trend data cannot be analyzed past 2002. See Analysis of Key Areas 1, 2 & 3 below.

Photo 23.0 - General View of Key Area 3

Courtesy of M. Pointel, RMS, BLM, TFS, 2005.

Analysis of Key Areas 1, 2 & 3

Key Areas 1, 2 & 3 represent the same range site in the same very productive area in the northern most portion of the Montezuma Allotment. The changes in vegetation on all three key areas are similar and will be analyzed together below.

The ecological site at these key areas is a loamy 5 – 8”, 029XY017NV. In PNC this ecological site is dominated by shadscale, bud sagebrush and Indian ricegrass. These soils have very sandy surface textures which support more Indian ricegrass and winterfat than is typical on a loamy 5 – 8” ecological site. The area represented by these key areas could support more Indian ricegrass than is currently found here. These are veryproductive soils which could produce good quality forage for both winter and growing season use by livestock if properly managed.

Use by livestock on this area has declined since 1990. The former lessee ran full numbers of livestock on the allotment until 1991 when he removed most of them. Few cattle used this area from 1992 until 2000 when TNR grazing was permitted. The TNR authorization were conservatively stocked and the majority of this use was south of this area. Wild horses from the Paymaster HMA left the HMA in the mid 1980s and started using this area in the Montezuma Allotment which is outside the HMA. Since 1992 the majority of use in this area has been by wild horses.

Important key forage species at these key areas are Indian ricegrass and winterfat. Both species are sensitive to spring use. Excessive grazing, especially during the growing season, can substantially reduce the number of these plants in the vegetative community. Production at this key area, when compared to the potential, shows a lack of Indian ricegrass and an abundance of winterfat at this key area. Winterfat, a half shrub, is very palatable and nutritious winter forage used by cattle (Stevens et al. 1977) (Blaisdell and Holmgren 1984). However, the majority of use on this site after 1991 has been by wild horses. Use exceeded allowable levels on Indian ricegrass in the early 1990s when use was read. Wild horses prefer grass over shrubs for forage but will make limited use of winterfat; cattle use both Indian ricegrass and winterfat. Use levels on winterfat on this site dropped in 1991 after the removal of cattle from this area.

Trend data shows a decrease between 1991 and 2002 in Indian ricegrass and shadscale and an increase in bud sagebrush with no change for these three plants between 2002 and 2004. Winterfat increased between 1991 to 2002 and was static between 2002 and 2004. Three dry years occurred between 1991 and 2002

The loss of ricegrass between 1991 and 2002 is due to wild horse use and drought. The loss of shadscale between 1991 and 2002 is mainly due to drought. Horses do not use shadscale and it is not important forage for cattle. The increase in winterfat and bud sagebrush between 1991 and 2002 would be due to the open niche left by the loss of ricegrass and shadscale. The only change between 2002 and 2004 was a loss of winterfat. This may be due to the drought in 2002.

Age Class

Age Class was examined on 300 plots at Key Area 2 in 2006. The year 2005 was a very wet year and seedling plants of Indian ricegrass, winterfat and bud sagebrush were observed in 2006 at Key Area 2. Notes made on study forms in 2002 mention dead shadscale. Notes at Key Area 3 mention young plants for both bud sagebrush and shadscale. The open niche due to the loss of shadscale and Indian ricegrass between 1991 and 2002 appears to be filling with the seedlings of Indian ricegrass, winterfat and bud sagebrush. Seedlings sprout only in very wet years Esmeralda and southern Nye Counties. Since the majority of years in this area are dry or normal, seedlings only establish in the few wet years. It is typical in Esmeralda and southern Nye Counties to find sites like this with large numbers of plants in one single age class and very few individuals in the other age classes.

Trend

Trend on Key Area 2 is undetermined. Important forage species are increasing and declining. Indian ricegrass declined while winterfat increased. Wild horses not cattle grazed this area. They prefer grasses to shrubs; they overused the grass, and only lightly used the winterfat.

South Central Nevada lies between two different weather patterns. This causes highly variable precipitation, by year and by season. This variability in precipitation leads to sudden changes in the plant community such as mass die offs partially due to drought and sudden increases in plant species in wet years especially when there is an open niche left by a die off. Trend is seldom static, and the changes are often not solely due to grazing. The sensitivity of these species to large changes in available moisture leads to a need to more conservatively graze these plant communities than is necessary in places with wetter and more stable weather patterns.

Cover

Percent cover was collected at Key Area 2 in 2006 using the Step Point Method. Overall cover for vegetation was nine percent. This is lower than the 15 to 25 percent potential for the site. The loss of shadscale due to drought and the loss of Indian ricegrass due to grazing and drought account for the lower reading.

Recommendation

This recommendation covers Key Areas 1, 2 & 3. This soil is very sandy and productive. This area has two important forages, winterfat, a good winter forage species for livestock use, and Indian ricegrass. This northern end of Montezuma is very well suited for winter use with occasional rests. It can tolerate occasional growing season use if not heavily stocked. Because of the highly variable precipitation, a conservative stocking rate should be established. No AUMs should be allocated outside the sandy area in adjacent hills or upper alluvial fans. These areas receive little use by livestock and the increased stocking rate would cause overuse on lower elevation areas like this sandy area.

Standards, Guidelines & Land Use Plan Assessment for Key Areas 1, 2 & 3

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 30.0 - Indicator Assessment for Key Areas 1, 2 & 3

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	Age class information and cover were taken at Key Area 2 in 2006. Cover is 9%, under the 15% the ecological site description shows as typical for the site. This loss is due to the loss of ricegrass and shadscale in this area.	Not Met	Causal factors are 1. Excessive use by cattle and wild horses and; 2. Drought due to highly variable weather patterns.
Vegetation composition (relative abundance of species)	Winterfat exceeds 100% production for the area, however Indian ricegrass produces between 7 and 35% of the potential production for the soil. Trend shows a large loss of Indian ricegrass at all three key areas.	Not Met	Causal factors are 1. Excessive use by cattle and wild horses and; 2. Drought due to highly variable weather patterns.
Vegetation structure (life forms, cover, height, and age classes)	Age class information was taken at Key Area 2 in 2006. Results were 1% seedling and young, 71% mature and 18% dead. Only in very wet years do seedlings sprout, since the majority of years here are dry or normal seedlings do not establish yearly in this desert but establish in large numbers during a few very wet years. It is typical in this desert to find sites like this with large numbers of plants in one single age class.	Met	
Vegetation productivity	Production was collected in 2004. Production at Key Area 1 (132%) and 3 (112%) exceed the potential for the site. Most or all of the total production is native perennial species.	Met	
Vegetation nutritional value	Winterfat and Indian ricegrass grow here and provide good quality forage.	Met	

Table 31.0 - Standard Assessment for Key Areas 1, 2 & 3

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Not Met	Causal factors are 1. Excessive use by cattle and wild horses and; 2. Drought due to highly variable weather patterns.
Standard 2	Not Met	Causal factors are 1. Excessive use by cattle and wild horses and; 2. Drought due to highly variable weather patterns.
Standard 3	Met	

Key Area 4

Ecological Site: 029XY017NV Loamy 5-8" p.z.
Production: 355 lbs (all perennial species)
Dominant Vegetation: Spiny menodora, gray molly and bud sagebrush

Photo 24.0 -General View of Key Area 4 – Montezuma Allotment

Courtesy of M. Pointel, RMS, BLM, TFS, 2006.

Percent Utilization Data

Table 32.0 - Key Area 4 - Percent Utilization – Montezuma Allotment

Species	Percent Utilization				
	Feb 1990	Jan 1991	Dec 1991	Dec 1993	Mar 2004
Galleta	20	16	32	29	5
Squirreltail	-	-	-	-	12
Winterfat	-	-	-	48	-
Indian ricegrass	61	40	-	-	-

- No data collected.

Desired Plant Community

Table 33.0 - Key Area 4 – Desired Plant Community - Montezuma Allotment

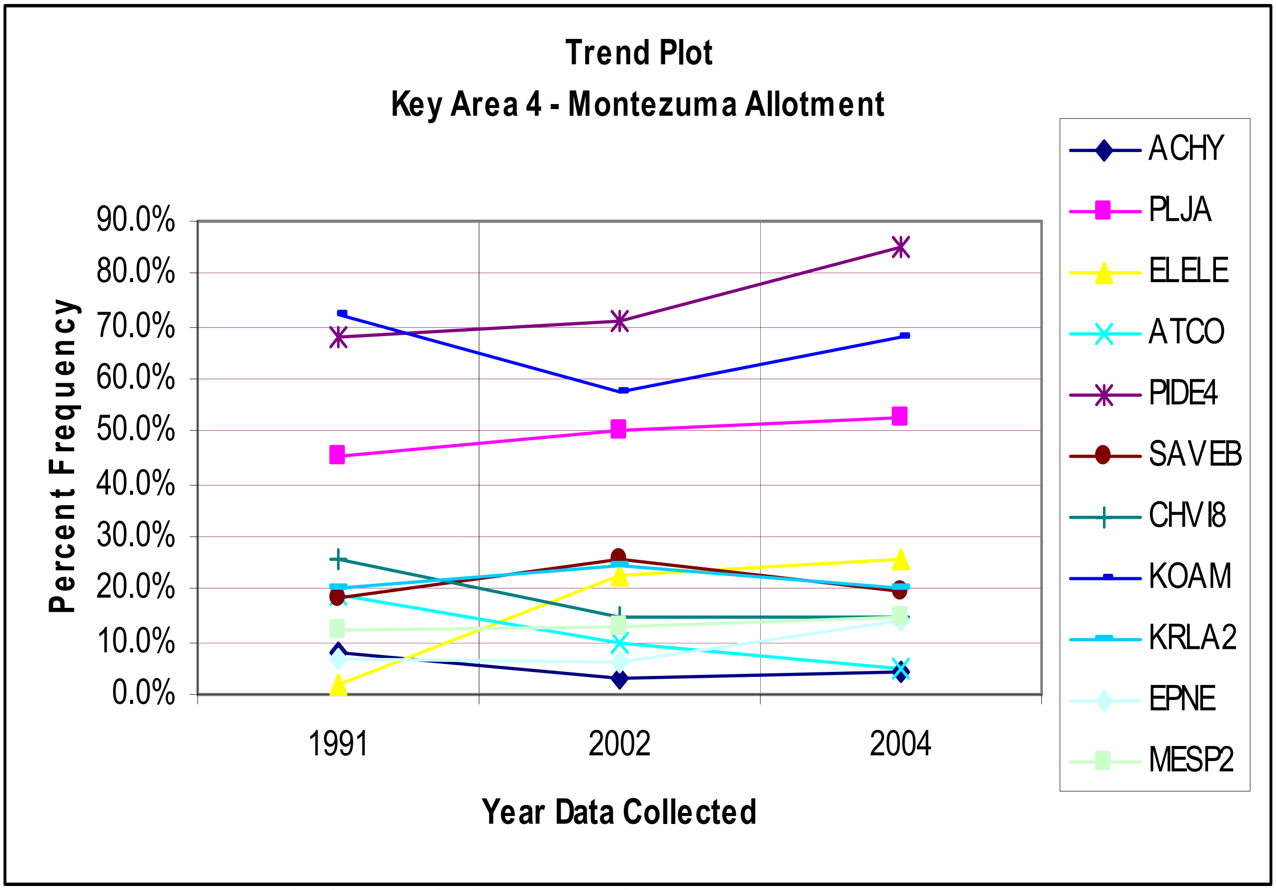
Species	2004 Pounds/Acre	PNC	Desired Plant Community Pounds/Acre
Indian ricegrass	5	15-45	10
Bottlebrush squirreltail	31	6-24	Varies with precipitation
Galleta grass	26	6-24	26
Winterfat	24	5-15	24
Shadscale	7	15-45	10
Bud sagebrush	181	6-15	160
Spiny menodora	T	105-135	20
Green molly kochia	20	5-15	20
Douglas rabbitbrush	58	5-15	40
Astragalus	4	-	4

Trend Data

Table 34.0 - Key Area 4 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 4 – Percent Frequency		
Common Name	Scientific Name	Plant Symbol	1991	2002	2004
Indian ricegrass	*Achnatherum hymenoides*	ACHY	8.0%	3.0%	4.0%
Galleta grass	*Picrothamnus desertorum*	PLJA	45.5%	50.0%	52.5%
King desertgrass	*Blepharidachne kingii*	BLKI	6.0%	0.5%	1.5%
Bottlebrush squirreltail	*Elymus elymoides elymoides*	ELELE	2.0%	22.5%	26.0%
Shadscale saltbush	*Atriplex confertifolia*	ATCO	19.0%	9.5%	5.0%
Bud sagebrush	*Picrothamnus desertorum*	PIDE4	68.0%	71.0%	85.0%
Spiny hopsage	*Grayia spinosa*	GRSP	0.0%	0.5%	2.5%
Bailey greasewood	*Sarcobatus vermiculatus baileyi*	SAVEB	18.5%	26.0%	19.5%
Douglas rabbitbrush	*Chrysothamnus viscidiflorus*	CHVI8	26.0%	15.0%	15.0%
Green molly kochia	*Kochia americana*	KOAM	72.0%	57.5%	68.0%
Winterfat	*Krascheninnikovia lanata*	KRLA2	20.5%	24.5%	20.0%
Nevada ephedra	*Ephedra nevadensis*	EPNE	7.0%	6.0%	14.0%
Spiny menodora	*Menodora spinescens*	MESP2	12.0%	13.0%	15.0%

Graph 5.0 - Key Area 4 - Trend Data Plot - Montezuma Allotment



Analysis of Trend

Table 35.0 - Key Area 4 – Analysis of Trend

Plant Species	Trend 1991 - 2002	Trend 2002 - 2004	Trend 1991 - 2004
Indian Ricegrass	Decrease	Static	Decrease
Galleta	Static	Static	Static
Squirreltail	Increase	Static	Increase
Shadscale	Decrease	Decrease	Decrease
Bud sagebrush	Static	Increase	Increase
Bailey greasewood	Increase	Decrease	Static
Green rabbitbrush	Decrease	Static	Decrease
Green molly	Decrease	Increase	Static
Winterfat	Static	Static	Static
Nevada ephedra	Static	Increase	Increase
Spiny menodora	Static	Static	Static

Analysis

Key Area 4 is just west of the northern end of the Montezuma Range within the Montezuma Peak HMA. The ecological site at this key area is a loamy 5 – 8", 029XY017NV. In PNC, shadscale and bud sagebrush dominate. Some Indian ricegrass, and other shrubs also occur here.

Use on this area has declined since 1990. The former lessee ran full numbers of livestock on the allotment until 1991 when he removed most of them. Few cattle have used this area from 1992 until 2007. Since 1992, wild horses or burros have made the majority of use in this area. After 1990, use has been light in years with normal levels of precipitation.

Trend

Key forage species at this key area is mainly galleta grass. Trend on galleta grass shows a slow, gradual increase of galleta grass at the key area. It appears to be filling in the niche Indian ricegrass previously occupied. Indian ricegrass declined between 1991 and 2002, mainly due to drought (1991, 1996 and 2002). Other changes also appear to be related to lack of moisture during the 1991 to 2002 reading. Shadscale, rabbitbrush and grey molly also declined during this period. Currently, shadscale is declining throughout much of the Tonopah Planning Area. Shadscale goes through frequent die-offs (Refer to Appendix C – Plant Community Dynamics). Throughout the Planning Area, the majority of all shadscale vegetation at any site is in one age class. This is because shadscale seed sprouts in only a very few wet years. On sites with an open niche in wet years, shadscale will dominate. Since the majority of shadscale is in one age class, the loss of shadscale at this key area is due to a decadent population gradually dieing. Drought, insects or other natural events accelerate this loss of shadscale.

Bailey greasewood and bottlebrush squirreltail increased slightly during these dry years between 1991 and 2002. Between 2002 and 2004, bud sagebrush and Nevada ephedra both increased to fill in the open niche left by shadscale.

South Central Nevada lies between two different weather patterns. This causes highly variable precipitation, by year and by season. This variability in precipitation leads to sudden changes in the plant community, such as mass die-offs due to drought and sudden increases in plant species in wet years, especially when there is an open niche. Trend is seldom static, and the changes are often not solely due to grazing. The sensitivity of these species to large changes in available moisture leads to the need to more conservatively graze these plant communities than is necessary in places with more stable weather patterns.

Trend appears to be downward. The vegetation at this key area has changed mainly due to the three dry years, 1991, 1996 and 2002. Use does not appear to be a factor. Few cattle have used the area since 1991. There has been some light use by burros and wild horses.

Cover

Cover was read with the Step Point Method in 2006. Overall cover for vegetation was 26 percent. This is consistent with the 15 to 25 percent potential for the site.

Recommendation

This portion of Montezuma, which is east of the Montezuma Range, is well suited for growing-season use. The main forage species is galleta grass, which is most often grazed during the growing season. There are few other forage species at this location except bottlebrush squirreltail. Indian ricegrass on this site cannot be managed for due to the frequent droughts. Galleta grass is very resistant to grazing and will not suffer from use during the grazing season if that use level falls within the Nevada Rangeland Monitoring Handbook standards. Bottlebrush squirreltail often grows under shrubs where it may be difficult to graze. Changes in the amount of squirreltail are directly related to moisture. It is common in wet years and scarce in dry years.

Standards, Guidelines & Land Use Plan Assessment for Key Area 4

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 36.0 - Indicator Assessment for Key Area 4

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	Cover data was collected at Key Area 4 in 2006. Cover is 26%, just over the 15% to 25% the ecological site description shows as typical for the site.	Met	
Vegetation composition (relative abundance of species)	Trend shows a slight decline of Indian ricegrass and a large loss of shadscale.	Not Met	Drought in 1991, 1996 and 2002 is the causal factor. These droughts partially cause frequent die-offs of important perennial species.
Vegetation structure (life forms, cover, height, and age classes)	Age class information was not collected at this key area. The loss of shadscale is likely due to a decant age class and drought.	Not Met	Drought in 1991, 1996 and 2002 is the causal factor. These droughts partially cause frequent die offs of important perennial species.

Table 36.0 - Indicator Assessment for Key Area 4 (con't)

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Vegetation productivity	Production was collected in 2004. Production is lower than the potential for the site. However, this soil is not as productive as is typical for a Loamy 5-8" Ecological Site. Native perennial species make up 100% of the production.	Met	
Vegetation nutritional value	Winterfat provides good quality forage.	Met	

Table 37.0 - Standard Assessment for Key Area 4

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Met	
Standard 2	Met	
Standard 3	Not Met	Drought in 1991, 1996 and 2002 is the causal factor. These droughts partially cause frequent die offs of important perennial species.

Key Area 5

Ecological Site: 029XY035NV Loamy 3-5" p.z.
Production: 733 lbs
Dominant Vegetation: Bailey greasewood, bud sagebrush, and shadscale

Percent Utilization Data

Table 38.0 - Key Area 5 - Percent Utilization – Montezuma Allotment

Species	Percent Utilization				
	Feb 1990	Jan 1991	Dec 1991	Jan 1993	Mar 2004
Indian ricegrass	66	62	56	53	16

Production & Desired Plant Community

Table 39.0 - Key Area 5 – Desired Plant Community - Montezuma Allotment

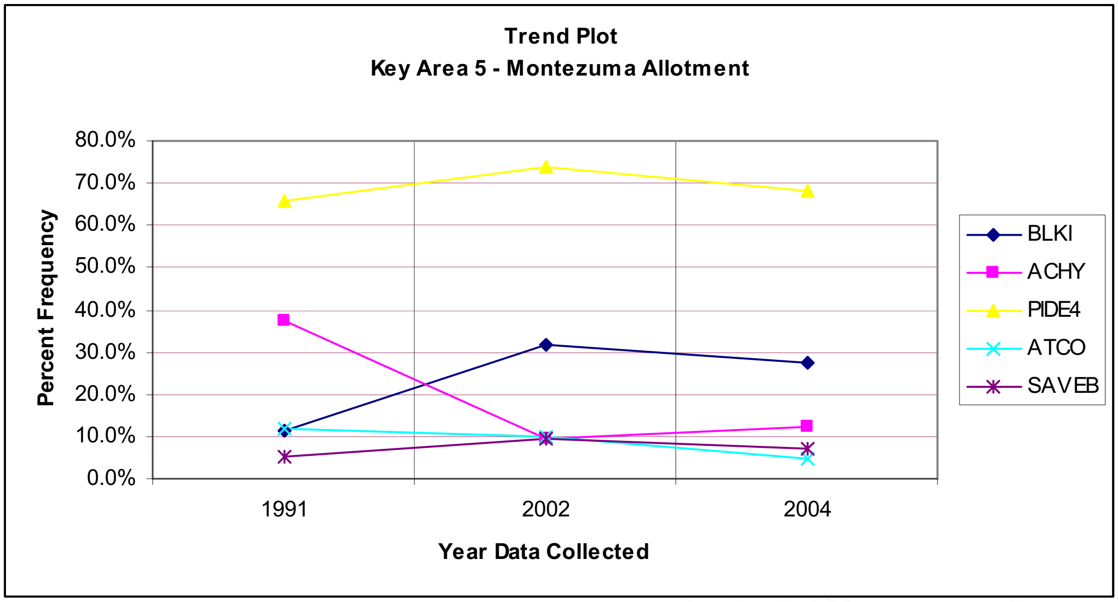
Species	2004 Pounds/Acre	PNC	Desired Plant Community Pounds/Acre
Bud sagebrush	189	15-30	170
Bailey greasewood	557	T-15	500
Shadscale	27	45-60	40
Indian ricegrass	5	8-23	8
Cheeseweed	3	T-8	3
Prince's plume	3	3	3

Trend Data

Table 40.0 - Key Area 5 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 5 – Percent Frequency		
Common Name	**Scientific Name**	**Plant Symbol**	**1991**	**2002**	**2004**
King desertgrass	*Blepharidachne kingii*	BLKI	11.5%	31.5%	27.5%
Indian ricegrass	*Achnatherum* hymenoides	ACHY	37.5%	9.5%	12.5%
Russian thistle	*Salsola kali*	SAKA	1.0%	0.0%	2.5%
Globemallow		SPHAE	3.0%	0.0%	0.0%
Bud sagebrush	*Picrothamnus desertorum*	PIDE4	66.0%	74.0%	68.0%
Shadscale	*Atriplex confertifolia*	ATCO	12.0%	10.0%	4.5%
Bailey greasewood	*Sarcobatus vermiculatus baileyi*	SAVEB	5.0%	9.5%	7.0%
Winterfat	*Krascheninnikovia lanata*	KRLA2	1.5%	1.5%	1.5%
Nevada ephedra	*Ephedra nevadensis*	EPNE	0.0%	1.0%	0.0%
Cholla	*Cylindropuntia spp*	CYLIN2	0.0%	1.0%	0.0%
Cheeseweed	Hymenoclea salsola	HYSA	0.5%	1.0%	0.5%

Graph 6.0 - Key Area 5 - Trend Data Plot - Montezuma Allotment



Analysis of Trend

Table 41.0 - Key Area 5 – Analysis of Trend

Plant Species	Trend 1991 - 2002	Trend 2002 - 2004	Trend 1991 - 2004
Indian ricegrass	Decrease	Static	Decrease
Bud sagebrush	Increase	Static	Static
Shadscale	Static	Decrease	Decrease
Bailey greasewood	Increase	Static	Static

Photo 25.0 – General View of Key Area 5 – Montezuma Allotment

Courtesy of M. Pointel, RMS, BLM, TFS, 2006.

Analysis

Key Area 5 is northwest of the northern end of the Montezuma Range and inside the Montezuma Peak HMA. It is four miles north of Key Area 4 and is on the fan skirt of the same alluvial fan. The vegetation at this key area has little potential to change due to the dry climate and poor quality soil.

The ecological site at this key area is a loamy 3 – 5", 029XY035NV. In PNC, shadscale and bud sagebrush dominate. Ten percent or less of the vegetation on this ecological site is grass in PNC. This is a less productive soil; however, it was very productive in 2004 when it was clipped to collect production data. However, most (69%) of the production was on Bailey greasewood, generally an unpalatable shrub. Bailey greasewood does receive use in drought years when forage is sparse. Bailey greasewood often dominates this ecological site instead of shadscale. Both species are adapted to the same soil types.

Use on this area has declined since 1990. The former lessee ran full numbers of livestock on the allotment until 1991 when he removed most of them. Very few cattle used this area from 1992 until 2005. Since 1992, the majority of use in this area has been by wild horses or burros. The majority of wild horses that used this area were removed in 1996. This key area has received more use than Key Area 4, which is higher up on the alluvial fan.

Trend

Trend appears to be downward due to the loss of both Indian ricegrass and shadscale. However, highly variable precipitation, by year and by season leads to losses of both Indian ricegrass and shadscale in this allotment. Sudden increases in plant species are also possible in wet years especially when there is a large open niche. This soil has some potential to allow a small increase in Indian ricegrass during wet years only. It is unlikely any other change will benefit grazing animals.

Recommendation

This portion of Montezuma, just north of the Montezuma Range, is suited for use during the growing season, if use levels are low. See Key Area 4 above. To keep or increase the population of Indian ricegrass here, conservative stocking rates are necessary. Use should not exceed 25 to 35 percent (Holechek 1988).

Standards, Guidelines & Land Use Plan Assessment for Key Area 5

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 42.0 - Indicator Assessment for Key Area 5

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	No cover data was collected at this key area, however production was collected in 2004. Higher production on perennial species generally results in higher ground cover. Production exceeded the potential for the site. 100% of the total production is native perennial species.	Met	
Vegetation composition (relative abundance of species)	Trend shows a loss of Indian ricegrass and shadscale.	Not Met	The Causal factor is drought in 1991, 1996 and 2002, poor quality soils, use by wild equids and past use by cattle.
Vegetation structure (life forms, cover, height, and age classes)	Age class information was not taken at these key areas. However there was a large loss of both Indian ricegrass and shadscale indicating both plants are decadent.	Not Met	The Causal factor is drought in 1991, 1996 and 2002, poor quality soils, use by wild equids and past use by cattle.
Vegetation productivity	Production was collected in 2004. Production exceeds the potential for the site. All of the total production is native perennial species.	Met	
Vegetation nutritional value	The site has little potential to produce highly palatable species. However, less palatable shrub species grow on this soil and can support wild burros.	Met	

Table 43.0 - Standard Assessment for Key Area 5

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Met	
Standard 2	Met	
Standard 3	Not Met	The Causal factor is drought in 1991, 1996 and 2002 and use by wild horses and past use by cattle.

Key Area 6

Ecological Site: 029XY042NV Coarse Silty 5 – 8" p.z. (Soil Geer, fan skirts)
Production: 497 lbs (430 lbs native perennial species)
Dominant Vegetation: Winterfat

Photo 26.0 - General View of Key Area 6 – Montezuma Allotment

Courtesy of M. Pointel, RMS, BLM, TFS, 2007.

Percent Utilization Data

Table 44.0 - Key Area 6 - Percent Utilization – Montezuma Allotment

Species	Percent Utilization				
	Feb 1990	Jan 1991	Dec 1991	Jan 1993	Mar 2004
Indian ricegrass	78	68	19	25	19
Winterfat	76	32	13	10	7
Squirreltail	-	-	-	-	29

- No data collected.

Desired Plant Community

Table 45.0 - Key Area 6 – Desired Plant Community - Montezuma Allotment

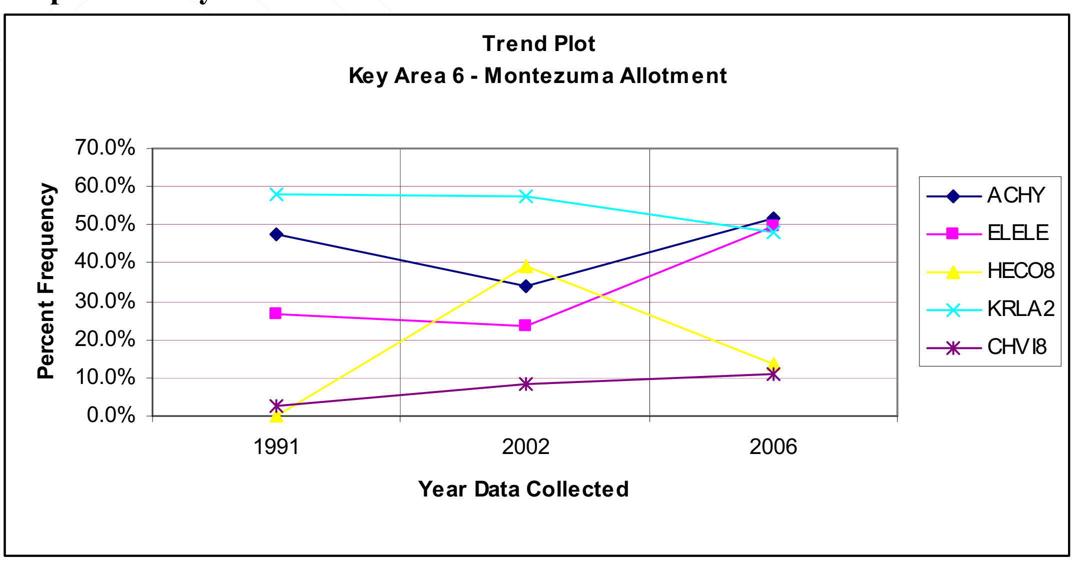
Species	2004 Pounds/Acre	PNC	Desired Plant Community Pounds/Acre
Indian ricegrass	10	180-225	50
Bottlebrush squirreltail	19	9-23	Varies with precipitation
Needle and thread	31	23-45	31
Winterfat	370	245-280	370
Annual forbs	67	T-23	Varies with precipitation

Trend Data

Table 46.0 - Key Area 6 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 6 – Percent Frequency		
Common Name	**Scientific Name**	**Plant Symbol**	**1991**	**2002**	**2006**
Indian ricegrass	Achnatherum hymenoides	ACHY	47.5%	34.0%	51.5%
Bottlebrush squirreltail	Elymus elymoides elymoides	ELELE	26.5%	23.5%	49.5%
Needleandthread	Hesperostipa comata	HECO8	0.0%	39.0%	13.5%
Winterfat	*Krascheninnikovia lanata*	KRLA2	58.0%	57.5%	48.0%
Douglas rabbitbrush	Chrysothamnus viscidiflorus	CHVI8	2.5%	8.5%	11.0%

Graph 7.0 - Key Area 6 - Trend Data Plot – Montezuma Allotment



Analysis of Trend

Table 47.0 - Key Area 6 – Analysis of Trend

Plant Species	Trend 1991 - 2002	Trend 2002 - 2006	Trend 1991 - 2006
Indian ricegrass	Decrease	Increase	Static
Squirreltail	Static	Increase	Increase
Needleandthread	Increase	Decrease	Increase
Winterfat	Static	Decrease	Decrease
Douglas Rabbitbrush	Increase	Static	Increase

Analysis

Key Area 6 is southwest of Goldfield, 11 miles from U.S. Highway 95 and south of the majority of the Montezuma Range in the northern part of the allotment. It is west of the Montezuma Peak HMA on a small inset fan. The majority of the soils in the area are a less productive 029XY036NV Cobbly Loam 5 – 8 p.z., dominated by spiny menodora and shadscale or a 029XY008NV Shallow Calcareous Loam 8 – 10" p.z. dominated by black sagebrush.

The ecological site at this key area is a course silty 5 – 8", 029XY042NV. In PNC this ecological site is dominated by winterfat and Indian ricegrass. It could support more Indian ricegrass than currently grows on the site. This is a very productive soil which produces very good quality forage for mainly winter use by cattle. Occasional use during the growing season should not damage the site if use does not exceed 25 to 35 percent.

Use on this area has declined since 1990. The former lessee ran full numbers of livestock on the allotment until 1991 when he removed the majority of them. Few cattle used this area from 1992 until 2006. This is within the Montezuma HMA. A small amount of use by wild horses appears to have occurred before 1996 when a large number of horses were removed from this HMA.

Important key forage species at these key areas are winterfat and Indian ricegrass. Both species are sensitive to spring use. Excessive grazing, especially during the growing season, can substantially reduce the number of these plants in the vegetative community. Production at this key area, when compared to the potential, shows a lack of Indian ricegrass and an abundance of winterfat at this key area. Winterfat, a half shrub, is very palatable and nutritious winter forage used by cattle (Stevens et al. 1977, Blaisdell and Holmgren 1984). The DPC goal it to maintain the current amount of winterfat found on the site and not to manage for the lower level found in PNC.

Cover

Cover was examined using the Step Point Method at this key area in 2006. Overall cover for vegetation was 26 percent. This is within the 15 to 30 percent range of potential cover for the site.

Trend

Trend is downward, away from DPC. Trend data shows a possible increase of needleandthread and ricegrass, an increase in rabbitbrush, an undesirable shrub and a loss of winterfat, an important winter forage. Squirreltail has increased, mainly due to changes in precipitation. Squirreltail is short lived and fluctuates based on precipitation levels. In 1991, needleandthread was not identified. It appears that it was mistakenly called ricegrass. Therefore it is difficult to analyze the data for both plants accurately. However, both grasses appear to have increased between 2002 and 2006. Between 1991 and 2002, there were three dry years, one of which (2002) has been the driest year since 1955. The dry year in 2002 may have not affected this site because there appears to be no die-off on ricegrass or other plant at this key area. The increase of rabbitbrush and loss of winterfat is undesirable. This site is moving away from the DPC.

South Central Nevada lies between two different weather patterns. This causes highly variable precipitation, by year and by season. Trend is seldom static, and the changes are often not solely due to grazing. The sensitivity of these species to large changes in available moisture leads to a need to more conservatively graze these plant communities than is necessary in more stable weather patterns.

Recommendation

This soil is very productive and supports winterfat, a good winter forage species for livestock use, and Indian ricegrass. This is a very small area and should be managed mainly as winter range with limited growing season use. The surrounding area is dominated by spiny menodora and shadscale on the valleys and sagebrush on the adjacent hills. Season of use on the less productive soils in the area is well suited for growing-season use. There are few other forage species outside of this small winterfat area.

Standards, Guidelines & Land Use Plan Assessment for Key Area 6

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 48.0 - Indicator Assessment for Key Area 6

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	Cover was read in 2006. Cover is 26%, which is within the 15 to 30% the ecological site description shows as typical for the site.	Met	
Vegetation composition (relative abundance of species)	Species composition is close to potential for the site. There has been a loss of winterfat at the site between 1991 and 2002. There was an increase of grass between 1991 and 2006.	Partially Met	Drought in 1991, 1996 and 2002 and use are the causal factors for the loss of winterfat. The increase in grass is due to the reduction of both livestock and wild horses in the area.
Vegetation structure (life forms, cover, height, and age classes)	Age class information was not collected at this key area. However there was a loss of winterfat and an increase in perennial grasses. The age class of the grasses is most likely young. Winterfat is possibly a decadent stand.	Met	
Vegetation productivity	Production was collected in 2004. Native perennial production is close to the potential for the site. 86% of the total production is native perennial species.	Met	
Vegetation nutritional value	Winterfat grows here and provides good quality forage.	Met	

Table 49.0 - Standard Assessment for Key Area 6

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Met	
Standard 2	Met	
Standard 3	Not Met	Drought in 1991, 1996 and use are the causal factors for the loss of winterfat. The increase in grass is due to the reduction of both livestock and wild horses in the area.

Key Area 7

This site is no longer relevant as a key area because it is surrounded by private land and offers no further values in determining long term trend. A new key area will be established on a soil with more potential.

Percent Utilization Data

Table 50.0 - Key Area 7 - Percent Utilization – Montezuma Allotment

Species	Percent Utilization				
	Feb 1990	Jan 1991	Dec 1991	Jan 1992	Mar 2004
Indian ricegrass	76	63	27	72	14
Winterfat	84	49	50	76	7
Galleta	-	39	22	62	-

- No data collected.

Trend Data

Table 51.0 - Key Area 7 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 7 – Percent Frequency		Trend
Common Name	**Scientific Name**	**Plant Symbol**	**1991**	**2002**	
Galleta grass	Pleuraphis jamesii	PLJA	84.0%	88.0%	Static
Bud sagebrush	Picrothamnus desertorum	PIDE4	13.5%	25.0%	Increase
Shadscale	Atriplex confertifolia	ATCO	10.0%	15.5%	Increase

Key Area 8

Ecological Site: 030XA010NV Gravelly Sandy Loam 3-5” p.z.
Production: 660 lbs (654 lbs native perennial species)

Dominant Vegetation: Creosote bush and wolfberry

Photo 27.0 - General View of Key Area 8 – Montezuma Allotment

Percent Utilization Data

Table 52.0 - Key Area 8 - Percent Utilization – Montezuma Allotment

Species	Percent Utilization				
	Jan 1990	Nov 1990	Dec 1991	Dec 1993	Mar 2004
Indian ricegrass	61	-	20	64	-
White bursage	-	-	29	18	3
Nevada Ephedra	11	-	-	22	3
Desert needlegrass	-	74	-	-	-

- No data collected.

Desired Plant Community

Table 53.0 - Key Area 8 - Desired Plant Community – Montezuma Allotment

Species	2004 Pounds/Acre	PNC	Desired Plant Community Pounds/Acre
Red brome	6	0	0
Creosote bush	300	25-63	200
White bursage	23	88-125	45
Shadscale	11	T-8	11
Nevada ephedra	5	T-8	8
Spiny hopsage	65	T-8	65
Littleleaf horsebrush	70	T-8	55
Cheeseweed	14	T-8	8
Anderson wolfberry	86	5-20	70
Pale wolfberry	80	5-20	70
Mojave aster	7	T-8	7

Trend Data

Table 54.0 - Key Area 8 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 8 – Percent Frequency		
Common Name	**Scientific Name**	**Plant Symbol**	**1991**	**2006**	**Apparent trend**
Desert needlegrass	Achnatherum speciosum	STCAD	0.0%	1.5%	Static
Spiny menodora	*Menodora spinescens*	MESP2	0.0%	1.0%	Static
Anderson woldberry	*Lycium andersonii*	LYAN	4.5%	7.5%	Static
Pale desert thorn	Lycium pallidum	LYPA	4.5%	0.5%	Static
White bursage	*Ambrosia dumosa*	AMDU2	13.0%	15.0%	Static
Douglas rabbitbrush	Chrysothamnus vicisdlorus	CHVI8	14.0%	23.5%	Increase
Cresote bush	Larrea tridentata	LATR2	2.0%	1.0%	Static
Nevada ephedra	Ephedra nevadensis	EPNE	6.0%	14.0%	Increase
Shadscale	Atriplex confertifolia	ATCO	5.0%	5.0%	Static
Burro bush	Hymenoclea salsola	HYSA	0.0%	0.5%	Static
Spiny hopsage	Grayia spinosa	GRSP	3.0%	3.0%	Static
Barrel cactus	Ferocactus spp.	FEROC	0.0%	0.5%	Static

Analysis

Key Area 8 is 1 mile from the town of Beatty in the northern Mojave and 1.8 miles from water within the Bullfrog HMA.

It is located in a 030XA010NV gravelly sandy loam 3-5” that ecotones between the southern Great Basin and Mojave vegetation types and is more productive than would be typical for this ecological site.

Use on this area was heavy in 1990 and 1993. This use was most likely made by burros, since livestock did not normally use this portion of the allotment. A large number of burros were removed in 1996 due to drought. No use by burros or other large ungulates was observed in 2004. Although burros prefer to graze grass, they also browse many shrubs neither cattle or wild horses will. One of their preferred shrubs in this portion of the Mojave is white bursage. At this site it appears that use in 1993 was heavier on grass than on the bursage. However, other locations in the Beatty area have lost white bursage due to burro use. Use was also observed on Nevada ephedra.

Key species for this site are Indian ricegrass and desert needlegrass. Both white bursage and Nevada ephedra need to be added as key species.

Trend

Trend appears to be static between 1991 and 2006. Nevada ephedra and rabbitbrush both increased between 1991 and 2006. Otherwise, there was no change in vegetation on the site. Both Nevada ephedra and rabbitbrush are early seral stage plant species. There were a number of dry years between both readings and a very wet year in 2005. It appears that both plants increased to fill in open niches. Grass is not common on this site and did not decline between 1991 and 2006. This part of the Mojave supports little grass. Grasses appear to be poorly adapted to the low precipitation in the northern Mojave. In 2006, an age class count on the area shows few seedling or young plants. The majority were mature and decadent plants. The surviving grasses grow under the shrub canopy. Annual forbs vary with the amount of spring precipitation.

Recommendation

There is potential for an increase of white bursage if the Appropriate Management Level (AML) is conservatively determined. The variable precipitation pattern will limit forage for burros in dry years. If the AML is conservatively set, then fewer gathers will be required in the future.

This area is unsuitable for wild horses and marginally suitable for cattle due to the lack of forage (grass).

Standards, Guidelines & Land Use Plan Assessment for Key Area 8

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 55.0 - Indicator Assessment for Key Area 8

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	Cover was read in 2006. Cover is 25%, which is higher than the 10 to 15% the ecological site description shows as typical for the site.	Met	
Vegetation composition (relative abundance of species)	There is a larger variety of plants than is typical for this ecological site.	Met	
Vegetation structure (life forms, cover, height, and age classes)	Age class information was collected in 2006. Results were 0% seedling and young, 58% mature, 18% decadent and 24% dead. Only in very wet years do seedlings sprout, since the majority of years here are dry or normal seedlings do not establish yearly in this desert but establish in large numbers during a few very wet years. It is typical in this desert to find sites like this with large numbers of plants in one single age class.	Met	
Vegetation productivity	Production was collected in 2004. Production is well above potential for the site. 99% of the total production is native perennial species.	Met	
Vegetation nutritional value	Forage suitable for burros is available on the site.	Met	

Table 56.0 - Standard Assessment for Key Area 8

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Met	
Standard 2	Met	
Standard 3	Met	

Key Area 9

Ecological Site: 030XA063NV Sandy 5-7" p.z.
Production: 238 lbs (231 lbs native perennial species)
Dominant Vegetation: Fourwing saltbush and winterfat

Photo 28.0 - General View of Key Area 9 – Montezuma Allotment

Courtesy of M. Pointel, RMS, BLM, TFS, 2007.

Percent Utilization Data

Table 57.0 - Key Area 9 - Percent Utilization – Montezuma Allotment

Species	Percent Utilization				
	Jan 1990	Nov 1990	Dec 1991	Dec 1992	Mar 2004
Indian ricegrass	80	63	-	-	3
Winterfat	40	27	10	14	3
Fourwing saltbrush	76	43	20	4	3

- No data collected.

Desired Plant Community

Table 58.0 - Key Area 9 – Desired Plant Community - Montezuma Allotment

Species	2004 Pounds/Acre	PNC	Desired Plant Community Pounds/Acre
Red brome	7	0	0
Indian ricegrass	Trace	100-150	50
Fourwing saltbush	104	100-200	104
Winterfat	120	50-100	120
Annual forbs	7	T-50	7

Trend Data

Table 59.0 - Key Area 9 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 9 – Percent Frequency		
Common Name	**Scientific Name**	**Plant Symbol**	**1991**	**2006**	**Apparent Trend**
Indian ricegrass	Achnatherum hymenoides	**ACHY**	1.5%	5.0%	**Increase**
Bud sagebrush	*Picrothamnus desertorum*	**PIDE4**	1.5%	1.5%	**Static**
Fourwing saltbush	*Atriplex canescens*	**ATCA2**	4.5%	4.5%	**Static**
Winterfat	*Krascheninnikovia lanata*	**KRLA2**	25.5%	28.0%	**Static**
Shadscale	Atriplex confertifolia	**ATCO**	2.0%	5.5%	**Increase**

Analysis

Key Area 9 is 8 miles northwest of the town of Beatty in the northern Mojave, just less than two miles from water and outside the northern border of the Bullfrog HMA.

This is a 030XA063NV sandy 5-7" p.z., a very productive sandy soil. This area ecotones with the southern Great Basin and this site is very similar to a 029XY012NV sandy 5-8" ecological site. This soil can support more Indian ricegrass than is currently here. However, this portion of the Montezuma Complex is marginal habitat for Indian ricegrass due to the extremely low precipitation in drought years. For this reason, the amount of Indian ricegrass will fluctuate from year to year based on the amount of precipitation and most likely remain below the potential listed for the soil in the Ecological Site Description.

Use on this area was heavy in 1989 and 1990. In the late 1980s and early 1990s a large number of burros used this area which is outside the HMA. They were removed in 1996. No use was observed in 2004.

Both winterfat and fourwing saltbush are highly nutritious and palatable winter feed for cattle. Indian ricegrass is also important forage. Key species for this site are Indian ricegrass, winterfat and fourwing saltbush.

Trend

Any damage done by excessive burro use prior to 1996 is not evident. Over the past 11 years, vegetation has recovered. There have been two wet years between 1996 and the present. This has allowed important plant species to repopulate the area. However, this improvement is not shown in the data above because studies were conducted well before and after the 1996 drought. Therefore, trend appears to be static between 1991 and 2006.

Indian ricegrass and shadscale both increased between 1991 and 2006. Otherwise, there was no change in vegetation on the site. Indian ricegrass and shadscale are both uncommon on this site. In 2006, a count of age class on the area shows a preponderance of mature, decadent or dead shrubs with an absence of seedling and young plants.

Recommendation

This soil is very productive and good quality winter range for cattle. This productive soil is surrounded by other vegetation types that also support some of these palatable shrubs. It would be best suited for fall and winter grazing. Occasionally spring use might be allowed if the use levels of 25 to 35 percent are not exceeded on any plant during the growing season. There is potential for a small increase of Indian ricegrass if the area is conservatively stocked.

Standards, Guidelines & Land Use Plan Assessment for Key Area 9

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 60.0 - Indicator Assessment for Key Area 9

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	Cover was read in 2006. Cover is 12% perennial plants and 31% total. 12% is near the 15 to 30% the ecological site description shows as typical for the site.	Met	
Vegetation composition (relative abundance of species)	There is a large variety of plants which is typical for this ecological site.	Met	
Vegetation structure (life forms, cover, height, and age classes)	Age class information was collected here in 2006. Results were 0% seedling and young, 89% mature, 19% decadent and 32% dead. Only in very wet years do seedlings sprout, since the majority of years here are dry or normal seedlings do not establish yearly in this desert but establish in large numbers during a few very wet years. It is typical in this desert to find sites like this with large numbers of plants in one single age class.	Met	
Vegetation productivity	Production was collected in 2004. Production is below potential for the site, 47% of potential. 97% of the total production is native perennial species.	Not Met	Causal factors are excessive use by burros prior to 1996 and excessive droughts in 1996 and 2002.
Vegetation nutritional value	Fourwing saltbush and winterfat are excellent winter forage for cattle.	Met	

Table 61.0 - Standard Assessment for Key Area 9

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Met	
Standard 2	Met	
Standard 3	Not Met	Causal factors are excessive use by burros prior to 1996 and severe droughts in 1996 and 2002.

Key Area 10

Ecological Site: ‚029XY017NV Loamy 5-8" p.z. (Soil Wardenot, lower fan piedmonts)
Production: 223 lbs (206 lbs native perennial species)
Dominant Vegetation: Fourwing saltbush and winterfat

Photo 29.0 - General View of Key Area 10 – Montezuma Allotment

Courtesy of M. Pointel, RMS, BLM, TFS, 2005.

Percent Utilization Data

Table 62.0 - Key Area 10 - Percent Utilization –-Montezuma Allotment

Species	Percent Utilization				
	Feb 1990	Feb 1991	Dec 1991	Dec 1992	Mar 2004
Indian ricegrass	38	62	60	18	3
Galleta	30	50	-	14	-
Winterfat	35	24	50	38	3

Desired Plant Community

Table 63.0 - Key Area 10 – Desired Plant Community – Montezuma Allotment

Species	2004 Pounds/Acre	PNC	Desired Plant Community Pounds/Acre
Galleta grass	23	2-10	23
Shadscale saltbush	26	20-35	26
Winterfat	21	5-15	25
Bud sagebrush	149	5-15	130
Indian ricegrass	0	113-203	15
Globemallow	4	0-5	4

Table 64.0 - Key Area 10 – Trend Plot Data – Montezuma Allotment

Montezuma Allotment		Trend Data Plot	Key Area 10 – Percent Frequency		
Common Name	Scientific Name	Plant Symbol	1991	2002	2006
Galleta grass	Pleuraphis jamesii	PLJA	30.0%	34.5%	35.0%
Indian ricegrass	Achnatherum hymenoides	ACHY	20.5%	0.5%	0.5%
King desertgrass	Blepharidachne kingii	BLKI	24.5%	3.5%	0.0%
Globemallow	Sphaeralcea *spp*.	SPHAE	5.5%	0.0%	9.0%
Douglas rabbitbrush	Chrysothamnus viscidiflorus	CHVI8	2.5%	0.0%	0.0%
Shadscale saltbush	Atriplex confertifolia	ATCO	41.0%	23.0%	19.0%
Bud sagebrush	Picrothamnus desertorum	PIDE4	59.0%	54.0%	60.0%
Goldenweed	*Haplopappus spp*	HAPLO11	0.0%	4.5%	4.0%
Cheeseweed	Hymenoclea salsola	HYSA	9.5%	8.5%	8.5%
Winterfat	Krascheninnikovia lanata	KRLA2	17.0%	20.5%	28.5%
Nevada ephedra	*Krascheninnikovia lanata*	EPNE	5.0%	6.5%	6.0%
Spiny menodora	Menodora spinescens	MESP2	5.0%	8.0%	7.5%
Spiny hopsage	Grayia spinosa	GRSP	0.0%	1.0%	1.0%
Bailey greasewood	Sarcobatus vermiculatus	SAVEB	4.0%	4.0%	5.5%
Green molly kochia	Bassia americana	BAAM4	0.0%	0.5%	0.5%
Littleleaf horsebrush	Tetradymia glabrata	TEGL	0.0%	0.5%	0.5%
Spiny horsebrush	Tetradymia spinosa	TESP2	0.0%	0.5%	0.0%

Graph 8.0 - Key Area 10 - Trend Data Plot - Montezuma Allotment

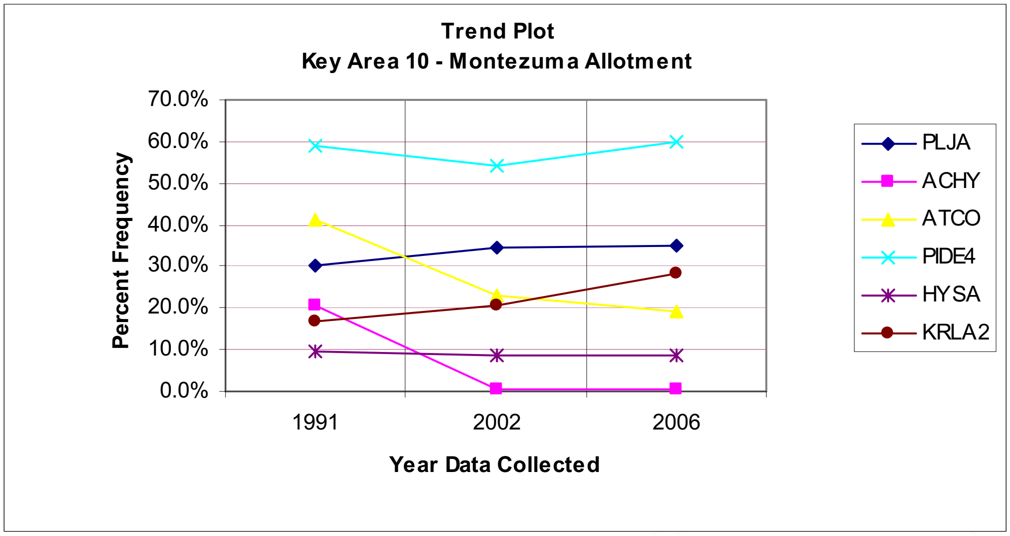


Table 65.0 – Key Area 10 – Analysis of Trend

Plant Species	Trend 1991 - 2002	Trend 2002 - 2006	Trend 1991 - 2006
Galleta grass	Static	Static	Static
Indian ricegrass	Decrease	Static	Decrease
Bud sagebrush	Static	Static	Static
Shadscale	Decrease	Decrease	Decrease
Burrobrush	Static	Static	Static
Winterfat	Static	Increase	Increase

Key Area 10 is less than a mile north of Lida Junction on the east side of the U.S. Highway 95. It is adjacent to but outside of the Stonewall HMA. This key area represents a very small portion of the allotment. It is much more productive than is typical for this area. Less palatable or unpalatable shrubs dominate most of the vegetation on the valleys inside and surrounding the Stonewall HMA. There is little to no grass available to graze in this area.

The ecological site at this key area is a loamy 5 – 8", 029XY017NV that ecotones with a dryer site. In PNC, this ecological site is dominated by shadscale, bud sagebrush, Indian ricegrass and galleta grass. This soil however, does support a lot of winterfat, more than is typical for the ecological site. Some galleta grass occurs on these soils. The sandy soil surface could support more Indian ricegrass. However, this soil produces less grass than is typical for this ecological site because precipitation in this area is lower and less reliable than the standard 5 – 8 inch p.z. site.

