FINDING OF NO SIGNIFICANT IMPACT
for the
Establishment of Appropriate Management Levels for the Red Rock Herd Management Area

FONSI

I have reviewed the attached Environmental Assessment (EA) NV-050-04-346, dated May 2004. After consideration of the environmental effects as described in the EA, I have determined that the action of establishing appropriate management levels (AML) for wild horses and burros in the Red Rock Herd Management Area (HMA) as identified in the EA will not significantly affect the quality of the human environment and that an Environmental Impact Statement (EIS) is not required to be prepared.

Rationale

Within the Las Vegas Field Office (LVFO) area, The Red Rock HMA is designated for the management of wild horses and/or burros as one of the multiple uses in the Las Vegas Valley Resource Management Plan (RMP) (1998). The HMA addressed encompasses 164,684 acres within LVFO managed lands. Any future decisions would establish an AML of 16-27 wild horses and 29-49 wild burros for the HMA. The establishment of an AML for the Red Rock HMA would retain wild horses and burros as one of the multiple uses within the boundaries of the HMA. The upper limit of the AML range established would also be the benchmark above which an excess wild horse and/or burro population for this HMA exists. Wild horse and burro gathers would now occur on a scheduled basis for the animals within the Red Rock HMA.

Intensity

1) *Impacts that may be both beneficial and adverse*.
As stated in the EA (Section 4.11.4 pg. 40), the environmental assessment has considered both beneficial and adverse impacts of establishment of an appropriate management level (AML) for the HMA. No significant beneficial or adverse effect will occur.

2) *The degree to which the proposed action affects public health or safety.*
The proposed action to establish an AML for the Red Rock HMA will have no affect to public health or safety (Section 4.11.4 pg. 40).

3) *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.*
Though approximately one-half of the HMA overlaps into the Red Rock Canyon National Conservation Area (RRCNCA), the establishment of this AMLs consistent with the Interim General Management Plan (IGMP) (December 2000) as well as the proposed

GMP. The AML will have no significant impacts on any unique characteristics of the RRCNCA (Section 4.0 pg. 14).

4) *The degree to which the effects on the quality of the human environment are likely to be highly controversial.*
Establishing an appropriate management level of zero within any portion of this HMA as analyzed within Alternatives A, B, and C would likely be highly controversial based upon public input during the initial review process. Conversely, not establishing an AML and managing wild horses and burros on an emergency basis only is highly controversial as well. However, the proposed action to establish an AML for the HMA will have no significant impact to the quality of the human environment (Section 4.10.1 pg. 34).

5) *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.*
The establishment of an AML has been completed for 5 other HMAs in the LVFO area. Therefore, the proposed action does not have any highly uncertain or involve any unique or unknown risks (Section 4.11.4 pg. 39).

6) *The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.*
The proposed action does not establish any precedence for future actions with significant effects and does not represent a decision in principle about future considerations since AML has been established previously for five HMAs within the LVFO area. Further, all future wild horse actions would be subject to the same environmental assessment standards as well as an independent decision making process (Section 2.3 pg. 7).

7) *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.*
No significant cumulative impacts are identified in the EA due to the fact that 5 of 9 HMAs within the LVFO area have an AML established without any cumulatively significant impacts occurring (4.11.4 pg. 39).

8) *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP or may cause loss or destruction of significant scientific, cultural, or historical resources.*
The proposed action will not cause the loss or destruction of significant scientific, cultural or historical resources or these resources be adversely affected (Section 4.0 pg. 14).

9) *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined by the BLM to not jeopardize the existence of the species.*
As stated in Section 4.5.2.1 (pg. 27 of the EA), the endangered Pahrump poolfish, limited to a single fenced spring at Spring Mountain Ranch State Park, and threatened desert tortoise occur within the Red Rock HMA. In accordance with the Endangered Species Act, section 7 consultation with the US Fish and Wildlife Service for the federally listed

desert tortoise will be addressed programmatically associated with consultation for the RRCNCA GMP. A decision to establish an AML of 16-27 horses and 29-49 burros is lower than what is occurring under existing conditions. The proposed action will reduce the potential for conflicts between wild horses and threatened and endangered species. The EA has identified that no significant or adverse impacts would result to these species from implementing the proposed action.

10) *Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.*
This action will not violate or threaten to violate any federal, state, or local law or requirement imposed for the protection of the environment (Section 2.2 pg. 6).

_____ _____

Mark Morse, Field Manager **Date**

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Las Vegas Field Office
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130-2301

EA COVERSHEET

FIELD OFFICE AREA: Las Vegas Field Office

FY& EA #: NV-050-04-346

ACTION/TITLE: Establishment of Wild Horse and Burro Appropriate Management Levels

LOCATION: Red Rock Herd Management Area

FOR FURTHER INFORMATION CONTACT