Use was heavy in 1990 and 1991. The former lessee ran full numbers of livestock on the allotment until 1991 when he removed the majority of them. Few cattle used this area from 1992 until 2006. Wild horses and burros from the Stonewall HMA have used this area outside the HMA up until 1996. In 1996, the majority of wild horses and burros were removed due to a drought.

Trend Data

Trend data shows a loss of desert king grass and Indian ricegrass between 1991 and 2002. In 1991, there was 20 percent frequency on ricegrass but by 2002, no ricegrass was found on either the frequency study or the production study. This is marginal habitat for Indian ricegrass due to the extremely low precipitation in drought years. For this reason, Indian ricegrass frequently dies out of the plant community.

Winterfat increased between 2002 and 2006. There was no significant change in galleta grass or bud sagebrush. The loss of Indian ricegrass and gain in winterfat are related. It was most likely wild horse use on Indian ricegrass and three drought years that caused its loss. Winterfat increased during a wet period and after cattle and wild horses were removed from the area. Winterfat is important cattle winter forage. Trend first declines with the loss of ricegrass and then recovers with the increase of winterfat

Analysis

Important key forage species at this key area are winterfat and galleta grass. There is potential for Indian ricegrass to increase on this soil. Indian ricegrass and winterfat are sensitive to spring use. However, galleta grass is very resistant to heavy use. There is little available grass in the Stonewall HMA. In dry years grass is very uncommon and wild horses have suffered and died due to a lack of forage.

In 2006, an age class tally of plants was taken on Key Area 10. The majority of plants were mature or decadent. There were few seedlings. This may slow the recovery of Indian ricegrass.

Recommendation

This soil is sandy and productive. Unfortunately, this productive area is a small portion of this pasture. There is little available forage outside the HMA for cattle or horse use. The area east of Lida Junction, which includes the Stonewall HMA, is better suited for use by a few burros. Wild horses were removed from the Stonewall HMA in 1996 to prevent their death by starvation.

Standards, Guidelines & Land Use Plan Assessment for Key Area 10

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 66.0 - Indicator Assessment for Key Area 10

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	Cover was read in 2006. Cover is 25%, which is higher than the 10 to 15% the ecological site description shows as typical for the site.	Met	
Vegetation composition (relative abundance of species)	Species composition is close to potential for the site. Indian ricegrass is below potential and has decreased since 1991. There has been an increase of winterfat at the site between 2002 and 2006.	Partially Met	Drought in 1991, 1996 and 2002 and excessive use are the causal factors for the loss of Indian ricegrass. The increase in winterfat is due to the removal of cattle, wild horses and burros from the area.
Vegetation structure (life forms, cover, height, and age classes)	Age class information was collected here in 2006. Results were 3% seedling and young, 71% mature, 6% decadent and 20% dead. Only in very wet years do seedlings sprout, since the majority of years are dry or normal, seedlings do not establish except in the few wet years. It is typical in this desert to find sites like this with large numbers of plants in one single age class.	Met	
Vegetation productivity	Production was collected in 2004. Production is half of the potential production for the site. This is due to highly variable weather patterns that do not support the higher levels of grass typical for this ecological site and to excessive use by cattle, wild horses and burros prior to 1996. 92% of the total production is native perennial species.	Not Met	Causal factors are drought and excessive use by cattle, wild horses and burros prior to 1996.
Vegetation nutritional value	Forage suitable for burro use is available on the site. However, the area represented by the key area is small and does not represent the pasture. The majority of the pasture has little forage and little potential to produce forage.	Not Met	Climate and soils do not support the forage needed for wild horses and cattle.

Table 67.0 - Standard Assessment for Key Area 10

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Met	
Standard 2	Met	
Standard 3	Not Met	Causal factors are drought and excessive use by cattle, wild horses and burros prior to 1996.

<u>Summary of Data for all Key Areas in the Montezuma Allotment</u>

Portions of the Montezuma Complex are marginal habitat for Indian ricegrass due to the extremely low precipitation in drought years. For this reason, Indian ricegrass frequently dies out of the plant community often in ungrazed areas. During 2002 – 2003, this area was very dry. Populations of Indian ricegrass and other bunchgrasses died out of the dryer portions of Esmeralda and Southern Nye Counties. In 2005, an exceptionally wet growing season in this area, large numbers of Indian ricegrass seedlings were observed on sandy soils in areas with no mature grass plants. These plants will most likely survive until the next drought. However, the northern end of the Montezuma Allotment does not experience this extremely dry condition and the loss of Indian ricegrass there is due to grazing by wild horses.

The situation is similar for many shrubs in the area, especially shadscale. The recent die-off of shadscale is due to recent droughts. The shadscale in the plant community of this planning area are often all in the same age class. In the last few years, large populations of shadscale throughout the Complex have been found to be mainly decadent. In these decadent plant communities, droughts, insects, extremely wet years or diseases may kill or weaken the majority of the plants in an area causing a die-off in the area.

Key areas were established in the northern and southern portions of the Montezuma Allotment. None were established in the narrow strip of land that connects the two larger portions of the allotment. This narrow strip of land has received little use from cattle even when the lessee had fully stocked his allotment.

3. <u>Forage Determination & Vegetation</u>

Vegetation in the allotment varies from pinyon pine and juniper woodlands to hot desert shrub. The following nine vegetation categories exist in the allotment: saltbrush, hot desert shrub, sagebrush, barren areas, washes, saline meadows & alkaline soils, pinyon- juniper woodlands, blackbrush, and riparian. Saltbrush is the most dominant vegetation type in the allotment. Refer to the vegetation section of the EA for a more detailed description of each vegetation type.

Table 68.0 – Vegetation Types in Montezuma

Vegetation Type	Percent of Allotment
Saltbrush (Salt Desert Shrub)	45%
Hot Desert Shrub	27%
Sagebrush	12%
Barren	6%
Washes	5%
Saline Meadows & Alkaline Soils	2%
Pinyon-Juniper Woodlands	2%
Blackbrush	1%
Riparian	Trace

a. Available Forage Determination

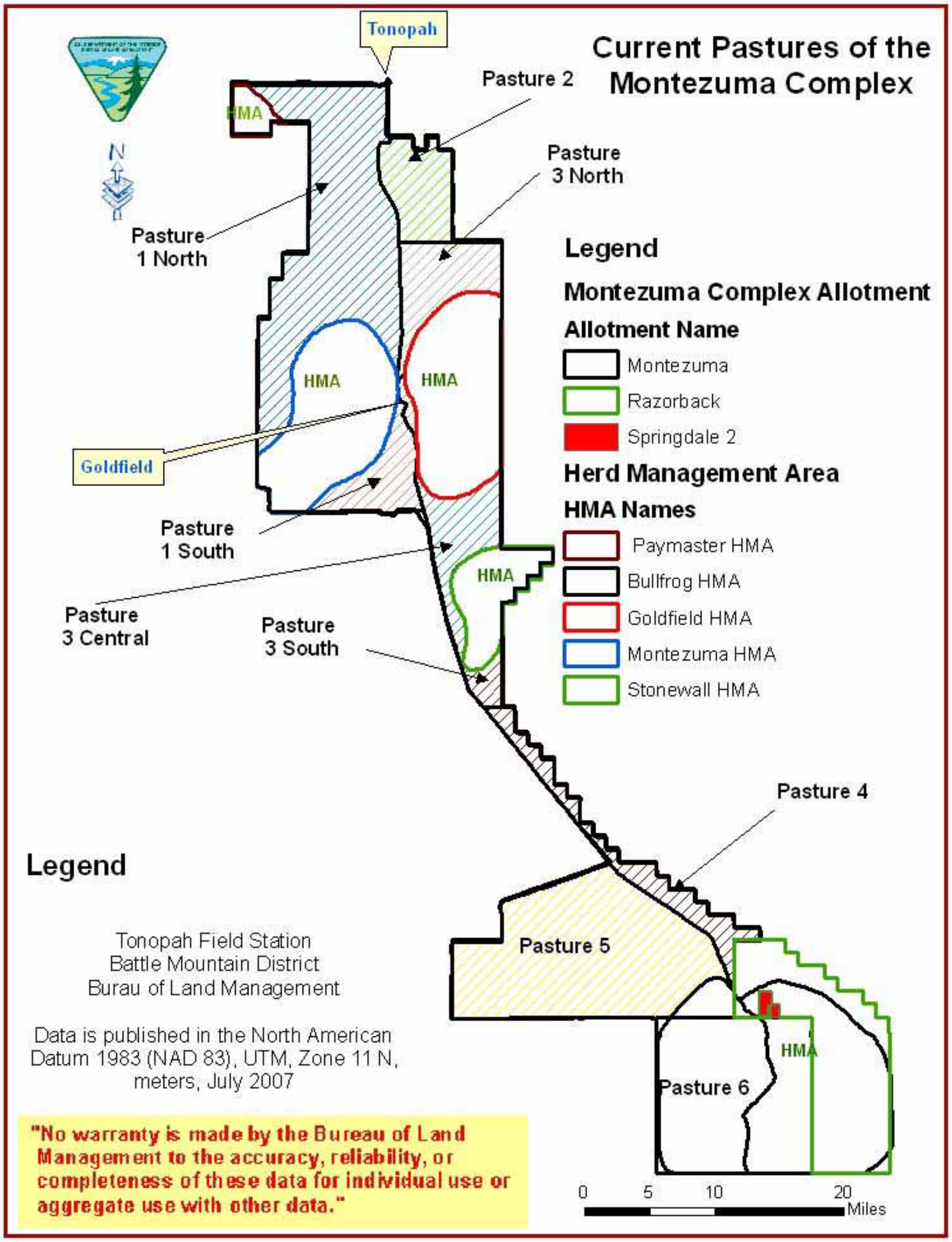
Because of the highly variable precipitation in the allotment and frequent droughts, a conservative stocking rate will be determined. All AUMs determined to be available to cattle or horse or burro in this section were figured based on production data gathered in the late 1980s and in the early 1990s from an Ecological Site Inventory of this allotment. Forage was figured based on the total pounds per acre (air dry weight) of forage multiplied by 25 percent (Holechek 1988) use multiplied by 75 percent, the amount of forage available in most drought years. The total pounds of forage in each HMA is then divided by 800 pounds (air dry), the amount of forage consumed in a month to get an Animal Unit Month (AUM). One AUM is the forage required to support one grazing animal for one month. See 43 Code of Federal Regulations (CFR), §4130.8-1(2) (c). The allocation of 75 percent of the available forage rather than 100 percent avoids reductions or removals of livestock and wild equids in the majority of dry years. However, during the last 50 years at the Tonopah Airport, 11 years had precipitation levels significantly below 75 percent of normal. The proposed stocking rates will require temporary reductions or removals in extremely dry years, which occur in approximately 22 percent of years in this area. In extremely dry years such as 1996 and 2002, little to no forage is produced. The stocking rates that follow are guidelines.

Generally, the Montezuma Allotment is too dry to support a dependable crop of annual forage; therefore, no annual plants were used in the analysis. Burros browse many shrubs and graze most grasses. The species used to calculate forage available for burros included white bursage, shadscale, fourwing saltbush, spiny hopsage, winterfat, both ephedra species, gray molly, budsage, galleta grass, alkali sacaton and all bunch grasses except fluff grass and desert king grass. Available horse forage was calculated using the production of winterfat, galleta grass, and all bunch grasses except fluff grass and desert king grass. Available cattle forage was calculated using the production of shadscale, bud sagebrush, winterfat, fourwing saltbush, galleta grass, and all bunch grasses except fluff grass and desert king grass. Fluff grass and desert king grass are not palatable or grazed. Cattle do browse shadscale in winter and budsage in late winter early spring. However, neither plant is highly preferred by cattle. Cattle that usually graze on grass pastures or on rangeland with abundant grasses and riparian vegetation do not generally use either plant and have difficulties adjusting and may starve on this range with no available grass.

The Montezuma Allotment can be divided into a northern portion containing Pastures 1, 2 and 3 with the Montezuma Peak, Goldfield, Stonewall and a small part of Paymaster HMAs. The central portion contains much of Pasture 4 and southern portion contains Pastures 5 and 6, as well as the Bullfrog HMA. The southern portion of the allotment contains the only desert tortoise habitat in the allotment which is within the Bullfrog HMA.

The tables in the following section showing available AUMs are not a final allocation of AUMs. They show all of the available forage for either, cattle, horse or burro. These available AUMs were derived from Ecological Site Inventory (ESI) production data for each pasture or HMA. An analysis on how these AUMs would be allocated is in Section 2.0, Proposed Action, of the EA.

Map 10.0 – Pastures and Herd Management Areas of the Montezuma Complex

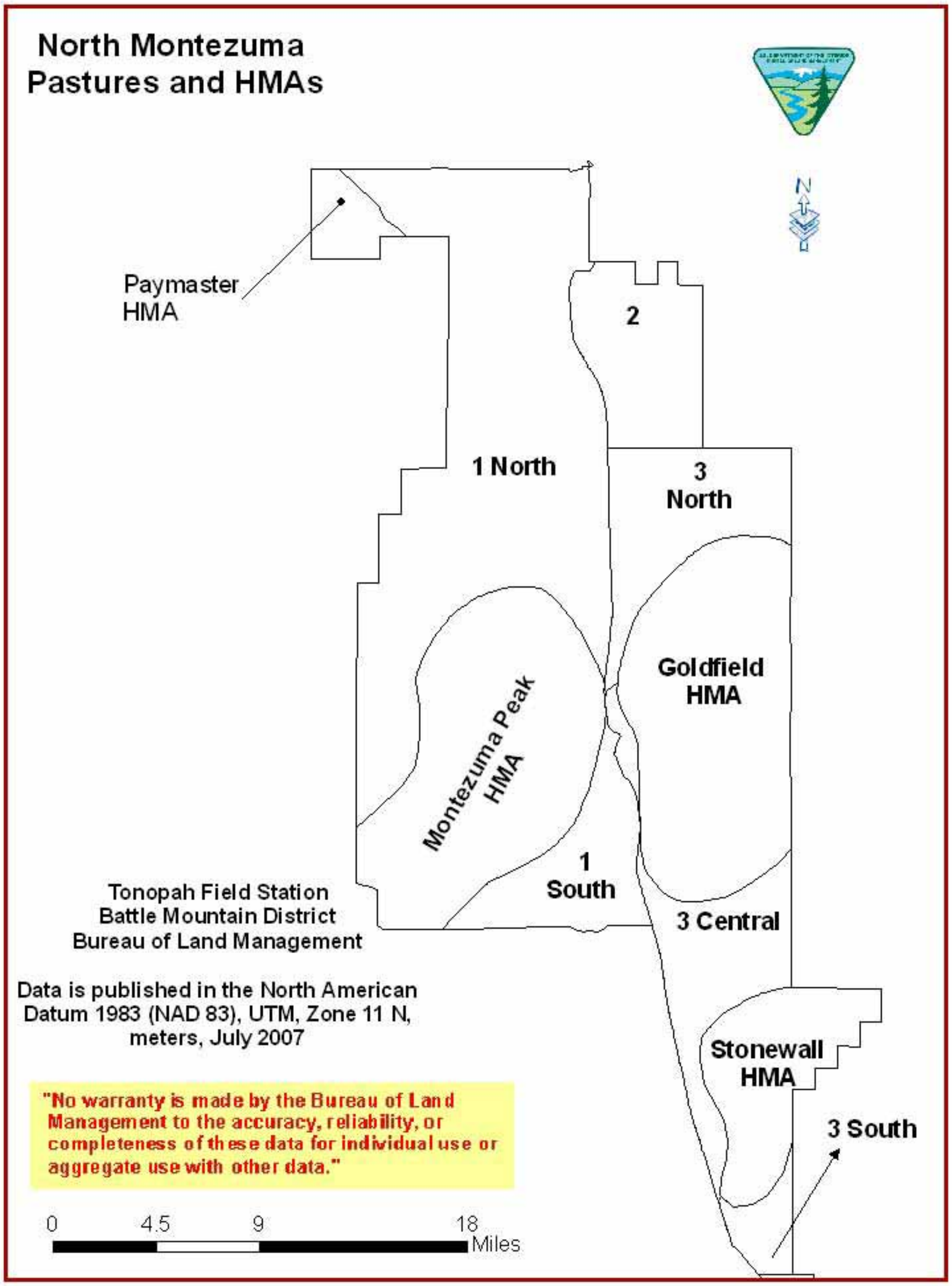


The tables in the following section showing available AUMs are not a final allocation of AUMs. They show all of the available forage for either, cattle, horse or burro. These available AUMs were derived from ESI data for each pasture or HMA. A final decision on how these AUMs will be allocated is in the Proposed Action section of the EA. To determine watered portions of the

HMAs, a four-mile circle was drawn around each water inside the HMA. Available forage was calculated separately for watered and un-watered portions of the HMA.

b. <u>Vegetation on North Montezuma</u>

Map 11.0 – North Montezuma Pastures and HMAs



Pasture 1

The northwest portion of North Montezuma Allotment west of U.S. Highway 95 is in Pasture 1. Pasture 1 can be divided into four areas: a small portion of the Paymaster HMA in the northwestern corner of the allotment, a northern portion just above the Montezuma Peak HMA, the Montezuma Peak HMA, and a small southern portion just below the HMA. The northern and southern portions are outside of any HMA. The vegetation and forage of each area is discussed below.

Paymaster HMA – The upper alluvial fan and low hills near Lone Mountain in the northwestern corner of this pasture has some forage, mainly grass. This area is in the Paymaster HMA and this small amount of forage should not be allocated to cattle. Cattle and wild horses do not normally graze on the upper alluvial fans and low hills in the HMA because very palatable forage exists in the valley bottom below the HMA in the vicinity of Key Areas 1, 2 & 3. See Northern portion of Pasture 1 below. The portion of the Paymaster HMA within the Sheep Mountain Allotment is allocated at 466 AUMs for 5,518 acres for both cattle and wild horses. This equals 12 acres per AUM for the 5,518 acres of the HMA within the Sheep Mountain Allotment. This is over-allocated. In comparison, the most productive range in the Montezuma Allotment supports a total of 45 acres per AUM, a much lighter stocking rate. To relieve grazing pressure on the Paymaster HMA as a whole, no AUMs for horses should be allocated in this small portion of the Paymaster HMA. No AUMs for cattle will be allocated within this small portion of the Paymaster HMA.

Northern portion of Pasture 1 – The majority of this pasture is salt desert shrub vegetation. Shadscale is the most common species and dominates most of the soils in this pasture. The northernmost end of this portion of Pasture 1 has a very productive sandy soil. These soils support shadscale, fourwing saltbush, winterfat and Indian ricegrass. Key Areas 1, 2 & 3 represent this area. These sandy soils make up 8 percent of the northern part of Pasture 1. They are excellent winter range, good spring and summer range. Prior to the late 1980s, these sandy soils provided the best forage in the allotment. In the mid 1980s water became available in this portion of the allotment and wild horses moved out of the Paymaster HMA into this area. It has since become degraded due to wild horse use and drought.

Table 69.0 - Percentages of General Vegetation Types in the North portion of Pasture 1

Saltbrush	Barren	Menodora	Sodic	Sagebrush	Washes	Woodlands
68%	8%	7%	6%	5%	4%	2%

The majority of Pasture 1 is in the valley between Lone Mountain, Split Mountain and the hills surrounding Tonopah. Sagebrush sites are found in these mountains and hills. Two thirds of these mountain sites are dominated by black sagebrush. The rest of the mountainous sites are dominated by big sagebrush that occurs on Lone Mountain outside of the HMA. The spiny menodora, a Mojave transition plant, occurs on the upper alluvial fans in the valley and on the lower elevations in the hills in Split Mountain and Lone Mountain. A small playa just outside Alkali is surrounded by sodic soils with little grass and dominated by black greasewood. Black greasewood has limited value as forage for cattle. It is browsed when little else remains to graze.

The hills surrounding the town of Tonopah on the northeastern corner of this pasture have little forage; AUMs should not be allocated for cattle in these hills. These very rocky soils support very little grass. They support mainly shadscale with some bud sagebrush. Both plants receive some winter use, but these hills are higher than the surrounding valley which supports much more palatable winter, spring and summer forage. For this reason, the hills surrounding Tonopah receive little use by cattle. The majority of the north portion of Pasture 1 occurs in the valley and is easily accessed by cattle. There are also inaccessible hills and mountains in the area of Lone Mountain, the far northwestern portion of the pasture, and in the Split Mountain area in the southwestern portion of the pasture. No AUMs should be allocated for livestock in hilly or mountainous areas due to poor accessibility and less palatable feed.

The valley soils just south of the very sandy soils between Tonopah and Lone Mountain are less sandy and have little potential to produce forage. Some suitable forage for cattle exists. This area extends to the northern and western boundary of the Montezuma Peak HMA. Some of the major shrub species in this area are shadscale, Bailey greasewood, and spiny menodora. Grasses include Indian ricegrass and galleta grass.

Because of the highly variable precipitation, a conservative stocking rate should be established in the productive sandy soils between Lone Mountain and Tonopah. Since an ESI was conducted in 1986-90, important forage species have died off due to extremely dry years (1996 & 2002) and excessive wild horse use. Due to drought and the excessive use by wild horses, this area initially needs a rest from livestock use. The area should be monitored before livestock are turned out to determine if it has recovered and to determine the amount of available forage. Not all of the proposed AUMs may be available at this time.

A conservative stocking rate should also be established in the valley portion of the northern portion of Pasture 1 for the same reasons as listed above.

All of the natural waters that occur in Pasture 1 are in Lone Mountain and in the Montezuma Range within the Paymaster and Montezuma Peak HMAs. These waters are not easily accessible to livestock and water must be hauled in order for livestock to use the valley portions of Pasture 1. Permanent wells could be established to improve this situation. The area could also be divided and assigned to other existing allotments. No fences divide it from the neighboring allotments.

The valley is allocated 45 acres per AUM. This includes the very productive sandy soils in the northernmost portion of the north part of Pasture 1.

Table 70.0 - Available AUMs in the North portion of Pasture 1 (Outside the HMAs)

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	388 AUMs	1812 AUMs
Total Valley AUMs**	330 AUMs	1750 AUMs
Productive Valley Dormant Season AUMs***		403 AUMs

*These AUMs include the Tonopah hills, Lone Mountain (outside the HMA) and Split Mountain. Forage in these areas is difficult for cattle to use due to slopes and is poorer quality forage when compared to the forage on the valley bottom.
**The total dormant season forage available and the total in the valley including the less palatable species; shadscale and budsage and the more palatable species; fourwing saltbush and winterfat equals 1750 AUMs.
***The 403 more productive AUMs are mainly due to the presence of winterfat and fourwing saltbrush, both are very palatable dormant season forage for cattle. The 1347 AUMs remaining in the valley are almost exclusively shadscale and budsage, which is less palatable forage.

Montezuma Peak HMA –Located in the south central portion of the Pasture 1, the Montezuma Peak HMA lies just west of the town of Goldfield. A small portion (6%) of the HMA is in the Magruder Mountain Allotment (refer to Map 5.0)

The majority of the HMA is in the Montezuma Range. The Montezuma Range is dominated by saltbrush or menodora vegetation on the lower hills (5 – 8" precipitation zone) and black sagebrush (8 – 10 or 12" precipitation zones) on the lower portions of the mountains and by pinyon-juniper woodlands (above 10" precipitation) on the highest mountains with Wyoming big sagebrush in mountain valleys and higher alluvial fans. The Montezuma Range is surrounded by valleys that are dominated by saltbrush and spiny menodora vegetation in 5 – 8 and some 3 – 5 precipitation zones. Portions of these valleys are included in the HMA.

The HMA was allocated for wild horse use in the 1997 Tonopah RMP. Wild horses are mainly grazers and make little use of browse. However, the majority of the available forage in this HMA is browse. Grass makes up only ten percent or less of the total vegetative production throughout the HMA. The majority of forage for wild horses exists on big sage-dominated ecological sites in open areas in the Montezuma Range. Some grass also grows on alluvial fans in saltbrush ecological sites and in black sage ecological sites on the Montezuma Range. The least productive ecological sites for grass in the HMA are on hillsides dominated by saltbrush and in pinyon-juniper woodlands.

In extremely dry years such as 1996 and 2002, there is little to no grass available. In these extremely dry years perennial bunch grasses die and rhizomatous grasses die back and produce little or no green forage. Almost no nutritious forage is available for horse use. The only forage available is old dry grass with little nutritive value. However, some browse remains available for burro use. Shrubs are deeper rooted than grasses or forbs and fewer shrubs than grasses die in extreme droughts. There were, however, significant die offs of some saltbrush species, mainly shadscale, during 2002.

Table 71.0 - Percentages of General Vegetation Types in the Montezuma HMA

Sagebrush	Saltbrush	Menodora	Woodlands	Rock outcrop	Washes
44%	26%	13%	9%	4%	4%

There may be fewer acres of saltbrush vegetation than sagebrush, but the saltbrush-dominated areas are more easily accessed by wild horses, burros and especially cattle. Sagebrush areas are generally less accessible to use due to the higher altitude and steeper slopes. Wild horses travel farther from water and are better able to use higher areas than cattle. Burros do not use wooded areas.

Saltbrush plant communities on valleys and alluvial fans comprise 16 percent of the HMA. Saltbrush plant communities on hillsides make up 8 ½ percent of the HMA. Sandy soils make up 1 ½ percent of the HMA. These sandy soils are the most productive sites in the HMA. They support fourwing saltbush, winterfat and Indian ricegrass, the most palatable forage species in the allotment. Both fourwing saltbush and winterfat are very palatable winter, forage species for cattle and burro use. Horses may browse on winterfat during winter, but do not browse on fourwing saltbrush. Shadscale and bud sagebrush provide the majority of the available forage. They are browsed by cattle in winter only, but may be browsed by burros yearlong. They are also the least palatable browse, but make up the majority of available forage for cattle.

The ecological sites menodora dominates are very similar to saltbrush sites dominated by shadscale in the 5-8 inch precipitation zone. These ecological sites also have the same associated species: galleta grass, Indian ricegrass, and bud sagebrush. Spiny menodora ecological sites are managed similarly to shadscale ecological sites. These menodora sites provide some of the same forage species. However, livestock and wild equids do not browse menodora. The soils spiny menodora dominate provide less forage due to the lack of shadscale.

Sagebrush plant communities can be divided into two main categories: black sagebrush and big sagebrush. Black sagebrush grows on less productive soils on hillsides in the 8-12 inch precipitation zone and makes up 23 percent of the Montezuma Peak HMA. Big sagebrush grows on more productive soils in mountain valleys. It comprises 21 percent of the HMA. There is less browse for burros on these sites than on saltbrush ecological sites.

The Montezuma Peak HMA (76,557 total acres) has water available in the Montezuma Range for grazing animals on the northern three quarters of the HMA, approximately 73 percent of the HMA. The southern 27 percent of the HMA is without a water source.

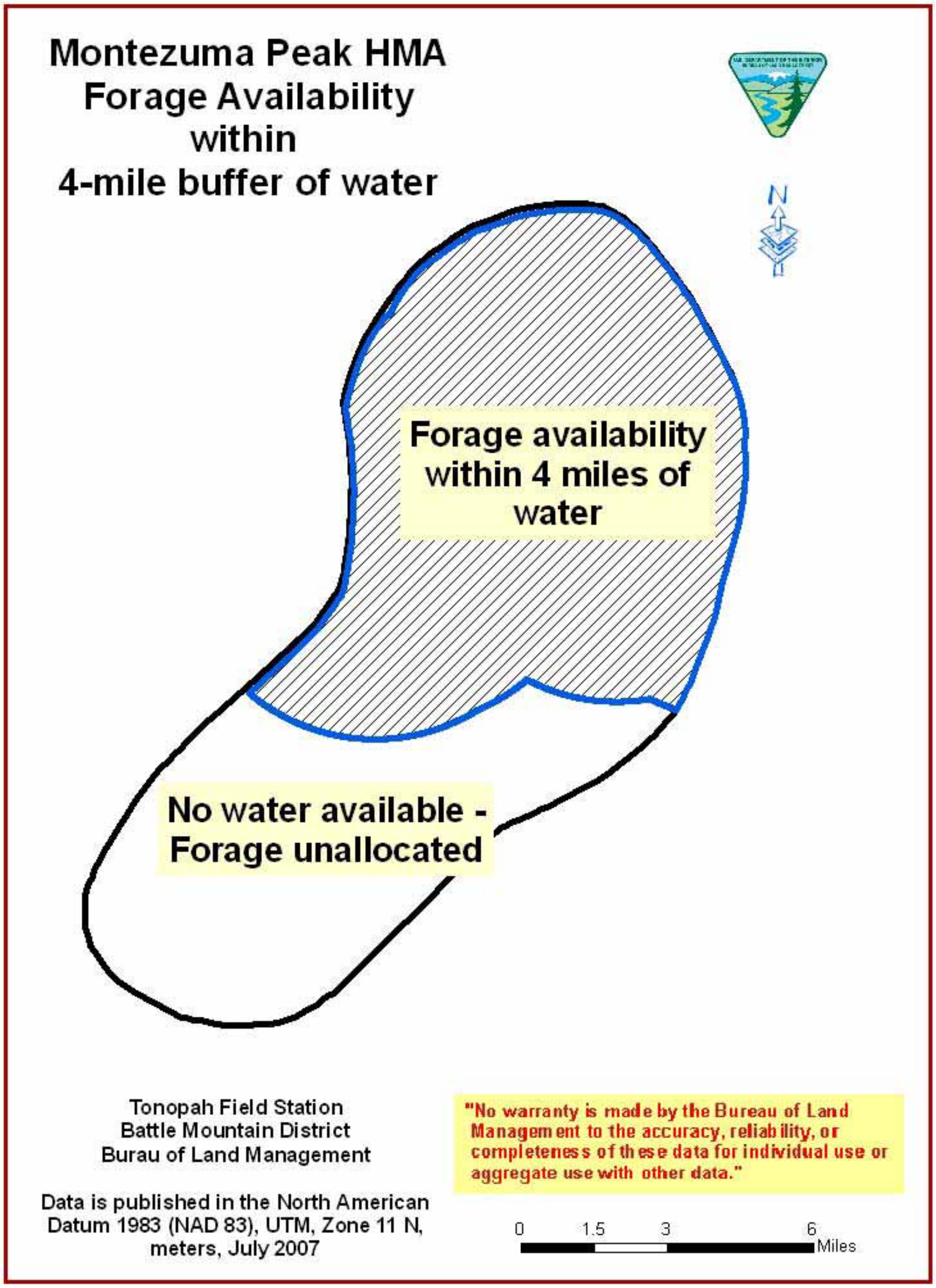
The following table allocates all forage to each individual grazing animal species only. Any stocking rate combining two species in the AML would require a reduction of the AUMs listed in the table for each species to accommodate both species in the HMA. For example, an equal number of both wild horses and burros would require the AUMs to be reduced in half for each animal. This would equal 113 AUMs for wild horses and 326 AUMs for burros in the watered portion of the HMA versus a total of 227 AUMs for wild horses only or 653 AUMs for burros alone (refer to amp below). The following acreages and AUM levels for the HMA do not exclude steep areas. These numbers may need to be reduced to account for some inaccessible forage. Also, the available forage in the high mountains can be inaccessible during winter due to snow.

Table 72.0 - Available AUMs in the Montezuma HMA

	Watered Portion of HMA	Dry Portion
Wild Horse or	227 AUMs (18 wild horses)*	110 AUMs (9 wild horses)*
Wild Burro or	653 AUMs (54 burros)*	327 AUMs (27 burros)*
Cattle	488 AUMs (mainly dormant season)**	278 AUMs (mainly dormant season)**

* Yearlong use by wild horses or burros.
** There is some grass available for spring and summer use. However, the majority of forage available for cattle is forage (shrubs).

Map 12.0 - Montezuma Peak HMA with forage availability within a 4-mile buffer of water



The HMA is poorly suited for hauling water for livestock due to the mountainous conditions. A number of developed springs do exist but the water rights are not currently available for livestock use. The limited number of available AUMs, the steep slopes on portions of the Montezuma Range, and the difficulty hauling water into the mountains for livestock use makes this HMA a poor location for a ten-year grazing lease or temporary grazing authorization. This HMA will support more burros than it can either wild horses or cattle. If permanent water could be provided in the dry portion of the HMA, a total of 81 burros could use the HMA yearlong. This is a more viable population size than 27 wild horses. Horses do not do well in the Montezuma Peak HMA in dry years due to the lack of grass.

Southern portion of Pasture 1 – This area is south of and outside the Montezuma Peak HMA. The majority of this pasture is salt desert shrub vegetation. Approximately 55 percent of the southern portion of Pasture 1 occurs in the lower hills of the Montezuma Range, the other 45 percent occurs in valleys surrounding the hills. Most of vegetation in the southern portion of the Montezuma Range is on the lower hills and is dominated by saltbrush. The majority of the Montezuma Range is in the Montezuma Peak HMA and is discussed above. Cattle make little use of forage on these hilly areas. The majority of spring and summer forage grows on sagebrush sites in the mountains or on the few sandy soils in the valleys.

The valley soils are dominated by shadscale, Bailey greasewood or spiny menodora. There is more forage suitable for cattle on saltbrush sites versus spiny menodora or Bailey greasewood sites. Neither spiny menodora nor Bailey greasewood is browsed by cattle. Grasses include some Indian ricegrass and galleta grass. The majority of the available forage in this pasture is shadscale and budsage, both of which are less palatable forage species and are suitable for winter use by cattle that are accustomed to browsing these species. There is little natural water in the pasture and water must be hauled in order for livestock to use the area. Permanent wells could be established to improve this situation. Due to the poor palatability of forage and lack of water, this pasture is better suited to temporary use than a ten-year grazing lease based on forage availability.

Table 73.0 - Percentages of General Vegetation Types in the South portion of Pasture 1

Saltbrush	Menodora	Sagebrush	Barren	Washes
60%	21%	13%	3%	3%

Table 74.0 Available AUMs in the South portion of Pasture 1

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	221 AUMs	206 AUMs
Total in Valleys**	51 AUMs	148 AUMs
Productive Valley Dormant Season AUMs***		5 AUMs

*These AUMs include the hills and mountains in the Montezuma Range. Forage in these areas is difficult for cattle to use due to slopes.
** The total forage available in the valley includes the less palatable species of shadscale and budsage; the more palatable species are fourwing saltbush and winterfat, which equals 148 AUMs.
***The five more productive AUMs are mainly winterfat, which is a very palatable dormant season forage for cattle. The 143 AUMs remaining in the valley are almost exclusively shadscale and budsage, which is less palatable dormant season forage.

Pasture 2

Pasture 2 is in the northeastern corner of the allotment near Tonopah and on the east side of U.S. Highway 95. It is in the southern Great Basin's salt desert vegetation and outside of the HMA.

The vegetation in this pasture is not diverse; it is dominated mainly by shadscale in the 3-5" or 5-8" precipitation zones. The soils that support shadscale are very poor quality soils that support few palatable shrubs or grasses. Sometimes Bailey greasewood (unused by cattle) or budsage are co-dominant with shadscale. Other species that occur at much smaller quantities are Nevada ephedra, gray molly, spiny menodora, winterfat, Shockley wolfberry, spiny hopsage and black sagebrush. With the exception of galleta grass dominating a few hillsides, perennial grass makes up less than ten percent of the plant communities in this pasture. Grass species found here include galleta grass, Indian ricegrass, desert king grass, bottlebrush Squirreltail and desert needlegrass. The small amount of sagebrush that grows in this pasture occurs on the highest hills in the 8-10" precipitation zone. These soils are also very poor quality and are dominated by black sagebrush.

Table 75.0 Percentages of General Vegetation Types in Pasture 2

Saltbrush	Washes	Barren	Sagebrush
81%	8%	7%	4%

Just over half of the saltbrush grows on the hills in the pasture. These hills are less accessible to cattle due to slopes. Only 46 percent of the pasture as a whole is in the more accessible valleys. Only 19 percent of the available AUMs are spring and summer forage (grass). Cattle prefer grass, and when grass is available, they switch from shrubs to grass in the spring. This pasture has little available grass outside of the area just north of the pasture fence between Pastures 2 and 3. Grass greens up starting approximately mid-March and may often be green intermittently through October in wetter years before it becomes dormant. Because the majority of available forage is browse, this pasture is suitable for cattle use during winter and possibly in late summer or fall only. The available winter forage is almost exclusively shadscale and budsage. Neither plant is highly palatable, but both are nutritious and browsed by cattle in winter when more palatable forage is unavailable. Cattle using this pasture must be accustomed to this area and to browsing these forage species. This is a very unproductive pasture. The stocking rate for cattle is approximately 72 acres per AUM in the valley portions of the pasture alone.

There are no natural waters in the pasture and water must be hauled in order for livestock to use the area. Permanent wells could be established to improve this situation. Due to the poor palatability of forage and lack of water, this pasture is better suited to temporary use based on forage availability.

Table 76.0 - Available AUMs in Pasture 2

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	97 AUMs	297 AUMs
Total in Valleys**	46 AUMs	200 AUMs
Productive Valley Dormant Season AUMs***		0 AUMs

*These AUMs include the hills at the north and south ends of the pasture. Forage in these areas is difficult for cattle to use due to slopes.
** The total forage available in the valley including the less palatable species of shadscale and budsage; the more palatable species are fourwing saltbush and winterfat, which equals 200 AUMs.
***There are no more productive AUMs available in this area.

Pasture 3

Pasture 3 contains both the Goldfield and Stonewall HMAs and a small area outside these HMAs in the north, central and south portions of the pasture.

The North Section – This area is very similar to Pasture 2 and is also outside of the HMAs. Both are very unproductive and much of the vegetation in this pasture is dominated by shadscale. These soils are poor quality and have little grass available except on the sandy soils that border the fence between Pasture 2 and 3 in the far northern portion of Pasture 3. The majority of available forage is shadscale and budsage, both winter feed. Very little grass is available due to the nature of the soils and the low precipitation. The area is suitable for winter and possibly in late-summer or fall use only. See the third paragraph of Pasture 2 above.

Table 77.0 - Percentage of General Vegetation Types in the North portion of Pasture 3

Saltbrush	Washes	Barren	Sagebrush	Menodora
83%	9%	6%	1%	1%

Ten percent of the saltbrush vegetation grows on the hills in this pasture, 69 percent grows in the valleys, and four percent grows on sandy soils in the valleys (total 83%).

There are no natural waters in the northern portion of this pasture and water must be hauled in order for livestock to use the area. Permanent wells could be established to improve this situation. Due to the poor palatability of forage and lack of water, this area is better suited for temporary use based on forage availability.

Table 78.0 - Available AUMs in Pasture 3, North

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	68 AUMs	314 AUMs
Total in Valleys**	61 AUMs	286 AUMs
Productive Valley Dormant Season AUMs***		11 AUMs

*These AUMs include the hills. Forage in hilly areas is difficult for cattle to use due to slopes.

** The total forage available in the valley includes the less palatable species of shadscale and budsage; the more palatable species are fourwing saltbush and winterfat, which equals 286 AUMs.

*** The 11 more productive AUMs are mainly winterfat and fourwing saltbrush, both of which are very palatable dormant season forage for cattle. The 275 AUMs remaining in the valley are almost exclusively shadscale and budsage, which are less palatable dormant season forage.

<u>Goldfield HMA</u> – The Goldfield HMA lies just east of the town of Goldfield and west of the Nevada Training and Testing Range. It includes much of the Goldfield Hills and some alluvial fans in the northern and southern portions of the HMA. The entire HMA is within the Montezuma Allotment east of U.S. Highway 95.

The majority of the vegetation on the HMA is saltbrush in the 5-8 and 3-5 inch precipitation zones. Some of the soils on the hills and valleys in the HMA are very young and are therefore poorly developed. These poorly developed soils do not hold water in the upper portion of the soil where it would be available for grass, and are dominated by shadscale, Bailey greasewood and other shrubs. Much of the HMA has little grass, which makes up only ten percent or less of the total vegetative production throughout the HMA. The grass most often available in saltbrush ecological sites is galleta grass. Galleta grass cures poorly in winter and provides little nutrition to maintain healthy wild horse herds. There is little Indian ricegrass available on the HMA.

In extremely dry years such as 1996 and 2002, there is little to no grass available in the allotment. In these extremely dry years perennial bunch grasses die and rhizomatous grasses die back and produce little or no green forage. Almost no nutritious forage is available for horse use. The only forage available is old dry grass with little nutritive value. Shrubs are deeper rooted than grasses or forbs and fewer shrubs than grasses die in extreme droughts. This leaves more available browse than grass for forage during extreme droughts. There were, however, significant die offs of some saltbrush species, mainly shadscale in 2002.

The Goldfield Hills are lower in elevation than the Montezuma Range and support very little sagebrush (8-10 inch precipitation zone). Sagebrush makes up only seven percent of the HMA.

The HMA was allocated for cattle, horse and burro use in the Tonopah RMP. Horses are mainly grazers and make little use of browse. However, the majority of the available forage in this HMA is browse. The lack of grass makes this HMA poor horse habitat, fair cattle winter range, but good burro range. The HMA is mainly suitable for year-long burro use or winter cattle use.

Table 79.0 - Percentage of General Vegetation Types in the Goldfield HMA

Saltbrush	Sagebrush	Menodora	Washes	Rock outcrop
82%	7%	6%	5%	Trace

The Goldfield HMA (53,271 acres) has water available on the center of the HMA for approximately 48 percent of the HMA. The dry portion is divided into a northern area (18% of the HMA) and southern area (34% of the HMA), and has no water the proposed grazing allocations are divided between these three sections. The following table allocates all forage to each individual grazing animal species only. Any stocking rate combining two species in the AML would require a reduction of the AUMs listed in the table for each species to accommodate both species in the HMA. For example, both cattle and burros would be reduced in half, for a total of 154 AUMs for cattle and 224 AUMs for burros in the watered portion of the HMA (refer to map below).

The following acreages and AUM levels for the HMA include steep areas. These numbers may need to be reduced to account for some inaccessible forage.

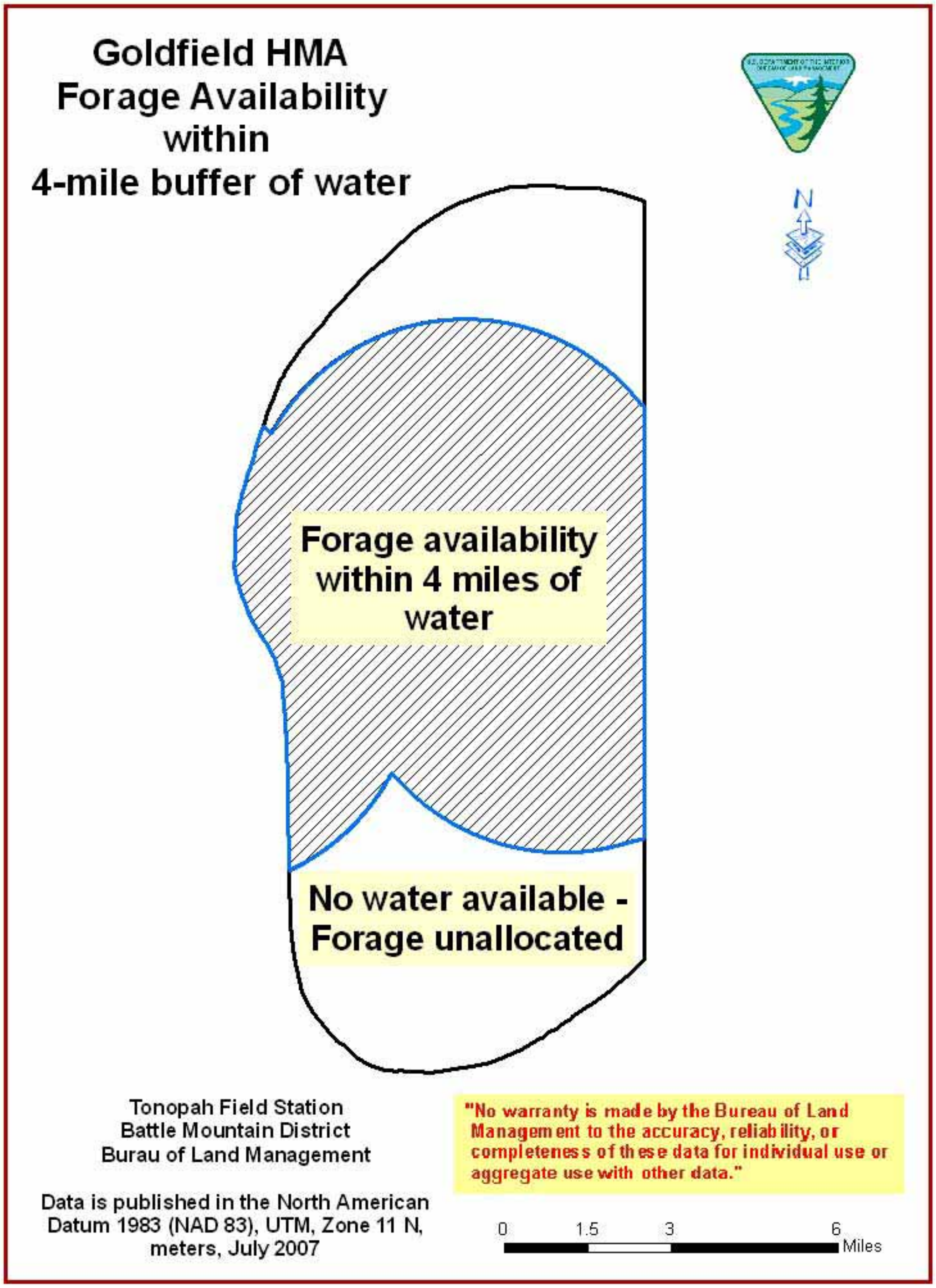
Table 80.0 - Available AUMs in the Goldfield HMA

	Watered Portion of HMA	Dry Portion North	Dry Portion South
Wild Horse or	98 AUMs (8 wild horses)*	15 AUMs (1 horse)	81 AUMs (6 wild horses)*
Wild Burro or	449 AUMs (37 burros)*	168 AUMs (14 burros)	416 AUMs (34 burros)*
Cattle	309 AUMs (mainly dormant season)**	123 AUMs (mainly dormant season)**	327 AUMs (mainly dormant season)**

* Yearlong use by wild horses or burros.

** There is some grass available for summer use. However, the majority of forage available for cattle is winter forage (shrubs).

Map 13.0 - Montezuma Peak HMA with forage availability within a 4-mile buffer of water



c. **<u>Vegetation on Central Portion of the Montezuma Allotment</u>** – This area is very similar to the northern portion of this pasture and to the alluvial fan portions of the Stonewall HMA. A small amount of winterfat grows near the playa. Most of the forage is in this pasture is shadscale and budsage. Shadscale and budsage decrease in the southern most portions of the pasture that are closer to the Mojave Desert. However, shadscale occurs farther south than budsage.

The central portion of this pasture is in a 3-5 and 5-8 inch precipitation zone. Some of the soils on the alluvial fan and in the valley are very young and are therefore poorly developed. These poorly developed soils do not hold water in the upper portion of the soil where it would be available for grass. These soils are dominated instead by spiny menodora, shadscale and Bailey greasewood. There is almost no grass on these saltbrush and menodora ecological sites, which make up 89 percent of the area. The majority of available forage is winter feed, and very little grass is available. This is one of the most unproductive portions of the allotment.

Table 81.0 – Percentage of General Vegetation Types in the Center of Pasture 3

Saltbrush	Menodora	Washes	Barren	Sagebrush
69%	21%	5%	5%	Trace

Of the 69 percent of the area that is dominated by saltbrush (including Bailey greasewood), only 1 percent grows on sandy soils. The majority of the barren area is a playa.

This area lies between the Goldfield and Stonewall HMAs. Some wild equids may use the area as there are no natural barriers between the central portion of the pasture and Stonewall HMA. Cattle have easy access into both HMAs. The only natural water in the area occurs at Stonewall Falls in the HMA. Otherwise this area is dry. The few AUMs available in the central portion of Pasture 3 in dry years may prolong the life of the few equids from the HMA and delay the need for an emergency gather. For this reason and the lack of a barrier between the HMA and the central portion of Pasture 3, and also due to the sparse amount of forage in both the Stonewall HMA and this part of the pasture, no AUMs should be allocated to cattle use here.

Table 82.0 - Available AUMs in Pasture 3, Center (outside the HMA)

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	56 AUMs	279 AUMs
Total in Valleys**	8 AUMs	169 AUMs
Productive Valley Dormant Season AUMs***		8 AUMs

*These AUMs include the few hills in the pasture. Forage in these areas is difficult for cattle to use due to slopes and its poor quality.

** The total forage available in the valley includes the less palatable species of shadscale and budsage; the more palatable species are fourwing saltbush and winterfat, which equals 169 AUMs.

*** The 8 more productive AUMs are mainly winterfat and fourwing saltbrush, both are very palatable dormant season forage for cattle. The 161 AUMs left in the valley are almost exclusively shadscale and budsage, less palatable dormant season forage.

<u>Stonewall HMA</u> – The Stonewall HMA is a very small HMA that lies just south of the Goldfield HMA and west Nevada Training and Testing Range. It includes Stonewall Mountain and some of the alluvial fan on the western side of the mountain. The entire HMA is within the Montezuma Allotment east of U.S. Highway 95.

The majority of the vegetation consists of spiny menodora and saltbrush ecological sites in the 5-8 and 3-5 inch precipitation zones. Some of the soils on alluvial fan and in the lower portion of the mountain are very young and are therefore poorly developed. These poorly developed soils do not hold water in the upper portion of the soil where it would be available for grass, and are dominated instead by spiny menodora, shadscale and Bailey greasewood. There is almost no grass on these saltbrush and menodora ecological sites, which make up 73 percent of the HMA. The upper elevations of the mountain is dominated by big sagebrush (8-10 inch precipitation zone) and pinyon-juniper (10 inch and above) vegetation. Sagebrush makes up 16 percent of the HMA. More grass is available on sagebrush ecological sites than on menodora or saltbrush sites. Little forage is available under the pinyon-juniper forest canopy. These higher areas and the limited amount of riparian vegetation, at Stonewall Falls and another mountain spring, provide much of the grass in the HMA. The rest of the HMA has little grass. These shrub-dominated sites provide browse for burros yearlong and for a very limited number of cattle in winter. The lack of grass makes this HMA unsuitable for yearlong horse use and cattle use during the growing season. In fact, this small HMA can support only a limited number of burros.

In extremely dry years such as 1996 and 2002, there is little to no grass available in the allotment. In these extremely dry years perennial bunch grasses die and rhizomatous grasses die back leaving just root systems alive and produce little or no green forage. In years with normal precipitation, little grass is available for horse use. In dry years, almost no nutritious forage is available for horse use. The only available forage is old dry grass with little nutritive value. Shrubs are deeper rooted than grasses or forbs and fewer shrubs than grasses die in extreme droughts. This leaves more available browse than grass for forage during extreme droughts. There were, however, significant die offs of some saltbrush species, mainly shadscale, during 2002.

Table 83.0 - Percentage of General Vegetation Types in the Stonewall HMA

Menodora	Saltbrush	Sagebrush	Woodlands	Rock outcrop	Playa
42%	31%	16%	7%	4%	Trace

The Stonewall HMA has water available at Stonewall Falls on the north side of Stonewall Mountain, which is on the northernmost edge of the HMA. Approximately 44 percent of the HMA relies on Stonewall Falls as the principal water source. Another eight percent is watered by a second spring high on the mountain top. However, neither of these waters adequately provides water for cattle, burros or wild horses because Stonewall Mountain blocks much of the access. The main access to the second spring is on the boundary of the HMA. The dry portion, 48 percent of the HMA, is mainly on the alluvial fan which has little forage available outside of the small sandy areas dominated by winterfat or fourwing saltbush.

The available forage was divided into the three sections of the HMA: the area watered by Stonewall Falls, the area watered by a spring on the top of the Stonewall Mountain, and the dry portion on the alluvial fan. The following table allocates all forage to each individual grazing animal species only. Any stocking rate combining two species in the AML would require a reduction of the AUMs listed in the table for each species to accommodate both species in the HMA. For example both cattle and burros would be reduced in half, 47 AUMs for cattle and 49 AUMs for burros in the watered portion of the HMA.

The following acreages and AUM levels use do not exclude steep areas. These numbers may need to be reduced to account for some inaccessible forage. Because this HMA is mountainous, any reduction of AUMs based in the steeper portions of this HMA would significantly reduce forage within the watered portion of the HMA. This reduction would most likely exclude the 2 horse stocking rate and most of the AUMs available for cattle and burro use. This HMA is the smallest and least suitable area for grazing or browsing (refer to map below).

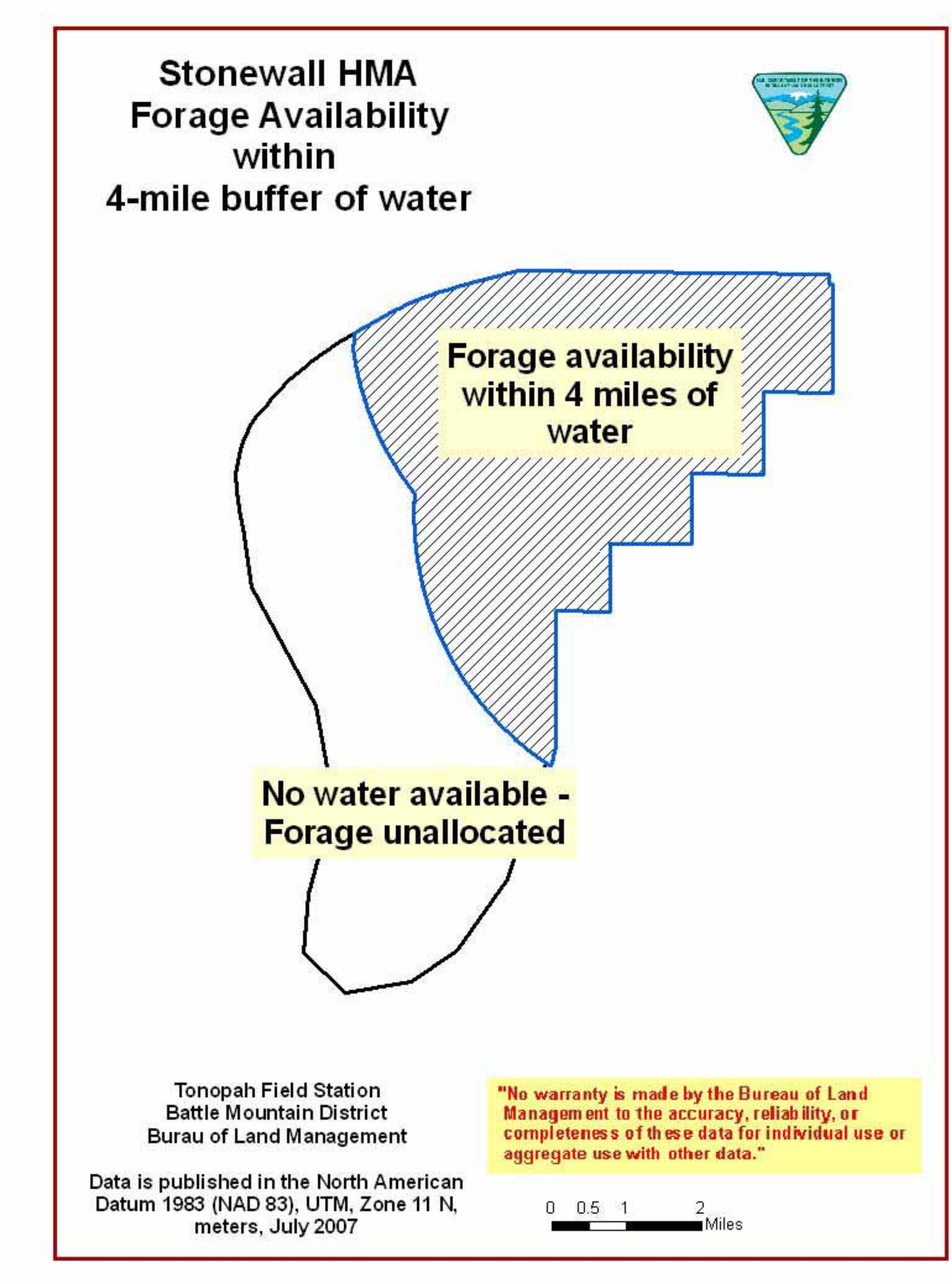
Table 84.0 - Available AUMs in the Stonewall HMA

	Watered Portion of HMA	2nd Spring	Dry Portion
Wild Horse or	32 AUMs (2 wild horses)*	3 AUMs (0 horse)	23 AUMs (2 wild horses)*
Wild Burro or	99 AUMs (8 burros)*	25 AUMs (2 burros)	225 AUMs (18 burros)*
Cattle	95 AUMs (mainly dormant season)**	17 AUMs (mainly dormant season)**	107 AUMs (mainly dormant season)**

* Wild wild horses or burros yearlong.

** There is some grass available for spring and summer use. However, the majority of forage available for cattle is dormant season forage (shrubs).

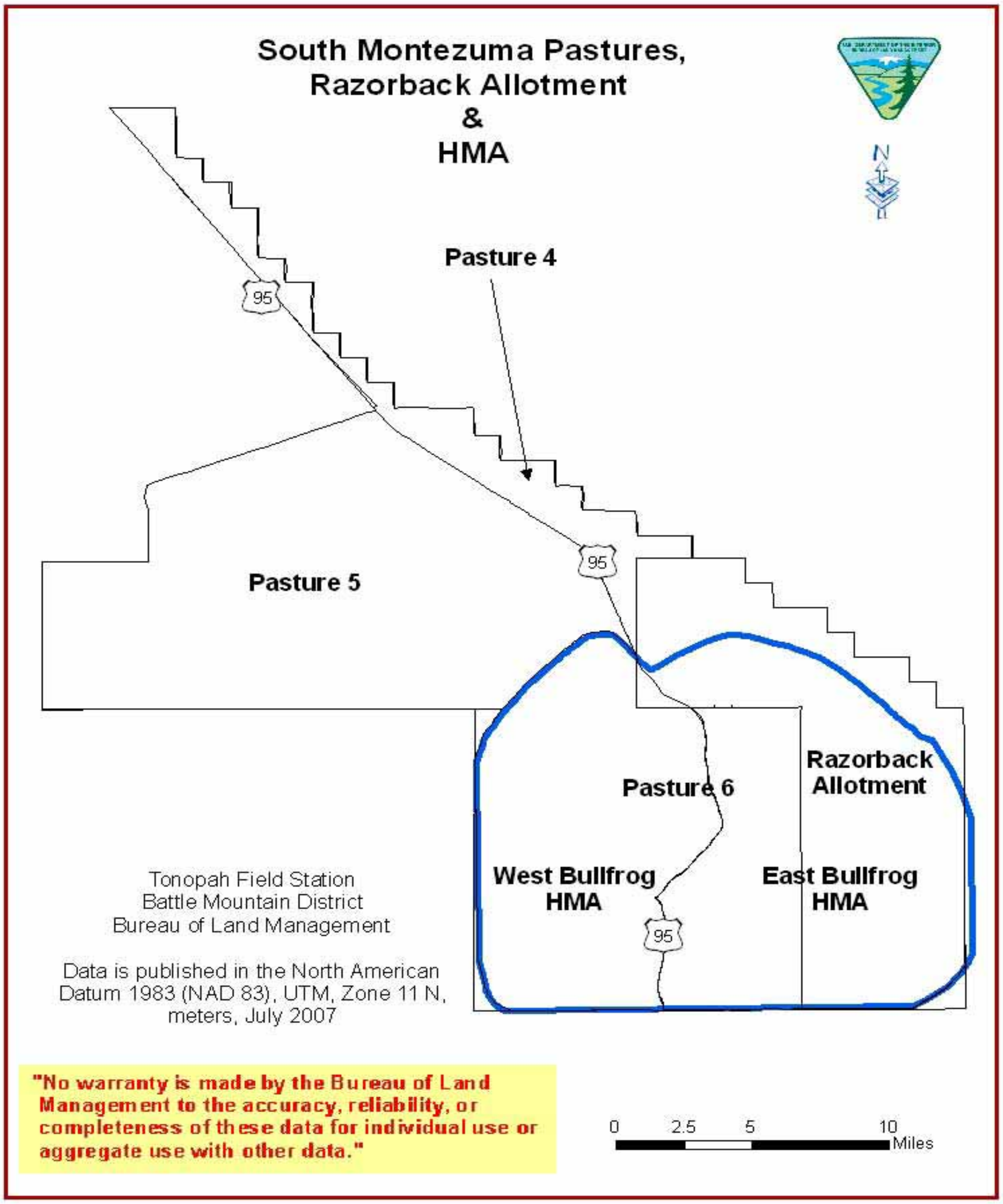
Map 14.0 - Stonewall HMA with forage availability within a 4-mile buffer of water



The HMA was allocated for horse and burro use in the Tonopah RMP. Wild horses are mainly grazers and make little use of browse. However, the majority of the available forage in this HMA is browse. The lack of grass, limited water availability and steep slopes makes this HMA poor horse habitat. No viable population of wild horses could exist in this habitat. However, horses have been included in the table to show their possible allocated forage use.

d. <u>Vegetation on South Portion of the Montezuma Allotment</u>

Map 15.0 – South Montezuma Pasture, Razorback Allotment and HMA



This area is also very unproductive and near the Stonewall HMA. It appears to be the most unproductive portion of the allotment. Very little grass grows on this area due to the nature of the soils and the low precipitation. No natural barrier exists between the HMA and the southern portion of Pasture 3. The few AUMs available should be left for wild equids in Stonewall HMA to be used in dry years. No allocation of AUMs for cattle should occur here. The extremely low number of available AUMs makes it economically unfeasible to use them for livestock on a temporary basis. Only 6 AUMs are available on the valley where they are easily accessed by cattle. This leaves 29 AUMs in the less accessible hilly areas. The majority of these AUMs are shadscale and budsage, which is less palatable forage for cattle.

Table 85.0 - Available AUMs in Pasture 3, South (outside the HMA)

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	4 AUMs	25 AUMs
Total in Valleys**	0 AUMs	6 AUMs
Productive Valley Dormant Season AUMs***		0 AUMs

*These AUMs include the hills at the end of the pasture. Forage in these areas is difficult for cattle to use due to slopes and its poor quality.
** The total forage available in the valley includes the less palatable species of shadscale and budsage; the more palatable species are fourwing saltbush and winterfat, which equals 6 AUMs. This leaves only 19 AUMs of dormant season forage in the hills.
*** There are no more productive AUMs available in this area.

Table 86.0 - Percentage of General Vegetation Types in the south portion of Pasture 3

Saltbrush	Menodora	Washes
80%	18%	2%

Of the 80 percent of the area dominated by saltbrush, 52 percent is on hills and 28 percent in the valley. Few sandy soils exist in the area. The vegetation on the valley is beginning to ecotone with the Mojave Desert more so than farther north in the allotment.

No AUMs should be allocated to cattle use in the south portion of Pasture 3.

Pasture 4

The majority of this pasture is in a valley called Sarcobatus Flat and is outside of the Stonewall HMA. It is a narrow strip of land between U.S. Highway 95 and Nevada Training and Testing Range. The boundary between Nevada Training and Testing Range and Pasture 4 is unfenced. The available forage for cattle is mainly less palatable winter species. This area is within both saltbrush sites dominated by shadscale and the hot desert sites dominated by creosote bush, white bursage, and Anderson wolfberry. The saltbrush ecological sites ecotone combined with hot desert vegetation in this pasture. The area supports very little grass due to low precipitation levels and natural soil conditions.

Table 87.0 - Percentage of General Vegetation Types in the Pasture

Saltbrush	Hot Desert	Sodic	Menodora	Wash	Playa
65%	25%	5%	3%	1%	1%

Sandy sites make up eight percent of total area in Pasture 4. These soils support the best quality forage in the pasture, including winterfat and fourwing saltbrush. Hills cover 3 percent of

Pasture 4. Approximately half of these hills are dominated by saltbrush vegetation and the other half hot desert vegetation.

There are no natural waters in this pasture and water must be hauled in order for livestock to use the area. Permanent wells could be established to improve this situation. Due to the poor palatability of forage and lack of water, this area is better suited to temporary use based on forage availability.

Table 88.0 - Available AUMs in Pasture 4 (outside of HMAs)

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	22 AUMs	226 AUMs
Total in Valleys	22 AUMs	218 AUMs
Productive Valley Dormant Season AUMs**		32 AUMs

*These AUMs include the hills at the end of the pasture. Forage in these areas is limited and difficult for cattle to use due to slopes.
** The 32 more productive AUMs are mainly winterfat and fourwing saltbrush, both very palatable dormant season forage for cattle. The 186 AUMs remain in the valley are almost exclusively shadscale and budsage, which is less palatable dormant season forage.

Pasture 5

Pasture 5 is on the west side of U.S. Highway 95 in the southern portion of the allotment. It contains the western portion of the Bullfrog HMA and a large area in just north of the western half of the Bullfrog HMA. The majority of Pasture 5 is outside of the HMA. A small portion of the Bullfrog HMA occurs within this pasture on the southeastern edge of the pasture.

The North Portion of Pasture 5 – Saltbrush vegetation ecotones with Mojave vegetation occur in the northern most portion of the pasture. Dominant species in this portion of the Montezuma Allotment are Great Basin plant species, such as shadscale, bud sagebrush, fourwing saltbush and winterfat. However, associated species are often Mojave Desert and Mojave transition species, such as Anderson wolfberry, spiny menodora, cheeseweed, various goldenhead species, desert needlegrass and red brome. These sites are sometimes dominated by Anderson wolfberry with some associated Great Basin vegetation. The saltbrush ecological sites have some grass that provides a very limited amount of forage for cattle during the growing season. With about 95,000 acres, this is the largest portion of the six pastures in the Montezuma Allotment.

Table 89.0 - Percentage of General Vegetation Types in the North Portion of Pasture 5

Saltbrush	Menodora	Sodic	Barren	Big Sage	Hot Desert	Saline Meadow	Woodland
42%	19%	7%	6%	6%	2%	1%	1%

Approximately seven percent of the pasture consists of sandy soils which occur mainly in the valley. These soils are very productive, soils supporting important forage species such as winterfat, fourwing saltbush and Indian ricegrass, and provide very good quality forage for cattle. Only ten percent of the pasture is within hills, most of which are dominated by saltbrush. Only one percent of the hills are dominated by hot desert vegetation.

There is one natural water in this pasture and water must be hauled in order for livestock to use the area. Permanent wells could be established to improve this situation.

Table 90.0 - Available AUMs in Pasture 5, North portion

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	368 AUMs	1410 AUMs
Total in Valleys**	226 AUMs	1235 AUMs
Productive Valley Dormant Season AUMs***	NA	192 AUMs

*These AUMs include the hills at the end of the pasture. Forage in these areas is limited and difficult for cattle to use due to slopes.
**The total dormant season forage available and the total forage in the valley include the less palatable species of shadscale and budsage. The more palatable species include fourwing saltbush and winterfat equals AUMs.
*** The 192 more productive AUMs are mainly winterfat and fourwing saltbrush, both very palatable dormant season forage for cattle. The 1043 AUMs remaining in the valley are almost exclusively shadscale, a less palatable dormant season forage.

Bullfrog HMA – The Bullfrog HMA surrounds the town of Beatty and abuts the western boundary of the Nevada Training and Testing Range. It includes much of the Bare Mountains and Bullfrog Hills. The HMA spans parts of the Montezuma, Razorback and Springdale 2 allotments. It is divided by the U.S. Highway 95 fence into two portions that should be managed separately.

Western Half of the Bullfrog HMA – Saltbrush vegetation ecotones with Mojave vegetation occur in the northernmost portion of the HMA. Dominant species in this portion of the HMA are Great Basin plant species, such as shadscale, bud sagebrush, fourwing saltbush and winterfat. However, associated species are often Mojave Desert species, such as Anderson wolfberry, spiny menodora, cheeseweed, various goldenhead species, desert needlegrass and red brome. These sites are sometimes dominated by Anderson wolfberry with some associated Great Basin vegetation. The saltbrush ecological sites have some grass that provides a very limited amount of forage for wild horses yearlong and cattle during the growing season. A few soils in the northern most part of the HMA are very productive silty and sandy soils. These soils support important forage species, like winterfat, fourwing saltbush and Indian ricegrass. These soils also

occur north of the HMA boundary and are very productive and suitable for cattle grazing. However, they only cover one percent of the western half of the HMA.
Approximately 55 percent of the western half of the HMA is covered by the Bullfrog Hills. Higher elevations and north aspects of these hills are dominated by big sagebrush. South slopes and upper alluvial fans are dominated by spiny menodora, and provide little grass or other forage. Big sagebrush ecological sites provide good quality forage (perennial grass) during the growing season for wild horses and cattle. Due to the higher elevation, these grasses are less available to cattle and unavailable during winter for horse use. Outside of the big sagebrush, and the silty and sandy soils, forage for wild horses is very limited in the western half of the HMA. Forage for cattle is almost exclusively available in winter (shrub). The ecological sites that provide a limited amount of growing season cattle or horse range are ecological sites that ecotone with Great Basin ecological sites. The hot desert vegetation provides almost no horse forage and a very limited amount of winter forage for cattle.

The majority of the western half of the HMA is dominated by hot desert (Mojave Desert) vegetation. These ecological sites are dominated by creosote bush, white bursage (an important burro forage), wolfberries (pale and Anderson), and annual grasses and forbs. These soils support almost no perennial grasses and have no forage available for horse use and little for cattle use (winter only). Perennial grasses frequently die off in dry years such as 1996 and 2002. The majority of the available forage is browse, which makes this HMA suitable burro habitat.

Annual forbs and grasses do grow on this HMA. The most common forb is fiddlehead (*Amsinkia spp.*) and the most common annual grass is red brome. Red brome is a fire hazard similar to cheatgrass (*Bromus tectorum*) in Northern Nevada. Last year, two fires occurred in the HMA, one on the east and one on the west half of the HMA. Annual plants provide little consistent forage. They are often absent in dry years.

Table 91.0 - Acres of General Vegetation Types in the West Half of Bullfrog HMA

Hot Desert	Menodora	Sagebrush	Saltbrush	Washes	Rock outcrop
46%	27%	10%	9%	4%	4%

The western half of the Bullfrog HMA has water available at several springs, which allows 83 percent of the western portion of the HMA to be utilized. The dry portion (17% of the HMA) is divided into two areas: one is a small corner in the northwestern tip of the west half and the second is southwestern edge of the west half. The western half of the Bullfrog HMA has more available water than the rest of the Montezuma allotment.

The allocations are divided into all three sections of the HMA: the two dry areas and the portion with available water. The following table allocates all forage to each individual grazing animal species only. Any stocking rate combining two species in the AML would require a reduction of the AUMs listed in the table for each species to accommodate both species in the HMA. For example, both cattle and burros would be reduced in half, 154 AUMs for cattle and 224 AUMs for burros in the watered portion of the HMA (refer to Map 15.0).

Table 92.0 - Available AUMs in the West Half of Bullfrog HMA

	Watered Portion of HMA	Dry Portion, North	Dry Portion, South
Wild Horse or	66 AUMs (5 wild horses)*	18 AUMs (1 horse)	0 AUMs (0 wild horses)*
Wild Burro or	823 AUMs (68 burros)*	81 AUMs (6 burros)	99 AUMs (8 burros)*
Cattle	248 AUMs (mainly dormant season)**	47 AUMs (mainly dormant season)**	10 AUMs (dormant season)**

* Wild horses or burros yearlong.
** There is some grass available for spring and summer use. However, the majority of forage available for cattle is dormant season forage (shrubs).

Pasture 6

Eastern Half of the Bullfrog HMA – This includes the Springdale 2 Allotment and a portion of the Razorback Allotment. Approximately 60 percent of the eastern half of the HMA is mountainous. The majority of the hills are dominated by blackbrush. The northernmost end of the HMA is located in the Oasis Valley. This portion of the Bullfrog HMA will be discussed under the "Razorback Allotment Data" section, "Ecological Site Inventory Forage Availability & Vegetation" as well as "the Eastern Half of the Bullfrog HMA" below. The following tables are copied from the Razorback Allotment Data section.

Table 93.0 - Available AUMs in the East Half of Bullfrog HMA including Montezuma, Razorback and Springdale 2 Allotments

	Watered Portion of HMA	Dry Portion
Wild Horse or	19 AUMs (1 wild horses)*	61 AUMs (5 wild horses)*
Wild Burro or	283 AUMs (23 burros)*	973 AUMs (81 burros)*
Cattle	114 AUMs (mainly dormant season)**	393 AUMs (dormant season)**

* Wild horses or burros yearlong.
** There is some grass available for spring and summer use. However, the majority of forage available for cattle is dormant season forage (shrubs). This includes Montezuma, Razorback and Springdale 2 AUMs.

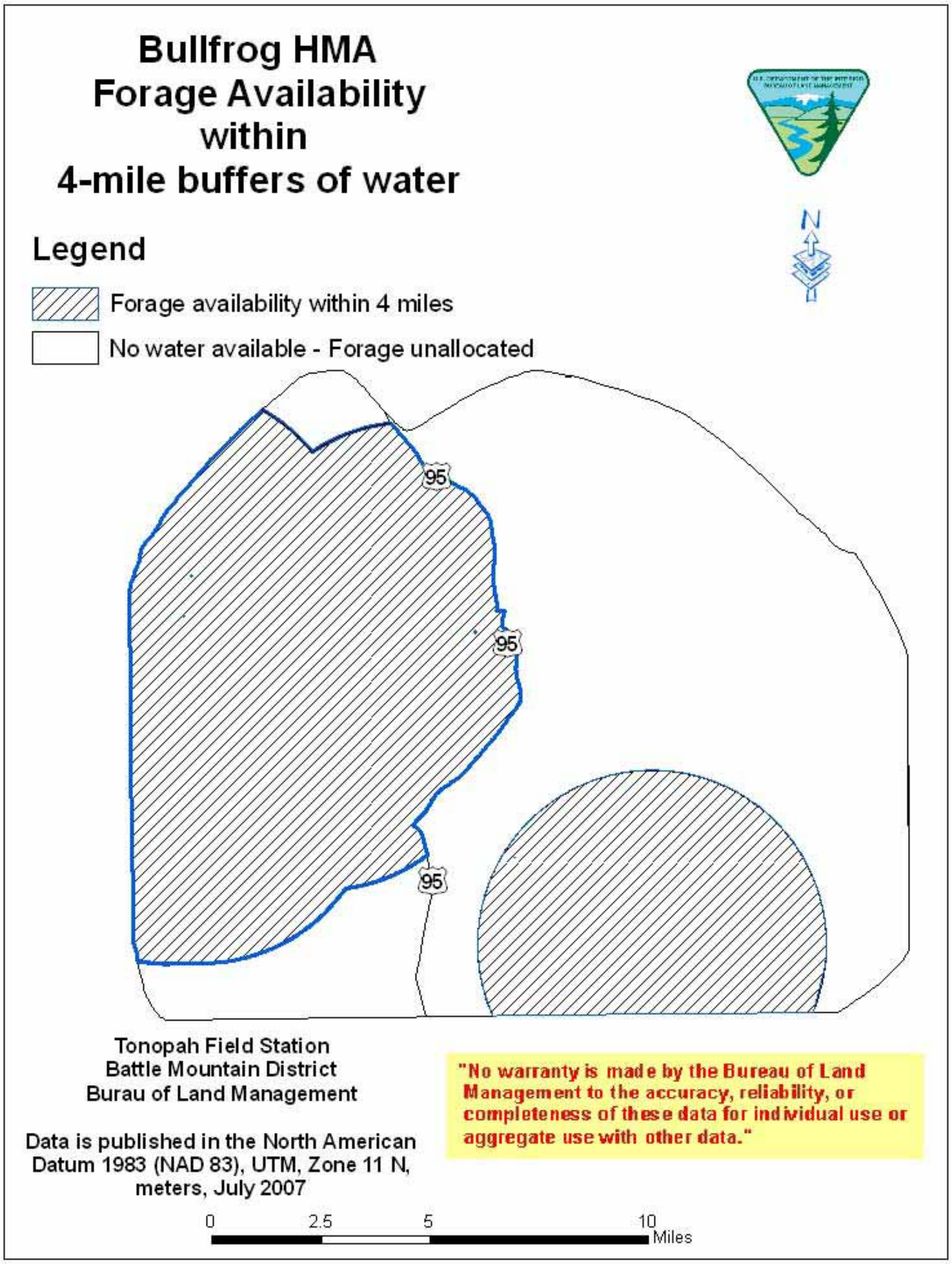
Table 94.0 - Livestock AUMs available in each Allotment, Bullfrog East

Allotment	Watered Portion of HMA	Dry Portion
Montezuma	56 AUMs (dormant season)	115 AUMs (dormant season)
Razorback	58 AUMs (dormant season)	261 AUMs (yearlong)
Springdale 2	none	17 AUMs (yearlong)

Table 95.0 - Burro and Horse AUMs in each Allotment, Bullfrog East

Allotment	Watered Portion	Dry Portion
Montezuma	154 burro or 8 horse AUMs	362 burro or 6 horse AUMs
Razorback	129 burro or 11 horse AUMs	582 burro or 52 horse AUMs
Springdale 2	none	29 burro or 3 horse AUMs

Map 16.0 - East and West of the Bullfrog HMA, with forage availability within 4-mile buffers of water



e. Summary

In extremely dry years such as 1996 and 2002, there is little to no grass available throughout the allotment of the Montezuma Complex. In these extremely dry years, perennial bunch grasses die and rhizomatous grasses die back and produce little or no green forage. Almost no nutritious forage is available for wild horse use. The only forage available is old dry grass with little nutritive value. However, some browse is still available for burro use. Shrubs are deeper rooted than grasses or forbs and fewer shrubs than grasses die in extreme droughts. This leaves more available browse than grass for forage during extreme droughts. There were, however, significant die offs of some saltbrush species, mainly shadscale, during 2002.

HMA Summary

There are five HMAs analyzed within this evaluation. Only a small portion of the Paymaster HMA is within the Complex. No AUMs should be allocated to wild horses or cattle in the Paymaster HMA because the adjacent allotment is over-allocated to both cattle and wild horses AUMs. Not allocating AUMs for wild horses or cattle in this portion of the HMA will relieve grazing pressure on the Paymaster HMA as a whole.

In the Montezuma, Goldfield, Stonewall and Bullfrog HMAs, the majority of the vegetation is dominated by saltbrush or hot desert shrub. There is little available grass on the majority of these HMAs. The lack of grass is due to low levels of precipitation and very young, poorly developed soils. These poorly developed soils in 3-5 and 5-8 inch precipitation zones do not hold water in the upper portion of the soil where it would be available for grass. Instead, these soils are dominated mainly by deep rooted shrubs. In HMAs with higher elevations in sagebrush dominated vegetation, access is limited by steep slopes and tree cover. Since these HMAs support very little grass, they have little forage available for horse or cattle use. Grass may be available on some soils, but during the frequent droughts, important perennial grasses often die off. This means shrubs provide the majority of the available forage in these HMAs. Burros are opportunistic and will browse and graze. They make better use of available forage in these HMAs. Because more forage is available for burros, these HMAs can support larger numbers of burros than wild horses or cattle.

Livestock Summary

The majority of the available forage on the Complex is in the valleys. The hills and mountains usually have poorer quality forage that is often less accessible to cattle due to steep slopes. Cattle prefer to make the majority of their use in valleys. No AUMs should be allocated to livestock on hills to avoid overuse by cattle on valleys. This would also reduce the need to remove cattle in dry years to preserve vegetation and soil resources and to avoid starvation due to lack of forage. The majority of the hills and mountains in the Complex are within HMAs. Under this management strategy, the HMAs should be allocated for wild equids and the valleys outside the HMAs for cattle. There would be some overlap in use by livestock and wild equids along the borders of the HMAs, especially inside the Bullfrog East HMA, but little overlap elsewhere

The following tables show the acreage in each pasture and HMA. It also includes the acreage by hills and valleys.

Table 96.0 - Percent of Acres in Hill and Valleys by Pasture and HMA in the Montezuma Allotment

Pasture	Percent Acres in Valleys	Percent Acres in Hills	Total Acres in pasture
Pasture 1 North	79%	21%	119,642
Pasture 1 South	47%	53%	19,726
Pasture 2	80%	20%	17,926
Pasture 3 North	80%	20%	32,194
Pasture 3 Center	85%	15%	20,178
Pasture 3 South	6%	94%	31,585
Pasture 4	97%	3%	25239
Pasture 5	92%	8%	95,016
Montezuma HMA	22%	78%	73,251
Paymaster HMA	0%	100%	7,041
Goldfield HMA	48%	52%	61,519
Stonewall HMA	53%	47%	25,790
Bullfrog HMA west*	60%	40%	67,323
Bullfrog HMA east	43%	57%	84,459**

*Pasture 6 in the Montezuma Allotment is part of the Bullfrog west HMA.
** This acreage includes the Springdale 2 Allotment and much of the Razorback Allotment. This is the total acreage of the Bullfrog East HMA.

The following AUMs are available for cattle use outside HMAs in the Montezuma Allotment. These acreages do not include AUMs in hilly areas or HMAs.

Table 97.0 - Available AUMs* for Cattle Use in the Montezuma Allotment – Outside the HMAs

Pasture	Growing Season AUMs	Dormant Season AUMs (most palatable forage only)	Dormant Season AUMs (least palatable forage only)	TNR or Ten-Year Grazing Lease or No Allocation for Cattle
Pasture 1 North	330	403	1347	Ten- Year Lease or TNR
Pasture 1 South	51	5	143	TNR
Pasture 2	46	0	200	TNR
Pasture 3 North	61	11	275	TNR
Pasture 3 Center	8	8	161	No allocation to cattle
Pasture 3 South	0	6	19	No allocation to cattle
Pasture 4	22	32	186	TNR
Pasture 5	226	192	1043	Ten-Year Lease or TNR
Pasture 6	0	0	0	Within the HMA

*Available AUMs were determined from the ESI data for this evaluation. These are proposed recommended stocking rates for the pastures in the Montezuma Allotment for Alternative 1 in the EA.

The following table shows the AUMs available by cattle, wild horses or burros in each HMA. If an allocation were to be made within the HMA to both cattle and burros, the amount of AUMs available for each animal would have to be reduced. For example, in the Goldfield HMA there are either 309 AUMs available for cattle in the watered portion or 449 AUMs for burros. If half were allocated to burros and half to cattle, then burros would be allocated 224 AUMs and cattle would be allocated 154 AUMs.

Table 98.0 - Available AUMs inside the HMAs for Cattle *or* Wild Horses *or* Burros in the Montezuma Allotment, Divided by Watered and Un-watered areas.

Herd Management Area	AUMs Horse	AUMs Horse *or*	AUMs Burro	AUMs Burro *or*	AUMs Cattle	AUMs Cattle
Watered or un-watered portions of the HMAs	Watered	Un-watered	Watered	Un-watered	Watered	Un-watered
Montezuma HMA	227	110	653	327	488	278
Paymaster HMA	0	0	0	0	0	0
Goldfield HMA	98	96	449	584	309	450
Stonewall HMA	32	26	99	250	95	124
Bullfrog HMA west*	66	18	823	180	248	57
Bullfrog HMA east**	19	61	283	973	114	393

*includes Pasture 6 of the Montezuma Allotment.

** includes parts of Montezuma and Razorback Allotments; and all of Springdale 2 Allotment.

4. <u>Riparian & Wetland Functioning Condition Data</u>

The riparian areas in the Complex were assessed by the riparian Proper Functioning Condition (PFC) method. The PFC process involves qualitative assessment of quantifiable riparian characteristics. This included assessment of channel morphology, hydrology, soil, and vegetative parameters to determine a rating. The rating system ranges from Proper Functioning Condition (PFC), to Functional at Risk (FAR), and finally Non-Functional (NF). A FAR rating must also have a trend assigned of Upward (FARU), Not Apparent (FARN), or Downward (FARD) for completion. The trend of a FAR riparian area is determined by analysis of historical photographs, prior PFC assessments, and the current site characteristics. Site characteristics, such as riparian area expansion or contraction, vegetative seral stage, vegetative vigor, soil deposition or erosion, are all important indicators of trend. Technical Reference Series 1737 developed by the Bureau of Land Management (BLM), National Resource Conservation Service (NRCS), and US Forest Service (USFS) further explains the methodology of Riparian FC Assessments.

a. **Lentic Riparian Rating**

Table 99.0 – Montezuma Allotment Lentic Proper Functioning Condition Ratings, Trends and Causative Factors

Site	Legal Description	PFC Rating, Date	Trend	Developed	Acres	Causal Factor
Lentic Sites						
Gold Bar Spring	T10S, R46E, sec. 33	Functional-At Risk, 3/1995	Not Apparent	Yes	0.001	Livestock and burros
		Functional-At-Risk, 6/1999	Upward	Yes	0.1	Burros
		Proper Functioning Condition, 3/2005		Yes	0.1	Source has been dynamited shut, not maintained Past development
Buck Spring	T12S, R46E, sec. 5	Nonfunctional, 3/1995	~	Yes	0.001	Livestock, burros, road, source dug out and not maintained
		Nonfunctional, 6/1999	~	Yes	0.001	
		Functional-At Risk, 3/2005	Downward	Yes	0.001	
Mud Spring	T11S, R46E, sec. 8	Functional-At Risk, 3/1995	Not Apparent	Yes	0.01	Livestock, burros, road, source dug out, ditching and not maintained
	"	Nonfunctional, 6/99	~	Yes	0.001	Livestock, burros, road, source dug out, ditching and not maintained
		Functional-At Risk, 3/2005	Not Apparent	Yes	0.001	Road, source dug out activities, ditching and not maintained
Crystal Spring	T11S, R47E, sec. 18 "	Functional-At Risk, 7/1994	Not Apparent	Yes	0.25	
		Proper Functioning Condition, 6/1999	~	Yes	0.25	
		Proper Functioning Condition, 9/2005		Yes	0.25	
Brickyard Spring	T2S, R41E, sec.36	Nonfunctional, 3/1995	~	Yes	0	Source dug out, little opportunity for rehabilitation or riparian vegetation
		Functional-At-Risk, 9/2005	Upward	Yes		
Cole Spring	T3S, R43E, sec. 2	Nonfunctional, 3/1995	~	Yes	0	Source has been developed. May not be enough subsurface water to support riparian vegetation

Table 99.0 – Montezuma Allotment Lentic Proper Functioning Condition Ratings, Trends and Causative Factors (con't)

Site	Legal Description	PFC Rating, Date	Trend	Developed	Acres	Causal Factor
Dago Joe	T2S, R41E, sec.36	Nonfunctional, 3/1995	~	Yes	0	Developed but maintained
Trespass Seep	T11S, R47E, sec. 7	Functional-At-Risk, 6/1999	Upward	No	0.001	Burros
		Proper Functioning Condition 9/2005		No	0.001	
Lower Indian Spring	T11S, R46E, sec. 26	Functional-At-Risk, 6/1999	Downward	Yes	0.25	
		Proper Functioning Condition 9/2005				
Upper Cave Spring	T11S, R46E, sec. 26	Proper Functioning Condition, 6/1999	~	No	0.1	
Wild Burro Seep	T11S, R46E, sec. 9	Functional-At-Risk, 6/1999	Upward	No	1.5	Burros
		Proper Functioning Condition, 9/2005		No	1.5	
Unnamed Seep (Jim's)	T11S, R46E, sec. 6	Proper Functioning Condition, 6/1999	~	No	0.001	
		Proper Functioning Condition, 6/1999	~		0.05	
Tognoni Spring.		No rated 9/2005		Yes		
Willow Spring		Functional-At-Risk, 9/2005	Not Apparent	Yes	0.05	Trespass Livestock
Unnamed Seep near Eagle Mine	T3S, R42E, sec. 5	Functional-At-Risk 3/1995	Not Apparent	Yes		Source dug out
Younghan's Spring		Proper Functioning Condition, 6/99		No		
Un-named Seep		Nonfunctional, 3/95		Yes		Wild Horse, Livestock , poor maintenance of development
Rainbow Mtn. Spring		Functional-At-Risk, 9/2005	Not Apparent	Yes		Dugout with heavy equipment
Harlan Keel Pond		Proper Functioning Condition, 9/2005		Yes		Ponding, piping

Analysis of Lentic Riparian Habitat

One of the major factors in the deterioration of the riparian habitat was the lack of engineering design in the development and follow-up maintenance of the range improvement projects. Human intrusions such as road development in the vicinity of the spring were factors in the worsening condition of the riparian habitat. In addition, free access to the spring sources by livestock, wild horses and burros contributed to further deterioration of these springs. Almost all of the springs affected in 1995 by grazing have since improved. There appears to be a direct relationship in the modification of spring hydrology and water availability during drought periods. A spring may more easily dry-up during periods of below normal precipitation because the hydrology of the spring has been altered.

The general trend in the lentic riparian habitat is moving toward proper functioning condition and away from non-functioning (NF) and functioning-at-risk conditions. In 2005, 11 sites were inventoried and none were rated as NF.

The general improvement in the lentic riparian habitat is principally due to the lower number of livestock, wild horses and burros. Burros, horses and cattle were removed from the allotment in the early to mid 1990s. In addition, water hauls are required as part Terms and Conditions stipulations for TNR authorization.

Table 100.0 –Riparian Rating Distribution in 2005

Rating/Lentic	PFC Rating Distribution in 2005
Non Functional	0
FARN	3
FARD	1
FARU	1
PFC	6

b. Lotic Riparian Rating

Table 101.0 – Lotic Proper Functioning Condition Ratings and Trends

Lotic Sites						
Site	**Locations**	**PFC Rating, Date**	**Trend**	**Causative Factor**		Acres
Amargosa River*	North of Beatty, near Jims Spring	Nonfunctional, 3/1994	~	None	~	0.5
		Proper Functioning Condition, 9/2005		None	~	0.5
Amargosa River*	Near the Narrows	Functional-At-Risk, 3/1994	Upward	None	~	1
		Functional-At-Risk, 9/2005	Upward	None	~	1
Amargosa River**	Between Hot Springs and TNC	Proper Functioning Condition, 6/1999	~	None	~	1
Amargosa River**	North of Sober-Up Gulch	Proper Functioning Condition, 6/1999	~	None	~	0.25
Amargosa River**	Manley's	Proper Functioning Condition, 6/1999	~	None	~	0.25
		Proper Functioning Condition, 9/2005	~	None	~	0.25
Amargosa River**	North of Stage Coach to Revert	Proper Functioning Condition, 6/1999	~	None	~	0.5
Amargosa River**	Cottonwood Road to Fluorspar Road	Proper Functioning Condition, 6/1999	~	None	~	0.5
Amargosa River**	Fluorspar Road south to Narrows	Proper Functioning Condition, 6/99	~	None	~	0.5
		Proper Functioning Condition, 9/2005			~	0.5
Amargosa River	Behind Stagecoach up to private	Proper Functioning Condition, 9/2005		None		
Amargosa River	North of town of Beatty, south Meadow	Proper Functioning Condition, 9/2005		None		
Amargosa River	North of town of Beatty, south	Proper Functioning Condition, 9/2005		None		
Amargosa River	South of Oleo Road	Functional-At-Risk, 9/2005	Upward	None		

* 1994 PFC assessment divided the Amargosa River into 3 segments
**1999 PFC assessment divided the Amargosa River into 7 segments rather than 3

Analysis of Lotic Riparian Habitat

Table 102.0 – Riparian Rating, 2005

Rating	PFC Rating Distribution in 2005
Non Functional	0
FARN	0
FARD	0
FARU	2
PFC	6

The 91 percent of the lotic habitat along the Amargosa has remained stable and not deteriorated. The Amargosa River reach #2 has improved from Non-functional in 1994 to PFC in 2005. The general improvement in the lentic riparian habitat is principally due to the lower number of livestock, wild horses and burros. Wild burros, wild horses and cattle were removed from the allotment in the early a mid-990s.

5. Wildlife Habitat Data

Habitat condition for any wildlife species can be defined as the ability of a specific land area to supply the forage, cover, water, and space requirements of an animal. Habitat condition, therefore, is a measure of habitat quality, and is determined by assessments, surveys, and studies. Trend is a measure of the directional change of the habitat, away from or toward a desired condition. Habitat Condition and Trend studies were completed for mule deer (BLM manual 6630.2) and bighorn sheep (BLM manual 6630.4) in the Montezuma Complex.

BH = Bighorn
DW = Mule deer winter range

Mule Deer Point Rating Summary
81-100 EXCELLENT
61-80 GOOD
51-60 FAIR
10-50 POOR

Bighorn Sheep Point Rating Summary
180+ EXCELLENT
160-179 GOOD
130-159 FAIR-GOOD
111-129 FAIR
81-110 POOR-FAIR
80 POOR

Habitat condition studies for big game were conducted on the allotment from 1988 to 1992 (refer to Table 103). According to the habitat condition studies, the overall upland habitat condition for the big game species that were monitored is at acceptable levels. Since the habitat condition studies were conducted, a significant number of wild horses and burros were removed in 1996 from Herd Management Areas located within theMontezuma Allotment. These wild horse and burro removals, combined with a cancellation of the Montezuma livestock grazing lease in 1992, have contributed to an increase in habitat quality and availability to wildlife. Pronghorns are increasingly being observed within the Montezuma Allotment from Tonopah to Tolicha Flat north of Beatty. Wild horse and burro removals, several favorable precipitation years producing high quality and quantity of preferred forage, and reducing wild horse numbers on the adjoining Nevada Training and Testing Range, have encouraged pronghorns to increase their population levels and distribution in Central Nevada. Pronghorn habitat management needs to be addressed at least on a seasonal basis (spring and winter) at this time. The allotment is lacking sufficient water distribution for pronghorn and a water development program may allow for a herd establishment. The Tonopah RMP Wildlife Habitat Determination Number 6 supports water development for pronghorn.

A thriving desert bighorn sheep population currently exists within Bare Mountain, Stonewall Mountain, and Lone Mountain. A Central Nevada Desert Bighorn Sheep Reintroduction-Augmentation Plan has been prepared for the entire Tonopah Planning Area. This operations plan, once finalized, is in conformance with the RMP determination for desert sheep and identifies the habitat areas that current and additional desert sheep management may occur with augmentations or transplants. The limiting factor for desert sheep in the Tonopah Planning Area is perennial water sources. Desert sheep water developments (guzzlers) should be planned for the Sawtooth and the Montezuma habitat areas. The desert sheep habitat areas in the Montezuma Allotment include all of the Goldfield, Stonewall and Sawtooth; and portions of Montezuma, Lone Mountain, Bare Mountain, and Grapevine ranges.

Table 103.0 - Big-Game Habitat Condition Studies, Montezuma Allotment

STUDY SITE	PREVIOUS RATING	RATING
WS-40-BH	N/A	GOOD 1/88*
WS-40-DW	N/A	EXCEL** 1/88
WS-62-BH	N/A	EXCEL 2/88
WS-62-DW	N/A	GOOD 2/88
WS-74-BH	N/A	GOOD 6/88
WS-74-DW	N/A	GOOD 6/88
WS-75-BH	N/A	GOOD 6/88
WS-75-DW	N/A	GOOD 6/88
WS-89-BH	REPLACE	FAIR/GOOD 7/88
WS-89-DW	REPLACE	FAIR 7/88
WS-90-DW	N/A	EXCEL 7/88
WS-101-DW	N/A	GOOD 11/88
WS-108-DW	N/A	GOOD 3/89
WS-109-BH	N/A	EXCEL 3/89
WS-109-DW	N/A	GOOD 3/89
WS-121-BH	N/A	FAIR/GOOD 6/89
WS-121-DW	N/A	GOOD 6/89
WS-138-BH	GOOD 8/89	FAIR/GOOD 11/92
WS-138-DW	FAIR 8/89	FAIR 11/92
WS-173-BH	N/A	GOOD 1/91
WS-173-DW	N/A	N/A

*date study was conducted
**Excellent

Summary of Data

The majority (7 out of 11) of big game studies show habitat in good condition. Only two were in fair condition and two were in excellent condition. For bighorn sheep, 4 out of 10 habitat studies were in good condition, and 3 were in fair to good condition. Two sites were in excellent condition. No sites were in poor condition. This may be due to the lack of cattle use in mule deer and bighorn sheep habitat. Apparently, neither burros nor wild horses competed with either species in this Complex.

6. Data Summary in the Montezuma Allotment

North Montezuma

The northern portion of the allotment is mainly dominated by salt desert shrub plant communities dominated by shadscale, Bailey greasewood or spiny menodora. The Montezuma Range is in saltbrush, sagebrush and pinyon-juniper vegetation types.

The number of livestock in the northern portion of the allotment was greatly reduced in 1991. From 1991 onward, the majority of use was by wild horses, only a few cattle remained. Changes in vegetation have been due to weather changes. The following years were dry: 1986, 1989, 1992, 1996, 2002, & 2003 and 1987, 1995, 1998, 2000 & 2005 were wet. The loss of shadscale and Indian ricegrass is mainly due to the effects of drought on a decadent plant community. Wild horse use did contribute to the loss of Indian ricegrass prior to 1996 in the majority of the allotment, and up until 2006 in the area between Lone Mountain and Tonopah.

In 1996, wild horses were removed from the Montezuma, Goldfield and Stonewall HMAs to prevent further death from starvation. Available forage in these HMAs was scarce due to poor quality soils. Wild horses in the Paymaster HMA were not removed in 1996. Horses had moved down off the HMA into a very productive area in the northern most portion of the allotment, between the town of Tonopah and Lone Mountain. The continued use by wild horses in this area has damaged the vegetation between Tonopah and Lone Mountain this area needs to be rested. Horses were removed from this area in 2006. However, the wild horses still reside in the area between Lone Mountain and Tonopah. After the gather in 2007, some wild horses were returned to the Paymaster HMA and they have now moved back out of the HMA into the area between Lone Mountain and Tonopah. Until wild horses are permanently removed, this area will continue to receive use by wild horses.

Precipitation in south central Nevada is highly variable. The stocking rate for cattle, wild horses and wild burros needs to be based on the amount of forage available in most dry years.

South Montezuma

The southern portion of the allotment is dominated by hot desert vegetation in the valleys and spiny menodora and sagebrush in the Bare Mountains.

Livestock have not used the majority of the southern portion of the allotment. The area south of the Bullfrog Hills was considered undesirable range for cattle by the former lessee. In 1994, he offered to remove his cattle permanently from the Bullfrog Hills and the valley south of the hills. All of this southern portion of the allotment is in the Bullfrog HMA and is dominated mainly hot desert vegetation: creosote bush, white bursage and wolfberry in the valleys or spiny menodora and sagebrush in the hills. It is suitable burro range but is not suitable wild horse range and is poor cattle range. Burros browse the white bursage and other shrubs in this area. Key Area 8 is typical of the valleys in the southern most portion of the allotment.

The northern portion of the southern end of Montezuma (called pasture 5 below), north of the Bullfrog HMA is good quality cattle range. The hot desert vegetation ecotones with salt desert shrub vegetation in this area. Parts of this area are dominated by winterfat and fourwing saltbush with some Indian ricegrass. The ricegrass has died out of much of this area due to droughts in the 1990s and in 2002. Since the removal of the majority of burros in 1996, the pasture appears to be slowly recovering. This area can be conservatively stocked for cattle use. Pasture 5 is better suited for winter use.

G. Razorback Allotment Data Analysis

1. Actual Use

Table 104.0 - History of Grazing Use in the Razorback Allotment – Fleur De Lis Ranch

Year	Actual Use	AUMS	Year	Actual Use	AUMs	Year	Actual Use	AUMs
2004 (1)	192	959	1999	0	0	1994	350(2)	876
2003	0	0	1998	0	0	1993	112	1348
2002	0	0	1997	21	218	1992	112	1348
2001(3)	38	37	1996	24	207	1991	112	1348
2000	0	0	1995	24	207			

(1) variable number throughout the authorized grazing number ranging from 30 animals for one month to 100 head
(2) pasturing agreement did not exceed the permitted AUMs
(3) grazing for one month

Herd Management Areas within Razorback Allotment

Table 105.0 – HMA within the Razorback Allotment

HMA	Type of Animal	Number of Animals
Bullfrog	Burro	53 (636 AUMs)

There is no fence between the Razorback Allotment and the Nevada Training and Testing Range, livestock and burros can freely move in and out of the allotment. Burros were gathered in 1995 because they were over AML and 1996 because there was a drought. In 1995, 164 burros were removed and in 1996, 150 were removed from the allotment. Some of these burros may have spent part of their time on the Nevada Training and Testing Range.

2. Key Area Assessments

Key Area 1

Ecological Site: 030XA093NV, Quartzite Fan 5-7"
Production: 262 lbs (66 lbs native perennial species), 400 lbs/acre in PNC
Dominant Vegetation: Nevada ephedra and spiny hopsage

Percent Utilization Data

Table 106.0 - Key Area 1 - Percent Utilization – Razorback Allotment

Species	Percent Utilization												
	Jan 1990	Nov 1990	Dec 1991	Mar 1993	Nov 1993	Mar 1994	Dec 1994	Mar 1995	Oct 1995	Mar 1996	Nov 1996	Feb 2004	May 2004
Nevada ephedra	5	40	41	10	30	10	10	10	10	10	10	2.5	2.5
Desert needlegrass	62	52	52	12	16	16	14	14	10	10	10	2.5	2.5
White bursage	-	-	-	-	10	-	19	10	10	10	10	2.5	2.5
Spiny hopsage	-	-	-	-	-	-	-	-	-	-	-	2.5	2.5
Spiny menodora	-	-	-	-	-	-	-	-	10	10	10	-	-

- No data collected.

Desired Plant Community

Table 107.0 - Desired Plant Community- Key Area 1 - Razorback Allotment

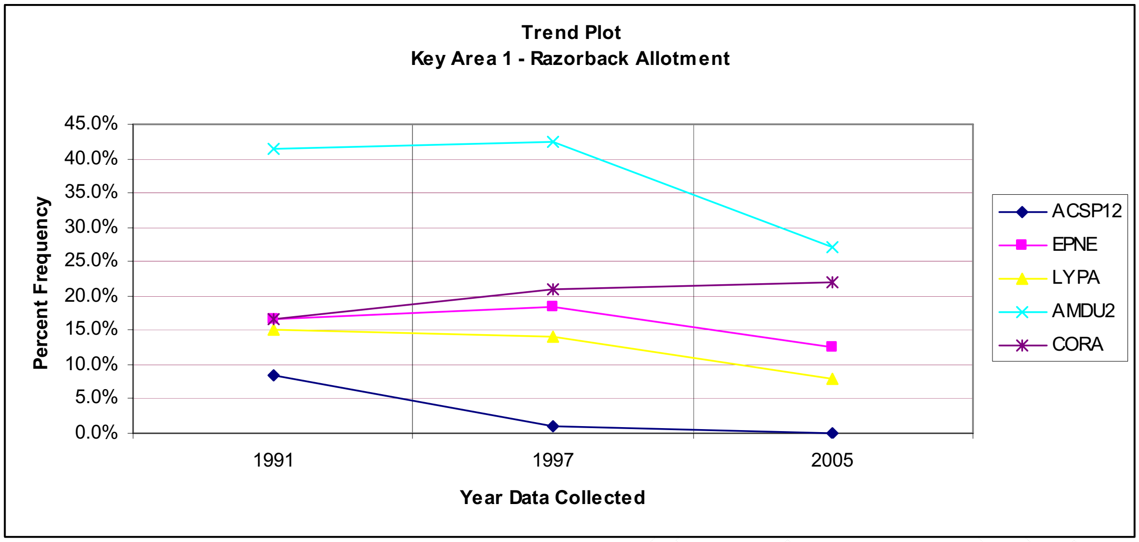
Species	Pounds/Acre	PNC	Desired Plant Community
Red brome	171	0	0
Desert Needlegrass	T	8-32	3
Annual forbs	25	T-32	Varies with precipitation
White bursage	15	60-120	35
Blackbrush	12	120-180	12
Nevada ephedra	20	T-12	20
Spiny hopsage	19	T-12	19
Creosote bush	T	T-12	T
Winterfat	T	T-12	1
Anderson's wolfberry	T	T-12	T
Pale wolfberry	T	T-12	T
Spiny menodora	T	8-20	T
Golden bush	T	T-12	T
Mojave aster	T	T-12	T

Trend Data

Table 108.0 - Key Area 1 – Trend Plot Data – Razorback Allotment

Razorback Allotment		Trend Data Plot	Key Area 1 - Percent Frequency		
Common Name	**Scientific Name**	**Plant Symbol**	**1991**	**1997**	**2005**
Desert needlegrass	*Achnatherum speciosum*	ACSP12	8.5%	1.0%	0.0%
Red brome	*Bromus rubens*	BRRU2	54.0%	99.0%	100.0%
Winterfat	*Krascheninnikovia lanata*	KRLA2	2.0%	1.0%	2.5%
Spiny Hopsage	*Grayia spinosa*	GRSP	7.0%	7.5%	7.0%
Spiny Mendora	*Menodora spinescens*	MESP2	3.5%	2.5%	2.5%
Nevada Ephedra	*Ephedra nevadensis*	EPNE	16.5%	18.5%	12.5%
Goldenhead	Haplopappus spp	HAPLO11	4.5%	8.0%	6.5%
Pale wolfberry	*Lycium pallidum*	LYPA	15.0%	14.0%	8.0%
Anderson's wolfberry	*Lycium andersonii*	LYAN	2.0%	2.5%	1.5%
White bursage	*Ambrosia dumosa*	AMDU2	41.5%	42.5%	27.0%
Blackbrush	*Coleogyne ramosissima*	CORA	16.5%	21.0%	22.0%
Shockley's goldenhead	*Acamptopappus shockleyi*	ACSH	2.0%	3.0%	3.0%
Mojave aster	*Xylorhiza tortifolia*	XYT02	0.0%	2.0%	1.0%

Graph 9.0 - Key Area 1 - Trend Plot Data - Razorback Allotment



Analysis of Trend

Table 109.0 – Key Species 1 – Analysis of Trend

Plant Species	Trend 1991 - 1997	Trend 1997 - 2005	Trend 1991 - 2005
White bursage	Static	Decrease	Decrease
Nevada ephedra	Static	Static	Decrease
blackbrush	Static	Static	Static
Pale wolfberry	Static	Static	Static

Photo 30.0 – General View of Key Area 1 – Razorback Allotment

Analysis and Discussion

Key Area 1 is in the most southern portion of the Razorback Allotment in an area that has traditionally received less use by cattle than the northern portion of the allotment. It is within desert tortoise habitat and in the Bullfrog HMA.

There is little potential for grass to increase on this site. Soils are shallow with a pan restricting root depth. Vegetation productivity and rainfall are low. The potential natural plant community (PNC) is best suited for burro use. There is little forage for cattle in spring and summer and almost no available forage for wild horses.

The former lessee ran well below his grazing preference from 1994 to 1997. Thereafter, the lessee grazed his livestock only once in 2003 for one month. One hundred and sixty four burros were gathered from the allotment in 1995 because the animals were over AML and 150 more in 1996 because of drought. It appears that burros and cattle did not graze near this key area because utilization levels were minimal after 1993. Utilization has generally not exceeded allowable use levels. Changes in the plant community between 1991 and 2005 appear to be more related to drought than grazing. There is no data prior to 1990 when this key area was established.

White bursage and Nevada ephedra both have decreased on the site while it appears that blackbrush may have increased; however, it is not a statistically significant increase. Ephedra is an early seral stage plant while blackbrush is late seral. If future readings show a significant increase in blackbrush, it would appear the site moving toward the natural plant community for a blackbrush dominated plant community. These changes may not be related to grazing or precipitation. The loss of white bursage may also be part of this trend towards a plant community dominated by blackbrush. Even though the site may be moving back toward the potential natural community with the increase of blackbrush and loss of Nevada ephedra, trend would be considered downward due to the loss of white bursage and Nevada ephedra, both important burro forage species. These losses are most likely due to drought in 1996 and 2002.

Sixty-five percent of the production at this key area is red brome, an annual non-native grass species. Red brome is a fire hazard similar to cheatgrass in northern Nevada. Two fires burned in 2006 in the Beatty area. The high production of red brome is due to the wet weather the last few years. Total production of native perennials is 66 lbs per acre; the potential for the site is 400 lbs per acre. This is 16 percent of the potential production is low for the site.

Recommendation

This soil is very unproductive. There is little forage available for wild horse or cattle use. However, there is some wild burro forage. There has been little use by livestock in this southern portion of the allotment throughout the evaluation period. Because this soil is very unproductive, a conservative stocking rate should be established for burro use only.

Standard & Guidelines & Land Use Plan Assessment for Key Area 1

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 110.0 - Indicator Assessment for Key Areas 1

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	No cover data was collected at this key area, however production was collected in 2004. Lower production on perennial species generally results in lower ground cover. Production at this key area was only 38% of the potential for the site. 25% of the total production here is native perennial species.	Not Met	Soil is less productive than is average for this site. Little to no use by cattle or wild equids in this area. Poor quality soil and recent droughts -causal factors.
Vegetation composition (relative abundance of species)	Trend shows a loss of Nevada ephedra and white bursage, both important burro browse.	Not Met	Recent droughts are the most likely the causal factor.
Vegetation structure (life forms, cover, height, and age classes)	Age class information was not taken at this key area. The loss of white bursage and Nevada ephedra leads to the conclusion that these species may be decadent.	Not Met	Recent droughts are the most likely the causal factor.
Vegetation productivity	Production at this key area was only 38% of the potential for the site. 25% of the total production here is native perennial species. Only in very wet years do seedlings sprout, since the majority of years here are dry or normal, seedlings do not establish yearly in this desert but establish in large numbers during a few very wet years. It is typical in this desert to find large numbers of plants in one single age class.	Not Met	Soil is less productive than is average for this site. No use by cattle or wild equids in this area. Poor quality soil and recent droughts -causal factors.-causal factor for lack of productivity.
Vegetation nutritional value	White bursage and Nevada ephedra grow here and provide wild burro forage. This site does not support forage suitable for wild horses or cattle.	Partially Met	Poor quality soils and climate do not support cattle or horse forage.

Table 111.0 - Standard Assessment for Key Area 1, Razorback Allotment

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Not Met	Causal factors are 1. Soil is less productive than is average for this site; 2. Drought in 1996 and 2002.
Standard 2	Not Met	Causal factors are 1. Soil is less productive than is average for this site; 2. Drought in 1996 and 2002.
Standard 3	Not Met	Causal factors are 1. Soil is less productive than is average for this site; 2. Drought in 1996 and 2002.

<u>Key Area 2</u> – Only utilization is gathered at this plot.

<u>Percent Utilization Data</u>

Table 112.0 – Key Area 2 - Percent Utilization - Razorback Allotment

Species	Percent Utilization						
	Jan 1990	**Nov 1990**	**Dec 1991**	**Mar 1994**	**Apr 1995**	**Mar 1997**	**Mar 2004**
Indian ricegrass	70	-	-	57	-	7	-
Fourwing saltbush	84	90	54	44	30	9	2.5
Nevada ephedra	-	72	44	30	30	-	2.5
Cattle saltbush	-	-	-	10	-	-	-
Spiny hopsage	-	-	-	-	30	-	-

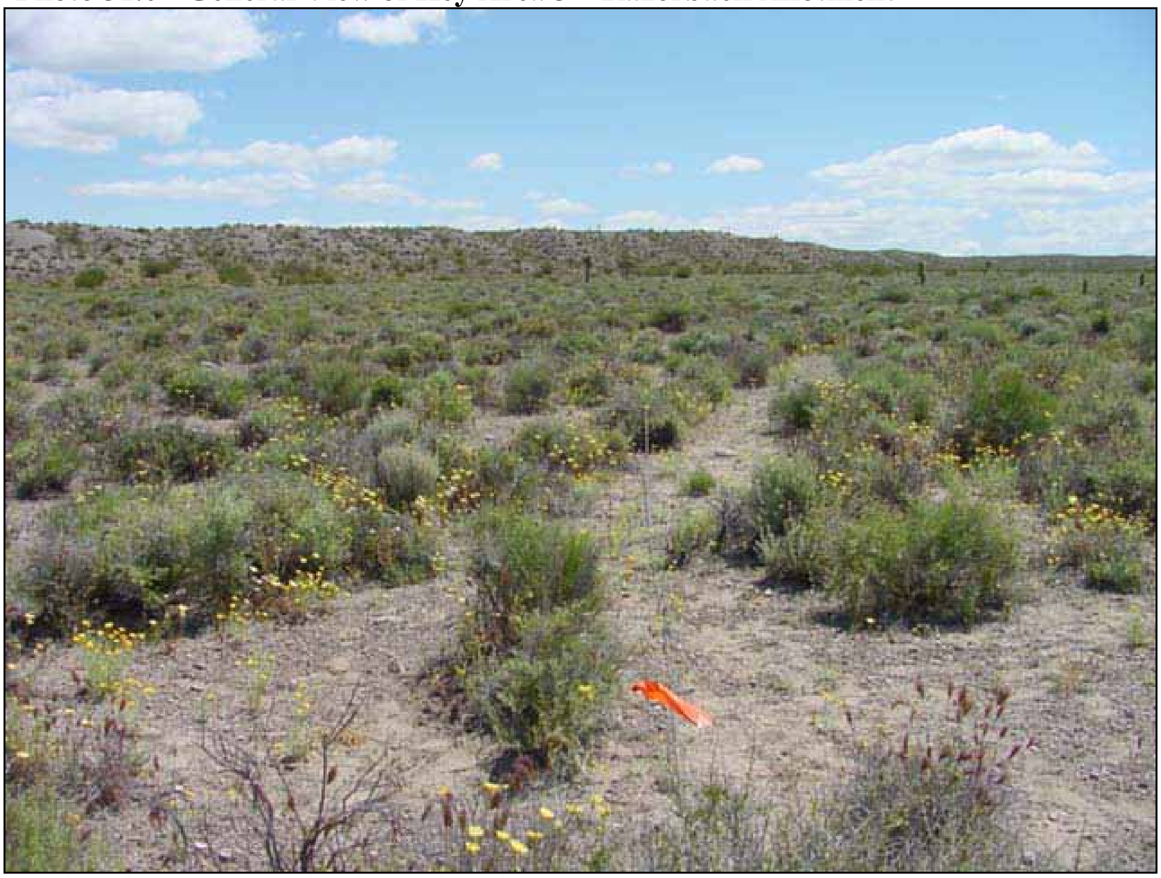
- No data collected.

Key Area 2 is in the northern portion of the allotment in Beatty Wash, which has received excessive use from livestock and wild equids prior to 1997. It is within the northern portion of the Bullfrog HMA. Utilization level was heavy to severe in 1990. Livestock were completely removed in 1997 and burros were gathered in 1995 and 1996. Burros were gathered in 1995 because they were well over AML and in 1996 because there was a drought. Use has dropped significantly since then.

Key Area 3

Ecological Site: 030XA063NV, Sandy 5-7"
Production: 566 lbs (all native perennial species), 500 lbs/acre in PNC
Dominant Vegetation: Fourwing saltbush

Photo 31.0 - General View of Key Area 3 – Razorback Allotment



Percent Utilization Data

Table 113.0 - Key Area 3 - Percent Utilization – Razorback Allotment

Species	Percent Utilization								
	Jan 1990	Nov 1990	Dec 1991	Mar 1993	Mar 1994	Mar 1995	Mar 1996	Mar 1997	Mar 2004
Indian ricegrass	62	70	29	67	-	10	10	-	-
Fourwing saltbush	61	54	20	10	15	10	10	30	2.5
Nevada ephedra	28	-	-	-	-	-	-	-	-
Winterfat	-	53	14	-	10	10	10	19	2.5
Bud sagebrush	-	-	-	10	-	-	-	-	2.5

- No data collected.

Desired Plant Community

Table 114.0 - Desired Plant Community -Key Area 3 - Razorback Allotment

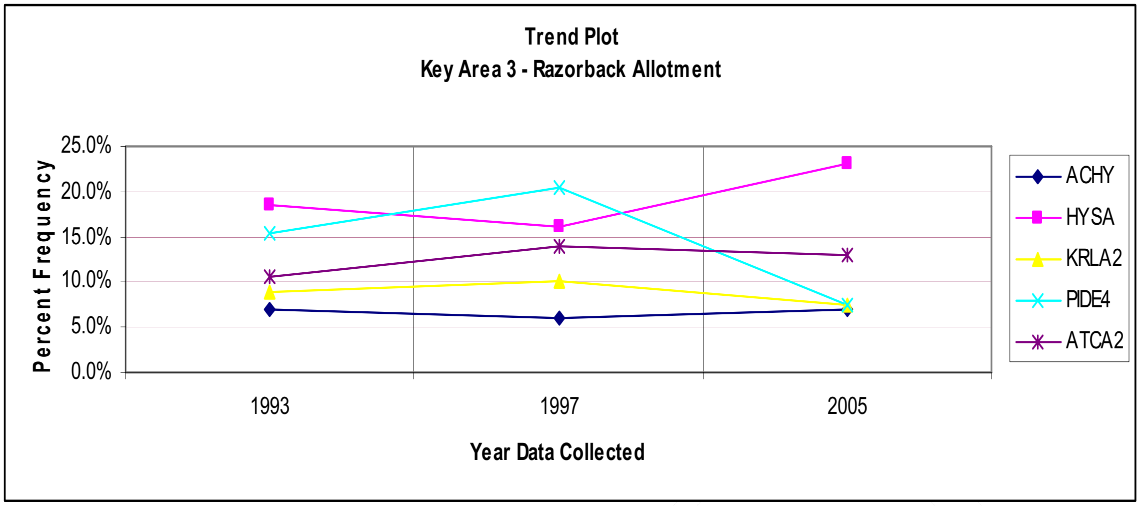
Species	Pounds/Acre	PNC	Desired Plant Community
Red brome	Trace	0	0
Indian ricegrass	Trace	100-150	50
Annual forbs	Trace	1	1
Winterfat	17	50-100	25
Spiny menodora	79	T-15	50
Bud sagebrush	62	T-15	62
Spiny hopsage	16	T-15	16
Fourwing saltbush	292	100-200	292
Cheeseweed	92	T-15	72
Anderson wolfberry	8	T-15	8

Trend Data

Table 115.0 - Key Area 3 – Trend Plot Data – Razorback Allotment

Razorback Allotment		Trend Data Plot	Key Area 3 – Percent Frequency		
Common Name	Scientific Name	Plant Symbol	1993	1997	2005
Indian ricegrass	*Achnatherum hymenoides*	ACHY	7.0%	6.0%	7.0%
Squirreltail	*Elymus elymoides elymoides*	ELELE	2.0%	0.5%	0.0%
Burrobrush	*Hymenoclea salsola*	HYSA	18.5%	16.0%	23.0%
Winterfat	*Krascheninnikovia lanata*	KRLA2	9.0%	10.0%	7.5%
Spiny Hopsage	*Grayia spinosa*	GRSP	1.0%	1.5%	2.0%
Bud sagebrush	*Picrothamnus desertorum*	PIDE4	15.5%	20.5%	7.5%
Spiny Mendora	*Menodora spinescens*	MESP2	4.5%	4.5%	5.0%
Nevada Ephedra	*Ephedra nevadensis*	EPNE	3.5%	4.5%	2.0%
Anderson's wolfberry	*Lycium andersonii*	LYAN	2.5%	6.0%	5.0%
White bursage	*Ambrosia dumosa*	AMDU2	1.0%	2.0%	1.5%
Fourwing Saltbush	*Atriplex canescens*	ATCA2	10.5%	14.0%	13.0%

Graph 10.0 - Key Area 3 - Trend Plot Data - Razorback Allotment



Analysis of Trend

Table 116.0 - Key Area 3 – Analysis of Trend – Razorback Allotment

Plant Species	Trend 1991 - 1997	Trend 1997 - 2005	Trend 1991 - 2005
Burrobrush	Static	Increase	Static
Spiny Hopsage	Static	Static	Static
Spiny Mendora	Static	Decrease	Decrease
Nevada Ephedra	Static	Static	Static

Analysis and Discussion

Key Area 3 has a very productive sandy soil. This soil could support more Indian ricegrass than is currently available. Droughts cause periodic die offs of ricegrass and the full potential for ricegrass listed in the ecological site may never be reached in this area. However, the goal of 50 pounds per acre should be attainable with lower stocking rates. Increases in amounts of desirable vegetation generally come only during wet periods.

Key Area 3 is approximately one mile from the base property of Fleur de Lis Ranch and within the most northern edge of the Bullfrog HMA. Use by cattle has always been heavier near the ranch. Utilization transects studies from 1990 to 2004 demonstrated that use was heavy prior to 1994 and slight between 1994 and 2004. The former lessee greatly reduced his numbers in 1994 and stopped running livestock in 1997 except in 2001. Large numbers of burros were removed in 1995 to 1996. However, the removal of burros did not affect the use in this area, because use decreased prior to their removal. Cattle made the majority of the use on this key area. The grazing season regime provided for rest from use from January 1 to April 30 every year. This rest gave fourwing saltbush and winterfat the opportunity to grow and recover. There was no loss or gain in these three important forage species (fourwing, winterfat and ricegrass) between 1993 – 1997 and 1997 – 2005. The only changes in the plant community were a loss of bud sagebrush and a gain in burrobrush. Neither plant is preferred forage for cattle. Bud sagebrush is used when it grows in areas with no other available forage. However, here it grows with three other highly palatable species and is therefore not highly desired. The change in vegetation may be related to weather rather than grazing.

Trend is static. Production is 113 percent of normal. This site is in very good condition. Little change is expected except a possible increase in Indian ricegrass.

Recommendation

This soil is a very productive sandy soil that is still supports three important forage species (fourwing saltbush, winterfat and Indian ricegrass). Because of the low precipitation rate and periodic droughts, a conservative stocking rate should be established for livestock use. The current grazing season is successful at maintaining fourwing saltbush in the site.

Standards & Guidelines & Land Use Plan Assessment for Key Area 3

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 117.0 - Indicator Assessment for Key Area 3

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	No cover data was collected at this key area, however production was collected in 2004. Higher production on perennial species generally results in higher ground cover. Production exceeded the potential for the site. 100% of the total production here is native perennial species.	Met	
Vegetation composition (relative abundance of species)	Trend is static. Production is 113% of normal. This site is in very good condition (late seral). Important forage species present.	Met	
Vegetation structure (life forms, cover, height, and age classes)	Age class information was not taken at this key area. Trend is static which indicates there is little decadence in the plant community beyond what is typical for this area.	Met	
Vegetation productivity	Production was collected in 2004. Production exceeds the potential for the site. All of the total production is native perennial species.	Met	
Vegetation nutritional value	Fourwing saltbush, winterfat and some Indian ricegrass grow here and provide high quality cattle forage.	Met	

Table 118.0 - Standard Assessment for Key Area 3, Razorback

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Met	
Standard 2	Met	
Standard 3	Met	

Key Area 4

Ecological Site: 030XA063NV, Sandy 5-7”
Production: 788 lbs (774 lbs native perennial species), 500 lbs/acre in PNC
Dominant Vegetation: Spiny hopsage

Photo 32.0 - General View of Key Area 4 – Razorback Allotment

Courtesy of M. Pointel, RMS, BLM, TFS, 2006.

Percent Utilization Data

Table 119.0 - Key Area 4 - Percent Utilization – Razorback Allotment

Species	Percent Utilization								
	Jan 1990	Nov 1990	Dec 1991	Mar 1993	Mar 1994	Mar 1995	Mar 1996	Mar 1997	Mar 2004
Indian ricegrass	76	-	-	-	18	-	-	31	-
Nevada ephedra	16	-	-	10	-	10	10	-	2.5
Desert needlegrass	-	60	10	-	-	-	-	-	-
Winterfat	-	-	-	10	10	10	10	-	-
Spiny hopsage	-	-	-	10	10	10	10	-	2.5
Spiny menodora	-	-	-	10	-	10	10	-	2.5

- No data collected.

Desired Plant Community

Table 120.0 - Key Area 4 - Desired Plant Community - Razorback Allotment

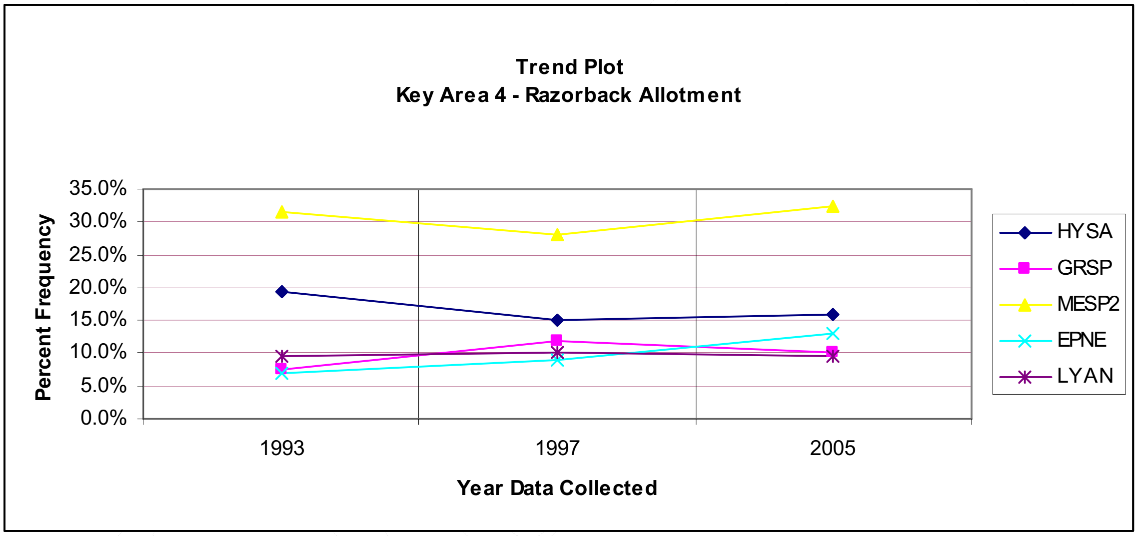
Species	Pounds/Acre	PNC	Desired Plant Community
Red brome	4	0	0
Desert needlegrass	27	T-15	27
Indian ricegrass	T	100-150	50
Annual forbs	10	T-10	10
Fourwing saltbush	T	100-200	40
Spiny menodora	152	T-15	120
Blackbrush	42	T-15	42
Spiny hopsage	495	T-15	400
Burrobrush	8	T-15	8
Anderson wolfberry	50	T-15	50
Winterfat	T	50-100	30
Ephedra	T	T-15	T
Bud sagebrush	T	T-15	T

Trend Data

Table 121.0 - Key Area 4 – Trend Plot Data – Razorback Allotment

Razorback Allotment		Trend Data Plot	Key Area 4 – Percent Frequency		
Common Name	**Scientific Name**	**Plant Symbol**	**1993**	**1997**	**2005**
Burrobrush	*Hymenoclea salsola*	HYSA	19.5%	15.0%	16.0%
Winterfat	*Krascheninnikovia lanata*	KRLA2	5.0%	4.0%	8.0%
Blackbrush	*Coleogyne ramosissima*	CORA	6.5%	3.5%	5.0%
Spiny hopsage	*Grayia spinosa*	GRSP	7.5%	12.0%	10.0%
Bud sagebrush	*Picrothamnus desertorum*	PIDE4	5.5%	4.0%	3.0%
Spiny menodora	*Menodora spinescens*	MESP2	31.5%	28.0%	32.5%
Nevada ephedra	*Ephedra nevadensis*	EPNE	7.0%	9.0%	13.0%
Anderson's wolfberry	*Lycium andersonii*	LYAN	9.5%	10.0%	9.5%

Graph 11.0 - Key Area 4 - Trend Plot Data - Razorback Allotment



Analysis of Trend

Table 122.0 – Key Area 4 - Analysis of Trend – Razorback Allotment

Plant Species	Trend 1993 - 1997	Trend 1993-2005	Trend 1997- 2005
Burrobrush	Static	Static	Static
Spiny hopsage	Static	Decrease	Decrease
Nevada ephedra	Increase	Increase	Increase
Spiny menodora	Static	Static	Static
Anderson wolfberry	Static	Static	Static

Analysis and Discussion

Key Area 4 is a very productive sandy soil and should support more Indian ricegrass than is currently here. Periodic droughts cause periodic die offs of ricegrass and the full potential for ricegrass listed in the ecological site may never be reached in this area. However, the goal of 50 pounds per acre should be attainable with lower stocking rates for this area. Increases in amounts of desirable vegetation generally come only during wet periods. Fourwing saltbush and winterfat should make up more of the plant community. This site has potential to improve by increasing the amount of fourwing and winterfat. Eventually, both should dominate the soil.

This key area is approximately five miles from the base property and within the northern portion of the Bullfrog HMA. Utilization transects taken from 1990 to 2004 displayed that utilization was heavy in 1990 and slight between 1991 and 2004. The former lessee, greatly reduced numbers of his livestock in 1994 and quit running livestock in 1997l except in 2001. The former lessee greatly reduced his numbers in 1994 and stopped running livestock in 1997 except in 2001. Large numbers of burros were removed in 1995 to 1996. However, the removal of burros did not affect the use in this area, because use decreased prior to their removal. Cattle made the majority of the use on this key area.

This site is dominated by spiny hopsage and spiny menodora, both increasers on sandy soils in the Mojave. Nevada ephedra, an early seral stage plant, increased between 1993 and 2005. There was no other significant change in the plant community between 1993 and 2005.

Trend is static. Production is 155 percent of normal.

Recommendation

This soil is a very productive sandy soil. Because of the highly variable precipitation, a conservative stocking rate should be established for livestock use.

Standards & Guidelines & Land Use Plan Assessment for Key Area 4

Standards 1, 2 & 3 will be assessed for the following indicators.

1. Ground Cover (standards 1 & 2);
2. Vegetation composition (standard 3);
3. Vegetation structure (standard 3);
4. Vegetation productivity (standard 3);
5. Vegetation nutritional value (standard 3).

Table 123.0 - Indicator Assessment for Key Area 4, Razorback Allotment

Indicator	Analysis	Met or Not Met	Causal Factor if not met
Ground Cover	No cover data was collected at this key area, however production was collected in 2004. Higher production on perennial species generally results in higher ground cover. Production exceeded the potential for the site. 100% of the total production here is native perennial species.	Met	
Vegetation composition (relative abundance of species)	Trend is static. Production is 155% of normal. This site is in good condition.	Met	
Vegetation structure (life forms, cover, height, and age classes)	Age class information was not taken at this key area. Trend is static which indicates there is little decadence in the plant community beyond what is normal for this area.	Met	
Vegetation productivity	Production was collected in 2004. Production exceeds the potential for the site. All of the total production is native perennial species.	Met	
Vegetation nutritional value	Desert needlegrass grows here. Site could support more fourwing saltbush and winterfat sometime in the future but indicator is still met without them.	Met	

Table 124.0 - Standard Assessment for Key Area 4, Razorback Allotment

Standard	Met or Not Met	Causal Factor if not met
Standard 1	Met	
Standard 2	Met	
Standard 3	Met	

Key Area 6 – Only utilization is gathered at this plot.

Percent Utilization Data

Table 125.0 - Key Area 6 - Percent Utilization – Razorback Allotment

Species	Percent Utilization					
	Dec 1994	Mar 1995	Oct 1995	Mar 1996	Nov 1996	Feb 2004
Nevada ephedra	10	10	10	10	10	2.5
Shadscale saltbush	10	10	10	10	10	2.5
White bursage	-	-	10	-	-	2.5

- No data collected.

Key Area 6 is in the most southern portion of the allotment in an area that has traditionally received less use by cattle than the northern portion of the allotment. It is farther down on the alluvial fan 2 to 3 miles east of Key Area 1. Utilization has been slight from 1994 to 2004. Cattle and burros have not used this site since it was established. This key area is within desert tortoise habitat and the southern portion of the Bullfrog HMA.

Key Area 7– Only utilization is gathered at this plot.

Percent Utilization Data

Table 126.0 - Key Area 7 - Percent Utilization – Razorback Allotment

Species	Percent Utilization					
	Dec 1994	Mar 1995	Oct 1995	Mar 1996	Nov 1996	Feb 2004
Nevada ephedra	10	10	10	10	10	2.5
Shadscale	10	-	-	-	-	-
Spiny hopsage	-	-	-	-	-	2.5

- No data collected.

Key Area 7 is in the southern half of the allotment in an area that has traditionally received less use by cattle than the northern portion of the allotment. Use has been slight from 1994 to 2004. Cattle and burros have not used this site since it was established. It is within the southern portion of the Bullfrog HMA.

3. Ecological Site Inventory Forage Availability & Vegetation

Vegetation in the Razorback Allotment varies from pinyon pine and blackbrush to saltbrush. The five vegetation categories that exist in the allotment are: blackbrush, saltbrush, hot desert shrub, washes, saline meadows, riparian and alkaline soils. Blackbrush is the most dominant vegetation type in the allotment.

Table 127.0 – Vegetation Types in Razorback

Vegetation Type	Percent of Allotment
Blackbrush	61%
Saltbrush	15%
Hot Desert Shrub	14%
Washes	9.5%
Saline Meadows, Alkaline Soils & Riparian	0.5%

a. Available Forage Determination

Because of the highly variable precipitation in the allotment and frequent droughts, a conservative stocking rate will be determined. All AUMs determined to be available to cattle or horse or burro in this section were calculated based on production data gathered in the early 1990s from an Ecological Site Inventory of this allotment. Forage was calculated based on the total pounds per acre (air dry weight) of forage multiplied by 25 percent (Holochek 1988; Holochek 1993 and Holochek et al. 2003) use multiplied by 75 percent, the amount of forage (Society for Range Management 1989) available in most drought years. The total pounds of forage in each HMA is then divided by 800 pounds (air dry), the amount of forage consumed in a month, to get an Animal Unit Month (AUM). One AUM is the forage required to support one grazing animal for one month. See 43 Code of Federal Regulations (CFR), §4130.8-1(2)(c). The allocation of 75 percent of the available forage rather than 100 percent avoids reductions or removals of livestock and wild equids in the majority of dry years. However, during the last 50 years at the Tonopah Airport, 11 years had precipitation levels significantly below 75 percent of normal. The proposed stocking rates will require temporary reductions or removals in extremely dry years, which occur in approximately 22 percent of years in this area. In extremely dry years such as 1996 and 2002, little to no forage is produced. The stocking rates that follow are guidelines.

Generally, this area is too dry to support a dependable crop of annual forage; therefore, annual plants were used in the analysis. Burros browse many shrubs and graze most grasses. The species that were used to calculate forage available for burros include white bursage, shadscale, fourwing saltbush, spiny hopsage, winterfat, both ephedra species, gray molly, budsage, galleta grass, alkali sacaton and all bunch grasses except fluff grass and desert king grass. Available horse forage was calculated using production of the winterfat, galleta grass, and all bunch grasses except fluff grass and desert king grass. Available cattle forage was calculated using shadscale, bud sagebrush, winterfat, fourwing saltbush, galleta grass, and all bunch grasses except fluff grass and desert king grass. Fluff grass and desert king grass are not palatable or grazed. Cattle browse shadscale in winter and budsage in late winter early spring. However, neither plant is highly preferred by cattle. Cattle that usually graze on grass pastures or on rangeland with abundant grasses and riparian vegetation do not generally use either budsage or shadscale and have difficulties adjusting and may starve on this range with no available grass.

The Razorback Allotment may be divided into a northern portion of approximately 25,000 acres and southern portion of approximately 48,000 acres (66% of the allotment). The southern portion of the allotment contains the desert tortoise habitat of the allotment, and it is within the Bullfrog HMA. The northern portion of the Razorback Allotment is divided into 2 areas. One area is within the Bullfrog HMA containing approximately 27 percent of the northern portion. The other area is approximately 73 percent of the northern portion and is outside the HMA.

The tables in the following section showing available AUMs and are not a final allocation of AUMs. They demonstrates that all of the available forage for cattle, wild horses or burro. These available AUMs were derived from ESI data for each pasture or HMA. The Proposed Action section of the EA explains how the AUMs will be allocated.

To determine watered portions of the HMAs, a four-mile buffer was drawn around each water inside the HMA using geographic information system. The available forage was calculated separately for watered and un-watered portions of the HMA.

b. <u>North Razorback</u>

The majority of North Razorback is outside the Bullfrog HMA. The southern end of the northern portion is within the HMA (Refer to Map 17.0).

Approximately 55 percent of the northern part of the allotment is in a valley and consists of salt desert shrub plant communities dominated by shadscale, spiny menodora, Nevada ephedra, Anderson wolfberry as well as; hot desert plant communities dominated by creosote bush, white bursage, spiny menodora, wolfberry, spiny hopsage and Nevada ephedra. These valley soils provide the majority of the forage in North Razorback.

The hills are dominated mainly by blackbrush with some spiny menodora. Neither vegetation type provides much forage for cattle.

Table 128.0 - Vegetation in the Northern portion of razorback outside the HMA

Salt	Hot	Sandy	Salt hill	Blackbrush	Menodora	Wash	RO
38%	12%	1%	5%	35%	5%	3%	1%

Table 129.0 - Available AUMs in Northern Razorback outside the HMA*

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	1 AUM	158 AUMs
Total in Valleys**	0 AUMs	83 AUMs

*These AUMs include the hills at the end of the pasture. Forage in these areas is limited and difficult for cattle to use due to slopes.
**The total dormant season forage available and the total in the valley. This leaves 75 AUMs available for dormant season use in the hills.

Table 130.0 - Vegetation in the Northern portion of razorback outside the HMA

Salt	Hot	Sandy	Salt hill	Blackbrush	Menodora	Wash	RO
38%	12%	1%	5%	35%	5%	3%	1%

Map 17.0 - North and South Portion of the Razorback Allotment

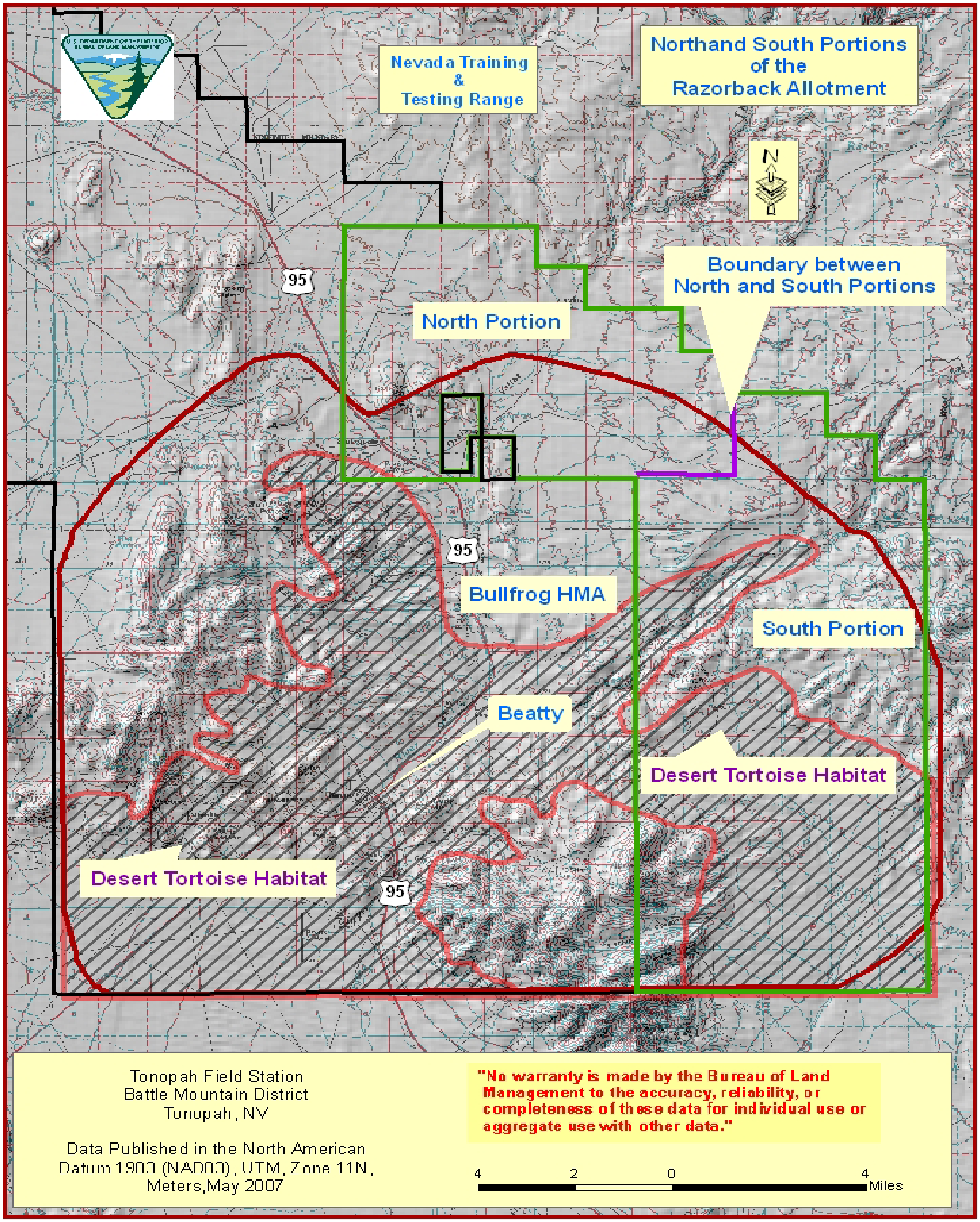


Table 131.0 - Available AUMs in Northern Razorback outside the HMA*

Cattle AUMs	Growing Season Forage (grass)	Dormant Season Forage (shrubs)
Total available*	1 AUM	158 AUMs
Total in Valleys**	0 AUMs	83 AUMs

*These AUMs include the hills at the end of the pasture. Forage in these areas is difficult for cattle to use due to slopes and its poor quality.
**The total dormant season forage available as well in the valley. This leaves 75 AUMs available for dormant season use in the hills.

The portion of the North Razorback within the Bullfrog East HMA is also within Oasis Valley. Oasis Valley also contains the Springdale 2 Allotment. This area is dominated by saltbrush and hot desert vegetation similar to the area in North Razorback outside the HMA mentioned above. There are some saline meadows and riparian areas in Oasis Valley but the majority of these meadows and riparian areas occur on private land. This private land in Oasis Valley is the base property for both the Razorback and Springdale 2 Allotments.

Table 132.0 - Vegetation in the Northern portion of razorback inside the HMA

Salt	Hot	Wash	Sandy	Saline Meadow	Sodic
48%	33%	8%	7%	3%	1%

Table 133.0 - Available AUMs, Northern Razorback Allotment in the Bullfrog East HMA

Grazing Animal	North Portion of HMA
Wild Horse or	2 AUMs* (0 wild horses)**
Wild Burro or	156 AUMs* (10 burros)**
Cattle	110 AUMs* (mainly Growing Season)

* These AUMs are included in Table 137.0 below, in the dry portion of the HMA
** Wild horses or burros yearlong.

c. South Razorback

Eastern Half of the Bullfrog HMA – This area includes the northern portion of the Razorback Allotment mentioned above as well as the Springdale 2 Allotment and a portion of the Montezuma Allotment. Refer to the "Montezuma Allotment Data" section, "Ecological Site Inventory Forage Availability & Vegetation." Approximately 60 percent of the east-half of the HMA is hilly terrain. The most northern end of the HMA is in Oasis Valley. This area has a high water table, and approximately one percent of the East Bullfrog HMA is dominated by inland saltgrass and Baltic rush. Much of the private land in the area occurs in Oasis Valley. Outside these saline meadows are saltbrush and hot desert vegetation communities.

The majority of the vegetation in the valley, south of Oasis Valley is hot desert vegetation dominated by creosote bush, white bursage, spiny menodora, shadscale, wolfberry, spiny hopsage and Nevada ephedra. South of Oasis Valley, the Bullfrog Hills are dominated by blackbrush. The southern most portion of the allotment is a valley dominated by creosote bush, white bursage and wolfberry. This area is within Desert Tortoise habitat and use annual forage in spring and fall when the come out of hibernation.

Annual forbs and grasses do grow on this HMA. The most common forb is fiddlehead (*Amsinkia spp.*) and the most common annual grass is red brome. Red brome, a non-native grass, is a fire hazard similar to cheatgrass (*Bromus tectorum*) in Northern Nevada. In 2006, two fires occurred in the HMA, one on the east portion and one on the west half of the HMA. Annual plants provide little consistent forage. They are often absent in dry years.

Table 134.0 - General Vegetation Types in the Eastern Half of Bullfrog HMA*

Blackbrush	Hot Desert	Washes	Saltbrush	Barren	Sandy	Saline Meadow
49%	29%	10%	5%	6%	1%	Trace

* includes all of Springdale 2 Allotment and portions of Razorback and Montezuma Allotments

The portion of the Bullfrog East HMA inside the Razorback Allotment alone has the following vegetation:

Table 135.0 - Southern portion of Razorback inside the HMA, no water

Blackbrush	Hot	Wash	Salt	Sandy
78%	9%	8%	2½%	1½%

Table 136.0 - Southern portion of Razorback inside the HMA, water available

Blackbrush	Hot	Wash
65%	21%	14%

East Bullfrog is approximately 80 percent hills dominated mainly by blackbrush, and 20 percent valleys dominated mainly hot desert vegetation, creosote bush, white bursage, Nevada ephedra, and various wolfberries. These soils do not support much perennial grass. The main forage species available are white bursage and Nevada ephedra. Both are important burro forage, but are not browsed by cattle or wild horses.

The following acreages and AUM levels for the HMA do not exclude steep areas. These numbers may need to be reduced to account for some inaccessible forage. Any reduction of AUMs based in the steeper portions of this HMA would significantly reduce forage within the HMA.

Table 137.0 - Available AUMs in the Eastern Half of Bullfrog HMA including Montezuma, Razorback and Springdale 2 Allotments

	Watered Portion of HMA	Dry Portion
Wild Horse or	19 AUMs (1 wild horses)*	61 AUMs (5 wild horses)*
Wild Burro or	283 AUMs (23 burros)*	973 AUMs (81 burros)*
Cattle	114 AUMs (mainly dormant season)**	393 AUMs (mainly dormant season)**

* Wild horses or burros yearlong.

** There is some grass available for spring and summer use. However, the majority of forage available for cattle is dormant season forage (shrubs). This table includes Montezuma, Razorback and Springdale 2 AUMs.

Table 138.0 - Livestock AUMs available in each Allotment, Bullfrog East

Allotment	Watered Portion of HMA	Dry Portion
Montezuma	56 AUMs (dormant season)	115 AUMs (dormant season)
Razorback	58 AUMs (dormant season)	261 AUMs (yearlong)
Springdale 2	none	17 AUMs (yearlong)

Table 139.0 - Burro and Horse AUMs in each Allotment, Bullfrog East

Allotment	Watered Portion	Dry Portion
Montezuma	154 burro or 8 horse AUMs	362 burro or 6 horse AUMs
Razorback	129 burro or 11 horse AUMs	582 burro or 52 horse AUMs
Springdale 2	none	29 burro or 3 horse AUMs

Specie Spring is located in the eastern-half of the Bullfrog HMA and is the only available water in the area. Approximately 70 percent of the eastern-half of the HMA is dry and a small reach of the Amargosa River, which often also dry. This severely limits the amount of forage available for livestock or wild equids. This portion of the HMA has the lowest amount of available water in the Complex.

d. Summary

In extremely dry years, there is little to no grass available. Almost no nutritious forage is available for horse use. However, some browse is still available for burro use. Shrubs are deeper rooted than grasses or forbs and fewer shrubs than grasses die in extreme droughts. This leaves more available browse than grass for forage during extreme droughts.

HMA Summary

In the Bullfrog HMA, the majority of the vegetation is dominated by blackbrush and hot desert shrub. Since the Bullfrog East HMA supports very little grass, it has little forage available for horse or cattle except in the Oasis Valley portion of the HMA. More forage is available for burros than either wild horses or cattle.

Livestock Summary

The majority of the available forage on the Complex is in the valleys. The hills have poorer quality forage that is often less accessible to cattle due to steep slopes. This HMA has very little suitable horse range and the forage in the HMA should be reserved for burros not wild horses. The northern most portion of the HMA in Oasis Valley is suitable for cattle use and should be allocated to both cattle and burros. The remainder of the HMA should be allocated exclusively for burro use.

Table 140.0 - Acres in Valleys and Hills in each Pasture in the Razorback Allotment

Pasture	Acres in Valleys	Acres in Hills	Total Acres in Pasture
North Pasture outside HMA	9,953	8,034	17,987
North Pasture inside HMA	6,680	0	6,680
Bullfrog HMA east	9,727	31,391	49,660

Table 141.0 - Percent of Valleys and Hills in each Pasture in the Razorback Allotment

Pasture	Percent Acres Valleys	Percent Acres Hills	Total Acres in Pasture
North Pasture outside HMA	55%	45%	17,987
North Pasture inside HMA	100%	0	6,680
South Bullfrog HMA (East)	20%	80%	49,660*

* This includes 35,743 acres within the HMA with no available water and 13,917 acres within the HMA with water available.

4. Riparian Wetland Functioning Condition Data

The riparian areas in the Complex were assessed by the riparian Proper Functioning Condition (PFC) method.

Table 142.0 – Lentic Habitat Rating in the Razorback Allotment

Riparian Habitat Rating				
Site	PFC Rating, Date	Trend	Developed	Causal Factor
Specie Spring	Nonfunctional, 3/1994	Not apparent	Yes	Artificial pond created because of man made dam, road adjacent to riparian area
	Proper Functioning Condition, 6/2006		Yes	

Analysis

There is only one riparian area in the allotment, Specie Spring. Functional condition improved at this spring between 1994 and 2006. It improved from nonfunctional to Proper Functioning Condition. Following the wild burro gathers that removed large numbers of wild burros from the Bullfrog HMA and the removal of livestock in the mid 1990's from the Razorback Allotment, the riparian area has been able to recover from excessive utilization. Desert bighorn sheep also utilize Specie Spring.

Photo 33.0 – Specie Spring – Razorback Allotment

Courtesy of M. Pointel, RMS, BLM, TFS, 2007.

5. Wildlife Habitat Data

There are no wildlife habitat studies in the Razorback Allotment. This allotment is in the Mojave Desert which provides marginal habitat for big game species.

6. Data Summary of the in the Razorback Allotment

Following the removal of cattle and large numbers of burros, riparian condition on the allotment has improved. Vegetation outside riparian areas is poor quality and has little potential to change.

H. Springdale 2 Allotment Data Analysis

Photo 34.0 – Springdale 2 Allotment

Courtesy of M. Pointel, RMS, BLM, TFS, 2007.

1. **Actual Use**

a. **Livestock** - **Authorized Use**

Mr. George and Larene Younghans is the only lessee on the Springdale 2 Allotment. The season of use is yearlong for 2 cattle from March 1 to February 28 for 24 AUMs.

Table 143.0 - Current Permitted Use for Razorback Allotment

Allotment	Operator	Cattle Number	Grazing Begin	Grazing End	AUMs
Springdale 2	Younghans	2	1 March	28 February	24

b. **Wild Horse and Burro**

Table 144.0 – HMA within the Springdale 2 Allotment

HMA	Type of Animal	Number of Animals
Bullfrog	Burro	2
	Total AUMs	**24**

2. **Ecological Site Inventory Forage Availability**

Vegetation in the Springdale 2 Allotment varies from riparian to hot desert shrub. The following six vegetation categories exist in the allotment: Hot Desert, Saltbrush, Barren, Saline Meadows & Riparian, Sodic Soils and Washes. Hot desert is the most dominant vegetation type in the allotment. These six vegetation types are described in detail in the in the vegetation section of the EA.

Table 145.0 – Vegetation Types in Springdale 2

Vegetation Type	Percent of Allotment
Hot Desert	48%
Saltbrush	40%
Barren	7%
Saline Meadows and Riparian	3%
Sodic Soils	1%
Washes	1%

The majority of the Springdale 2 allotment is in a valley and is mainly dominated by hot desert vegetation, and saltbrush. The southwestern portion of the allotment has a high water table and is dominated by inland saltgrass and Baltic rush. Much of the use by livestock, prior to 1996, occurred in southwestern part of the allotment adjacent to the lessee's private land. This area is dominated by saline meadows and alkaline plant communities. A portion of a small hill is included in the southeastern portion of the allotment. This hill covers approximately 26 percent of the allotment and it receives little to no use by livestock. Just to the east of the hill is a sandy area providing highly palatable forage. This area was heavily grazed by livestock prior to 1996.

Table 146.0 - Available AUMs in the Springdale 2 Allotment *

	Dry Portion of Bullfrog HMA
Wild Horse or	2 AUMs (wild horses)*
Wild Burro or	29 AUMs (burros)*
Cattle	17 AUMs

* Wild horses or burros yearlong.

For a full discussion of the Bullfrog East HMA, see Montezuma Allotment's Ecological Site Inventory Forage Availability in this document.

__Summary__

Forage is limited in the Springdale 2 allotment. There is enough forage to support 2 burros *or* one cow. This is below the current allocations for both burros and cattle which include 2 burros *and* 2 cattle. The allotment boundary is unfenced and livestock or burros can easily leave the allotment to find more forage. The area is not suitable for wild horses.

Photo 35.0 - Beatty Wash, north of Beatty, NV

Courtesy of M. Pointel, RMS, BLM, TFS, 2006.

2. Riparian & Wetland Functioning Condition Data

The riparian areas in the Springdale 2 Allotment were assessed by the riparian Proper Functioning Condition (PFC) method.

Table 147.0 – Lotic Rating - Springdale 2 Allotment

Site	PFC Rating, Date	Causative Factor
Amargosa River #1*	Nonfunctional, 3/1994	Human intrusion, road development, burro use
	Proper Functioning Condition, 6/1999	
	Proper Functioning Condition, 9/2005	

#1 Fleur de Lis
#1 North of Younghan's
* 1994 PFC assessment broke up the Amargosa River into 3 segments
**1999 PFC assessment broke up the Amargosa River into 7 segments rather than 3

There is only one riparian area in the allotment, the Amargosa River. Functional condition improved at this area between 1994 and 1999-2005. It improved from nonfunctional to Proper Functioning Condition. Following the wild burro gathers that removed large numbers of wild burros from the Bullfrog HMA in the mid 1990's and the removal of livestock in the mid 1990's from the Razorback Allotment, the riparian area has been able to recover from excessive utilization.

3. Wildlife Habitat Data

There are no wildlife habitat studies in the Springdale 2 Allotment. This allotment is in the Mojave Desert which is marginal habitat for big game species.

4. Date Summary of the Springdale 2 Allotment

Following the removal of large numbers of burros, riparian condition on the allotment has improved. Vegetation outside riparian areas is poor quality and has little potential to change.

VI. <u>Management Evaluation</u>

Montezuma, Razorback and Springdale 2 Allotments

Purpose

The allotment evaluation and rangeland health assessment is the process in which to determine if current multiple uses for the allotment are making progress towards meeting the Land Use Plan (LUP) Objectives, allotment specific objectives, Rangeland Program Summary Objectives and the RAC Standards and Guidelines for Rangeland Health. The following section will evaluate the Montezuma, Razorback and Springdale 2 Allotments and the Bullfrog, Goldfield, Montezuma, and Stonewall HMAs, and a small portion of the Paymaster HMA for achievement of the objectives and standards.

A. Montezuma Allotment

1. RAC Standards Conformance Review

Standards Conformance Review of the Mojave/Southern Great Basin Resource Advisory Council Standards and Guidelines in the Montezuma Allotment

The Montezuma Allotment is located within the Mojave-Southern Great Basin RAC. Standards and Guidelines for rangeland health were approved and published in 1997. In December 2000, the Mojave-Southern Great Basin RAC approved Wild Horse and Burro Standards and Guidelines and they were incorporated into the existing rangeland health document. The current version of the RAC Standards and Guidelines is located in Appendix B.

Table 148.0 - Montezuma Allotment Key Area Assessment

Key Area	Standard 1		Standard 2		Standard 3	
		Causal Factor		Causal Factor		Causal Factor
1	Not Met	Drought Excessive use	Not Met	Drought Excessive use	**Met**	
2	Not Met	Drought Excessive use	Not Met	Drought Excessive use	**Met**	
3	Not Met	Drought Excessive use	Not Met	Drought Excessive use	**Met**	
4	**Met**		**Met**		Not Met	Drought
5	**Met**		**Met**		Not Met	Drought
6	**Met**		**Met**		Partially Met	Drought Excessive use
8	**Met**		**Met**		**Met**	
9	**Met**		**Met**		Not Met	Drought Excessive use
10	**Met**		**Met**		Not Met	Drought Excessive use

1. Excessive use by cattle or wild horses or wild burros
2. Frequent droughts due to highly variable weather patterns.

Standard 1: Soils

Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity, and sustain the hydrologic cycle.

Soil Indicator – Upland watershed condition

As indicated by: Ground Cover.
Surfaces (e.g. biological crust, pavement)
Compaction/filtration

MET on 78 percent of allotment.
NOT MET on 22 percent of allotment

This standard is MET on Pastures 2, 3, 4, 5, 6 and 1 South, which represent 78 percent of the allotment. The standard is **NOT MET** at Key Areas 1, 2 and 3 in the north portion of Pasture 1. Pasture 1 North covers approximately 22 percent of the allotment.

Significant Progress: Yes

Significant progress has been made towards meeting the standard by removing the wild horses from Pasture 1 North in the fall of 2006. For the plant, community to continue to progress, set a new lower allocation for livestock in Pasture 1 North and remove any remaining horses that are outside the Paymaster and Montezuma HMAs.

Rationale:

The BLM collected monitoring and baseline data at nine key areas within the Montezuma Allotment. These key areas serve as a basis for the upland health assessment. They are used to determine the effects of livestock, wild equids, and wildlife use within the allotment. An evaluation of this standard was completed on all key areas. Following the analysis, interpretation and evaluation of available monitoring information, it was determined that this standard is met at seven out of nine key areas. The standard is not met at Key Areas 1, 2 and 3. These key areas represent a very productive portion of North Montezuma Allotment, Pasture 1 North. This area in northern Montezuma has very productive soils and lies outside of the HMAs in the allotment. Frequency trend data shows a loss of Indian ricegrass, an important forage for wild horses and cattle. Precipitation data indicates there are frequent droughts. Cover at the sites shows reduction in cover to below the potential for the site. Cover collected at Key Areas 4 through 10 meets the average cover for the ecological sites.

This standard is met on Pastures 2, 3, 4, 5 and 6. It has also been met on the remaining portion of Pasture 1, which is south of the Montezuma HMA and outside the very productive soils in Pasture 1 North, Montezuma Allotment.

Causal Factor:

In 1990 to 1991, the lessee removed the majority of cattle from the allotment. In 1996, large numbers of wild horses and burros were removed due to drought from all of the HMAs in the allotment except the Paymaster HMA and this area outside the Paymaster HMA. Some of these HMAs were left with almost no wild equids. The horses from Paymaster HMA were residing outside the HMA in the Montezuma Allotment between Lone Mountain and Tonopah on the very productive soils in the northern portion of Pasture 1, Montezuma Allotment. This was the only place in the allotment with adequate forage to support horses in 1996. While the wild horses in the other HMAs were thin, the horses outside the Paymaster HMA were still healthy and for this reason they were not removed until the fall of 2006. Between 1996 and 2006, there were two droughts in the area and horses heavily used the forage in this area outside the HMA. As the horse population grew, their use exceeded allowable use levels and caused the loss of important forage species. The loss of Indian ricegrass and cover at Key Areas 1, 2 & 3 was due to this excessive use along with drought. The recent horse removal in 2006 will lead to an improvement in vegetation condition in the North portion of Pasture 1. In the future, we must remove all wild horses residing outside the Paymaster HMA in Pasture 1 and provide at least 3 years for the site to recover before introducing a limited number of livestock into the area.

Riparian Soil Indicators

As indicated by: Stream bank stability

MET on 100 percent of the Amargosa River in the allotment.

All reaches of the river had adequate vegetation cover on streambanks.

Significant Progress: Yes

The riparian sites along the Amargosa River have made significant progress towards proper functioning condition since the first Proper Functioning Condition studies were conducted in 1994. All reaches of the Amargosa River have improved. To maintain condition, a new lower allocation of both cattle and wild horses and burros needs to be made and maintained.

Rationale:

Streambank stability is indicated by proper vegetative cover along the streambank. The BLM assessed Proper Functioning Condition along the Amargosa River in 2005 and 2006 and earlier in 1994 and 1999. All reaches of the Amargosa River examined in 1994 (three reaches) lacked adequate vegetation cover on streambanks. In 1999 and 2005, all reaches of the Amargosa River had adequate vegetative cover on the streambanks.

Causal Factor:

Prior to 1996, wild horses and burros were well above their AML on the allotment and many had left the HMAs to find forage. Full numbers of cattle were run in conjunction with wild equids on the allotment. In 1990 to 1991, the lessee removed the majority of cattle from the Montezuma Allotment. He left approximately 50 to 60 cattle scattered throughout the allotment. In 1996 due to drought, a large number of wild horses and burros were removed the Allotment. Riparian conditions improved between the mid 1990s and 2006 due to the removal of grazing animals.

Standard 2: Ecosystem Components

Watersheds should possess the necessary ecological components to achieve State water quality criteria, maintain ecological processes, and sustain appropriate uses.

Upland Indicators:

As indicated by:

- Canopy and ground cover, including litter, live vegetation, biological crust, and rock appropriate to the potential of the ecological site.
- Ecological processes are adequate for the vegetation communities.

MET on 78 percent of allotment.
NOT MET on 22 percent of allotment

This standard is **MET** on Pastures 2, 3, 4, 5, 6 and 1 South.

The standard is **NOT MET** at Key Areas 1, 2 and 3 in Pasture 1 North.

Significant Progress: Yes

The BLM removed wild horses from Pasture 1 North in the fall of 2006. Tit is too soon to see an improvement in Pasture 1 North. But significant progress has been made towards meeting the standard by removing the majority of horses from this area.

Rationale:

The BLM collected monitoring and baseline data at nine key areas within the Montezuma Allotment. These key areas serve as a basis for the upland health assessment. They are used to determine the effects of livestock, wild horse and wildlife use within the allotment. An evaluation of this standard was completed on all key areas. Following the analysis, interpretation and evaluation of available monitoring information, it was determined that this standard is met at seven out of nine key areas. The standard is not met at Key Areas 1, 2 and 3. These key areas represent a very productive portion of North Montezuma Allotment, Pasture 1. This area in northern Montezuma has very productive soils and lies outside of the HMAs in the allotment. Frequency trend data shows a loss of Indian ricegrass, an important forage for wild horses and cattle. Precipitation data indicates there are frequent droughts. Cover at these sites shows reduction in cover to below the potential for the site. Cover collected at Key Areas 4 through 10 meets the average cover for the ecological sites.

This standard is met on Pastures 2, 3, 4, 5 and 6. It has also been met on the remaining portion of Pasture 1, which is south of the Montezuma HMA and outside the very productive soils in Pasture 1 North, Montezuma Allotment.

Causal Factor:

In 1990 to 1991, the lessee removed the majority of cattle from the allotment. In 1996, large numbers of wild horses and burros were removed due to drought from all of the HMAs in the allotment except the Paymaster HMA and this area outside the HMA. Some of these HMAs were left with almost no wild equids. The wild horses from Paymaster HMA were residing outside the HMA in the Montezuma Allotment betweenLone Mountain and Tonopah on the very productive soils in the northern portion of Pasture 1, Montezuma Allotment. This was the only place in the allotment with adequate forage to support wild horses in 1996. While the horses in the other HMAs were thin, the horses outside the Paymaster HMA were still healthy and for this reason they were not removed until the fall of 2006. Between 1996 and 2006, there were two droughts in the area and horses heavily used the forage in this area outside the HMA. As the horse population grew their use exceeded allowable use levels and caused the loss of important forage species. The loss of Indian ricegrass and cover at Key Areas 1, 2 & 3 was due to this excessive use along with drought. The recent horse removal in 2006 will lead to an improvement in vegetation condition in the North portion of Pasture 1. In the future, all wild horses residing outside the Paymaster HMA in Pasture 1 should be removed and at least 3 years rest be provided for site recovery before introducing a limited number of livestock into the area.

Riparian Indicators:

As indicated by:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows.
- Elements indicating proper functioning condition such as avoiding accelerating erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics:

- Width/Depth ratio;

- Channel roughness;

- Sinuosity of stream channel;

- Bank stability;

- Vegetative cover (amount, spacing, life form); and

- Other cover (large woody debris, rock).

- Natural springs, seeps, and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering, and release as indicated by plant species and cover appropriate to the site characteristics.

MET or making significant progress on 100 percent of the riparian areas in the allotment.

The majority the riparian areas are in Proper Functioning Condition.

Significant Progress: Yes

The few riparian areas that are Functioning at Risk have improved from Non-Functioning to Functioning at Risk. Riparian areas have made significant progress towards Proper Functioning Condition since the first Functioning Condition studies were read in 1994.

Rationale:

The Functioning Condition study measures whether adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows. The BLM assessed Functioning Condition along the Amargosa River in 2005 and 2006 and earlier in 1995 and 1999. In 2005 and 2006, seven out of nine reaches of the Amargosa were properly functioning, the remaining two were functioning at risk with an upward trend. This is an improvement between 1994 and 1999 when there were two reaches in nonfunctioning condition (1994), one functioning at risk (1994) and six properly functioning (1999). See the following table.

Table 149.0 – Riparian Habitat Rating

Rating on the Amargosa River (lotic sites)	Proper Functioning Condition	Functioning at Risk	Non-Functioning	Total number of Reaches Evaluated***
1994-1999	6	1*	2	9
2005-2006	7	2**	0	9

* In 1994-1999, 1 was functioning at risk with upward trend.
** In 2005-2006, 2 were functioning at risk with an upward trend.
*** Total reaches evaluated along the Amargosa River was 13, some of which covered different areas in 1995-1999 and 2005-2006.

Thirteen springs and seeps were evaluated in 2005 and 2006. Eight were properly functioning, five were functioning at risk, two were upward trend, and three had not apparent trend. This is an improvement in functionality since 1994 and 1999. There were seven nonfunctioning; six at risk and only three properly functioning (refer the following table).

Table 150.0 – Riparian Habitat Rating

Ratings on Springs and Seeps* (lentic sites)	Proper Functioning Condition	Functioning at Risk	Non-Functioning	Total number of Springs or Seeps Evaluated
1994-1999	3	6	7	16
2005-2006	8	5	0	13

* In 1994-1999, 1 was functioning at risk with downward trend, 3 were upward and 2 had no apparent trend.
** In 2005-2006, 1 was functioning at risk with downward trend, 1 was upward and 3 had no apparent trend.

Causal Factor:

Prior to 1996, wild horses and burros were well above their AML on the allotment and had left the HMAs to find forage on areas outside of the HMAs. Full numbers of cattle were run in conjunction with wild equids on the allotment until the lessee removed the majority of cattle from the Montezuma Allotment in 1990 – 1991. He left approximately 50 to 60 cattle scattered throughout the allotment. In 1996 due to drought, a large number of wild horses and burros were removed the Allotment. Since the removal of these animals, riparian conditions have improved between the mid 1990s and 2006.

Water Quality Indicators:

As indicated by:

- Chemical, physical and biological constituents do not exceed the State water quality Standards.

The above indicators shall be applied to the potential of the ecological site.

Most likely **MET** or making significant progress on 100 percent of the riparian areas in the allotment.

Water quality data was not collected for these riparian areas.

Significant Progress: Yes

Due to the low number of animals using these waters, the water quality in the allotment may not be affected by grazing animals.

Causal Factor:

The gathers in 1996 almost completely removed wild horses and burros from the range. The lessee removed the majority of cattle from the allotment in 1990 to 1991. The few cattle and wild equids remaining in the allotment may have caused some water quality issues at a few springs because they are unfenced. However, because these few remaining animals do not use many waters, most waters are unused by many grazing animals.

Standard 3: Habitat and Biota

Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses.

As indicated by: *Vegetation composition (relative abundance of species);*
Vegetation structure (life forms, cover, height, and age classes);
Vegetation distribution (patchiness, corridors);
Vegetation productivity;
Vegetation nutritional value.

NOT MET

This standard is met on Pastures 1 North, 2, 4 & 6 (Bullfrog HMA) for the indicators listed above. The standard is not met on Pastures 1 South, 3, 5, including Goldfield, Montezuma, Stonewall HMAs.

Although some of these pastures and one HMA meet the indicators listed above, none of these pastures and HMAs can support the previously determined *appropriate uses* of 1) livestock grazing (outside HMAs) or 2) wild horse and/or wild burro with livestock inside HMAs, at the former stocking rates for cattle and current AMLs for wild equids. Therefore, the pastures listed above as meeting standards are determined to be not meeting the standard due to the lack of forage to support the previous stocking rates for cattle and the current AMLs for wild equids.

Significant Progress: Yes

Up until 1990 – 1991 and 1996, full numbers of cattle and excessive numbers of wild horses and burros were run in the allotment. Since the removal of cattle in 1990 – 1991, and horses and burros in 1996, the range conditions have improved. There were set backs during this time period due to drought that caused the loss of some plant species in the plant communities.

Rationale:

The BLM collected monitoring and baseline data at nine key areas within the Montezuma Allotment. The data collected are used to determine the effects of livestock, wild equids, and wildlife use within the allotment. An evaluation of this standard was completed at all key areas.

The BLM also conducted an Ecological Status Inventory on the Montezuma Allotment to determine production and species composition. This data serves as a basis for the upland health assessment and was used to determine the amount of forage available for cattle, wild horses or burros on the allotment.

Following the analysis, interpretation and evaluation of available monitoring information, it was determined that this standard is met for the indicators listed above when compared to the ecological site potential at four (1, 2, 3 & 8) out of nine key areas. The standard is not met at Key Areas 4, 5, 9 and 10, and partially met at Key Area 6. However, most of the soils in the allotment cannot support the former allocations for livestock and wild equids. This became obvious during the drought in 1996. Cattle had already been removed from the majority of the allotment in 1990 – 1991, but during the drought of 1996, wild horses starved due to lack of forage in Esmeralda and Nye counties.

The Ecological Status Inventory data indicates a total of 6331 AUMs are available in the allotment if all available AUMs were allocated to livestock exclusively (this includes the AUMs available inside the HMAs). The total AUMs previously permitted in the allotment for cattle and wild equids equals 18,324 AUMs, almost three times the available amount. The AML previously set for wild horses and burros greatly exceeded the available forage. Large numbers of wild horses and burros left the HMAs to find forage. This over-allocation damaged the vegetation on the more productive soils and on riparian areas in the allotment.

The climate in the allotment is very dry. The average rainfall is 5.24 inches a year and ranges from 1.42 to 10.64 inches a year in the valleys of northern Montezuma Allotment. The average rainfall is 6.2 inches a year and ranges from .46 to 12.62 inches a year in the valleys of southern Montezuma Allotment. Drought frequently occurs in the northern half of the allotment in approximately one out of every three years. Drought is not as frequent in the southern portion within the Mojave Desert as in the north but the amount of rainfall both portions of the allotment receive is very marginal. Not enough rain falls to support some of the important grass species such as Indian ricegrass during these dry years. In 15 out of 50 years, northern Montezuma received less than 4 inches of rainfall a year. These frequent extremely dry years cause perennial grasses to die out of the plant communities. Because of this there is little to no grass available for grazing species like wild horses in many years. It may take many years before the area receives enough rain for ricegrass and other perennial grass seed to sprout. These die offs of Indian ricegrass occur throughout Esmeralda and southern Nye Counties in areas with little or no grazing.

Causal Factor:

The Montezuma allotment is very dry and mainly in 3 to 5 inch and 5 to 8 inch precipitation zones. This arid climate, combined with the frequent severe droughts, cause major die-offs of important grasses and shrubs. Perennial grasses are scarce throughout the allotment due to the arid climate and poorly developed soils that cannot hold water near the surface. The lack of grass makes the HMAs in the allotment marginal habitat for wild horses. These HMAs are better burro habitat.

In the past, the maximum allocated numbers of cattle were run in conjunction with wild equids on the allotment. In 1990 – 1991, the lessee removed the majority of cattle from the allotment. Prior to 1996, horses and burros were well above their AML. In 1996, large numbers of horses and burros were removed due to drought. Few now remain. The reduction in numbers of grazing animals would have allowed the sites with potential to improve the opportunity to improve. However, much of the allotment has little potential to change.

Conservative stocking rates for cattle and conservative AMLs must be established to diminish the impact of grazing animals on this environment and on the animal's health. Lower stocking rates and AMLs will meet guidelines 3.3: "Wild horse and burro herd management should provide for growth, reproduction, and seedling establishment of those plant species needed to reach long-term land use plan objectives," and 3.5: "Wild horse and burro herd management practices will promote the conservation, restoration and maintenance of habitat for special status species."

It is not possible to meet guideline 3.4: "Wild Horse and Burro herd management practices should be planned and implemented to provide for integrated use by domestic livestock and wildlife" due to the lack of forage in the majority of these HMAs. In order to stock viable numbers of wild burros in these HMAs and to support native wildlife, no cattle can be run in conjunction with burros except on the northern portion of the Bullfrog HMA.

Standard 4: Wild Horses and Burros

Wild horses and burros within Herd Management Areas should be managed for herd viability and sustainability. Herd Management Areas should be managed to maintain a healthy ecological balance among wild horse and /or burro populations, wildlife, livestock, and vegetation.

As indicated by:

Herd health indicators.
Herd viability indicators.

NOT MET in any of the five HMAs in the allotment. The general health of wild horses is poor in the allotment. Wild horses are frequently thin and sometimes or crippled. In 1996, starving wild horses were removed from the allotment. In 2006, there was a high frequency of horses with club feet removed from just outside the Paymaster HMA in Pasture 1 North. These wild horses were very thin (Average Henneke Score of 3). Genetic variability of horses and burros in the allotment may be poor. Further studies are needed to confirm this.

Prior to the removal of burros from the HMA in 1996, burros were thin, but in fair condition. However, burros had not shed their winter coats, an indication of poor nutrition.

Due to little precipitation and arid soils, these HMAs support very little grass, especially for wild horses, and there is a drastic shortage of water. There is no water on approximately half of the total area of these HMAs.

Significant Progress: Yes

The lessee removed the majority of his cattle in 1990 to 1991 and the BLM removed large numbers of starving wild horses and stressed burros in 1996. This has led to an improvement in range condition in the allotment.

Rationale:

The issues at the HMAs in the Montezuma Complex are:

- Lack of forage in the HMAs, particularly for wild horses,
- Lack of water,
- Frequent droughts,
- Poor genetic variability of the wild horse and burro populations.

RAC Guideline 4.2, requires BLM to set the AML "to reflect the carrying capacity of the land in dry conditions based upon the most limiting factor: living space, water or forage." It also states, "Management levels will not conflict with achieving or maintaining standards for soils, ecological components, or diversity of habitat and biota."

The present AML cannot meet the standard. It exceeds the carrying capacity of the range. There is not enough forage to support the high number of wild horses and burros along with cattle grazing inside these HMAs. There is also not enough grass throughout the allotment to sustain viable wild horse populations. Historically large numbers of wild equids had to leave the HMAs to find feed. It became evident that these HMAs could not sustain the large numbers of animals on the range prior to 1996. Since then, rangeland monitoring has proven that the range cannot even sustain current AML, as evidenced by continued existence of very thin wild horses seen throughout the Complex even though numbers are below AML and almost no cattle are utilizing the allotment.

The Montezuma Complex has a history of drought, necessitating emergency wild horse and burro gathers to prevent starvation of the animals in the area. The Goldfield HMA alone was gathered in 1990, 1994, and twice in 1996 due to drought and starvation. The 1996 drought threatened the existence of wild horses and burros in both Esmeralda and Nye counties. Almost no growth occurred on vegetation in the spring of 1996, and wild horses were consuming dried grasses with little remaining food value. Grass became so scarce that wild horses were in very poor condition. Burros were thin, but in fair condition. Neither the wild horses nor the burros had shed their winter coats, an indication of poor nutrition. Most domestic cattle were removed and placed on their owner's base properties. A combined total of 305 wild horses, 594 burros and 1 mule were removed from inside and outside the five HMAs of the Montezuma Complex in 1996.

The Complex is dominated by shrubs due to the extremely arid climate and the poorly developed soils. Because wild horses are mainly grazers, almost no nutritious forage is available for horse use. Burros are adaptable and will browse when no grass is available and are better suited to this shrub-dominated habitat.

Throughout all of the HMAs, a severe shortage of water creates a constant concern for the well-being of the wild equids and wildlife in the area, especially during years of drought when many water sources dry up. Approximately half of the total area of the combined HMAs is without water for wild equids. There are few natural waters in the majority of the HMAs in the Montezuma Allotment. Wild horse and burro distribution is limited to a few miles around water sources, and if any source dries up, horses can die before finding an alternate source. Burros appear to be able to withstand the distance between water sources in these instances.

With low numbers of wild horses and burros currently inside these HMAs, genetic diversity is a potential problem. During the 2003 gather of Silver Peak HMA, which neighbors Paymaster and Montezuma Peak HMAs, blood samples were drawn from 57 wild horses. Genetic analysis indicated that the genetic variability of the Silver Peak herd was low. This is most likely the case for the Paymaster and Montezuma HMA horse herds and possibly other HMAs in the allotment. The low genetic diversity may account for the high number club footed wild horses removed from the northern portion of the allotment outside the Paymaster HMA in 2006. Genetics results are pending from animals gathered in the 2006 Paymaster gather.

Causal Factor:

Frequent droughts, poor quality soils and low rainfall combined make the habitat inside the Goldfield, Montezuma, Paymaster, Stonewall and Bullfrog HMAs poor horse habitat. These factors also limit the amount of forage for cattle and burros. There is sufficient forage available for burros if no cattle are run with burros in the HMAs and if water is available throughout the HMAs.

2. Land Use Plan Objectives

Multiple use objectives for the Tonopah Planning Area were developed in the Tonopah Resource Management Plan (RMP) and Record of Decision, dated 1997. The Land Use Plan (LUP) objectives pertain to livestock forage production, vegetation ecological condition and trends, terrestrial big game habitat condition and trends, and aquatic/riparian habitat trends. These objectives are evaluated below for achievement for the Montezuma Allotment.

Fire Management

Objective:

To protect natural resources from unacceptable damage by fire in a cost-effective manner with a high regard for private property and safety. Promote resource management through prescribed fire to maintain the natural component of the ecosystem.

Table 151.0 - Fire RMP Determinations – Montezuma Allotment

Fire RMP Determinations	Conclusion	Rationale
All wildfires in Fire Management Zone 1 will receive aggressive initial attack, to contain all fires in intensity levels 1 through 6, 90 percent of the time to 300 acres or less. All fire zones are shown on Map39 (in the RMP).	Met	
Wildfires that threaten life and property will be kept to five acres or less 90 percent of the time utilizing the most cost-effective and efficient suppression action. This will include town sites, developed mines, ranches, powerlines, and other structures and property	Met	
Wildfires that threaten resources such as critical watersheds, riparian areas, desirable range (salt desert shrub), sage grouse strutting grounds, sensitive plant species sites, cultural resource sites, and sensitive forage plant species (bitterbrush and mountain mahogany) will be kept to minimum acres utilizing suppression action which could suppress and/or divert the fire and be cost-effective and efficient.	Partially met	Two fires occurred in 2006. One of the fires burned within desert tortoise habitat and the other burned in desert bighorn sheep habitat.

Forestry and Vegetative Products

Objective:

To provide forest and other vegetation products for consumptive use on a sustained yield basis.

Table 152.0 - Forestry and Vegetative Products RMP Determinations – Montezuma Allotment

Forestry and Vegetative Products RMP Determinations	Conclusion	Rationale
Authorize the harvest of live trees for firewood, fence posts, and other woodland products in greenwood cutting areas. Limit authorization to 1,000 cords per year. This quantity may be adjusted through monitoring and evaluation. . . Establish new greenwood cutting areas at . . . Montezuma . . . Newly opened cutting areas may be closed when tree canopy cover is reduced to between 10 and 20 percent.	Met	
Authorize cutting of Christmas trees only in areas outside wilderness study areas, and limit harvest to 1,000 trees per year. This quantity may be adjusted through monitoring and evaluation. Authorize only noncommercial harvest.	Met	
The harvest of Joshua trees for landscape uses will not be authorized in the Joshua tree viewing area (100,000 acres) (see Map 31, area 5). Commercial harvest of Joshua trees will be authorized only through salvage operations incidental to surface disturbance. Until a complete inventory is available to determine the sustained yield and a new level of authorization can be calculated, noncommercial authorizations will be limited to 100 trees per year.	Met	

Livestock Grazing Management

Objective:

To create healthy, productive rangelands through implementation of the recommendations of the ongoing rangeland monitoring and evaluation program.

Table 153.0 - Livestock Management RMP Determinations Montezuma Allotment

livestock MANAGEMENT RMP Determinations	Conclusion	Rationale
Manage livestock at initial stocking levels…. Monitoring will be in consultation with the grazing permittee and other publics. If the desired trend does not occur, the responsible class of animal (where it can be determined) will be reduced or excluded…	Not Met	This is a very dry allotment with highly variable precipitation. The capacity to produce forage for cattle is limited. Monitoring data indicates a loss of forage in portions of the allotment due to overuse by wild horses in the northern portion of the allotment and drought throughout the allotment. The removal of the majority of livestock and wild horses in the 1990s has caused an improvement in range condition. However, the overall capacity of the range in the Montezuma Allotment is less than the initial stocking rate. Therefore, the stocking rate needs to be reduced.

In accordance with the August 14, 1991 Biological Opinion for the Proposed Livestock Program Within Desert Tortoise Habitat in Southern Nevada

Table 154.0 - Livestock Management RMP Determinations Desert Tortoise Habitat Montezuma Allotment

livestock MANAGEMENT RMP Determinations Desert Tortoise Habitat	Conclusion	Rationale
1) Livestock use within the desert tortoise habitat may occur from March 1 through Ocotber 14, forage utilization shall not exceed 40 percent on key perennial grasses. Forbs, and shrubs.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
2) Livestock use in desert tortoise habitat may occur from October 15 to February 27; forage utilization shall not exceed 50 percent on key perennial grasses, and 45 percent on key shrubs and perennial forbs.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
3) The key forage species within this habitat include at a minimum: Desert Needlegrass (Stipa speciosa), Indian Ricegrass (Oryzopsis hymenoides), White Burrobrush (Hymenoclea Salsola) and Winterfat (Eurotia Lanata).	Met	
4) Should utilization exceed 40 percent on key perennial grasses, forbs and shrubs during the period of March 1 through October 14; 50 percent on key perennial grasses and 45 percent on key shrubs and perennial forbs during the period of October 15 through February 28, the lessee shall have ten (10 calendar days in which to remove all livestock from desert tortoise habitat. Utilization within each allotment shall not be averaged either among the locations or over time.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.

Table 154.0 - Livestock Management RMP Determinations Desert Tortoise Habitat Montezuma Allotment (con't)

livestock MANAGEMENT RMP Determinations Desert Tortoise Habitat	Conclusion	Rationale
5) All vehicle use in the desert tortoise habitat associated with the livestock grazing program shall be restricted to existing roads and trails	Met	No new roads have been created for livestock operators.
6) Trash and garbage associated with livestock grazing operations (i.e., branding, roundups, etc.) shall be removed from each camp site or work location and disposed of in a designated facility. No trash or garbage shall be buried at the work locations within desert tortoise habitat.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991. No livestock have been worked inside tortoise habitat.
7) Use of hay or grains as feeding supplement shall be prohibited in desert tortoise habitat to avoid the introduction of nonnative plant species. Mineral and salt blocks are authorized in accordance with Title 43 Code of Federal Regulation 4100.	Met	No supplements have been fed to livestock inside tortoise habitat. Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.

The new biological opinion on desert tortoise dated March 26, 2003 has different mitigating measures than the previous one. The new stipulations are listed in the table below.

Table 155.0 - Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat

livestock mAnagement 2003 Biological Opinion Desert Tortoise Habitat	Conclusion	Rationale
Grazing will be permitted as long as forage utilization does not exceed 35 percent on key perennial grasses, forbs, and shrubs.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
Trash and garbage associated with livestock grazing operations (i.e., branding, roundups, etc.) shall be removed from each camp site or work location and disposed of in a designated facility. No trash or garbage shall be buried at the work locations within desert tortoise habitat.	Met	Livestock operations have not generated trash in the tortoise area. Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
Use of hay or grains as feeding supplement shall be prohibited in desert tortoise habitat to avoid the introduction of non-native plant species. Mineral, protein and salt blocks are authorized subject to 43 CFR section 4130.3-2© and shall be placed a minimum of one mile from water developments.	Met	No supplements have been fed to livestock inside the tortoise area. Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.

Table 155.0 - Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat (con't)

livestock mAnagement 2003 Biological Opinion Desert Tortoise Habitat	Conclusion	Rationale
BLM will provide desert tortoise information to all permittees about desert tortoise. this will be in the form of a fact sheet on the life history of the desert tortoise, legal protection for desert tortoises, the definition of take, penalties for violations of federal and state laws, general tortoise activity patterns, reporting requirements, measures to protect tortoises, and personal measures employees can take to promote the conservation of desert tortoises. the fact sheet will include the pertinent terms and conditions of the biological opinion. the contractor will ensure that all employees working on the allotment are knowledgeable of the terms and conditions of the biological opinion.	Met	Since this is a vacant allotment, there is no lessee to give information to. livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
The allotment shall be visited by a qualified BLM specialist to ensure compliance with the utilization standards and the stipulations of the grazing lease/permit. Conditions of non-compliance shall be rectified by BLM no later than the beginning of the following growing season, and reported to the Service.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
In grazing allotments that include HMAs, combined usage shall not exceed the limits set above.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991. The majority of wild equids have been removed from the allotment, including this area, in 1996. Few burros remain in tortoise area.

Riparian Habitat

Objective:

To achieve or maintain the presence of adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high water flows for all riparian-wetland areas (proper functioning condition).

Table 156.0 - Riparian Habitat RMP Determinations – Montezuma Allotment

Riparian habitat RMP Determinations	Conclusion	Rationale
Manage for proper functioning condition on all streamside riparian areas, and all springs, seeps, wet meadows and other riparian areas in the Tonopah Planning Area.	Met	See Standards 1 and 2 above. The majority of riparian areas are in Proper Functioning Condition. No riparian areas are currently nonfunctional. The riparian areas found to be nonfunctioning in 1994 have improved to functioning at risk. The functioning at risk riparian areas in 1994 are now properly functioning.
Where streams and riparian areas are functioning but are at risk of deteriorating, manage for an improving trend, as determined using techniques described in current BLM Technical References and/or other BLM guidelines. If needed, and in conjunction with the grazing permittees and other publics, design and implement management practices to achieve an upward trend. If the desired trend does not occur, the responsible class of animal (where it can be determined) will be reduced or excluded.	Met	See Standards 1 and 2 above. The majority of riparian areas are in Proper Functioning Condition. No riparian areas are currently nonfunctional. The riparian areas found to be nonfunctioning in 1994 have improved to functioning at risk. The functioning at risk riparian areas in 1994 are now properly functioning.
Where streams and riparian areas are nonfunctional, work with livestock permittees and other publics to modify management. If the desired trend does not occur, the responsible class of animal (where it can be determined) will be reduced or excluded.	Met	See Standards 1 and 2 above. The majority of riparian areas are in Proper Functioning Condition. No riparian areas are currently nonfunctional. The riparian areas found to be nonfunctioning in 1994 have improved to functioning at risk. The functioning at risk riparian areas in 1994 are now properly functioning.

Vegetation

Objective:

To provide for vegetative and ecological diversity.

Table 157.0 - Vegetation RMP Determination Montezuma Allotment

VEgetation RMP Determination	Conclusion	Rationale
Manage the vegetation resource for desired plant communities. . . Descriptions of specific desired plant communities will be developed by allotment at key areas. . . Management of the vegetative resource will provide for the physiological needs (such as critical growth periods, biomass production, root reserve increase, and seed production) of the key forage plant species. . .	Partially Met	Eight out of nine key areas did not meet the Mojave-Southern Great Basin RAC Standards. This was due to excessive use by wild horses in the northern portion of Pasture 1 and to drought for 3 of them and to drought and poor quality soils and excessive use in the past by both cattle and wild equids. This allotment has highly variable precipitation patterns leading to frequent droughts. The average rainfall is low, between 3 and 8 inches a year. Much of the allotment has little potential to change due to low precipitation and soils.

Wild Horse and Burro

Objective:

To manage wild horse and/or burro populations within Herd Management Areas at levels which will preserve and maintain a thriving natural ecological balance consistent with other multiple-use objectives.

RMP Determinations: Continue the following management determinations:

Table 158.0 - Wild Horse and Burro RMP Determinations – Montezuma Allotment

Wild Horse and Burro RMP Determinations	Conclusion	Rationale
Manage wild horses and/or burros populations in 16 herd management areas (HMAs) listed.	Not Met	In 1996 a severe drought caused many wild horses to starve due to lack of forage. Wild horses and burros were removed from the HMAs in this allotment. These HMAs have been found to be unsuitable for wild horses and for large numbers of burros. A more conservative stocking rate for burros needs to be set. None of the HMAs provides suitable habitat for wild horses. There is not enough forage in the HMAs to permit burros and livestock to coexist and still support viable numbers of burros.

Table 158.0 - Wild Horse and Burro RMP Determinations – Montezuma Allotment (con't)

Wild Horse and Burro RMP Determinations	Conclusion	Rationale
Manage wild horses and/or burros at appropriate management level (AML). . . Future herd size or appropriate management levels within each herd management area will be adjusted as determined through short-term and long-term monitoring data methods as outlined in the *Nevada Rangeland Monitoring Handbook* and BLM technical references.	Not Met	The AMLs established in 1994 by decision exceed the amount of forage available for both wild horses and burros. These HMAs are not suitable for wild horses. New AMLs lower will be set in this evaluation.
Assure sufficient water and forage exist for wild horses and/or burros in herd management areas.	Not Met	Sufficient water and forage does not exist for wild horses and burros at current AML in these HMAs. Availability of water is limited and supply is irregular. Portions of all of these HMAs are dry. This limits the amount of forage available for wild equids. Approximately half of the forage in these HMAs is unavailable due to lack of water. The climate and soils in this allotment cannot produce enough forage to support a viable horse herd. These HMAs are better suited for burros.
Apply for appropriative water rights and/or assert public water reserves on water sources as necessary to ensure a reliable, year-round water source for wild horses and burros in herd management areas.	Not Met	Range Improvements were not maintained by the former lessee and due to non-payment of grazing fees, all Range Improvements were cancelled along with his permitted use and grazing lease.

The new biological opinion on desert tortoise dated March 26, 2003 has different mitigating measures than the previous one. The new stipulations are listed in the table below.

Table 159.0 – Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat

livestock mAnagement 2003 Biological Opinion Desert Tortoise Habitat	Conclusion	Rationale
Grazing will be permitted as long as forage utilization does not exceed 35 percent on key perennial grasses, forbs, and shrubs.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991. The majority of wild burros were removed from tortoise area in 1995 & 1996.
The HMA will be visited by a qualified BLM specialist to ensure compliance with the utilization standard. Any items in non-compliance shall be rectified by BLM no later than the beginning of the following growing season, and reported to the Service.	Met	Use was read in the area when livestock and burros inhabited the area.
Trap sites for wild burro removal should be located in previous trap sites or in previously disturbed areas, if at all possible.	N/A	No gathers occurred after the implementation of this biological opinion. It is policy that all trap sites were located in disturbed areas.
Holding facilities for gather operations should be placed either in previously disturbed areas or outside of desert tortoise habitat.	N/A	No gathers occurred after the implementation of this biological opinion.
Trap sites or holding sites will be cleared by a qualified biologist before being set up or designated. The site will be surveyed for desert tortoise using survey techniques which provide 100 percent coverage.	Met	No gathers occurred after the implementation of this biological opinion.

Table 159.0 – Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat (con't)

livestock mAnagement 2003 Biological Opinion Desert Tortoise Habitat	Conclusion	Rationale
All vehicle use in desert tortoise habitat shall be restricted to existing roads and trails; vehicle speed should not exceed 25 miles-per-hour (mph).	Met	No gathers occurred after the implementation of this biological opinion.
Trash and garbage shall be removed from each trap and holding site and disposed of in an off-site designated facility. No trash or garbage shall be buried at the sites.		It is policy that all trash is removed from the gather sites after gathers are finished.
Use of hay or grains as enticements into the traps will not be authorized within desert tortoise habitat to avoid introduction of non-native plant species. The feeding of hay or grains to animals shall be avoided in holding facilities within desert tortoise habitat when possible, with the exception of weed-free hay.	Met	No gathers occurred after the implementation of this biological opinion.
BLM will provide desert tortoise information to all contractors about desert tortoise. This will be in the form of a fact sheet on the life history of the desert tortoise, legal protection for desert tortoises, the definition of take, penalties for violations of Federal and State laws, general tortoise activity patterns, reporting requirements, measures to protect tortoises, and personal measures employees can take to promote the conservation of desert tortoises. The fact sheet will include the pertinent terms and conditions of the biological opinion. The contractor will ensure that all employees working on the gather are knowledgeable of the terms and conditions of the biological opinion.	Met	No gathers occurred after the implementation of this biological opinion.
The discharge of firearms will be prohibited at all trap and holding facilities except in the case of euthanasia of a captured animal by an authorized blm employee or contractor.	met	No gathers occurred after the implementation of this biological opinion.
If the HMA includes grazing allotments, combined usage shall not exceed the limits set above.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991. The majority of wild equids have been removed from the allotment, including this area, in 1996. Few burros remain in tortoise area.

Wildlife Habitat Management

Objective:

To maintain and enhance wildlife habitat and provide for species diversity.

Table 160.0 - Wildlife RMP Determinations – Montezuma Allotment

Wildlife RMP Determinations	Conclusion	Rationale
Continue to support the augmentation or reintroduction of bighorn sheep by the Nevada Division of Wildlife into potential or existing habitat areas in the Goldfield, Amargosa, Montezuma, Sawtooth, …(see Maps 10 and 13).	Met	This is an on-going process with the Nevada Department of Wildlife.
Prepare, revise, or maintain habitat management plans, or their functional equivalent, to - enhance the habitat for game and nongame wildlife species, when appropriate. The identification of specific wildlife objectives will be determined when each habitat plan is developed in consultation with affected publics, i.e., range users, interest groups, and county governments. Habitat Management Plan. In conjunction with affected publics, prepare habitat management plans for the following areas: Bullfrog Hills . . . Montezuma . . .	Met	This assessment meets the Requirement of a habitat plan for Bullfrog Hills and Montezuma. The August 14, 1991 Biological Opinion for the Proposed Livestock Program Within Desert Tortoise Habitat in Southern Nevada also meets this requirement.
Manage mule deer habitat for best possible condition within the site potential. On 28,920 acres of mule deer winter range, restrict activities which might be disturbing to mule deer between January 15 and May 15 (see Maps 34 and 35, and Appendix 14).	Met	The removal of large numbers of wild equids in 1996 and some in 2007 have improved habitat.
Maintain or improve existing or potential bighorn sheep habitat areas (324,000 acres) (see Maps 10 and 13). To ensure this occurs, management actions will include . . .; 4) restricting between February 1 and May 15, activities in lambing areas which might be disturbing to bighorn sheep (17,480 acres); and 5) prohibiting land uses that are incompatible with bighorn sheep lambing areas at Stonewall Falls and Little Meadows (see Maps 10 and 13, and Appendix 14).	Met	The removal of large numbers of wild equids in 1996 and some in 2007 have improved habitat.

Special Status Species

Objective:

To protect, restore, enhance, and expand habitat of species identified as threatened, endangered, or Nevada BLM Sensitive Species under the Endangered Species Act.

Table 161.0 - Special Status Species RMP Determinations - Montezuma Allotment

Special STATUS Species RMP Determinations	Conclusion	Rationale
Manage desert tortoise Non-Intensive Category III habitat (70,600 acres) to maintain current populations levels (see Map 15). Where new road construction is discretionary, no new roads will be constructed within washes. Livestock grazing will be in accordance with the August 14, 1991 *Biological Opinion for the Proposed Livestock Program Within Desert Tortoise Habitat in Southern Nevada.* Refer to the Livestock Grazing Management determination section for terms and conditions of this Biological Opinion.	Met	Refer to Table above on "Livestock Management RMP Determinations Desert Tortoise Habitat Montezuma Allotment"
Habitat for all Federally listed threatened or endangered species or Nevada BLM Sensitive Species (plant and animal) will be managed to maintain or increase current populations of these species. The introduction, reintroduction, or augmentation of Nevada BLM Sensitive Species, as well as Federally listed threatened or endangered species, may be allowed if, in coordination with Nevada Division of Wildlife and the U.S. Fish and Wildlife Service, it is deemed appropriate. Such actions will be considered on a case-by-case basis and will be subject to applicable procedures outlined in the section on Standard Operating Procedures, Environmental Review and Management.	Met	

Allotment-Specific Objectives for the Montezuma Allotment:

Table 162.0 - Allotment-Specific Objectives – Montezuma Allotment

Allotment-Specific Objectives	Conclusion	Rationale
Improve forage availability through developments.	Not Met	New waters and fences have been built since 1983 but this has not increased available forage for livestock. This is due to the following reasons. Due to low precipitation and poor soils, the allotment does not have potential to produce a large amount of forage for livestock. Seeding cannot solve the problem because the majority of the allotment is in a 3 to 8 inch precipitation zone, too dry for seedings. Areas that receive more than 8 inches are not in areas accessible to livestock. Range Improvements were not maintained by the former lessee long before he quit paying grazing fees. All range improvements were cancelled along with his preference and grazing lease.
Maintain and/or improve wild horse and burro habitat through water developments.	Not Met	Additional waters have not been developed for wild horses or burros. There are large portions of all the HMAs in the Complex that have no available water for wild equids.
Develop range improvements for effective livestock management in reopened areas.	N/A	This allotment-specific objective is no longer applicable since the allotment is now vacant. All of the former lessee's range improvement permits were cancelled through decision on May 1, 2002.
Improve range condition in localized areas northwest of Beatty and near Alkali by development and implementation of an Allotment Management Plan or its functional equivalent.	Met	This document and EA are the functional equivalent of an Allotment Management Plan.
Maintain habitat for Amargosa toad and Oasis Valley speckled Dace.	Met	No livestock grazed in speckled Dace habitat.

B. Razorback Allotment

1. RAC Standards Conformance Review

Standards Conformance Review of the Mojave/Southern Great Basin Resource Advisory Council Standards and Guidelines in the Razorback Allotment

The Razorback Allotment is located within the Mojave-Southern Great Basin RAC. Standards and Guidelines for rangeland health were approved and published in 1997. In December 2000, the Mojave-Southern Great Basin RAC approved Wild Horse and Burro Standards and Guidelines that were incorporated into the existing rangeland health document. The current version of the RAC Standards and Guidelines is located in Appendix B.

Table 163.0 - Razorback Allotment Key Area Assessment*

Key Area	Standard 1		Standard 2		Standard 3	
		Causal Factor		**Causal Factor**		**Causal Factor**
1	Not Met	Drought Poor soils	Not Met	Drought Poor soils	Not Met	Drought Poor soils
3	**Met**		**Met**		**Met**	
4	**Met**		**Met**		**Met**	

* See pages X – Y in sections Y

Standard 1: Soils

Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity, and sustain the hydrologic cycle.

Soil Indicator – Upland watershed condition

As indicated by: Ground Cover.
Surfaces (e.g. biological crust, pavement)
Compaction/filtration

MET on 33 percent of allotment.
NOT MET on 67 percent of allotment

This standard is **Met** at Key Areas 2 and 3, which represent the northern portion of the allotment. This portion of the allotment has some suitable forage for cattle use.

The standard is **NOT MET** at Key Area 1 in the southern portion of the allotment. The southern two thirds of the allotment are within the Bullfrog HMA. This area also includes the entire desert tortoise habitat in the allotment.

Significant Progress: Yes

Large numbers of burros and most of the cattle were removed from the allotment starting in 1994 through 1996. This has provided vegetation in the area an 11-year rest period.

Rationale:

Three key areas exist in the allotment. Key Areas 2 and 3 have met all standards. They occur within the northern portion of the allotment outside desert tortoise habitat, but within the northern most edge of the HMA. This area has forage suitable for cattle and burro use.

Key Area 1 represents the southern portion of the allotment inside both the HMA and desert tortoise habitat. Key Area 1 has not met this Standard 1. The soils at this site are very poor quality and do not support the potential production determined in the Ecological Site description. Recent droughts are another factor in failure to meet the standard. Cover may increase during wet periods but the poor soils will limit the amount of improvement. The southern two thirds of the allotment does not support much forage suitable for cattle use. However, the area adequate burro habitat.

An evaluation of this standard was completed using use pattern data. Utilization levels in the allotment meet this standard. Between 1987 to 2004, use pattern maps show acceptable levels of utilization to maintain proper cover in the watershed. With these minimal use levels, enough residual vegetation remains to provide some cover on the northern third of the allotment. There has been little grazing by cattle and burros since 1995 on the Razorback Allotment.

Causal Factor:

Full numbers of cattle were run in conjunction with wild equids on the allotment. In 1994 the lessee removed the majority of cattle from the Razorback Allotment. Prior to 1996, burros were well above their AML on the allotment. In 1996 large numbers of burros were removed due to drought. Few now remain. Cattle were returned to the allotment in 2005. The reduction in numbers of grazing animals would have allowed the sites with potential to improve the opportunity to improve. However, much of the allotment has little potential to change.

Riparian soil Indicators

As indicated by: Stream bank stability

MET at the one riparian area in the allotment.

The one riparian area in the allotment is in Proper Functioning Condition.

Significant Progress: Yes

Specie Spring had a rating of Non-Functioning condition in 1994 and was rated in 2006 as Proper Functioning Condition.

Rationale:

The Proper Functioning Condition study measures when adequate vegetation, large woody debris, or rock is present to dissipate energy associated with wave action. The BLM assessed Functioning Condition at Specie Spring in 1994 and 2006. It was Non-Functioning in 1994 and in Proper Functioning Condition in 2006.

Causal Factor:

Full numbers of cattle were run in conjunction with wild equids on the allotment. In 1994 the lessee removed the majority of cattle from the Razorback Allotment. Prior to 1996, burros were well above their AML on the allotment. In 1996 large numbers of burros were removed due to drought. Few now remain. Cattle were returned to the allotment in 2005. This reduction in animals allowed Specie Spring to recover from use.

Standard 2: Ecosystem Components

Watersheds should possess the necessary ecological components to achieve State water quality criteria, maintain ecological processes, and sustain appropriate uses.

Upland Indicators:

As indicated by:

- Canopy and ground cover, including litter, live vegetation, biological crust, and rock appropriate to the potential of the ecological site.
- Ecological processes are adequate for the vegetation communities.

MET on 33 percent of allotment.
NOT MET on 67 percent of allotment

This standard is met at Key Areas 2 and 3, which represent the northern third of the allotment.

The standard is not met at Key Area 1 in the southern portion of the allotment. This southern portion of the allotment is within the Bullfrog HMA. It also includes the entire desert tortoise habitat in the allotment.

Significant Progress: Yes

Large numbers of burros and most of the cattle were removed from the allotment starting in 1994 through 1996. This has provided vegetation in the area an 11 year-rest period.

Rationale:

Three key areas exist in the allotment. Key Areas 2 and 3 have met all standards. They occur within the northern portion of the allotment outside desert tortoise habitat, but within the northern most edge of the HMA. Forage suitable for cattle and burro use is available in this portion of the allotment. Production exceeds the potential for the site and species composition at these key areas is appropriate for the ecological site.

Key Area 1 represents the southern two thirds of the allotment inside both the HMA and desert tortoise habitat. Key Area 1 has not met this Standard 2. The soils at this site are of very poor quality and do not support the potential production determined in the Ecological Site description. Recent droughts are another factor in failure to meet the standard. Cover may increase during wet periods but the poor soils will limit the amount of improvement. Forage suitable for cattle and horse use does not grow on these soils. The soils, vegetation and climate do not support an appropriate use by livestock.

Use by cattle and burros is currently not a factor in the failure to meet this standard. An evaluation of this standard was completed on use pattern data. Utilization levels in the allotment meet this standard. Between 1987 to 2004, the use pattern maps show acceptable levels of use to maintain proper cover in the watershed. The there has been little grazing by cattle and burros since 1995 on Razorback Allotment.

Causal Factor:

In the past, the maximum allotted numbers of cattle grazed in conjunction with wild equids on the allotment. In 1994, the lessee removed the majority of cattle from the Razorback Allotment. Prior to 1996, burros gathered because the animal were well above their AML on the allotment and a large number of burros were removed due to drought in 1996. Cattle begin to graze in the allotment in 2005 under a pasturing agreement. The reduction in numbers of grazing animals would have allowed the sites with potential to improve during this period. However, much of the allotment has little potential to change.

Riparian Indicators:

As indicated by:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows.
- Elements indicating proper functioning condition such as avoiding accelerating erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics:

- Width/Depth ratio;

- Channel roughness;

- Sinuosity of stream channel;

- Bank stability;

- Vegetative cover (amount, spacing, life form); and

- Other cover (large woody debris, rock).

- Natural springs, seeps, and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering, and release as indicated by plant species and cover appropriate to the site characteristics.

MET at the one riparian area in the allotment.

There in one riparian area in the allotment which is in Proper Functioning Condition.

Significant Progress: Yes

Specie Spring was rated as Non-Functioning condition in 1994 and was rated as Proper Functioning Condition in 2006.

Rationale:

The Functioning Condition study measures when adequate vegetation, large woody debris, or rock is present to dissipate energy associated with wave action. The BLM assessed Functioning Condition at Specie Spring in 1994 and 2006. It was Non-Functioning in 1994 and in Proper Functioning Condition in 2006.

Causal Factor:

Prior to 1996, burros were well above their AML on the allotment. In the past, the maximum allotted number of cattle ran in conjunction with wild equids on the allotment. In 1994, the lessee removed the majority of cattle from the Razorback Allotment and cattle began to graze the allotment in 2005 under a pasturing agreement. Cattle have not been using the area in the vicinity of Specie Spring.

Water Quality Indicators:

As indicated by:

- Chemical, physical and biological constituents do not exceed the State water quality Standards.

The above indicators shall be applied to the potential of the ecological site.

Most likely **MET** or making significant progress on 100 percent of the riparian areas in the allotment.

Water quality data was not collected for this riparian area.

Significant Progress: Yes

Due to the low number of animals using this water, it is unlikely the water quality is affected by burros and cattle.

Causal Factor:

The gathers in 1996 almost completely removed burros from the HMA. The lessee removed the majority of cattle from the allotment in 1994. The wild burros and cattle do not use the area surrounding the spring.

Standard 3: Habitat and Biota

Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses.

As indicated by: Vegetation composition (relative abundance of species);
Vegetation structure (life forms, cover, height, and age classes);
Vegetation distribution (patchiness, corridors);
Vegetation productivity;
Vegetation nutritional value.

MET on 33 percent of allotment.
NOT MET on 67 percent of allotment

This standard is met at Key Areas 2 and 3, which represent the northern portion of the allotment. This portion has some suitable forage for cattle use.

The standard is not met at Key Area 1 in the southern portion of the allotment. This portion of the allotment is within the HMA. It also includes the entire desert tortoise habitat in the allotment.

Significant Progress: Yes

Large numbers of burros and most of the cattle were removed from the allotment starting in 1994 through 1996. This has provided vegetation an 11-year rest period. The northern portion of the allotment has improved due to the removal of livestock and burros from the allotment.

The southern 67 percent of the allotment is suitable burro habitat. However, due to the poor potential of the range in the southern portion of the allotment, the removal of grazing animals may never improve the range or make it suitable for horse or cattle use.

Rationale:

Three key areas exist in the allotment. Key Areas 2 and 3 have met all standards. They occur within the northern portion of the allotment outside desert tortoise habitat, but partially within the northern most edge of the HMA.

Key Area 1 represents the southern portion of the allotment inside both the HMA and desert tortoise habitat. Key Area 1 has not met this Standard 3. The soils at this site are very poor quality and cannot support forage for cattle or wild horses. Recent droughts are another factor in failure to meet the standard. It is unlikely this area may improve. The area represented by Key Area 1 is suitable for burro use because it supports their preferred forage.

An evaluation of this standard was completed on use pattern data. Utilization levels in the allotment meet this standard. Between 1987 to 2004, the use pattern maps show acceptable levels of use to maintain proper cover in the watershed. The there has been little grazing by cattle and burros since 1995 on Razorback Allotment.

Causal Factor:

Full numbers of cattle were run in conjunction with wild equids on the allotment. In 1994 the lessee removed the majority of cattle from the Razorback Allotment. The majority of burros were removed in 1996 due to drought. Cattle were returned to the allotment in 2005 but burro numbers are still very low. The reduction in numbers of grazing animals would have allowed the sites with good soils the opportunity to improve. However, much of the allotment has little potential to change.

It is not possible to meet guideline 3.4 “Wild Horse and Burro herd management practices should be planned and implemented to provide for integrated use by domestic livestock and wildlife” due to the lack of forage in the majority of these HMAs. In order to stock viable numbers of wild burros in these HMAs and to support native wildlife, no cattle can be run in conjunction with burros except on the northern portion of the Bullfrog HMA.

Standard 4: Wild Horses and Burros

Wild horses and burros within Herd Management Areas should be managed for herd viability and sustainability. Herd Management Areas should be managed to maintain a healthy ecological balance among wild horse and /or burro populations, wildlife, livestock, and vegetation.

As indicated by:

Herd health indicators.
Herd viability indicators.

NOT MET in the Bullfrog HMA in the Razorback allotment. Prior to the removal of burros from the HMA in 1996, burros were thin, but in fair condition. However, burros had not shed their winter coats, an indication of poor nutrition.

After burros were removed from the HMA in 1996, the number of burros remaining in the HMA may not have been a genetically viable number.

There is a lack of forage for burros in dry years on the HMA. Due to a scarcity of water, approximately 77 percent of the available forage in this portion of the HMA is unusable.

Significant Progress: Yes

BLM removed large numbers of stressed burros in 1996. This has lead to an improvement in range condition in the allotment, where there was potential to improve.

Rationale:

The issues at the HMAs in the Razorback Allotment are:

- Lack of forage in the HMA,
- Lack of water,
- Frequent droughts,
- Poor genetic variability of the wild burro populations

Guideline 4.2, requires BLM to set the AML "to reflect the carrying capacity of the land in dry conditions based upon the most limiting factor: living space, water or forage." It also states, "Management levels will not conflict with achieving or maintaining standards for soils, ecological components, or diversity of habitat and biota."

The current AML cannot meet the standard if livestock are also permitted to run in the HMA. There is not enough forage to support the AML set for burros along with cattle grazing inside this HMA. The HMA could support a small overlap between cattle and burros in the northern most edge of the HMA.

The Razorback Allotment has a history of drought, necessitating an emergency wild burro gather in 1996 to prevent starvation. The 1996 drought threatened the existence of wild horses and burros in both Esmeralda and Nye counties. Almost no growth occurred on vegetation in the spring of 1996. Burros were thin, but in fair condition. However, the burros had not shed their winter coats, an indication of poor nutrition. Most domestic cattle were removed and placed on their owner's base properties.

The allotment is dominated by shrubs due to the extremely arid climate and the poorly developed soils. Burros are adaptable and browse when no grass is available. The animal is better suited then wild horses or cattle to this shrub-dominated habitat. The southern two-thirds of the allotment are poorly suited for cattle use. None of the allotment is suitable horse habitat.

Throughout the eastern-half of the Bullfrog HMA, a severe shortage of water creates a constant concern for the well-being of the wild burros and wildlife in the area, especially during years of drought when many water sources dry up. Approximately 77 percent of the forage on the eastern-half of Bullfrog HMA is unusable due to the lack of water. There are few natural waters in the majority of the HMA. Wild burro distribution is limited to approximately a few miles around water sources along the Amargosa River.

Causal Factor:

The combination of frequent droughts, poor quality soils and low rainfall all limit the amount of forage for cattle and burros inside the Bullfrog HMA. There is sufficient forage available for burros if few cattle are run with burros in this HMA and if water is available throughout the HMA.

In order to sustain viable burro herds, new waters must be developed to open up the HMA for burro use. At this time, there is not enough water to support genetically viable herds of burros in the eastern-half of the HMA.

2. Land Use Plan Objectives

Multiple use objectives for the Tonopah Planning Area were developed in the Tonopah Resource Management Plan (RMP) and Record of Decision, dated 1997. The Land Use Plan (LUP) objectives pertain to livestock forage production, vegetation ecological condition and trends, terrestrial big game habitat condition and trends, and aquatic/riparian habitat trends. These objectives are evaluated below for achievement for the Razorback Allotment.

Fire Management

Objective:

To protect natural resources from unacceptable damage by fire in a cost-effective manner with a high regard for private property and safety. Promote resource management through prescribed fire to maintain the natural component of the ecosystem.

Table 164.0 - Fire RMP Determinations – Razorback Allotment

Fire RMP Determinations	Conclusion	Rationale
All wildfires in Fire Management Zone 1 will receive aggressive initial attack, to contain all fires in intensity levels 1 through 6, 90 percent of the time to 300 acres or less. All fire zones are shown on Maps 38 and 39 (in the RMP).	Met	
Wildfires that threaten life and property will be kept to five acres or less 90 percent of the time utilizing the most cost-effective and efficient suppression action. This will include town sites, developed mines, ranches, powerlines, and other structures and property	Met	
Wildfires that threaten resources such as critical watersheds, riparian areas, desirable range (salt desert shrub), sage grouse strutting grounds, sensitive plant species sites, cultural resource sites, and sensitive forage plant species (bitterbrush and mountain mahogany) will be kept to minimum acres utilizing suppression action which could suppress and/or divert the fire and be cost-effective and efficient.	Partially met	Two fires occurred in 2006. One of the fires burned within desert tortoise habitat and the other burned in desert bighorn sheep habitat.

Livestock Grazing Management

Objective:

To create healthy, productive rangelands through implementation of the recommendations of the ongoing rangeland monitoring and evaluation program.

Table 165.0 - Livestock Management RMP Determinations – Razorback Allotment

livestock MANAGEMENT RMP Determinations	Conclusion	Rationale
Manage livestock at initial stocking levels…. Monitoring will be in consultation with the grazing permittee and other publics. If the desired trend does not occur, the responsible class of animal (where it can be determined) will be reduced or excluded…	Partially Met	Two key areas out of three have met or are making progress towards the Mojave-Southern Great Basin RAC Standards. However, this is a very dry allotment with little capacity to produce forage for cattle. The removal of the majority of wild burros in the mid 1990s has caused an improvement in range condition. However, the overall capacity of the range in this allotment is less than the initial stocking rate. Therefore, the stocking rate needs to be reduced. There is some livestock trespass between the Razorback and Springdale 2 allotments due to the unfenced boundary.

In accordance with the August 14, 1991 Biological Opinion for the Proposed Livestock *Program Within Desert Tortoise Habitat in Southern Nevada*

Table 166.0 - Livestock Management RMP Determinations for the Desert Tortoise Habitat – Razorback Allotment

livestock MANAGEMENT RMP Determinations Desert Tortoise Habitat	Conclusion	Rationale
Livestock use within the desert tortoise habitat may occur from March 1 through October 14, forage utilization shall not exceed 40 percent on key perennial grasses. Forbs, and shrubs	Met	The grazing lease is from May 1 to January 31. This grazing period is closed during tortoise activity in spring.
Livestock use in desert tortoise habitat may occur from October 15 to February 27; forage utilization shall not exceed 50 percent on key perennial grasses and 45 percent on key shrubs and perennial forbs	Met	Few livestock have grazed inside desert tortoise habitat. None have grazed inside desert tortoise habitat between 1998 and 2004.
The key forage species within this habitat include a minimum: Desert Needlegrass (Stipa speciosa), Indian Ricegrass (Oryzopsis hymenoides), White Burrobrush (Hymenoclea Salsola) and Winterfat (Eurotia Lanata).	Met	
Should utilization exceed 40 percent on key perennial grasses, forbs and shrubs during the period of March 1 through October 14; 50 percent on key perennial grasses and 45 percent on key shrubs and perennial frobs during the period of Ocotber 15 through February 28, the lessee shall have ten (10 claendar days in which to remove all livestock from desert tortoise habitat. Utilization within each allotment shall not be avenged either among the locations or over time.	Met	Few livestock have grazed inside desert tortoise habitat. None have grazed inside desert tortoise habitat between 1998 and 2004.
All vehicle use in the desert tortoise habitat associated with the livestock grazing program shall be restricted to existing roads and trails	Met	No new roads have been created.
Trash and garbage associated with livestock grazing operations (i.e., branding, roundups, etc.) shall be removed from each camp site or work location and disposed of in a designated facility. no trash or garbage shall be buried at the work locations within desert tortoise habitat.	Met	
Use of hay or grains as feeding supplement shall be prohibited in desert tortoise habitat to avoid the introduction of nonnative plant species. Mineral and salt blocks are authorized in accordance with Title 43 Code of Federal Regulation 4100.	Met	No supplements have been fed to livestock inside tortoise habitat. Few livestock have grazed inside desert tortoise habitat. None have grazed inside desert tortoise habitat between 1998 and 2003.

The new biological opinion on desert tortoise dated March 26, 2003 has different mitigating measures than the previous one. The new stipulations are listed in the table below.

Table 155.0 - Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat

livestock mAnagement 2003 Biological Opinion Desert Tortoise Habitat	Conclusion	Rationale
Grazing will be permitted as long as forage utilization does not exceed 35 percent on key perennial grasses, forbs, and shrubs.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
Trash and garbage associated with livestock grazing operations (i.e., branding, roundups, etc.) shall be removed from each camp site or work location and disposed of in a designated facility. No trash or garbage shall be buried at the work locations within desert tortoise habitat.	Met	Livestock operations have not generated trash in the tortoise area. Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
Use of hay or grains as feeding supplement shall be prohibited in desert tortoise habitat to avoid the introduction of non-native plant species. Mineral, protein and salt blocks are authorized subject to 43 CFR section 4130.3-2© and shall be placed a minimum of one mile from water developments.	Met	No supplements have been fed to livestock inside the tortoise area. Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
BLM will provide desert tortoise information to all permittees about desert tortoise. This will be in the form of a fact sheet on the life history of the desert tortoise, legal protection for desert tortoises, the definition of take, penalties for violations of Federal and State laws, general tortoise activity patterns, reporting requirements, measures to protect tortoises, and personal measures employees can take to promote the conservation of desert tortoises. The fact sheet will include the pertinent terms and conditions of the biological opinion. The contractor will ensure that all employees working on the allotment are knowledgeable of the terms and conditions of the biological opinion.	Met	Since this is a vacant allotment, there is no lessee to give information to. Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
The allotment shall be visited by a qualified BLM specialist to ensure compliance with the utilization standards and the stipulations of the grazing lease/permit. Conditions of non-compliance shall be rectified by BLM no later than the beginning of the following growing season, and reported to the Service.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991.
In grazing allotments that include HMAs, combined usage shall not exceed the limits set above.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1990 – 1991. The majority of wild equids have been removed from the allotment, including this area, in 1996. Few burros remain in tortoise area.

Riparian Habitat

Objective:

To achieve or maintain the presence of adequate vegetation, landform, or large woody . debris to dissipate stream energy associated with high water flows for all riparian-wetland areas (proper functioning condition).

Table 168.0 - Riparian habitat RMP Determinations – Razorback Allotment

Riparian habitat RMP Determinations	Conclusion	Rationale
Manage for proper functioning condition on all streamside riparian areas, and all springs, .seeps, wet meadows and other riparian areas in the Tonopah Planning Area.	Met	Species Spring is the only spring in the Razorback Allotment and rated as PFC.
Where streams and riparian areas are functioning but are at risk of deteriorating, manage for an improving trend, as determined using techniques described in current BLM Technical References and/or other BLM guidelines. If needed, and in conjunction with the grazing permittees and other publics, design and implement management practices to achieve an upward trend. If the desired trend does not occur, the responsible class of animal (where it can be determined) will be reduced or excluded.	Met	Species Spring is the only spring in the Razorback Allotment and is rated as PFC.
Where streams and riparian areas are nonfunctional, work with livestock permittees and other publics to modify management. If the desired trend does not occur, the responsible class of animal (where it can be determined) will be reduced or excluded.	Met	The one riparian area in the allotment is in PFC.

Vegetation

Objective:

To provide for vegetative and ecological diversity.

Table 169.0 - Vegetation RMP Determination – Razorback Allotment

VEgetation RMP Determination	Conclusion	Rationale
Manage the vegetation resource for desired plant communities. . . Descriptions of specific desired plant communities will be developed by allotment at key areas. . . Management of the vegetative resource will provide for the physiological needs (such as critical growth periods, biomass production, root reserve increase, and seed production) of the key forage plant species. . .	Partially Met	This is a very dry allotment with little capacity to produce forage for cattle. The northern third of the allotment produces forage suitable for cattle use. However the southern two thirds does not produce forage suitable for cattle and does not have the proper climate, soils or temperature to produce forage for cattle. The removal of the majority of wild horses in the mid 1990s has caused an improvement in range condition. However, the overall capacity of the range in this allotment is less than the initial stocking rate. Therefore, the stocking rate needs to be reduced.

Wild Horse and Burro

Objective:

To manage wild horse and/or burro populations within Herd Management Areas at levels which will preserve and maintain a thriving natural ecological balance consistent with other multiple-use objectives.

RMP Determinations: Continue the following management determinations:

Table 170.0 - Wild Horse and Burro RMP Determinations – Razorback Allotment

Wild Horse and Burro RMP Determinations	Conclusion	Rationale
Manage wild horses and/or burros populations in 16 herd management areas (HMAs) listed.	Not Met	In 1996, a severe drought caused many horses to starve and burros to suffer due to lack of forage. Burros were removed from the HMA in this allotment. The Bullfrog HMA is unsuitable for horses and for the large numbers of burros that were residing in the HMA at the time. There not enough forage in the HMA to permit burros and livestock to coexist and still support viable numbers of burros on the majority of the HMA.
Manage wild horses and/or burros at appropriate management level (AML). . . Future herd size or appropriate management levels within each herd management area will be adjusted as determined through short-term and long-term monitoring data methods as outlined in the *Nevada Rangeland Monitoring Handbook* and BLM technical references.	Not Met	The AML established in 1997 by decision exceeds the amount of forage available for both wild horses and burros. This HMA is not suitable for wild horses.
Assure sufficient water and forage exists for wild horses and/or burros in herd management areas.	not met	Sufficient water and forage does not exist for wild burros at current aml in this hma. Availability of water is limited and supply is irregular. a large portion of the east half of bullfrog hma is dry. New waters need to be established in order to support a viable burro herd.
Apply for appropriative water rights and/or assert public water reserves on water sources as necessary to ensure a reliable, year-round water source for wild horses and burros in herd management areas.	Not Met	Not yet done. This evaluation will need to recommend developing new waters for burros.

The new biological opinion on desert tortoise dated March 26, 2003 has different mitigating measures than the previous one. The new stipulations are listed in the table below.

Table 171.0 - Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat

livestock and Wild Horse and Burro mAnagement 2003 Biological Opinion Desert Tortoise Habitat	Conclusion	Rationale
Grazing will be permitted as long as forage utilization does not exceed 35 percent on key perennial grasses, forbs, and shrubs.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1994. The majority of wild burros were removed from tortoise area in 1995 & 1996.
The HMA will be visited by a qualified BLM specialist to ensure compliance with the utilization standard. Any items in non-compliance shall be rectified by BLM no later than the beginning of the following growing season, and reported to the Service.	Met	Use was read in the area when livestock and burros inhabited the area.
Trap sites for wild burro removal should be located in previous trap sites or in previously disturbed areas, if at all possible.	Met	No gathers occurred after the implementation of this biological opinion. It is policy that all trap sites were located in disturbed areas.
Holding facilities for gather operations should be placed either in previously disturbed areas or outside of desert tortoise habitat.	Met	No gathers occurred after the implementation of this biological opinion.
Trap sites or holding sites will be cleared by a qualified biologist before being set up or designated. The site will be surveyed for desert tortoise using survey techniques which provide 100 percent coverage.	Met	No gathers occurred after the implementation of this biological opinion.
All vehicle use in desert tortoise habitat shall be restricted to existing roads and trails; vehicle speed should not exceed 25 miles-per-hour (mph).	Met	No gathers occurred after the implementation of this biological opinion.
Trash and garbage shall be removed from each trap and holding site and disposed of in an off-site designated facility. No trash or garbage shall be buried at the sites.		It is policy that all trash is removed from the gather sites after gathers are finished.
Use of hay or grains as enticements into the traps will not be authorized within desert tortoise habitat to avoid introduction of non-native plant species. The feeding of hay or grains to animals shall be avoided in holding facilities within desert tortoise habitat when possible, with the exception of weed-free hay.		No gathers occurred after the implementation of this biological opinion.
Blm will provide desert tortoise information to all contractors about desert tortoise. this will be in the form of a fact sheet on the life history of the desert tortoise, legal protection for desert tortoises, the definition of take, penalties for violations of federal and state laws, general tortoise activity patterns, reporting requirements, measures to protect tortoises, and personal measures employees can take to promote the conservation of desert tortoises. The fact sheet will include the pertinent terms and conditions of the biological opinion. The contractor will ensure that all employees working on the gather are knowledgeable of the terms and conditions of the biological opinion.		No gathers occurred after the implementation of this biological opinion.

Table 171.0 - Livestock and Wild Horse and Burro Management 2003 Biological Opinion Desert Tortoise Habitat (con't)

THE DISCHARGE OF FIREARMS WILL BE PROHIBITED AT ALL TRAP AND HOLDING FACILITIES EXCEPT IN THE CASE OF EUTHANASIA OF A CAPTURED ANIMAL BY AN AUTHORIZED BLM EMPLOYEE OR CONTRACTOR.		NO GATHERS OCCURRED AFTER THE IMPLEMENTATION OF THIS BIOLOGICAL OPINION.
If the HMA includes grazing allotments, combined usage shall not exceed the limits set above.	Met	Livestock have not grazed in the desert tortoise habitat since the lessee removed his cattle in 1994. The majority of wild equids have been removed from the allotment, including this area, in 1996. Few burros remain in tortoise area.

Wildlife Habitat Management

Objective:

To maintain and enhance wildlife habitat and provide for species diversity.

Table 172.0 - Wildlife RMP Determinations – Razorback Allotment

Wildlife RMP Determinations	Conclusion	Rationale
Prepare, revise, or maintain habitat management plans, or their functional equivalent, to - enhance the habitat for game and nongame wildlife species, when appropriate. The identification of specific wildlife objectives will be determined when each habitat plan is developed in consultation with affected publics, i.e., range users, interest groups, and county governments.	Met	This assessment meets the Requirement of a habitat plan for Bullfrog Hills and Montezuma. The August 14, 1991 Biological Opinion for the Proposed Livestock Program Within Desert Tortoise Habitat in Southern Nevada also meets this requirement.
Manage mule deer habitat for best possible condition within the site potential. On 28,920 acres of mule deer winter range, restrict activities which might be disturbing to mule deer between January 15 and May 15 (see Maps 34 and 35, and Appendix 14).	NA	There is no mule deer habitat in this allotment.
Maintain or improve existing or potential bighorn sheep habitat areas (324,000 acres) (see Maps 10 and 13). To ensure this occurs, management actions will include 1) prohibiting construction of new roads to communication site facilities; 2) limiting vehicle use to existing roads and trails; 3) prohibiting off-highway vehicle events within one-quarter mile of Specie Spring; 4) restricting, I between February 1 and May 15, activities in lambing areas which might be disturbing to bighorn sheep (17,480 acres); and 5) prohibiting land uses that are incompatible with bighorn sheep lambing areas at Stonewall Falls and Little Meadows (see Maps 10 and 13, and Appendix 14).	Met	The removal of large numbers of wild equids in 1996 and some in 2007 have improved habitat.

Special Status Species

Objective:

To protect, restore, enhance, and expand habitat of species identified as threatened, endangered, or Nevada BLM Sensitive Species under the Endangered Species Act.

Table 173.0 - Special Status Species RMP Determinations – Razorback Allotment

Special STATUS Species RMP Determinations	Conclusion	Rationale
Manage desert tortoise Non-Intensive Category III habitat (70,600 acres) to maintain current populations levels (see Map 15). Where new road construction is discretionary, no new roads will be constructed within washes. Livestock grazing will be in accordance with the August 14, 1991 *Biological Opinion for the Proposed Livestock Program Within Desert Tortoise Habitat in Southern Nevada.* Refer to the Livestock Grazing Management determination section for terms and conditions of this Biological Opinion.	Met	See Table 171.0 above, "Livestock Management RMP Determinations Desert Tortoise Habitat Montezuma Allotment"
Habitat for all Federally listed threatened or endangered species or Nevada BLM Sensitive Species (plant and animal) will be managed to maintain or increase current populations of these species. The introduction, reintroduction, or augmentation of Nevada BLM Sensitive Species, as well as Federally listed threatened or endangered species, may be allowed if, in coordination with Nevada Division of Wildlife and the U.S. Fish and Wildlife Service, it is deemed appropriate. Such actions will be considered on a case-by-case basis and will be subject to applicable procedures outlined in the section on Standard Operating Procedures, Environmental Review and Management.	Met	The utilization level in 1994, 1995, 1996 and 2004 did not exceed the standard established in the RMP Livestock Objective for desert tortoise habitat.

Allotment-Specific Objectives for the Razorback Allotment

Table 175.0 - Allotment-Specific Objectives - Razorback Allotment

Allotment-Specific Objectives	Conclusion	Rationale
Maintain the current range condition.	Partially Met	Two of three key areas have met the Mojave-Southern Great Basin RAC Standards. One has not met standards due to drought and poor quality soil.
Improve livestock distribution through water development.	Partially Met	Temporary water haul sites are used to improve livestock distribution. No permanent waters have been developed.
Maintain the current numbers of burros.	Not Met	Several emergency gathers were conducted on the allotment due to repeated droughts. The below-normal precipitation years has resulted in limited water availability and limited forage.
Maintain or improve riparian habitat along the Amargosa River and at spring sources.	Met	The Amargosa River runs through private land on the Razorback Allotment. Species Spring is the only spring source on this allotment and is rated as PFC in 2006. The Allotment Specific Objective was met.

Springdale 2 Allotment

1. RAC Standards Conformance Review

Standards Conformance Review of the Mojave/Southern Great Basin Resource Advisory Council Standards and Guidelines in the Springdale 2 Allotment

The Springdale 2 Allotment is located within the Mojave-Southern Great Basin RAC. Standards and Guidelines for rangeland health were approved and published in 1997. In December 2000, the Mojave-Southern Great Basin RAC approved Wild Horse and Burro Standards and Guidelines and they were incorporated into the existing rangeland health document. The current version of the RAC Standards and Guidelines is located in Appendix B.

Standard 1: Soils

Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity, and sustain the hydrologic cycle.

Soil Indicator – Upland watershed condition

As indicated by: Ground Cover.
Surfaces (e.g. biological crust, pavement)
Compaction/filtration

MET

Significant Progress: Yes

Numbers of animals using the allotment dropped between 1995 and 2004.

Rationale:

The BLM collected use pattern data within the Springdale 2 Allotment. This data serves as a basis for the upland health assessment to determine the effects of livestock, wild equids, and wildlife use within the allotment. Use pattern maps show a decrease in use in 1995. Following the analysis, interpretation and evaluation of use pattern information, it was determined that this standard is met. With these lower use levels, enough residual vegetation is left to protect the watershed (Appendix E).

Causal Factor:

Prior to 1996, burros were well above their AML in the Bullfrog HMA. In 1996, the majority of burros were removed from the HMA due to drought. Very few burros were left on the HMA. This has provided an 11 year-rest period from burro use on the allotment.

Riparian soil Indicators

As indicated by: Stream bank stability

MET at the one riparian area in the allotment.

There is only one riparian area in the allotment, which is in Proper Functioning Condition.

Significant Progress: Yes

The Amargosa River has improved in condition since its functioning condition was determined in 1994 and was found to be in Non-Functioning condition. In 1999 and 2006 the Amargosa River had improved and was in Proper Functioning Condition.

Rationale:

The Proper Functioning Condition study measures when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows. The BLM assessed Functioning Condition at the Amargosa River and it was in Proper Functioning Condition in 2006. It had adequate bank coverage to dissipate energy from high wave action on the pond.

Causal Factor:

Prior to 1996, burros were well above their AML on the allotment. In 1996, the majority of burros were removed from the HMA due to drought. Very few burros were left on the HMA. This has provided an 11-year rest period from burro use along the Amargosa River. The reduced utilization levels on the riparian area have led to this improvement.

Standard 2: Ecosystem Components

Watersheds should possess the necessary ecological components to achieve State water quality criteria, maintain ecological processes, and sustain appropriate uses.

Upland Indicators:

As indicated by:

- Canopy and ground cover, including litter, live vegetation, biological crust, and rock appropriate to the potential of the ecological site.
- Ecological processes are adequate for the vegetation communities.

MET

Significant Progress: Yes

Numbers of animals using the allotment dropped between 1995 and 2004.

Rationale:

The BLM collected use pattern within the Springdale 2 Allotment. This data serves as a basis for the upland health assessment to determine the effects of livestock, wild equids, and wildlife use within the allotment. Use pattern maps show a decrease in use in 1995. Following the analysis, interpretation and evaluation of use pattern information, it was determined that this standard is met (Appendix E).

Causal Factor:

Prior to 1996, burros were well above their AML in the Bullfrog HMA. In 1996, the majority of burros were removed from the HMA due to drought. Very few burros were left on the HMA. This has provided an 11-year rest period from burro use on the allotment.

Riparian Indicators:

As indicated by:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows.
- Elements indicating proper functioning condition such as avoiding accelerating erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics:

- Width/Depth ratio;

- Channel roughness;

- Sinuosity of stream channel;

- Bank stability;

- Vegetative cover (amount, spacing, life form); and

- Other cover (large woody debris, rock).

- Natural springs, seeps, and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering, and release as indicated by plant species and cover appropriate to the site characteristics.

MET at the one riparian area in the allotment.

There is only one riparian area in the allotment, which is in Proper Functioning Condition.

Significant Progress: Yes

The Amargosa River has improved in condition since it was read in 1994 and was found in Non-Functioning condition. In 1999 and 2006 it was in Proper Functioning Condition.

Rationale:

The Functioning Condition study measures when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows. The BLM assessed Functioning Condition at the Amargosa River in 2006 and was in Proper Functioning Condition.

Causal Factor:

Prior to 1996, burros were well above their AML on the allotment. In 1996, the majority of burros were removed from the HMA due to drought. Very few burros were left on the HMA. This provided an 11 year rest from burro use along the Amargosa River.

Water Quality Indicators:

As indicated by:

- Chemical, physical and biological constituents do not exceed the State water quality Standards.

The above indicators shall be applied to the potential of the ecological site.
Most likely **MET** or making significant progress on the riparian area in the allotment.

Water quality data was not collected for this riparian area.

Significant Progress: Yes

Due to the low number of animals using this water, it is unlikely water quality is affected by burros and cattle.

Causal Factor:

The gathers in 1996 almost completely removed burros from the HMA.

Rationale:

Due to the low number of animals using this water, it is unlikely it is affected by burros.

Causal Factor:

The gathers in 1996 almost completely removed burros from the HMA.
Most likely **MET** or making significant progress on 100 percent of the riparian areas in the allotment.

Standard 3: Habitat and Biota

Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses.

As indicated by: Vegetation composition (relative abundance of species);
Vegetation structure (life forms, cover, height, and age classes);
Vegetation distribution (patchiness, corridors);
Vegetation productivity;
Vegetation nutritional value.

NOT MET, the utilization levels meet the indicators listed above. However, the allotment does not contain enough forage to support the *appropriate uses* of both livestock and burro.

Significant Progress: Yes

The large removal of burros from the area has lead to some improvement in condition on sites with potential to improve.

Rationale:

An evaluation of this Standard 3 was completed on use pattern data. Utilization levels in the allotment meet this standard. The use pattern maps show acceptable levels of use to maintain proper cover in the watershed between 1987 and 2004. The there has been little grazing by burros since 1996 on the allotment. However, Ecological Status Inventory shows there is enough forage for only 2 cows for 9 months. This is not meeting guideline 3.4: "Wild Horse and Burro herd management practices should be planned and implemented to provide for integrated use by domestic livestock and wildlife."

Causal Factor:

Prior to 1996, burros were well above their AML on the allotment. The majority of burros were removed in 1996 due to drought. This provided vegetation an 11 year rest. The reduction in numbers of grazing animals allowed improvement on the Amargosa River from Non-Functioning to Proper Functioning Condition.

The other main causal factor is the allotment is too small to support both 2 cows and 2 burros.

Standard 4: Wild Horses and Burros

Wild horses and burros within Herd Management Areas should be managed for herd viability and sustainability. Herd Management Areas should be managed to maintain a healthy ecological balance among wild horse and /or burro populations, wildlife, livestock, and vegetation.

As indicated by:

Herd health indicators.
Herd viability indicators.

The Springdale 2 Allotment is a very small allotment surrounded by the Razorback Allotment. The same evaluation of burros for the Razorback Allotment applies here.

NOT MET in the Bullfrog HMA in the allotment. Prior to the removal of burros from the HMA in the drought of 1996, burros were thin, but in fair condition. However, burros had not shed their winter coats, an indication of poor nutrition. There is a lack of forage for burros in dry years on the HMA. Approximately 77 percent of the available forage in the HMA is unusable due to a lack of water. After burros were removed from the HMA in 1996, the number of burros remaining in the HMA may not be a genetically viable number.

Significant Progress: Yes

BLM removed large numbers of burros in 1995 and 1996. This has led to an improvement in range condition in areas where there was potential to improve.

Rationale:

The issues at the HMA in the Springdale 2 Allotment are:

- Lack of forage in the HMA,
- Lack of water,
- Frequent droughts,
- Poor genetic variability of the wild burro populations

The current AML cannot meet the standard. It exceeds the carrying capacity of the range. There is not enough forage to support the AML presently set for burros along with cattle grazing inside the HMA in this allotment.

The Springdale 2 Allotment has a history of drought, necessitating an emergency wild burro gather in 1996 to prevent starvation. The 1996 drought threatened the existence of wild horses and burros in both Esmeralda and Nye counties. Almost no growth occurred on vegetation in the spring of 1996. Most domestic cattle were removed and placed on their owner's base properties.

Throughout the eastern half of the Bullfrog HMA, a severe shortage of water creates a constant concern for the well-being of the wild burros and wildlife in the area, especially during years of drought when many water sources dry up. Approximately 77 percent of the forage on the eastern half of Bullfrog HMA is unusable due to the lack of water. There are few natural waters in the majority of the HMA. Wild burro distribution is limited to approximately a few miles around water sources along the Amargosa River within the Springdale 2 allotment.

Causal Factor:

Frequent droughts, poor quality soils and low rainfall combined limit the amount of forage for cattle and burros the habitat inside the Bullfrog HMA. There is sufficient forage available for burros if few cattle are run with burros in this HMA and if water is available throughout the HMA.

Guideline 4.2, requires us to set the AML "to reflect the carrying capacity of the land in dry conditions based upon the most limiting factor: living space, water or forage." It also states, "Management levels will not conflict with achieving or maintaining standards for soils, ecological components, or diversity of habitat and biota."

2. Land Use Plan Objectives

Multiple use objectives for the Tonopah Planning Area were developed in the Tonopah Resource Management Plan (RMP) and Record of Decision, dated 1997. The Land Use Plan (LUP) objectives pertain to livestock forage production, vegetation ecological condition and trends, terrestrial big game habitat condition and trends, and aquatic/riparian habitat trends. These objectives are evaluated below for achievement for the Springdale 2 Allotment.

Livestock Grazing Management

Objective:

To create healthy, productive rangelands through implementation of the recommendations of the ongoing rangeland monitoring and evaluation program.

Table 176.0 - Livestock Management RMP Determinations – Springdale 2 Allotment

livestock MANAGEMENT RMP Determinations	Conclusion	Rationale
.Adjustments in use for each allotment will be based on short-term and/or long-term monitoring data methods as outlined in the *Nevada Rangeland Monitoring Handbook* and BLM technical references.	Met	The 1987 to 2004 use pattern maps display a decrease in the grazing use level from livestock and wild equids. The grazing use level since 1995 has been within the allowable utilization. There is some livestock trespass between the Razorback and Springdale 2 allotments due to the unfenced boundary.

Riparian Habitat

Objective:

To achieve or maintain the presence of adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high water flows for all riparian-wetland areas (proper functioning condition).

Table 177.0 - Riparian habitat RMP Determinations – Springdale 2 Allotment

Riparian habitat RMP Determinations	Conclusion	Rationale
Manage for proper functioning condition on all streamside riparian areas, and all springs, seeps, wet meadows and other riparian areas in the Tonopah Planning Area.	Met	Riparian habitat is rated as PFC.
Where streams and riparian areas are functioning but are at risk of deteriorating, manage for an improving trend, as determined using techniques described in current BLM Technical References and/or other BLM guidelines. If needed, and in conjunction with the grazing permittees and other publics, design and implement management practices to achieve an upward trend. If the desired trend does not occur, the responsible class of animal (where it can be determined) will be reduced or excluded.	Met	Riparian habitat is rated as PFC.
Where streams and riparian areas are nonfunctional, work with livestock permittees and other publics to modify management. If the desired trend does not occur, the responsible class of animal (where it can be determined) will be reduced or excluded.	Met	The Stream in the allotment is rated as PFC.

Vegetation

Objective:

To provide for vegetative and ecological diversity.

Table 178.0 - Vegetation RMP Determination - Springdale 2 Allotment

VEgetation RMP Determination	Conclusion	Rationale
Manage the vegetation resource for desired plant communities. . . Descriptions of specific desired plant communities will be developed by allotment at key areas. . . Management of the vegetative resource will provide for the physiological needs (such as critical growth periods, biomass production, root reserve increase, and seed production) of the key forage plant species. . .	Met	The 1987 to 2004 use pattern maps display a decrease in the grazing use level from livestock and wild equids. The grazing use level since 1995 has been within the utilization standard of 50 percent. In 2004, the grazing use was 1454 acres in the negligible use category (0-5 percent) and 12 acres in the slight use category (6-20%).

Wild Horse and Burro

Objective:

To manage wild horse and/or burro populations within Herd Management Areas at levels which will preserve and maintain a thriving natural ecological balance consistent with other multiple-use objectives.

RMP Determinations: Continue the following management determinations:

Table 179.0 - Wild Horse and Burro RMP Determinations - Springdale 2 Allotment

Wild Horse and Burro RMP Determinations	Conclusion	Rationale
Manage wild horses and/or burros populations in 16 herd management areas (HMAs) listed.	Not Met	In 1996 a severe drought caused many wild horses to starve due to lack of forage. Wild horses and burros were removed from the HMAs in this allotment. The Bullfrog HMA is unsuitable for wild horses or for large numbers of burros. A more conservative stocking rate for burros needs to be established. There is not enough forage in the HMA to permit burros and livestock to coexist and still support viable numbers of burros.
Manage wild horses and/or burros at appropriate management level (AML).Future herd size or AMLs within each herd management area will be adjusted as determined through short-term and long-term monitoring data methods as outlined in the *Nevada Rangeland Monitoring Handbook* and BLM technical references.	Not Met	The AML established in 2005 by decision exceeds the amount of forage available for both wild horses and burros. This HMA is not suitable for wild horses. A new lower AML is proposed in this evaluation.

Table 179.0 - Wild Horse and Burro RMP Determinations - Springdale 2 Allotment (con't)

Wild Horse and Burro RMP Determinations	Conclusion	Rationale
Assure sufficient water and forage exist for wild horses and/or burros in herd management areas.	Not Met	Sufficient forage does not exist for wild burros at current AML in this HMA. The climate and soils in this allotment cannot produce enough forage for burros. This allotment is very small. No new waters will be established in this allotment. New waters need to be established in the neighboring Razorback Allotment.
Apply for appropriative water rights and/or assert public water reserves on water sources as necessary to ensure a reliable, year-round water source for wild horses and burros in herd management areas.	NA	The allotment is too small to establish new water sources. The adjacent allotment, Razorback, could have new waters established for wild burro use.

Special Status Species

Objective:

To protect, restore, enhance, and expand habitat of species identified as threatened, endangered, or Nevada BLM Sensitive Species under the Endangered Species Act.

Table 180.0 - Special Status Species RMP Determinations - Springdale 2 Allotment

Special STATUS Species RMP Determinations	Conclusion	Rationale
Habitat for all Federally listed threatened or endangered species or Nevada BLM Sensitive Species (plant and animal) will be managed to maintain or increase current populations of these species. The introduction, reintroduction, or augmentation of Nevada BLM Sensitive Species, as well as Federally listed threatened or endangered species, may be allowed if, in coordination with Nevada Division of Wildlife and the U.S. Fish and Wildlife Service, it is deemed appropriate. Such actions will be considered on a case-by-case basis and will be subject to applicable procedures outlined in the section on Standard Operating Procedures, Environmental Review and Management.	NA	Federally listed threatened or endangered species or Nevada BLM Sensitive Species do not occur on this allotment.

Allotment-Specific Objectives Springdale 2 Allotment:

Table 181.0 - Allotment-Specific Objectives - Springdale 2 Allotment

Allotment-Specific Objectives	Conclusion	Rationale
Maintain the current range condition.	Met	The 1987 to 2004 use pattern maps display a decrease in the grazing use level from livestock and wild equids. The grazing use level since 1995 has been within the utilization standard of 50 percent. In 2004, the grazing use was 1454 acres in the negligible use category (0-5 percent) and 12 acres in the slight use category (6-20%).
Manage for current burro numbers.	Not Met	See Table 177.0 above "Wild Horse and Burro RMP Determinations - Springdale 2 Allotment". There is not enough forage to support both burros and cattle in the allotment.
Maintain or improve riparian habitat at spring sources.	Met	This section of the Amargosa River is rated as PFC.

APPENDIX B - *MOJAVE/SOUTHERN GREAT BASIN AREA RESOURCE ADVISORY COUNCIL STANDARDS AND GUIDELINES*

MOJAVE/SOUTHERN GREAT BASIN AREA

PREAMBLE

The Standards and Guidelines for grazing administration on BLM lands in southern Nevada apply to livestock grazing. The Mojave-Southern Great Basin Resource Advisory Council (RAC) intends that the Standards and Guidelines will result in a balance of sustainable development and multiple use along with progress, over time, toward attaining desired rangeland conditions. Standards are expressions of physical and biological conditions required for sustaining rangelands for multiple uses. Guidelines point to management actions related to livestock grazing for achieving the Standards. Guidelines are options that move rangeland conditions toward the multiple use Standards. Guidelines are based on science, best rangeland management practices, and public input. Guidelines indicate the types of grazing methods and practices for achieving the Standards for multiple use, are developed for functional watersheds and implemented at the allotment level.

The Mojave-Southern Great Basin Resource Advisory Council recognizes that it will sometimes be a long-term process to restore rangelands to proper functioning condition. In some areas, it may take many years to achieve healthy rangelands.

The Resource Advisory Council may be requested by any party to assist reaching agreement in resolving disputes.

STANDARDS AND GUIDELINES

STANDARD 1. SOILS:

Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity, and sustain the hydrologic cycle.

Soil indicators:

- Ground cover (vegetation, litter, rock, bare ground);

- Surfaces (e.g., biological crusts, pavement); and

- Compaction/infiltration.

Riparian soil indicators:

- Stream bank stability.

All of the above indicators are appropriate to the potential of the ecological site.

GUIDELINES:

1.1 Upland management practices should maintain or promote adequate vegetative ground cover to achieve the Standards.

1.2 Riparian-wetland management practices should maintain or promote sufficient residual vegetation to maintain, improve, or restore functions such as stream flow energy dissipation, sediment capture, groundwater recharge, and streambank stability.

1.3 When proper grazing practices alone are not likely to restore areas, land management practices may be designed and implemented where appropriate.

1.4 Rangeland management practices should address improvement beyond this Standard, significant progress toward achieving Standards, time necessary for recovery, and time necessary for predicting trends.

STANDARD 2. ECOSYSTEM COMPONENTS:

Watersheds should possess the necessary ecological components to achieve State water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristic of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

Upland Indicators:

- Canopy and ground cover, including litter, live vegetation, biological crust, and rock appropriate to the potential of the ecological site.

- Ecological processes are adequate for the vegetative communities.

Riparian Indicators:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows.

- Elements indicating proper functioning condition such as avoiding accelerating erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics:

- Width/Depth ratio;

- Channel roughness;

- Sinuosity of stream channel;

- Bank stability;

- Vegetative cover (amount, spacing, life form); and

- Other cover (large woody debris, rock).

- Natural springs, seeps, and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering, and release as indicated by plant species and cover appropriate to the site characteristics.

Water Quality Indicators:

- Chemical, physical and biological constituents do not exceed the State water quality Standards.

The above indicators shall be applied to the potential of the ecological site.

GUIDELINES:

2.1 Management practices should maintain or promote appropriate stream channel morphology and structure consistent with the watershed.

2.2 Watershed management practices should maintain, restore or enhance water quality and flow rate to support desired ecological conditions.

2.3 Management practices should maintain or promote the physical and biological conditions necessary for achieving surface characteristics and desired natural plant community.

2.4 Grazing management practices will consider both the economic and physical environment, and will address all multiple uses including, but not limited to, (i) recreation, (ii) minerals, (iii) cultural resources and values, and (iv) designated wilderness and wilderness study areas.

2.5 New livestock facilities will be located away from riparian and wetland areas if they conflict with achieving or maintaining riparian and wetland functions. Existing facilities will be used in a way that does not conflict with achieving or maintaining riparian and wetland functions, or they will be relocated or modified when necessary to mitigate adverse impacts on riparian and wetland functions. The location, relocation, design and use of livestock facilities will consider economic feasibility and benefits to be gained for management of lands outside the riparian area along with the effects on riparian Functions.

2.6 Subject to all valid existing rights, the design of spring and seep developments shall include provisions to protect ecological functions and processes.

2.7 When proper grazing practices alone are not likely to restore areas of low infiltration or permeability, land management practices may be designed and implemented where appropriate. Grazing on designated ephemeral rangeland watersheds should be allowed only if (i) reliable estimates of production have been made, (ii) an identified level of annual growth or residue to remain on site at the end of the grazing season has been established, and (iii) adverse effects on perennial species and ecosystem processes are avoided.

2.8 Rangeland management practices should address improvement beyond these Standards, significant progress toward achieving Standards, time necessary for recovery, and time necessary for predicting trends.

STANDARD 3. HABITAT AND BIOTA:

Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

Habitat Indicators:

- Vegetation composition (relative abundance of species);

- Vegetation structure (life forms, cover, height, and age classes);

- Vegetation distribution (patchiness, corridors);

- Vegetation productivity; and

- Vegetation nutritional value.

Wildlife Indicators:

- Escape terrain;

- Relative abundance;

- Composition;

- Distribution;

- Nutritional value; and

- Edge-patch snags.

The above Indicators shall be applied to the potential of the ecological site.

GUIDELINES:

3.1 Mosaics of plant and animal communities that foster diverse and productive ecosystems should be maintained or achieved.

3.2 Management practices should emphasize native species except when others would serve better for attaining desired communities.

3.3 Intensity, frequency, season of use and distribution of grazing use should provide for growth, reproduction, and, when environmental conditions permit, seedling establishment of those plant species needed to reach long-term land use plan objectives. Measurements of ecological condition, trend, and utilization will be in accordance with techniques identified in the Nevada Rangeland Handbook.

3.4 Grazing management practices should be planned and implemented to provide for integrated use by domestic livestock and wildlife, as well as wild horses and burros inside Herd Management Areas.

3.5 Management practices will promote the conservation, restoration and maintenance of habitat for special status species.

3.6 Livestock grazing practices will be designed to protect fragile ecosystems of limited distribution and size that support unique sensitive/endemic species or communities. Where these practices are not successful, grazing will be excluded from these areas.

3.7 Where grazing practices alone are not likely to achieve habitat objectives, land management practices may be designed and implemented as appropriate.

3.8 Vegetation manipulation treatments may be implemented to improve native plant communities, consistent with appropriate land use plans, in areas where identified Standards cannot be achieved through proper grazing management practices alone. Fire is the preferred vegetation manipulation practice on areas historically adapted to fire; treatment of native vegetation with herbicides or through mechanical means will be used only when other management techniques are not effective.

3.9 Rangeland management practices should address improvement beyond these Standards, significant progress toward achieving Standards, time necessary for recovery, and time necessary for predicting trends.

PREAMBLE - WILD HORSES AND BURROS

Nevada is an arid State. The Standards and Guidelines for rangeland health and the guidelines for Wild Horse and Burro (WH&B) management on BLM lands in southern Nevada apply to Herd Management Areas (HMAs). The Mojave-Southern Great Basin Resource Advisory Council (RAC) intends that the Standards and Guidelines will result in a balance of sustainable development and multiple use.

The standards for rangeland health will be reached and maintained by managing wild horse and burro numbers so as not to exceed Appropriate Management Levels (AML) for each Herd Management Area. Controlling wild horse and burro numbers through gathers and other control programs is essential.

Standards are expressions of physical and biological conditions required for sustaining rangelands for multiple uses. Guidelines point to management actions related to HMAs for achieving the Standards. Guidelines are options that move rangeland conditions toward the multiple use Standards. Guidelines are based on science, best rangeland management practices, and public input. Guidelines indicate the types of management methods and practices for achieving the Standards for multiple use and are developed for functional watersheds and implemented within HMAs.

The Mojave-Southern Great Basin Resource Advisory Council recognizes that it will sometimes be a long-term process to achieve proper functioning condition(s) on degraded rangelands. Healthy rangelands contribute to healthy herds.

The Resource Advisory Council may be requested by any party to assist in addressing issues related to these Standards and Guidelines.

STANDARDS AND GUIDELINES

STANDARD 1. SOILS:

Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity, and sustain the hydrologic cycle.

Soil indicators:

- Ground cover (vegetation, litter, rock, bare ground);

- Surfaces (e.g., biological crusts, pavement); and

- Compaction/infiltration.

Riparian soil indicators:

- Stream bank stability.

All of the above indicators are appropriate to the potential of the ecological site.

GUIDELINES: (for SOILS)

1.1 Upland management practices should maintain or promote adequate vegetative ground cover to achieve the Standards. *(Apply to Wild Horse and Burro Guidelines also.)*

1.2 Riparian-wetland management practices should maintain or promote sufficient residual vegetation to maintain, improve, or restore functions such as stream flow energy dissipation, sediment capture, groundwater recharge, and streambank stability. *(Apply to Wild Horse and Burro Guidelines also.)*

1.3 When Wild Horse and Burro herd management practices alone are not likely to restore areas, land management practices may be designed and implemented where appropriate.

1.4 Wild Horse and burro herd management practices should address improvement beyond this standard, significant progress toward achieving standards, time necessary for recovery, and time necessary for predicting trends.

STANDARD 2. ECOSYSTEM COMPONENTS:

Watersheds should possess the necessary ecological components to achieve State water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristic of the stage of stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

Upland Indicators:

- Canopy and ground cover, including litter, live vegetation, biological crust, and rock appropriate to the potential of the ecological site.

- Ecological processes are adequate for the vegetative communities.

Riparian Indicators:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows.

- Elements indicating proper functioning condition such as avoiding accelerating erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics:

- Width/Depth ratio;

- Channel roughness;

- Sinuosity of stream channel;

- Bank stability;

- Vegetative cover (amount, spacing, life form); and

- Other cover (large woody debris, rock).

- Natural springs, seeps, and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering, and release as indicated by plant species and cover appropriate to the site characteristics.

Water Quality Indicators:

- Chemical, physical and biological constituents do not exceed the State water quality Standards.

The above indicators shall be applied to the potential of the ecological site.

GUIDELINES: (for ECOSYSTEM COMPONENTS)

2.1 Management practices should maintain or promote appropriate stream channel morphology and structure consistent with the watershed. *(Apply to Wild Horse and Burro Guidelines also.)*

2.2 Watershed management practices should maintain, restore or enhance water quality and flow rate to support desired ecological conditions. *(Apply to Wild Horse and Burro Guidelines also.)*

2.3 Management practices should maintain or promote the physical and biological conditions necessary for achieving surface characteristics and desired natural plant community. *(Apply to Wild Horse and Burro Guidelines also.)*

2.4 Wild Horse and Burro management practices will consider both economic and physical environment and will address all multiple uses including, but not limited to, (i) recreation, (ii) minerals, (iii) cultural resources, (iv) wildlife, (v) domestic livestock, (vi) community economics, (vii) Areas of Critical Environmental Concern, (viii) designated wilderness (iv) and wilderness study areas (WSAs).

2.5 New facilities should be located away from riparian and wetland areas if existing facilities conflict with achieving or maintaining riparian and wetland functions. Existing facilities will be used in a way that does not conflict with achieving or maintaining riparian and wetland functions or they will be relocated or modified when necessary to mitigate adverse impacts on riparian and wetland functions.

2.6 Subject to all valid existing rights, the design of spring and seep developments shall include provisions to maintain or promote ecological functions and processes.

2.7 When proper Wild Horse and Burro herd management is not likely to restore areas of low infiltration or permeability, land management practices may be designed and implemented where appropriate. When setting herd management levels on ephemeral rangeland watersheds, reliable estimates of production for drought conditions should be used to avoid adverse effects on perennial species and ecosystem processes and retain a desired minimum level of annual growth or residue remaining.

2.8 Wild Horse and Burro herd management practices should address improvement beyond this standard, significant progress toward achieving standards, time necessary for recovery, and time necessary for predicting trends.

STANDARD 3. HABITAT AND BIOTA:

Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

Habitat Indicators:

- Vegetation composition (relative abundance of species);

- Vegetation structure (life forms, cover, height, and age classes);

- Vegetation distribution (patchiness, corridors);

- Vegetation productivity; and

- Vegetation nutritional value.

Wildlife Indicators:

- Escape terrain;

- Relative abundance;

- Composition;

- Distribution;

- Nutritional value; and

- Edge-patch snags.

The above Indicators shall be applied to the potential of the ecological site.

GUIDELINES: (for HABITAT AND BIOTA)

3.1 Mosaics of plant and animal communities that foster diverse and productive ecosystems should be maintained or achieved. *(Apply to Wild Horse and Burro Guidelines also.)*

3.2 Management practices should emphasize native species except when others would serve better for attaining desired communities. *(Apply to Wild Horse and Burro Guidelines also.)*

3.3 Wild Horse and burro herd management should provide for growth, reproduction, and seedling establishment of those plant species needed to reach long-term land use plan objectives. Measurements of ecological conditions, trend, and utilization will be in accordance with techniques identified in the Nevada Rangeland Handbook.

3.4 Wild Horse and Burro herd management practices should be planned and implemented to provide for integrated use by domestic livestock and wildlife.

3.5 Wild Horse and Burro herd management practices will promote the conservation, restoration and maintenance of habitat for special status species.

3.6 Wild Horse and Burro herd management practices will be designed to protect fragile ecosystems of limited distribution and size that support unique sensitive/endemic species or communities. Where these practices are not successful, herd levels will be reduced or eliminated from these areas.

3.7 Where Wild Horse and Burro herd management practices alone are not likely to restore areas, land management practices may be designed and implemented as appropriate.

3.8 Vegetation manipulation treatments may be implemented to improve native plant communities, consistent with appropriate land use plans, in areas where identified standards cannot be achieved through Wild Horse and Burro herd management practices alone. Fire is the preferred vegetation manipulation practice on areas historically adapted to fire; treatment of native vegetation with herbicides or through mechanical means will be used only when other management techniques are not effective.

3.9 Wild Horse and Burro herd management practices should address improvement beyond this standard, significant progress toward achieving standards, time necessary for recovery, and time necessary for predicting trends.

STANDARD 4: WILD HORSES AND BURROS

Wild horses and burros within Herd Management Areas should be managed for herd viability and sustainability. Herd Management Areas should be managed to maintain a healthy ecological balance among wild horse and /or burro populations, wildlife, livestock, and vegetation.

Herd health indicators.

- General horse and/or burro appearance: Problems are often apparent and can be easily identified by just looking at the herd.

- Crippled or injured horses and/or burros: Excessive injuries can indicate problems.

Herd demographics indicators.

- Size of bands: A band with one stud or jack, one mare or jenny, and one foal indicates a problem. An oversized band also indicates there is a problem. Band sizes of 5-10 animals with one dominant stud per band is a good indicator.

- Size of Bachelor Bands: Large bachelor bands in the immediate vicinity of other bands could indicate potential problems.

Herd viability indicators.

- Heavy trailing into water sources may indicate a significant problem with forage availability or water distribution. Animals may be traveling considerable distances to obtain water or forage.

- Waiting for water. When available water becomes so scarce that a waiting line develops, horses and burros are in trouble.

- Availability of water. Address legal and/or climatic considerations. Situation exist where WH&B are present only because they currently have access to water which they could legally be deprived of under Nevada Water Laws. Situations exist where existing WH&B populations are dependent upon water hauling. If water hauling were to cease these animals would die within a matter of days.

- Depleted forage near all available water sources. Adequate water, and forage adjacent to water sources, are essential.

GUIDELINES: (for WILD HORSE AND BURRO)

4.1 Wild Horse and Burro population levels in HMAs should not exceed AML.

4.2 AMLs should be set to reflect the carrying capacity of the land in dry conditions based upon the most limiting factor: living space, water or forage. Management levels will not conflict with achieving or maintaining standards for soils, ecological components, or diversity of habitat and biota.

4.3 Interaction with herds should be minimized. Intrusive gathers should remove sufficient numbers of animals to ensure a period between gathers that reflects national wild horse and burro management strategies. Non intrusive gathers such as water trapping can be done on an "as needed" basis.

4.4 Herd Management Plans should be made with the best predictive information available. When emergency actions occur the Herd Management Plan should be re-evaluated.

4.5 Viable sex and age distribution should be a long term goal of any Wild Horse and Burro Herd Management Plan. Sex and age distribution of the herd should be addressed when (after) AML has been reached.

4.6 When Wild Horse and Burro herd management alone is not likely to restore areas, land management practices may be designed and implemented where appropriate.

4.7 Wild Horse and Burro herd management practices should address improvement beyond this standard, significant progress toward achieving standards, time necessary for recovery, and time necessary for predicting trends.

APPENDIX C – *PLANT COMMUNITY DYNAMICS*

I. Plant community Dynamics

Each plant species must relate to its physical environment and other plant or animal species. "Every plant species relationship to the physical environment has certain characteristics: 1) certain essential requirements, 2) possesses ecological amplitude and 3) has a characteristic capacity for utilizing the available resources of the environment in which it occurs. In addition plants species also have relationships among individuals of the same or different species which are characterized by 1) in competitive capacity, 2) in capacity of association, 3) in reproductive processes, 4) in resistance to grazing, mowing, or other treatment, 5) in susceptibility to parasites and 6) in mutualistic and commensal relationships" (Hanson and Churchill, 1961). A plant community reflects the climatic, soil and topographic factors of its environment and the ecological amplitude of the species associated with other plants.

The inter- and intra-species plant competition in the Great Basin and Mojave Deserts of Central Nevada appears to be fierce because of the limited resources necessary for continuation of the species. Plants which are able to harness the resources aggressively tend to have a competitive edge over other plants. (Hanson and Churchill, 1961).

Some of the vegetation patterns in Central Nevada are fairly distinctive because the limited resources of the desert environment. As the resources in both physical and biological realms become scarcer, the plant community tends to form groups or islands. On alkaline soils, the vegetation cannot grow in areas of the highest chemical concentration and the plant community distribution appears to be patchy and hilly. Soils with desert pavement are inclined to have very limited resources available for plant growth. They are mostly void of grasses and are dominated by shrubs. Plant communities on coarse textured soils have a propensity to be more uniformed in distribution. These soils are the least restrictive of any of the soils.

"All perennial species in this region (except for phreatophytes) undergo least partial dormancy in the hot, dry summer months. In many species, this dormancy appears to be the result of an interaction of higher temperature and low soil moisture" (Ackerman et al. 1980). "Regardless of growth habit and reproductive phenology, all species exhibit maximum canopy development in response to winter or spring rains, then enter relative states of dormancy in the dry summer period. Recovery from dormancy depends on the timing and magnitude of late summer or fall rains. Most species require at least 2 cm of rainfall to reinitiate growth" (Hodgkison et al 1978). "Species that exhibit active growth in the fall then enter at least partial dormancy with the onset of freezing temperatures in the winter."

Plants have adapted in different fashions to adjust to the changes in ambient environment. The following are some examples of adaptation: Grayia spinosa and Hymenoclea Salsola are drought deciduous shrubs that become completely deciduous when plant potential falls below –5 to – 6 MPa (MPa measurement of turgor pressure in megapascals). Artemesia tridentata exhibits high leaf abscission during the summer, but this occurs during a canopy turnover from large, ephemeral spring leaves to smaller, perennial leaves that survive both summer dry season and winter freezing temperatures.

The dynamic changes in plant communities may be due to the effects of livestock grazing, drought, disease, insects, animals such as graminivores and lagomorph or a combination of these factors. The following are some examples of plant dynamic fluctuation which occur in the assessment area.

Figure 1.0 - Example 1: The shadscale saltbush populations are experiencing a major die-off throughout Central Nevada. Bud sagebrush appears to be aggressively pioneering the areas left void by shadscale saltbush at Key Areas 9 and 11.

Shrub dynamic between shadscale saltbush and bud sagebrush.

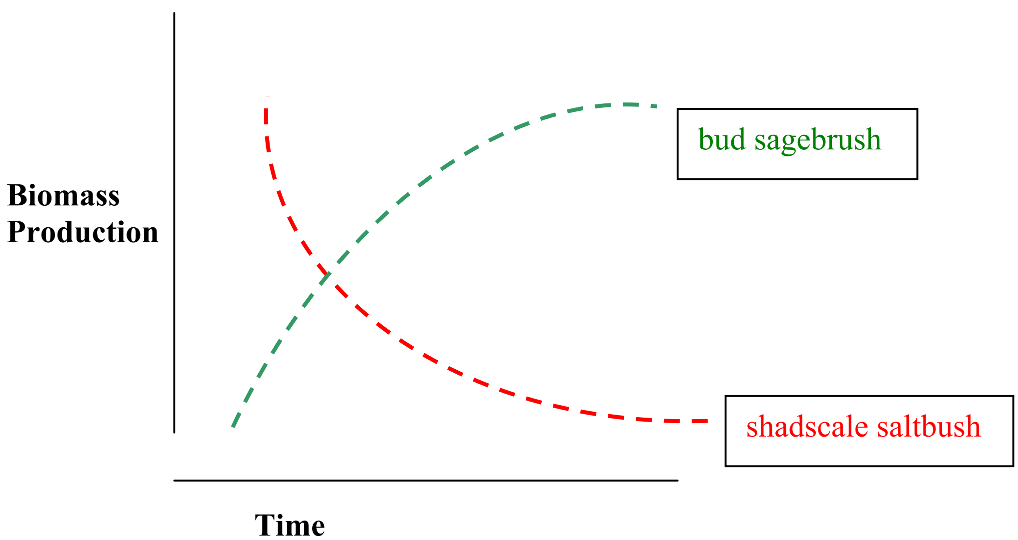


Figure 1.1 - Example 2: The proper use level on grasses has been exceeded over a period of time by livestock. The graph shows the consequences of the exceeding proper use limits.

Grass/Shrub Dynamics

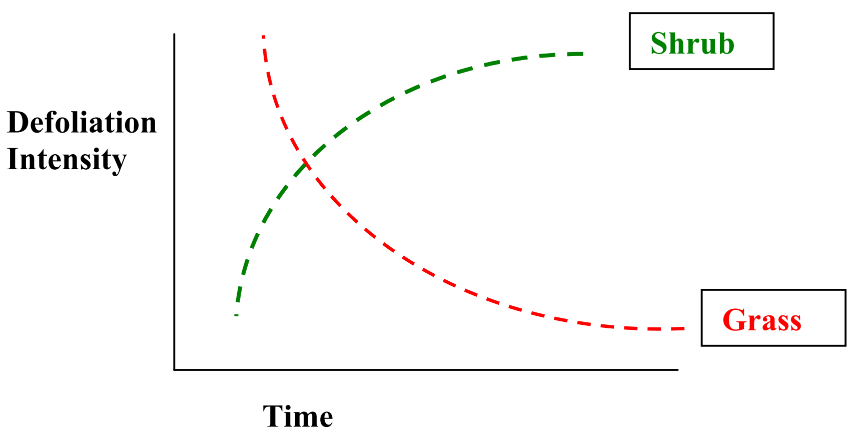


Figure 1.2 - Example 3: The proper use level on Indian ricegrass has been exceeded over a period of time by livestock. The graph shows the consequences of exceeding proper use limits and favoring one species at the expense of another.

Indian ricegrass and galleta

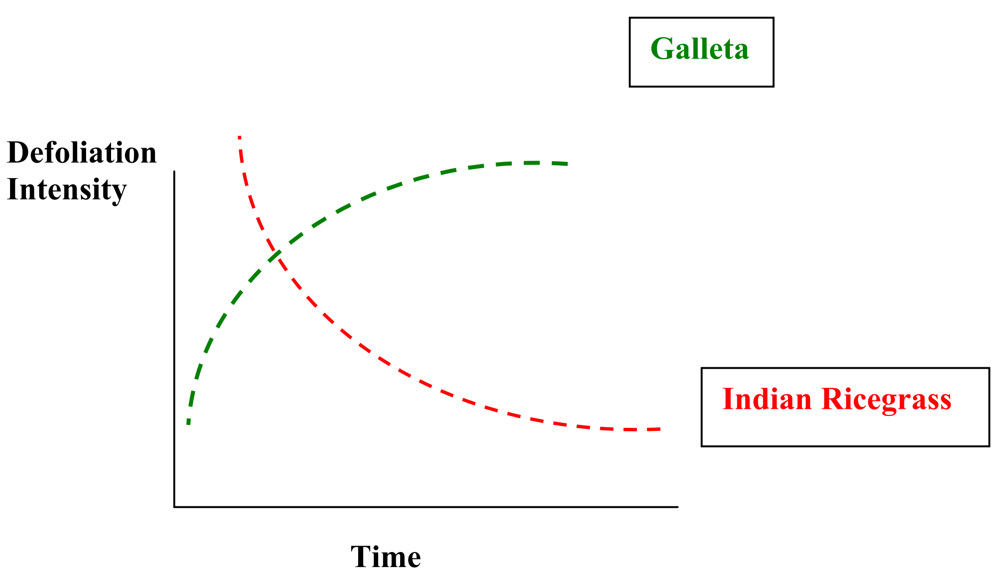
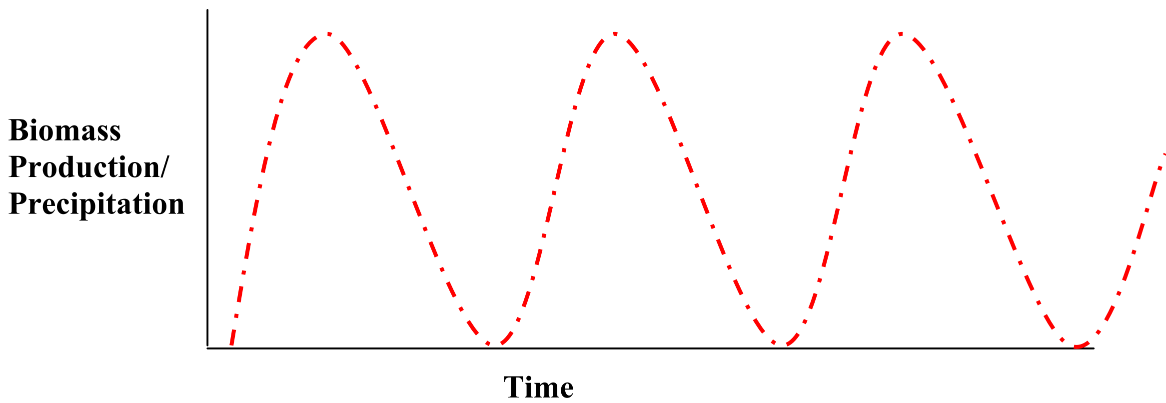


Figure 1.3 - Example 4: This shows a fluctuation of squirreltail in relationship to moisture availability with exclusion of livestock.



A. Shadscale Saltbush Cycle

Central Nevada is experiencing a major die-off of shadscale saltbush. The phenomenon appears not uncommon among plants belonging to the Chenopoidaceae family and has been reported in other parts of the country. Large areas of die-off may be observed. The age class structure tends to be uniform. Based on field observations, the re-establishment of shadscale saltbush in the die-off areas has been very limited. The reasons for the die-off are unknown at present but multiple biotic and abiotic factors cannot be ruled out.

Shadscale saltbrush is a complex, polymorphic species comprised of multiple series of races that occupy a variety of habitats (Sanderson et al. 1990). Shadscale saltbrush has been noted for its rapid growth rate, relatively short stand duration, and tendency to succumb *en masse* to abiotic and interacting biotic stresses (Meyer et al 1998). Documentation of stand mortality due to drought, or flooding and anaerobiosis followed by root disease epidemics were observed and noted (Nelson et al. 1989).

Sharp et al. (1990) discovered a scale insect on the roots of shadscale in the 1950's. The insect is moved by ants from one plant to another and was the cause of stand disappearance in some years. The insect, combined with drought in 1960 and 1961, caused the shadscale to be replaced by annual plants.

II. Grazing and Plant community Dynamics

A. Introduction

Arid rangelands do not readily recover from improper grazing management and may take a decade to demonstrate any improvements in the vegetation resources (Anderson and Holte 1981). The recovery rate of the vegetation resources will depend on the available precipitation and the implementation of grazing management suitable to the conditions and limitations of the Montezuma Complex.

B. Changes in the Vegetation

The changes in vegetation due to excessive livestock grazing have impacted the plant communities by eliminating or reducing livestock forage species and allowing an increase of unpalatable species.

Stewart *et al*. (1940) concluded that "palatable perennial, formerly conspicuous in all desert shrub association, today are few in numbers and low in vigor where the grazing has been severe during the protracted period of approximately 50 years. In comparison with those of low palatability, species of high palatability have suffered, (1) a greater loss in density of plant cover, (2) a higher plant mortality, (3) a greater decrease in reproduction and (4) a sharper decline in general vigor." In addition, Stewart *et al*. (1940) observed that "the evidence gained from the study of these plant associations does not support the theory that drought is the sole or even the chief cause of present deterioration and depletion of the range. Instead, it points to unrestricted grazing as the chief cause of loss of grazing values, invasion of inferior species, and gradual crowding out of the most palatable plants." Furthermore, the data show "clearly that the heavy utilization of the forage by livestock must be relaxed in order to provide for restoration of the range to normal production and subsequent maintenance. Permanent and vigorous forage production on the winter range will require the sort of range management that avoids complete utilization of the current year's growth and that will give relaxation in the degree of use during fall and spring".

Cook and Child (1971) discovered when "desert plants are defoliated to the extent that vigor is even moderately reduced, it required a rather long period of nonuse for complete restoration of vigor. Defoliation in the winter and again in the spring at even moderate intensities was considered deleterious to plant welfare. Late spring harvesting was significantly more harmful to plants than early spring harvesting." Furthermore, the authors explained that "the rate of recovery within a species was proportional to the stage of vigor: the lower the vigor, the less rapid the recovery."

Valone et al. (2002) stated that "the preponderance of such studies indicates that many arid grassland plant communities dominated by shrubs change little in the first 20 years following removal of livestock. Such time lags are known to occur in many ecological sites (Tilman 1989 and Dale et al. 2000)." "Empirical work has demonstrated time lags of 10-50 years following changes in nutrient stress and competition (Brown & Heske 1990, Heske et al. 1994; Milchunas & Lauenroth 1995, Havstad et al. 1999)." Thus "arid grasslands may be characterized by substantial inertia and may respond slowly to substantial changes in disturbance regime. In the southwestern arid grasslands are sensitive to the timing and amount of summer precipitation (Cable 1975, Neilson 1986 and Frazier 1989) and conditions for abundant seed production and establishment may occur only twice per decade (Neilson 1986). The rare, episodic nature of these events may explain why more than two decades may be required for the recovery of perennial grasses in the system." Hennessey *et al*. (1983) reported that "at the Jornada Experimental Range, a desertified arid grassland site in southern New Mexico, grass cover has not increased after more than 50 years of cattle exclusion."

C. Proper Use Levels for Central Nevada

The Montezuma Complex is in two major deserts, the Great Basin Desert (salt desert scrubland) and the northern edge of the Mojave Desert. The Nevada Rangeland Handbook (1984) established proper use levels for grasses at 55 percent and shrubs at 45 percent. Based on the collected data and field observations, the current proper use recommendations are too high for the desert environment. Studies on the proper use in the Great Basin and Mojave deserts concluded that 30 to 35 percent proper use is the preferred recommendation. Holecheck (1988) concluded that "in years of average or above average precipitation, about 30-35 percent of the current years' forage production could be consumed by livestock on desert ranges." Holecheck (1993) notes that "the goal of 50 percent forage use is appropriate for humid regions, but it causes range deterioration in the rugged, arid ranges of the West."

Beale et al. (1984) found that "the optimum utilization rate for sheep utilization levels appeared to be about 30 percent in semi-arid rangelands west of Queensland, Australia." Cook (1977) had the same conclusions (clipping studies were conducted on seven dominant plant species on sagebrush-grass rangelands in Western Utah) as those reported by Cook and Child in 1971.

Holecheck et al. (2003) concluded that "during a 13-year study on the Chihuahuan desert rangelands that an upward trend occurred on lightly grazed rangeland while a downward trend occurred on an adjacent moderately grazed rangeland." Holecheck et al. (1999) concluded that "so far the 30 percent harvest coefficient has proven superior in vegetation productivity, livestock productivity and financial returns."

Hart et al. (1993) stated that “stocking rates have much greater potential than the grazing systems for altering the frequency and intensity of defoliation and subsequent changes in botanical composition of range plant communities. Results of grazing studies support this conclusion. Hart et al. (1989) concludes that the stocking rate and distribution are much more important than rotation in determining the success of a grazing system. The effects of a few years of excessive stocking can be difficult to correct in arid lands.”

D. Drought and Grazing

Desert environments are subjected to regular drought periods lasting more than one growing season which decreases the vigor of the plants. Droughts have cumulative effects on the vegetation resources. Flexibility in grazing management during drought conditions is extremely crucial for ensuring long-term productivity of the rangeland.

Holecheck et al. (2003) reported that “severe grazing during drought greatly increases perennial grass mortality compared to light grazing.”

Wondzell and Ludwig (1995) discovered that “grazing and drought reduced plant cover and led to dominance of a few species of shrubs in the vegetation communities since 1955.” They suggested that water availability so strongly controls production and composition in these ecosystems that differences in soil texture and topographic position among landforms account for the vegetation patterns even though equilibrium may never occur.

E. Seed Germination

Minimum precipitation requirement for seed germination is about 25 mm (1 inch) (Went 1949; Beatly 1974b). This minimum moisture threshold apparently supplies sufficient soil moisture to ensure completion of the life cycle in the event that no further rainfall occurs (Noy-Meir 1973). Many desert annuals have accelerated life cycles that ensure seed set in as little as six weeks after germination. Other species commit a portion of their resources to nonstructural storage (Clark and Burk 1980). Consequently, the lengthening of the potential growing season and significantly increasing seed set in the event that additional soil moisture becomes available during the life cycle.

Desert annuals often germinate at densities that cannot be supported by existing soil moisture reserves. High mortality in winter annuals often occurs during early spring, at the time that a shift from slow vegetation growth to rapid stem elongation and many-fold increase in plant volume is observed (Klikoff 1966; Beatly 1967). Flexibility of life cycles is apparently one of the primary attributes that has allowed many introduced species (e.g. *Bromus* spp, and *Salsola* spp.) to obtain wide dominance on many degraded rangelands in the Great Basin. Most of the introduced ephemerals have been showed to exhibit phenotypic plasticity, a lack of seed dormancy and successful germination under a variety of conditions (Burk 1982; Mack and Pyke 1983). In contrast to desert annuals, woody perennials appear to germinate primarily in response to summer rainfall. Consequently, desert perennials only germinate in certain favorable years in winter rainfall desert (Went 1979).

F. Carbohydrate Levels and Defoliation

Carbohydrate production is extremely important not only to the survival of the plant but in completing its life cycle and reaching its replenishment levels prior to the onset of dormancy. The level of defoliation by grazing has significant impact on the ability of a plant to recover. The allowable use level, season of use, and timing of use may have to be adjusted to allow the plant to recover from defoliation. Continuous defoliation of the plant at the critical juncture in its development may have very detrimental impact or effects over prolonged periods. In the Great Basin Desert, the start of the growing season is determined by (1) the amount of winter-spring precipitations; and (2) increasing air and soil temperatures (Smith and Nowark 1900).

Cook (1971) concluded that the "depletion of carbohydrate reserves because of defoliation is believed a primary factor causing a reduction in plant vigor and subsequent range deterioration." Cook (1966) was able to "demonstrate that carbohydrate reserve depletion by excessive defoliation also reduces the herbage growth, and in extreme cases caused death of plants. Vigor of defoliated plants was significantly affected by both season and intensity of defoliation. In all cases, plants that were in lowered state of vigor had shorter and fewer seeds talks, shorter current growth, deader crown cover, and less herbage yield than plants in high vigor, even after a year of rest."

"Rate of recovery over a 7-year period was proportional to the initial state of vigor, the lower the vigor the less rapid the recovery. Winterfat and Indian ricegrass recovered completely after 7 years of rest from all the effects of past clipping treatments. Shadscale and squirreltail grass recovered completely, only when clipped at light and moderate intensities over all periods. Black sage recovered to normal only when harvested at light intensities during the winter or early spring."

Coyne and Cook (1970) found that "desert plants showed a depletion in spring of total available carbohydrates in the storage organs when new growth occurred. In similar manner, these desert species showed replenishment of the reserve during the later stages of development until they reached maturity. Maximum carbohydrate reserves were not attained until the plants had completed their annual life cycles. Therefore, it was concluded that maximum plant vigor as reflected by carbohydrate reserves was dependent upon the food reserve at the completion of the growth period at quiescence. In addition, the authors concluded that total carbohydrate draw down occurs during two seasonal periods, during the growth initiation stage in spring and in the plant regrowth period of fall."

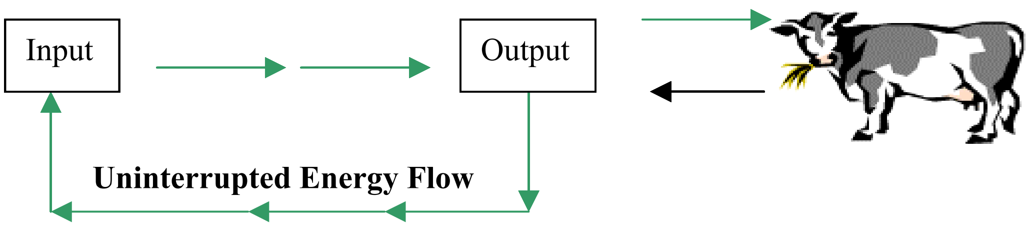
Trlica and Cook (1971) conducted "clipping studies of various levels of defoliation. They concluded based on their studies that the greatest reduction in autumn carbohydrate levels of the studied species were found when defoliation occurred during the rapid growth. In addition, the more regrowth attained by a species after defoliation the greater the carbohydrate level reserve replenishment."

G. The Grazing Plant Energy Flow Model

The model was developed by the Tonopah BLM Office to demonstrate the effects of over-utilization by livestock through time. The model explains the path of a rangeland plant community retrogression.

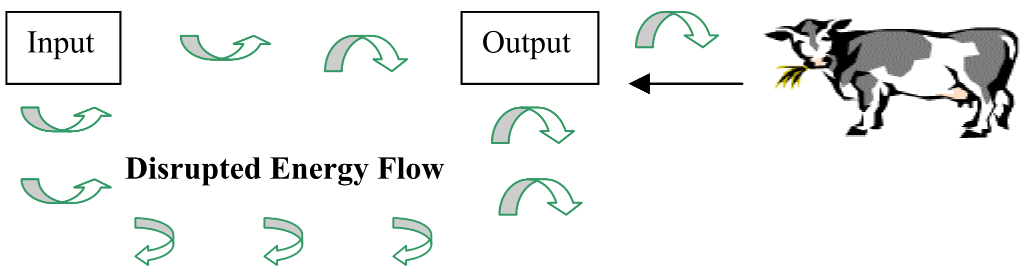
Grazing Plant Energy Flow Model

Figure 1.4 - Proper Use - Balance Equilibrium



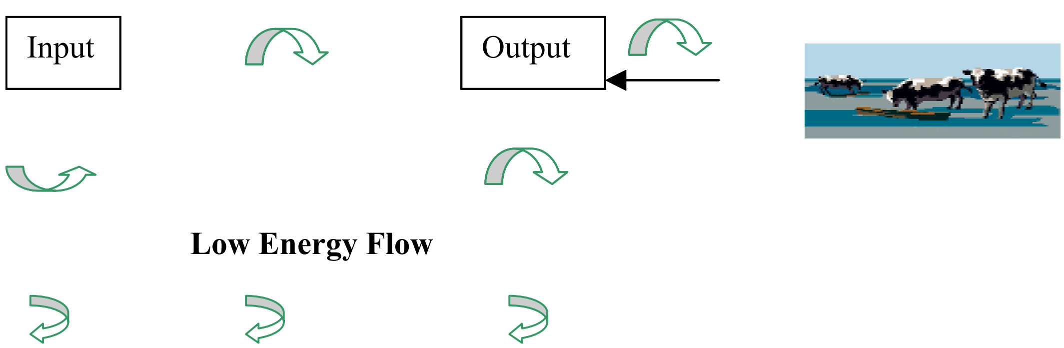
This model displays a system working within the established limits of proper utilization. The system is able to maintain itself because the relationship between input and output operate in a balanced equilibrium. The system does not have a deficit and sustained grazing is maintained. The season of grazing, the number of animals and proper utilization levels are achieved. Total available carbohydrate levels are replenished prior the onset of dormancy. Plant vigor is maintained at a good level. Many of the plants are able to complete their yearly life cycles.

Figure 1.5 - Deteriorating System - Unbalanced Equilibrium



This model displays a system working outside of the established limits of proper utilization. The system is unable to maintain itself because the demands for grazing exceed the available output. Consequently, the input may no longer provide the necessary energy level needs to maintain a sustained output. Decrease in palatable grasses and shrubs are evident. The plant vigor is also decreased. A reduction in the number of grazing animals and/or a season of grazing change is expected and stricter levels of proper utilization may be needed to reverse the upset equilibrium. Invasive plants become more common on the sites. Total available carbohydrate levels are not completely replenished prior to the onset of dormancy. The evidence of total available carbohydrate deficiency is beginning to develop in the plant community. Plant vigor starts to diminish.

Figure 1.6 - Decaying System -Critical Mass Equilibrium



This model displays a system continuing to work outside the established limits of proper utilization. The system is collapsing because the demands of grazing exceed the available output. The energy level is severely deteriorated. Consequently, the output is severely degraded; dead and dying grasses and shrubs are common. Less desirable plants begin to dominate the landscape and there is increased opportunity and high probability that invasive species will spread. The system will reach a non-reversible level and a human input is necessary to reestablish a balanced equilibrium. Total available carbohydrate levels replenishment is deficient prior the onset of dormancy. Low plant vigor is evident.

H. Threshold level

Habich, 2001 affirmed that "a state is recognizable, relatively resistant and resilient complex with attributes that include characteristic climate, soil resource including soil biota and the associated. The soil and vegetation components are inseparably connected through ecological processes that interact to produce a sustained equilibrium that is expressed by a specific suite of plant communities. The primary ecological processes are water cycle, nutrient cycle and the process of energy capture. Each state has distinctive characteristics, benefits, and values depending upon the intended use, products and environmental effects from the site."

"Two important attributes of a state are resistance and resilience. Resistance refers to the capability of the state to absorb disturbance and stresses and retain its ecological structure. Resilience refers to the amount of disturbance or stress a state can endure and still regain its original function after the disturbances and stresses are removed."

"States are relatively stable and resistant to disturbances up to the threshold. A threshold is the boundary between two states, such that one or more of the ecological processes has been irreversibly changed. Irreversible implies that restoration cannot be accomplished through natural events or a simple change in management. Additional thresholds may occur along the irreversible portion of a transition causing a change in the trajectory toward another state."

"Once the threshold is crossed, a disequilibrium among one or more of the primary ecological processes exists and will be expressed through changes in the vegetative community and eventually the soil resource. A new stable state is formed when the system reestablishes equilibrium among its primary ecological processes."

"A transition is the trajectory of system change between states that will not cease before the establishment of a new state. Some transitions may occur very quickly and others over long period of time. Two portions of a transition are recognized: reversible and irreversible. Prior to crossing a threshold, a transition is reversible and represents an opportunity to reverse or arrest the change. Vegetation manipulation practices, and if needed, facilitating practices are used to reserve the transition. Once a threshold is crossed, the transition is irreversible without significant inputs of management resources and energy. Significant inputs are associated with accelerating practices, such as brush management and range planting".

States are not static as they encompass a certain amount of variation due to climatic events, management actions, or both. Dynamics within a state do not represent a state of change since the threshold is not crossed."

Crawford and al (2004) proposes the following threshold models display the dynamics of fire and vegetation:

Figure 1.7 - Hypothesized Relationship between Grazing and Fire

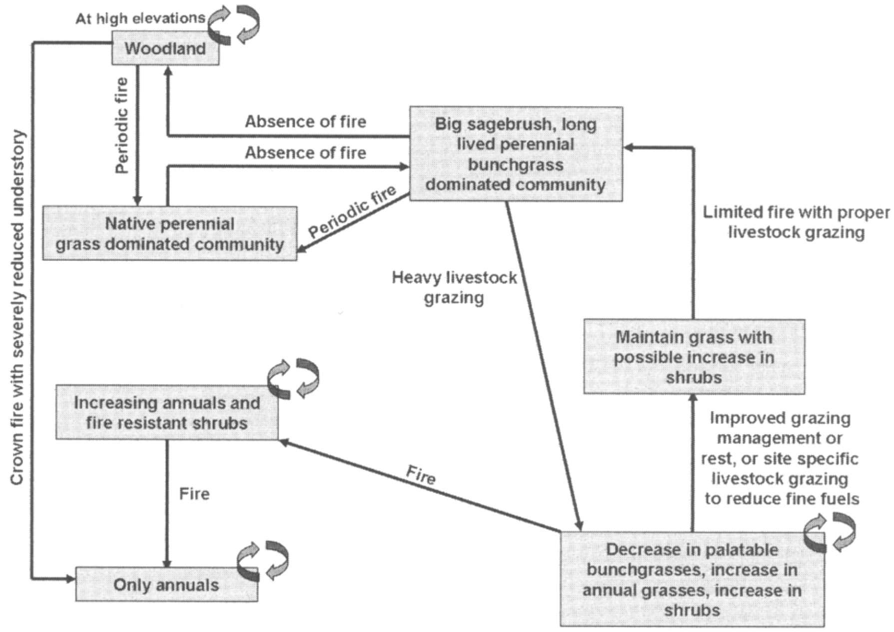


Fig. 4. Hypothesized relationship of grazing and fire to successional dynamics in sagebrush plant communities. Curved arrows indicate potentially steady states requiring management intervention to change community type to one more desirable for sage-grouse habitat. Movement to annual-dominated communities predominantly occurs in Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis* Welsh) and at elevations below 1500 m, but can occur following crown fires in woodlands with severely depleted understories. The specific elevation for transitional thresholds to annual or woodland communities will vary regionally. Adapted from West 1989.

Figure 1.8 - Conceptual Model Illustrating pre and post-European Settlement Shrubland and Woodland Dynamics

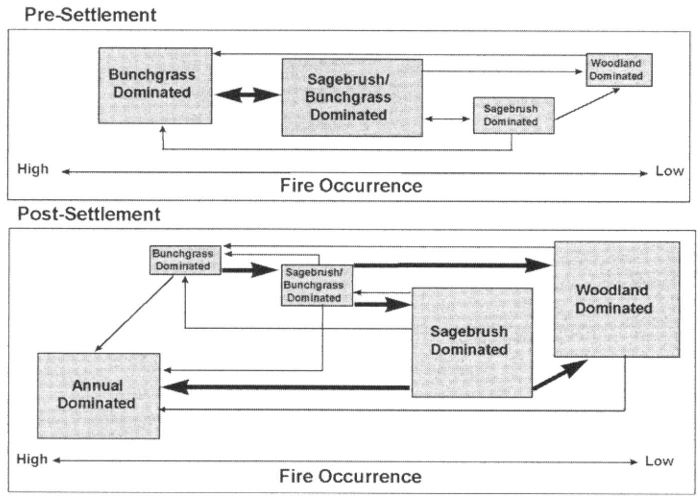


Fig. 3. Conceptual model illustrating pre and post-European settlement shrubland and woodland dynamics. Changes in box sizes represents shifts in area occupied by the different cover types. Heavy arrows indicate most common successional pathways. Adapted from Miller and Tausch 2001.

Appendix D – Analysis of Variance (ANOVA)

Statistical analysis of the trend studies

I. Montezuma Allotment

A. Key Area 1

Table 1.0 – Key Area 1 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Indian ricegrass	0.000	Year	1991, 2002, 2004
winterfat	0.005	Year	1991, 2002, 2004
Shadscale	0.003	Year	1991, 2002, 2004
Bud sagebrush	0.000	Year	1991, 2002, 2004

Table 2.0 - Key Area 1 Analysis of Variance -

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2002	1991 and 2002
Indian ricegrass	0.002	Decrease
Winterfat	0.0038	Increase
Shadscale	0.0193	Decrease
Bud sagebrush	0.000	Increase

Table 3.0 - Key Area 1 Analysis of Variance -

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2004	1991 and 2004
Indian ricegrass	0.002	Decrease
Winterfat	0.0977	Increase
Shadscale	0.0044	Decrease
Bud sagebrush	0.000	Increase

Table 4.0 - Key Area 1 Analysis of Variance -

	Adjusted P-Value	Trend
Plant Name/Year	2002 and 2004	2002 and 2004
Indian ricegrass	1.000	Static
Winterfat	0.4217	Decrease
Shadscale	0.8562	Static
Bud sagebrush	0.9339	Static

B. Key Area 2

Table 5.0 – Key Area 2 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Indian ricegrass	0.000	Year	1991, 2002, 2004
winterfat	0.005	Year	1991, 2002, 2004
Shadscale	0.000	Year	1991, 2002, 2004
Bud sagebrush	0.007	Year	1991, 2002, 2004

Table 6.0 - Key Area 2 Analysis of Variance – 1991 and 2002

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2002	1991 and 2002
Indian ricegrass	0.0001	Decrease
Winterfat	0.0091	Increase
Shadscale	0.0000	Increase
Bud sagebrush	0.0805	Decrease

Table 7.0 - Key Area 2 Analysis of Variance – 1991 -2004

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2004	1991 and 2004
Indian ricegrass	0.0050	Decrease
Winterfat	0.0198	Increase
Shadscale	0.0000	Increase
Bud sagebrush	0.0056	Decrease

Table 8.0 - Key Area 2 Analysis of Variance – 2002 -2004

	Adjusted P-Value	Trend
Plant Name/Year	2002 and 2004	2002 and 2004
Indian ricegrass	0.5016	Static
Winterfat	0.9554	Static
Shadscale	0.1153	Static
Bud sagebrush	0.5514	Decrease

C. Key Area 3

Table 9.0 – Key Area 3 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Indian ricegrass	0.000	Year	1991, 2002, 2004
Shadscale	0.000	Year	1991, 2002, 2004
Bud sagebrush	0.007	Year	1991, 2002, 2004

Table 10.0 - Key Area 3 Analysis of Variance – 1991 and 2002

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2002	1991 and 2002
Indian ricegrass	0.0001	Decrease
Shadscale	0.0000	Decrease
Bud sagebrush	0.2659	Increase

Table 11.0 - Key Area 3 Analysis of Variance – 1991 and 2004

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2004	1991 and 2004
Indian ricegrass	0.0011	Decrease
Shadscale	0.0000	Decrease
Bud sagebrush	0.0011	Increase

Table 12.0 - Key Area 3 Analysis of Variance – 2002 and 2004

	Adjusted P-Value	Trend
Plant Name/Year	2002 and 2004	2002 and 2004
Indian ricegrass	0.6420	Static
Shadscale	0.8294	Static
Bud sagebrush	0.0796	Decrease

D. Key Area 4

Table 13.0 – Key Area 4 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Indian Ricegrass	0.120	Year	1991, 2002, 2004
Galleta	0.636	Year	1991, 2002, 2004
Squirreltail	0.000	Year	1991, 2002, 2004
Shadscale	0.000	Year	1991, 2002, 2004
Bud sagebrush	0.002	Year	1991, 2002, 2004
Bailey greasewood	0.248	Year	1991, 2002, 2004
Green rabbitbrush	0.057	Year	1991, 2002, 2004
Green molly	0.060	Year	1991, 2002, 2004
Winterfat	0.574	Year	1991, 2002, 2004
Nevada ephedra	0.070	Year	1991, 2002, 2004
Spiny menodora	0.760	Year	1991, 2002, 2004

Table 14.0 - Key Area 4 - Analysis of Variance – 1991 and 2002

Plant Species	Adjusted P-Value	Trend
Indian Ricegrass	0.1254	Decrease
Galleta	0.8176	Static
Squirreltail	0.000	Increase
Shadscale	0.0099	Decrease
Bud sagebrush	0.8053	Static
Bailey greasewood	0.2727	Increase
Green rabbitbrush	0.0938	Decrease
Green molly	0.0564	Decrease
Winterfat	0.6688	Static
Nevada ephedra	0.9604	Static
Spiny menodora	0.9679	Static

Table 15.0 - Key Area 4 - Analysis of Variance – 1991 and 2004

Plant Species	Adjusted P-Value	Trend
Indian Ricegrass	0.2594	Decrease
Galleta	0.6162	Static
Squirreltail	0.000	Increase
Shadscale	0.0001	Decrease
Bud sagebrush	0.0022	Increase
Bailey greasewood	0.9765	Static
Green rabbitbrush	0.0938	Decrease
Green molly	0.7934	Static
Winterfat	0.9937	Static
Nevada ephedra	0.1495	Increase
Spiny menodora	0.7471	Static

Table 16.0 - Key Area 4 Analysis of Variance – 2002 and 2004

Plant Species	Adjusted P-Value	Trend
Indian Ricegrass	0.9170	Static
Galleta	0.9396	Static
Squirreltail	0.5609	Static
Shadscale salbush	0.3281	Decrease
Bud sagebrush	0.0133	Increase
Bailey greasewood	0.3743	Decrease
Green rabbitbrush	1.000	Static
Green molly	0.2121	Increase
Winterfat	0.6017	Static
Nevada ephedra	0.0860	Increase
Spiny menodora	0.8781	Static

E. Key Area 5

Table 17.0 – Key Area 5 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Indian ricegrass	0.000	Year	1991, 2002, 2004
Bud sagebrush	0.308	Year	1991, 2002, 2004
Shadscale	0.030	Year	1991, 2002, 2004
Bailey greasewood	0.308	Year	1991, 2002, 2004

Table 18.0 - Key Area 5 Analysis of Variance – 1991 and 2002

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2002	1991 and 2002
Indian ricegrass	0.000	Decrease
Bud sagebrush	0.3750	Increase
Shadscale Saltbrush	0.7628	Static
Bailey greasewood	0.2764	Increase

Table 19.0 - Key Area 5 Analysis of Variance -1991 and 2004

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2004	1991 and 2004
Indian ricegrass	0.000	Decrease
Bud sagebrush	0.9394	Static
Shadscale Saltbrush	0.0287	Decrease
Bailey greasewood	0.7714	Static

Table 20.0 - Key Area 5 Analysis of Variance -2002 and 2004

	Adjusted P-Value	Trend
Plant Name/Year	2002 and 2004	2002 and 2004
Indian ricegrass	0.8206	Static
Bud sagebrush	0.5731	Static
Shadscale Saltbrush	0.1388	Decrease
Bailey greasewood	0.6674	Static

F. Key Area 6

Table 21.0 – Key Area 6 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Indian Ricegrass	0.018	Year	1991, 2002, 2006
Squirreltail	0.000	Year	1991, 2002, 2006
Needleandthread	0.000	Year	1991, 2002, 2006
Winterfat	0.143	Year	1991, 2002, 2006
Douglas Rabbitbrush	0.108	Year	1991, 2002, 2006

Table 22.0 - Key Area 6 - Analysis of Variance – 1991 and 2002

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2002	1991 and 2002
Indian Ricegrass	0.0874	Decrease
Squirreltail	0.8505	Static
Needleandthread	0.0000	Increase
Winterfat	0.9956	Static
Douglas Rabbitbrush	0.2656	Increase

Table 23.0 - Key Area 6 - Analysis of Variance -1991 and 2006

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2006	1991 and 2006
Indian Ricegrass	0.7991	Static
Squirreltail	0.0003	Increase
Needleandthread	0.0572	Increase
Winterfat	0.1859	Decrease
Douglas Rabbitbrush	0.1082	Increase

Table 24.0 - Key Area 6 Analysis of Variance -2002 and 2006

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2006	1991 and 2006
Indian Ricegrass	0.0190	Increase
Squirreltail	0.0001	Increase
Needleandthread	0.0001	Decrease
Winterfat	0.2179	Decrease
Douglas Rabbitbrush	0.8792	Static

G. Key Area 10

Table 24.0 – Key Area 10 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Galleta grass	0.752	Year	1991, 2002, 2006
Indian Ricegrass	0.000	Year	1991, 2002, 2006
Bud sagebrush	0.539	Year	1991, 2002, 2006
Shadscale	0.000	Year	1991, 2002, 2006
Burrobrush	0.935	Year	1991, 2002, 2006
Winterfat	0.050	Year	1991, 2002, 2006

Table 25.0 - Key Area 10 - Analysis of Variance – 1991 and 2002

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2002	1991 and 2002
Galleta grass	0.8107	Static
Indian Ricegrass	0.0000	Decrease
Bud sagebrush	0.6617	Static
Shadscale	0.0003	Decrease
Burrobrush	0.9455	Static
Winterfat	0.7377	Static

Table 26.0 - Key Area 10 - Analysis of Variance -1991 and 2006

	Adjusted P-Value	Trend
Plant Name/Year	1991 and 2006	1991 and 2006
Galleta grass	0.7720	Static
Indian Ricegrass	0.000	Decrease
Bud sagebrush	0.9835	Static
Shadscale	0.000	Decrease
Burrobrush	0.9455	Static
Winterfat	0.1082	Increase

Table 27.0 - Key Area 10 - Analysis of Variance -2002 and 2006

	Adjusted P-Value	Trend
Plant Name/Year	2002 and 2006	2002 and 2006
Galleta grass	0.9974	Static
Indian Ricegrass	1.000	Static
Bud sagebrush	0.5531	Static
Shadscale	0.4795	Decrease
Burrobrush	1.000	Static
Winterfat	0.2127	Increase

II. Razorback Allotment

A. Key Area 1

Table 28.0 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
White bursage	0.002	Year	1991, 1997, 2005
Nevada ephedra	0.301	Year	1991, 1997, 2005
blackbrush	0.508	Year	1991, 1997, 2005
Pale wolfberry	0.979	Year	1991, 1997, 2005

Table2 9.0 - Analysis of Variance - Key Area 1 - Razorback Allotment

Plant Name/Year	Adjusted P-value 1991-1997	Trend
White bursage	0.9755	Static
Nevada ephedra	0.8656	Static
blackbrush	0.5708	Static
Pale wolfberry	0.9766	Static

Table 30.0 – Analysis of Variance - Key Area 1 - Razorback Allotment

	Adjusted P-value	Trend
Plant Name/Year	**1991-2005**	
White bursage	0.0089	Decrease
Nevada ephedra	0.5645	Static
blackbrush	0.5708	Static
Pale wolfberry	0.9941	Static

Table 31.0 – Analysis of Variance - Key Area 1 - Razorback Allotment

	Adjusted P-value	Trend
Plant Name/Year	**1997-2005**	
White bursage	0.0048	Decrease
Nevada ephedra	0.2815	Decrease
blackbrush	1.000	Static
Pale wolfberry	0.99412	Static

B. Key Area 3

Table 32.0 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Burrobrush	0.451	Year	1991, 1997, 2005
Spiny Hopsage	0.706	Year	1991, 1997, 2005
Spiny Mendora	0.024	Year	1991, 1997, 2005
Nevada Ephedra	0.583	Year	1991, 1997, 2005

Table 33.0 - Key Area 3 – Analysis of Variance - Razorback Allotment

	Adjusted P-value	Trend
Plant Name/Year	**1991-1997**	
Burrobrush	0.6620	Static
Spiny Hopsage	0.9409	Static
Spiny Mendora	0.5343	Static
Nevada Ephedra	0.5713	Static

Table 34.0- Key Area 3 – Analysis of Variance - Razorback Allotment

	Adjusted P-value	Trend
Plant Name/Year	**1991-2005**	
Burrobrush	0.9014	Static
Winterfat	0.8722	Static
Bud sagebrush	0.2075	Decrease
Fourwing Saltbush	0.7503	Static

Table 35.0 – Key Area 3 - Analysis of Variance - Razorback Allotment –

	Adjusted P-value	Trend
Plant Name/Year	**1997-2005**	
Burrobrush	0.9014	Increase
Winterfat	0.6853	Static
Bud sagebrush	0.0193	Decrease
Fourwing Saltbush	0.9548	Static

C. Key Area 4

Table 36.0 - P-Value with Factor = Year with Type Values – Fixed 3

Plant Species	P Value	Factor	Year with Type Values –fixed 3
Burrobrush	0.451	Year	1993, 1997, 2005
Spiny hopsage	0.493	Year	1993,1997, 2005
Nevada ephedra	0.129	Year	1993, 1997, 2005
Spiny menodora	0.745	Year	1993, 1995, 2005
Anderson wolfberry	0.987	Year	1993, 1995, 2005

Table 37.0 - Key Area 4 – Analysis of Variance - Razorback Allotment

	Adjusted P-value	Trend
Plant Name/Year	**1993-1997**	
Burrobrush	0.6164	Static
Spiny hopsage	0.7855	Static
Nevada ephedra	0.1162	Increase
Spiny menodora	0.9855	Static
Anderson wolfberry	0.6884	Static

Table 38.0 - Key Area 4 – Analysis of Variance - Razorback Allotment –

	Adjusted P-value	Trend
Plant Name/Year	**1993-2005**	
Burrobrush	0.9609	Static
Spiny hopsage	0.3750	Decrease
Nevada ephedra	0.0193	Increase
Spiny menodora	0.7457	Static
Anderson wolfberry	0.6884	Static

Table 39.0 - Key Area 4 – Analysis of Variance - Razorback Allotment

	Adjusted P-value	Trend
Plant Name/Year	**1997-2005**	
Burrobrush		
Spiny hopsage		
Nevada ephedra		
Spiny menodora		
Anderson wolfberry		

Appendix E

Springdale 2 Allotment

Monitoring Data

Use Pattern Maps

1987 – 2004

Livestock and Burro Grazing Use

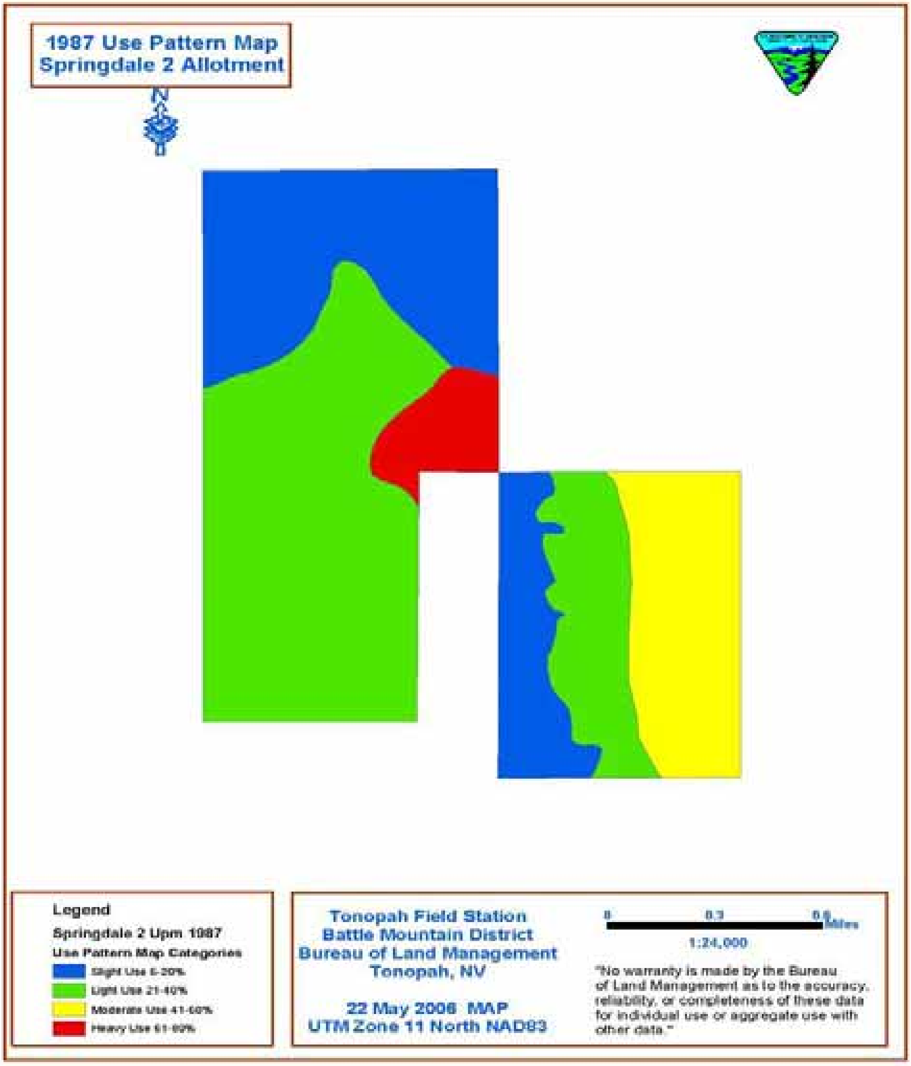


Table 1.0 – 1987 Use Mapping Category Acreage

Year	Use Category	Acres
1987	Slight Use 0-20%	461
	Light Use 21-40%	705
	Moderate Use 61-80%	227
	Heavy Use 61-80%	74
	Total Acres	1466

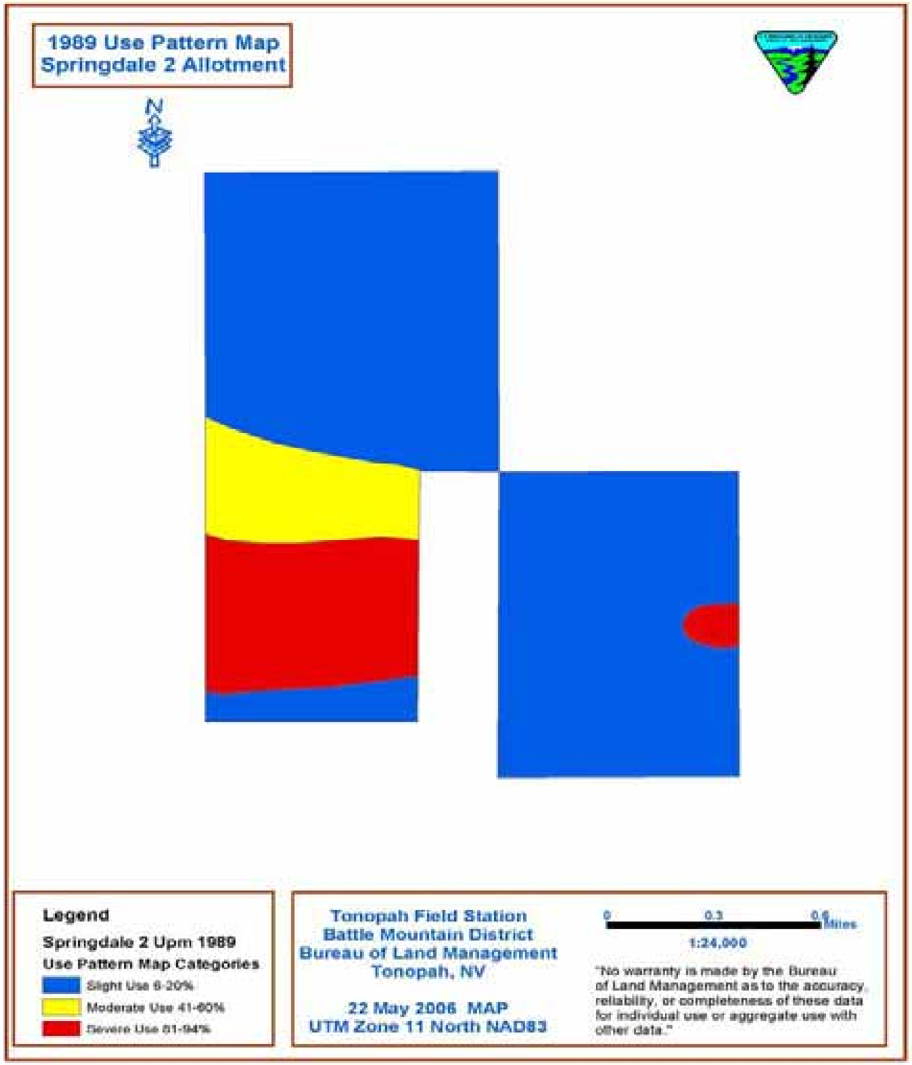


Table 2.0 – 1989 Use Mapping Category Acreage

Year	Use Category	Acres
1989	Slight Use 0-20%	1130
	Moderate Use 61-80%	125
	Severe Use 81-94%	211
	Total Acres	1466

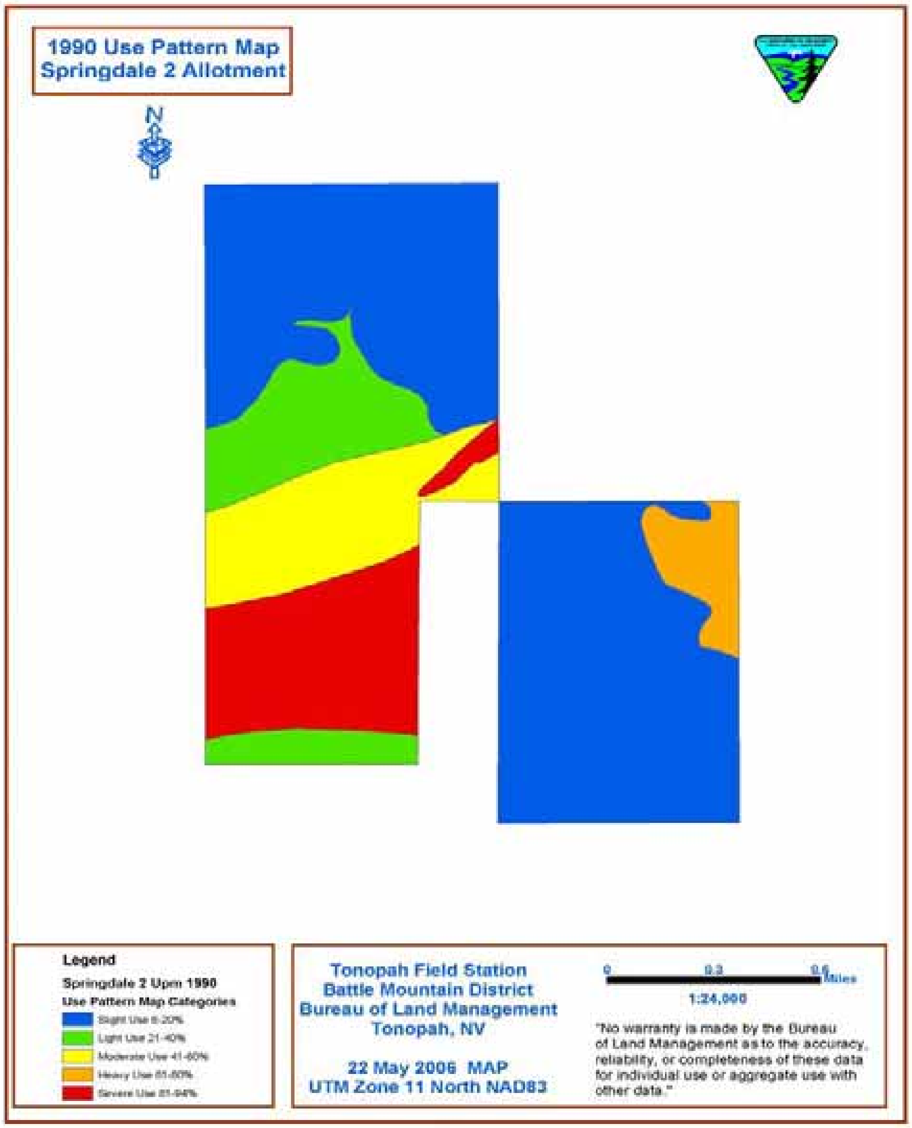


Table 3.0 – 1990 Use Mapping Category Acreage

Year	Use Category	Acres
1990	Slight Use 0-20%	832
	Light Use 21-40%	182
	Moderate Use 61-80%	174
	Heavy Use 61-80%	60
	Severe Use 61-80%	219
	Total Acres	1466

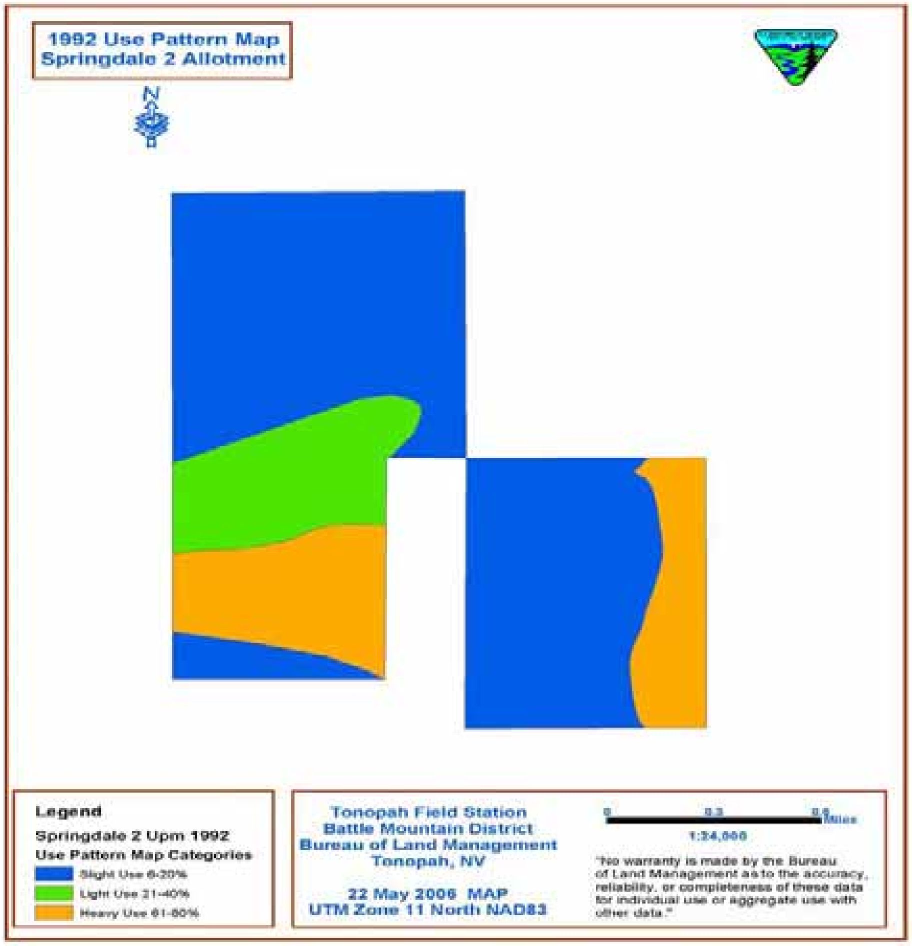


Table 4.0 – 1992 Use Mapping Category Acreage

Year	Use Category	Acres
1992	Slight Use 0-20%	973
	Light Use 21-40%	196
	Heavy Use 61-80%	297
	Total Acres	1466

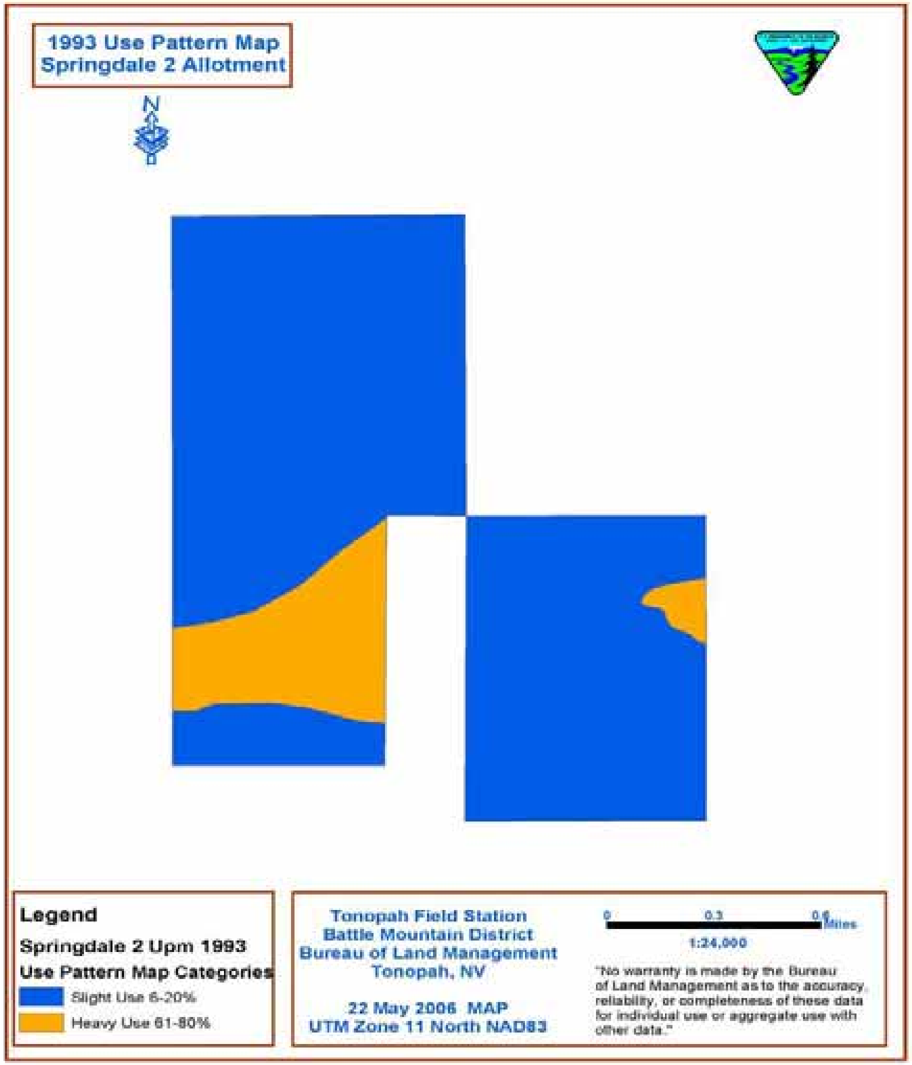


Table 5.0 – 1993 Use Mapping Category Acreage

Year	Use Category	Acres
1993	Slight Use 0-20%	194
	Heavy Use 61-80%	1272
	Total Acres	1466

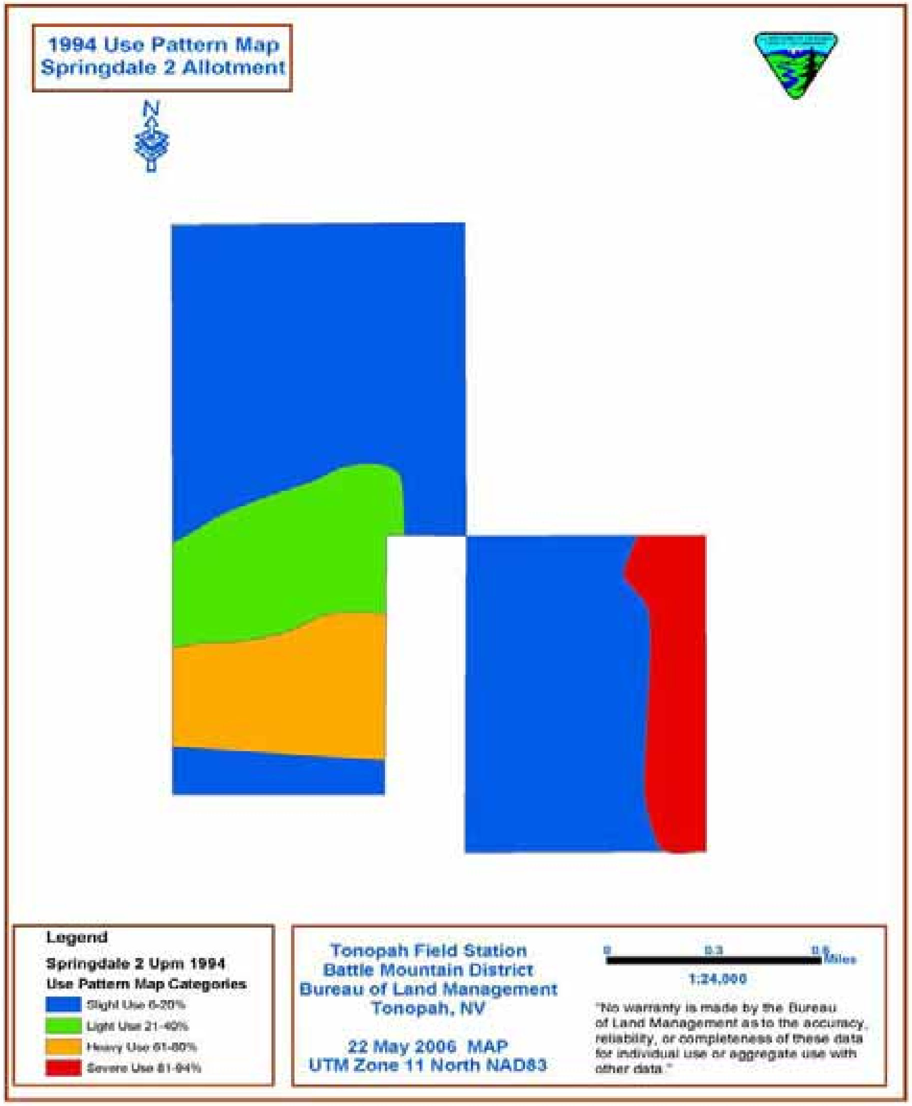


Table 6.0 – 1994 Use Mapping Category Acreage

Year	Use Category	Acres
1994	Slight Use 0-20%	968
	Light Use 21-40%	197
	Heavy Use 61-80%	174
	Severe Use 61-80%	128
	Total Acres	1466

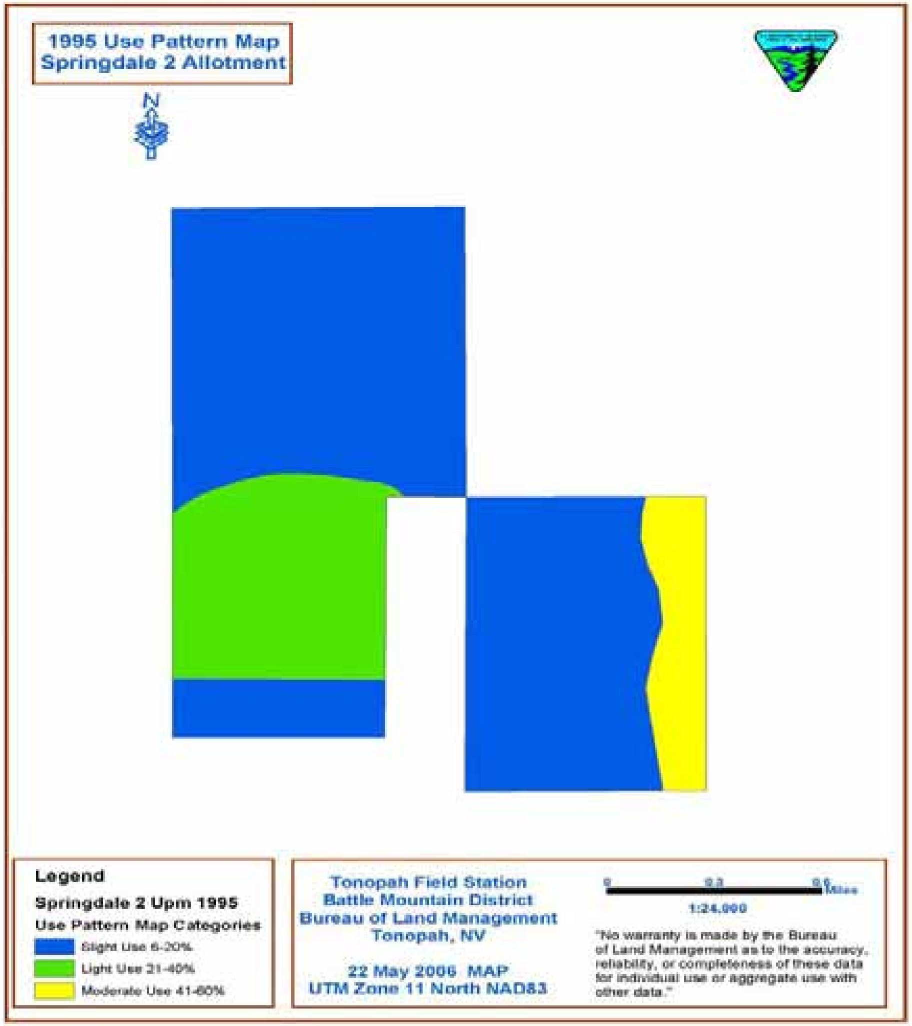


Table 7.0 – 1995 Use Mapping Category Acreage

Year	Use Category	Acres
1995	Slight Use 0-20%	1057
	Light Use 21-40%	297
	Moderate Use 61-80%	113
	Total Acres	1466

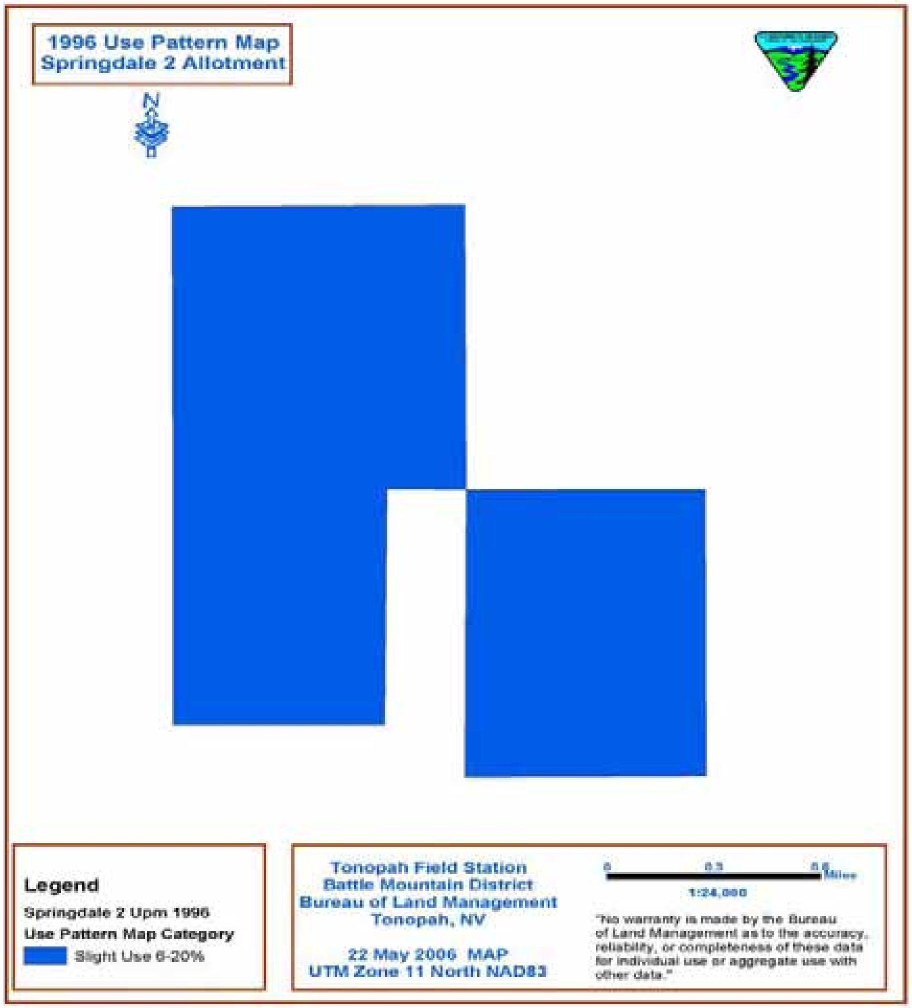


Table 8.0 – 1996 Use Mapping Category Acreage

Year	Use Category	Acres
1996	Slight Use 0-20%	1466
	Total Acres	1466

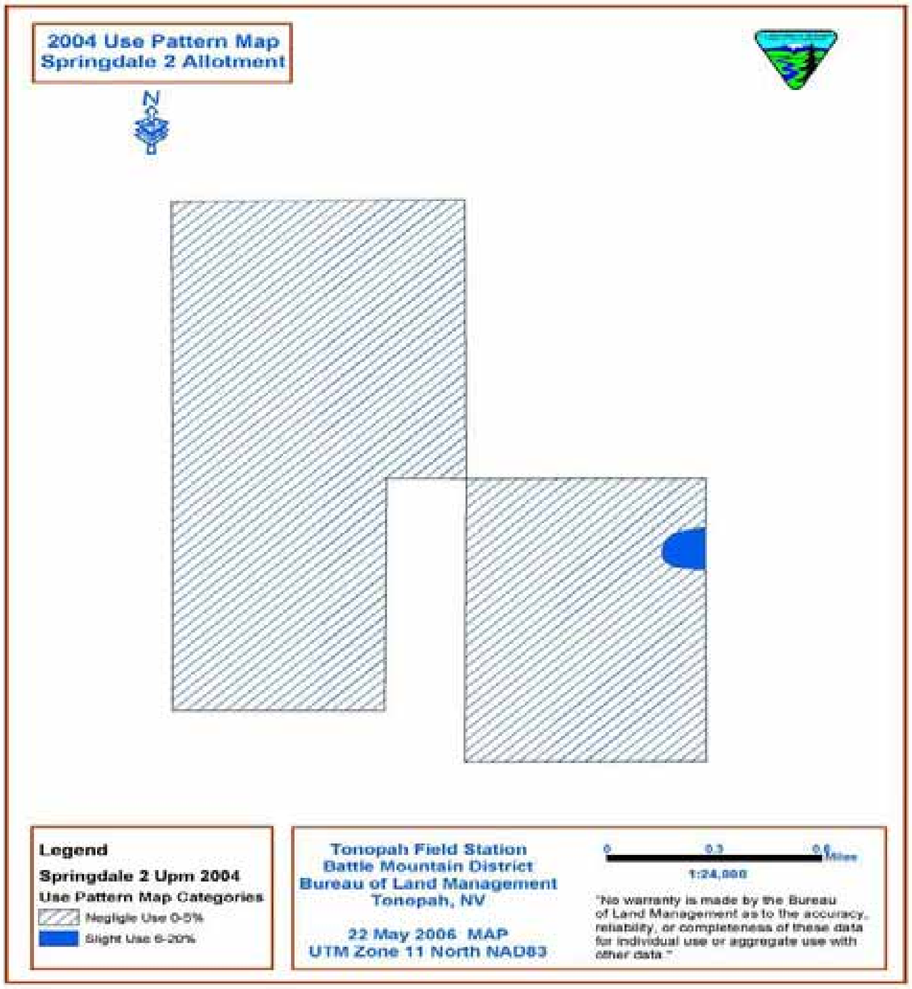


Table 9.0 – 2004 Use Mapping Category Acreage

Year	Use Category	Acres
2004	Negligible Use 0-20%	1454
	Slight Use 0-20%	12
	Total Acres	1466

Appendix F – Riparian Data Graph Analysis for Montezuma Allotment

The first three (3) bar graphs are displaying the trends over time for the lentic riparian habitat on the Montezuma Allotment. The other two allotments and the lotic riparian habitat were not displayed in graph form because the trend over time was minimally contrasting and did not provide addition support for conclusion of the analysis.

Table 1.0 – 1995 Riparian Rating Distribution

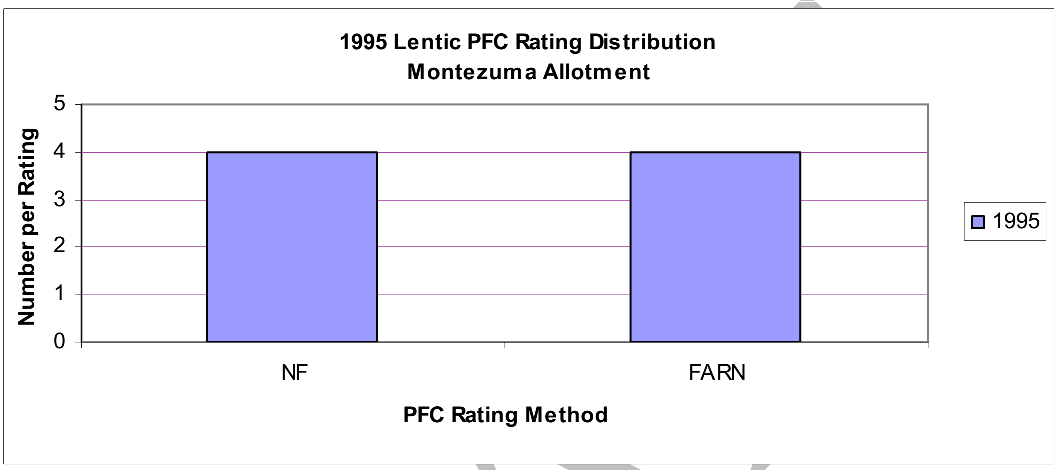


Table 2.0 – 1999 Riparian Rating Distribution

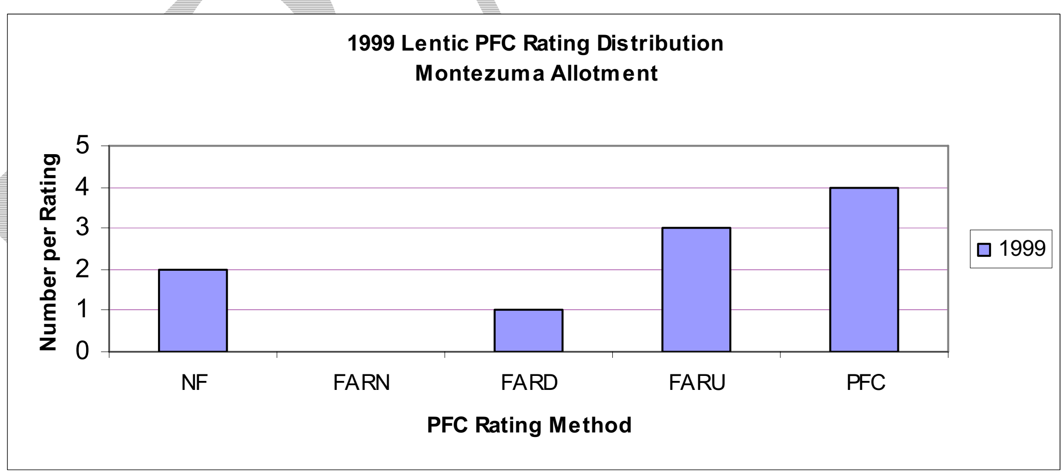
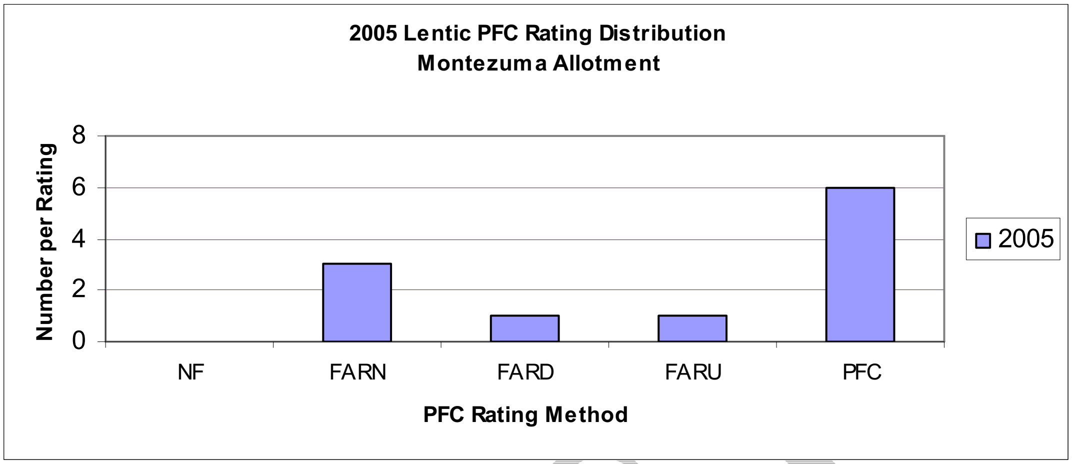


Table 3.0 – 2005 Riparian Rating Distribution



The following graphs are displaying the trend progression of each lentic riparian habitat inventoried on the Montezuma Allotment. A graphic exhibit was not built for a one rating in time.

Table 4.0 – Gold Bar Spring Riparian Rating for Three Different Years

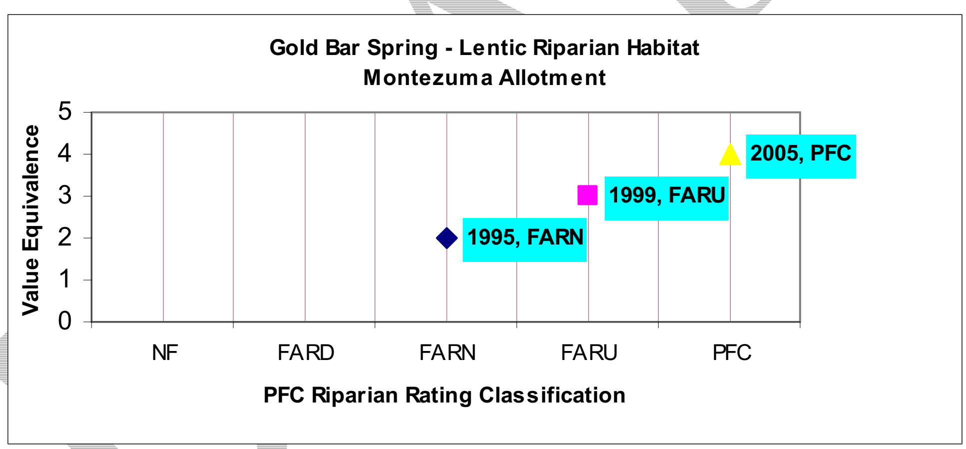


Table 5.0 – Mud Spring Riparian Rating for Three Different Years

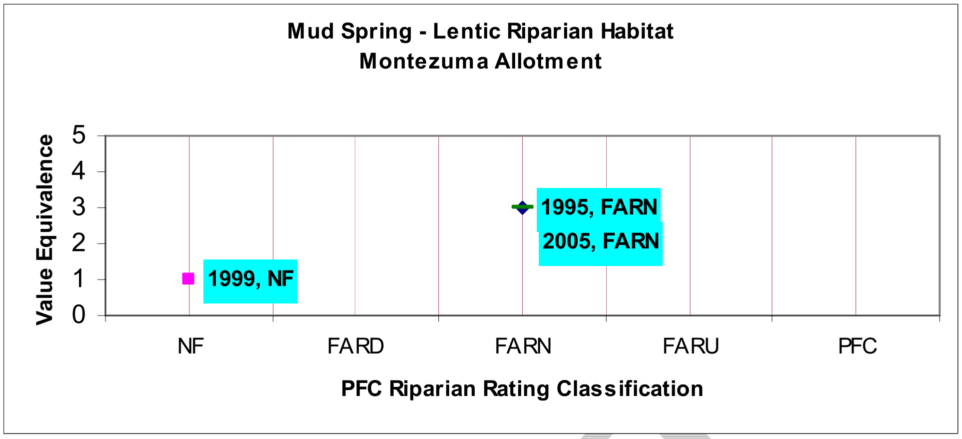


Table 6.0 – Mud Spring Riparian Rating for Three Different Years

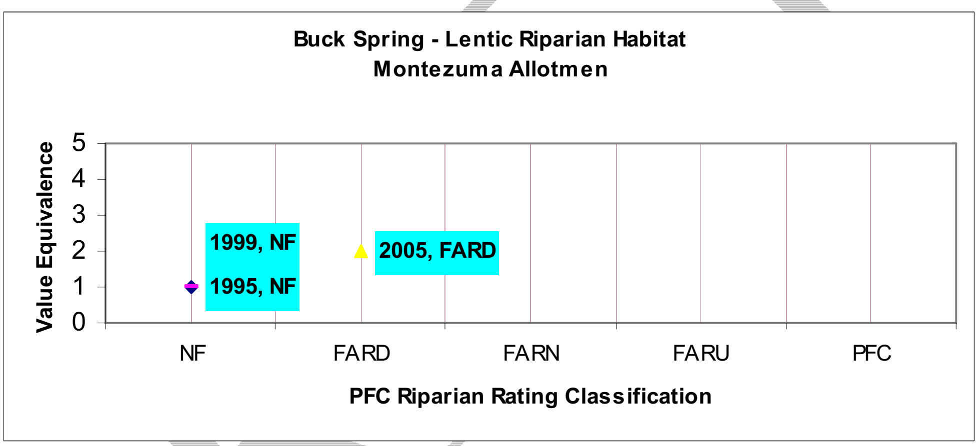


Table 7.0 – Wild Burro Seep Riparian Rating for Three Different Years

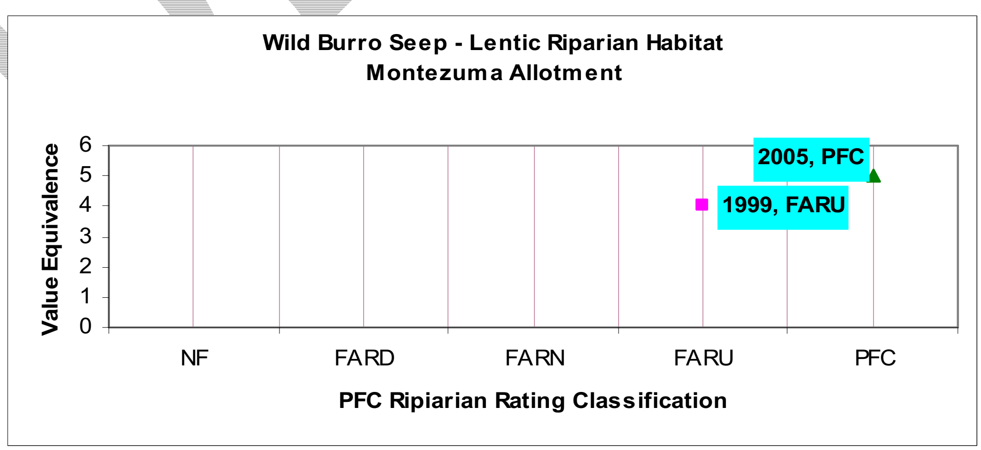


Table 8.0 – Crystal Spring Riparian Rating for Three Different Years

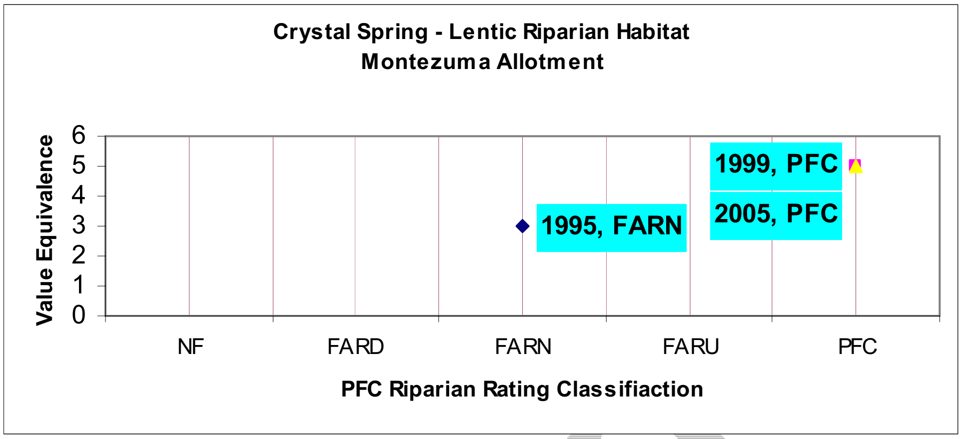


Table 9.0 – Brickyard Spring Riparian Rating for Three Different Years

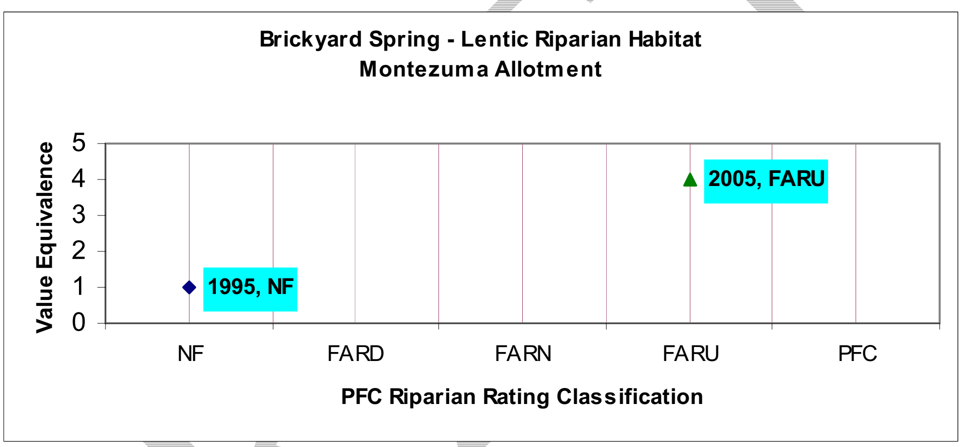
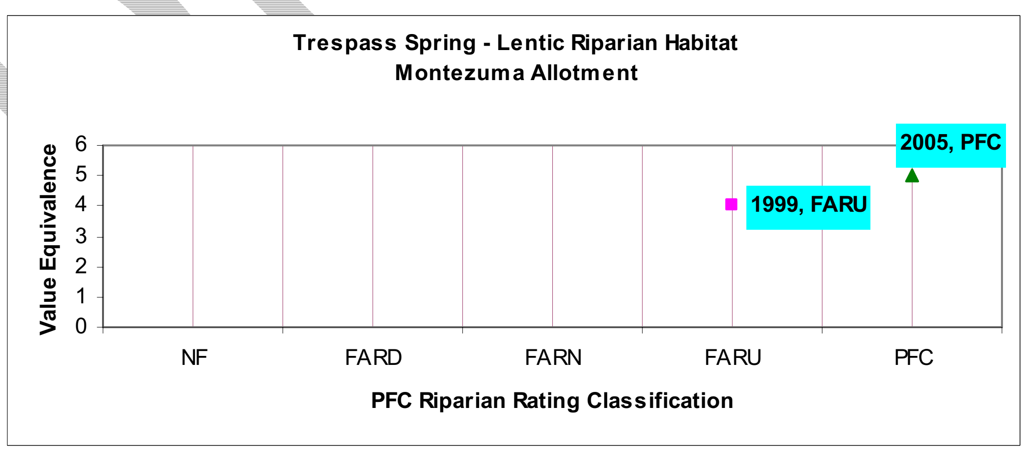


Table 10.0 – Trespass Spring Riparian Rating for Three Different Years



APPENDIX G

REALTY

LAND DISPOSAL

In

Montezuma, Razorback and Springdale2

Allotments

I. Realty - Land Disposal

Reduction of Animal Unit Months (AUMs) on the Montezuma Complex – Disposal Areas, RMP, 1997 (additional information on the realty actions maybe obtained from the Tonopah BLM Office and the map of the land disposal is available upon request). The calculations are based strictly on the potential land disposal acres and the RMP allotment acres. This may not be reflected in the Montezuma Complex Multiple Use Decisions. This is more for an informational basis rather a decision purpose. A separate decision or waiver will be issued once the administrative process begins on the land disposal.

A. Montezuma Allotment - Reduction in Animal Unit Months

1. Tonopah Land Disposal includes 6, 400 acres

The Montezuma Allotment is allocated at 50.4 acres per AUM.

6,400 acres/50.4acres per AUMs = 127 AUMs

Total new AUMs preference for the Montezuma Allotment will be 10541 AUMs.

2. Goldfield Land Disposal includes 22,624.80acres

The Montezuma Allotment is allocated at 50.4 acres per AUM.

22,624.80 acres/50.4acres per AUMs = 449 AUMs

Total new AUMs preference for the Montezuma Allotment will be 10,219 AUMs.

3. Scotty's Junction Land Disposal includes 3,200 acres

The Montezuma Allotment is allocated at 50.4 acres per AUM.

3,200 acres/50.4acres per AUMs = 63 AUMs

Total new AUMs preference for the Montezuma Allotment will be 10,605 AUMs.

4. **Summary of AUMs reductions for the Montezuma Allotment for 1, 2 & 3**

   127 AUMs + 449 AUMs + 63 AUMs = 639 AUMs

   Montezuma Allotment RMP AUMs is 10,668 AUMs

   10,668 AUMs – 639 AUMs = 10,029 AUMs

B. Beatty Land Disposal - Reduction in Animal Unit Months

Beatty Land Disposal includes 39, 389.19 acres

The Beatty Land Disposal includes a portion of the Montezuma, a portion of the Razorback and Springdale 2 Allotments

1. **Montezuma Allotment Land Disposal 28,556.44 acres**

   The Montezuma Allotment is allocated at 50.4 acres per AUM.

   28,556.44 acres/50.4acres per AUMs = 567 AUMs

   Total new AUMs preference for the Montezuma Allotment is 10,101 AUMs.

   Total New AUMS Allocation for the Montezuma Allotment will be

   10,029 AUMs - 567 AUMs = 9,462 AUMS

2. **Razorback Allotment Land Disposal 9,366.75 acres**

   The Razorback Allotment is allocated at 79.9 acres per AUM.

   9,366.75 acres/79.9 acres per AUMs = 117 AUMs

   Total new AUMs preference for the Razorback Allotment will be 845 AUMs.

3. **Springdale 2 Allotment Land Disposal 1,466 acres**

   The entire of the allotment will be subject to land disposal and may be completely reduced as a grazing allotment.

Appendix H – Communication, Cooperation and Coordination

Evaluation Period and Correspondence Timeline

The evaluation period for this EA ranges from 1981 to 2007. During the preparation and review process of the rangeland health assessment, input was solicited from all interested parties and Inter-disciplinary Team members (ID-Team), Nevada Department of Wildlife, Beatty Livestock Co., L.L.C., Truckee River Ranches and Mr. Jim Berg.

The ID Team met on a daily and weekly basis throughout the evaluation process and period.

On August 8, 2005, a letter was sent to the interested parties for the Montezuma Complex, notifying them of land management decisions regarding the Montezuma Complex.

On August 15, 2005, a letter was sent to the interested parties notifying them of a tour of the Montezuma Complex on October 18, 2005.

On October 18, 2005, a tour of the complex occurred with personnel from the Bureau of Land Management and Nevada Department of Wildlife (NDOW).

On November 30, 2005, BLM, Tonopah Office received a letter from NDOW concerning wildlife resources.

On December 6, 2005, a letter was sent to the U.S. Fish and Wildlife (USFWS) requesting a list of Threatened, Endangered, and Proposed species list.

On January 23, 2006, BLM, Tonopah Office received a letter from USFWS in response to August 8, 2006 letter.

On January 23, 2006, BLM, Tonopah Office received a letter from USFWS in response to December 6, 2006 letter.

In late February or early March, Tonopah staff took a copy of the wildlife section of the evaluation and a map of the Montezuma Complex to NDOW in Tonopah for their comments and input.

On March 8, 2006, BLM, Tonopah Office received an e-mail from NDOW in Tonopah responding to the wildlife information given to them on the Montezuma Complex the previous week.

On April 3, 24 and 25 2006, Tonopah Office sent an e-mail to NDOW in Tonopah concerning comments on the evaluation.

During the month of April, 2006, BLM staff personal communication with various NDOW staff for input on wildlife section of the evaluation.

On April 25, 2006, BLM, Tonopah Office sent an e-mail to NDOW in Las Vegas that included a copy of the wildlife information for the evaluation and requesting their review.

On April 27, 2006, BLM, Tonopah Office received an e-mail from NDOW in Tonopah.

On May 1, 2006, BLM, Tonopah Office sent an e-mail to NDOW in Las Vegas.

On May 5, 2006, BLM, Tonopah Office received an e-mail from NDOW in Las Vegas.

On May 12, 2006, a letter was sent to Mr. Hyde concerning the evaluation.

On June 12, 2006, BLM, Tonopah Office received a letter from NDOW concerning wildlife resources on the Montezuma Complex.

On June 14, 2006, BLM, Tonopah Office received an e-mail from NDOW concerning wildlife resources on the Montezuma Complex.

On July 6, 2006, BLM, Tonopah Office received an e-mail from NDOW in Tonopah and sent two emails to NDOW in Tonopah concerning comments on the evaluation.

On August 16, 2006, Tonopah Office sent an e-mail to NDOW in Las Vegas requesting information for the evaluation.

On August 17, 2006, BLM, Tonopah Office received a letter from NDOW concerning wildlife resources on the Montezuma Complex.

On August 23, 2006, BLM Tonopah Office received a letter from NDOW concerning wildlife resources on the Montezuma Complex.

On May 11, 2007, a letter was sent to Timbisha Shoshone Tribe to initiate native consultation.

Appendices I

I. List of Preparers and Consultants

II. References and Literature Cited

III. Abbreviations

IV. Glossary

V. Reference Manual

I. List of Preparers, Technical Review Staff and Consultants

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National Oceanographic and Atmospheric Administration
Western Regional Climate Center
Nevada Natural Heritage Program
US Geological Service

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IIII. Abbreviations

ANOVA	Analysis of variance
AML	Appropriate Management Level
AUM	Animal Unit Month
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
DPC	Desired Plant Community
EA	Environmental Assessment
FAR	Functional at Risk (riparian)
GIS	Geographic Information System
GLM	General Linear Model
HMA	Herd Management Area
HU	Hydrological Unit
IBLA	Interior Board of Land Appeals
LUP	Land Use Plan
KA	Key Area
NA	Not Apparent (riparian)
NDOW	Nevada Department of Wildlife
NF	Non-Functional (riparian)
NNHP	Nevada Natural Heritage Program
PFC	Proper Functioning Condition
PNC	Potential Native Community
RAC	Resource Advisory Council
ROD	Record of Decision
RMP	Resource Management Plan
VRM	Visual Resources Management
WSA	Wilderness Study Area

IV. GLOSSARY OF TERMS

A

Actual use: a report of the actual livestock grazing use certified to be accurate by the permittee or lessee. Actual use may be expressed in terms of animal unit months or animal months.

Allotment: an area of land designated and managed for grazing by livestock. Such an area may include intermingled private, state, or federal lands used for grazing in conjunction with the public lands.

Animal Unit Month (AUM): the amount of dry forage required by one animal unit for one month, based on a forage allowance of 26 pounds per day.

Apparent Trend: an assessment, using professional judgment, based on a one-time observation. It includes consideration of such factors as plant vigor, abundance of seedlings and young plants, accumulation or lack of plant residues on the soil surface, and soil surface characteristics (i.e., crusting, gravel pavement, pedicled plants, and sheet or rill erosion.

Available Forage: that portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

B

Bare Ground (bare soil): all land surfaces not covered by vegetation, rock or litter (SRM 1999). As used in this document, visible biological crusts and standing dead vegetation are included in cover estimates as a type of vegetation and therefore are not bare ground.

Basal Cover (area): the cross-sectional area of the stem or stems of a plant, or all plants in a stand. Herbaceous and small woody plants are measured at or near the ground level; larger woody plants are measured at breast or other designated height.

Browse: (I) the part of shrubs, half shrubs, woody vines, and trees available for animal consumption; or (2) to search for or consume browse.

Browse Plant or **Browse Species**: a shrub, half shrub, woody vine, or tree capable of producing shoot, twig, and leaf growth suitable for animal consumption.

C

Canopy Cover: the percentage of the ground covered by a vertical projection of the outer-most perimeter of the natural spread of foliage of plants. Small openings within the canopy are included. It may exceed 100 percent. Syn. crown cover. (SRM 1999).

Cool-Season Plant: a plant which generally makes the major portion of its growth during the late fall, winter, and early spring. Cool season grasses generally exhibit the C-3 photosynthetic pathway. Cf warm-season plants (SRM 1999).

Cover: the plant or plant parts, living or dead, on the surface of the ground. Vegetative cover or herbage cover is composed of living plants (including biological crusts), and the litter cover of dead parts of plants (SRM 1999).

D

Desired plant community: of the several plant communities that may occupy a site, the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum (SRM 1999).

Dominant Species: plant species or species groups, which by means of their number, coverage, or size, have considerable influence or control upon the conditions of existence of associated species (SRM 1999).

E

Ecological Site: a kind of rangeland with a specific potential natural community and specific physical site characteristics, differing from other kinds of rangeland in its ability to produce vegetation and to respond to management. Ecological sites are defined and described with soil, species composition, and production emphasis. Ecological site is synonymous with range site and ecological type (FS).

Ecological Status: the present state of vegetation of an ecological site in relation to the potential natural community for the site. Ecological status is independent of use. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a community resemble that of the potential natural community. The four ecological status classes correspond to 0-25,26-50, 51-75, or 76-100 percent similarity to the potential natural community and are called *early-seral, mid-seral, late-seral,* and *potential natural community,* respectively.

Estimated Use: the use made of forage on an area by wildlife, wild horses, wild burros, and/ or livestock where actual use data are not available. Estimated use may be expressed in terms of animal unit months or animal months.

Exotic Plant: a plant that is not born, growing, or produced naturally (native) in an area, region, or country. Syn. non-indigenous plant. (SRM 1999).

F

Foliar Cover: the percentage of ground covered by a downward vertical projection of the aerial portion of plant foliage, excluding small openings in the canopy, foliar cover is always less than canopy cover. Total foliar cover of all species may exceed 100 percent.

Forage: (1) browse and herbage which is available and can provide food for animals or be harvested for feeding or (2) to search for or consume forage.

Forage Production: the weight of forage that is produced within a designated period of time or a given area. Production may be expressed as green, air dry, or oven dry weight. The term may also be modified as to time of production such as annual, current year, or seasonal forage production.

Forb: (1) any herbaceous plant other than those in the Gramineae (true grasses), Cyperaceae (sedges), and Juncaceae (rushes) families-i.e., any nongrass-like plant having little or no woody material on it; or (2) a broadleaved flowering plant whose above- ground stem does not become woody and persistent.

Frequency: a quantitative expression of the presence or absence of individuals of a species in a population. It is defined as the percentage of occurrence of a species in a series of samples of uniform size.

G

Ground Cover: the percentage of material other than bare ground covering the land surface. It may include live and standing dead vegetation/ litter cobble/ gravel stones/ and bedrock. Ground cover plus bare ground would total 1 00 percent.

H

Half Shrub: half-shrub: A perennial plant with a woody base whose annually produced stems die each year (SRM 1999).

Herbaceous: vegetation growth with little or no woody component; nonwoody vegetation such as graminoids and forbs.

Hedging: (1) the appearance of browse plants that have been browsed so as to appear artificially clipped; or (2) consistent browsing of terminal buds of browse species that result in excessive lateral branching and a reduction in upward and outward growth.

I

Increaser: for a given plant community, those species that increase in amount as a result of a specific abiotic/biotic influence *or* management practice (SRM 1999).

Invasive Plant: plants that are not part of (exotic) or a minor component of (native) the original plant community or communities that increase above what's expected given the normal range of variability of a site.

K

Key Area: a relatively small portion of a range selected because of its location/ use or grazing value as a monitoring point for grazing use. It is assumed that key areas/ if properly selected/ will reflect the overall acceptability of current grazing management over the range.

Key Species: (1) forage species whose use serves as an indicator to the degree of use of associated species. (2) those species which must/ because of their importance/ be considered in the management program.

Kind of Livestock: species of domestic livestock-cattle/ sheep/ horses/ burros/ and goats.

L

Lithic Debitage: a scatter of stone waste flakes from stone tool production.

Litter: the uppermost layer of organic debris on the soil surface, essentially the freshly fallen or slightly decomposed vegetal material (SRM 1999). In this document, it includes persistent and non-persistent organic matter that is in contact with the soil surface.

M

Monitoring: the orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives. The process must be conducted over time in order to determine whether or not management objectives are being met (SRM 1999).

N

Noxious Weed: plant species declared noxious by laws concerned with plants that are weedy in cultivated crops and on the range.

0

Orographic Precipitation: rain, snow, or other precipitation produced when moist air is lifted as it moves over a mountain range. As the air rises and cools, orographic clouds form and serve as the source of the precipitation, most of which falls upwind of the mountain ridge. Some also falls a short distance downwind of the ridge and is sometimes called spillover (http://www.britannica.com/eb/article?eu=58876)

Overstory: the upper canopy or canopies of plant, usually referring to trees, shrubs, and vines.

P

Pasture: a grazing area enclosed and separated from other areas by a fence or natural barrier.

Plant Decadence: plants that are old or deteriorating. In a plant community, decadence refers to an overabundance of dead or dying plants relative to what is expected for a site given the natural range of variability in disease, climate, and management influences.

Potential Natural Community (PNC): the biotic community that would become established if all successional sequences were completed without interference by human beings under the present environmental conditions. Natural disturbances are inherent in development. PNCs can include naturalized non-native species.

Proper Use: (1) a degree of utilization of current year's growth which, if continued, will achieve objectives and maintain or improve the long-term productivity of the site; or (2) the percentage of a plant that is utilized when the rangeland as a whole is properly utilized. Proper use varies with time and systems of grazing. Proper use is synonymous with proper utilization.

Public Lands: any land and interest in land outside of Alaska owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management (see 43 CFR *4100.0-5).*

Plant mortality: the death of a plant or in a plant community the death of a number of plants in the community.

R

Range Condition: the present status of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site (SRM 1999).

Rangeland Health: the degree to which the integrity of the soil, vegetation, water, and air, as well as the ecological processes of the rangeland ecosystem, are balanced and sustained. Integrity is defined as maintenance of the structure and functional attributes characteristic of a locale, including normal variability (SRM 1999).

Range Site: (See ecological site.)

Recruitment: the successful entry of new individuals into the breeding population

Resource Management Plan: a public document prepared by consulting, cooperating, and coordinating with the permittee(s),lessee(s), or other interested publics which establishes the management objectives for the planning area.

Rhizomatous Plant: a plant that reproduces by rhizomes. Rhizomes are a horizontal under-ground stem, usually sending out roots and aboveground shoots from the nodes (SRM 1999).

Riparian zone: the banks and adjacent areas of water bodies, water courses, seeps, and springs whose waters provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a more moist habitat than that of contiguous flood plains and uplands.

S

Species Composition: the proportions of various plant species in relation to the total on a given area. It may be expressed in terms of cover, density, weight, etc. (SRM 1999).

Seral Community: one of a series of biotic communities that follow one another in time on any given area. Seral community is synonymous with successional community.

Seral Stage: the developmental stages of an ecological succession; synonymous with successional stage.

Soil Survey: the systematic examination, description, classification, and mapping of soils in an area. Soil surveys are classified according to the kind and intensity of field examination (SSSA 1997).

Special Status Plant: a species that is either Federally listed as threatened or endangered, officially proposed (or a candidate) for Federal listing as threatened or endangered, State listed as threatened or endangered) or listed by a BLM State Director as sensitive.

Stable State: a condition of an ecological site's characteristics; as characteristics change, there is a transition to a new state (USDA 1997).

Standing Dead Vegetation: the total amount of dead plant material, in aboveground parts, per unit of space at a given time (USDA 1997). This component includes all standing dead vegetation produced in previous (not the current) growing seasons not in contact with the soil surface

Structure (vegetation): the height and area occupied by different plants or life forms in a community.

Succession: the orderly process of community change; it is the sequence of communities that replace one another in a given area.

Successional Community: (See seral community.) successional stage: (See seral stage.)

T

Threshold: a transition boundary that an ecosystem crosses resulting in a new stable state that is not easily reversed without significant inputs of resources.

Transition: a shift in plant composition that results in relatively stable states, as reflected in composition and structure. These shifts can occur by natural forces or as a result of human actions.

Trend: the direction of change in ecological status or resource value rating observed over time (SRM 1999).

U

Understory: plants growing beneath the canopy of other plants; usually refers to grasses, forbs, and low shrubs under a tree or shrub canopy.

Useable Forage: that portion of forage that can be grazed without damage to the basic resources; may vary with season of use, species, and associated species.

Utilization: the proportion or degree of the current year's forage production by weight that is consumed or destroyed by animals (including insects). The term may refer either to a single plant species, a group of species, or the vegetation community as a whole. Utilization is synonymous with use.

V

Vegetation Type: a kind of existing plant community with distinguishable characteristics described in terms of the present vegetation that dominates the aspect or physiognomy of the area.

Vigor: relates to the relative robustness of a plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant and its parts in relation to its age and the environment in which it is growing.

W

Warm Season Species: a plant which makes most or all its growth during the spring, summer, and fall and is usually dormant in winter; a plant that exhibits the C-4 photosynthetic pathway (SRM 1999).

Wilderness Study Area (WSA): a wilderness study area is a road less area or island that has been inventoried and found to possess wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act and Section 2 of the wilderness Act of 1964. Private and other agency in holdings within the Wilderness Study Area boundaries are officially, legally, and technically not part of the Wilderness Study Area. Some private and other agency in holdings are not shown with the Wilderness Study Area boundary symbol around them (Nevada Wilderness Study Area Network, April 2001)

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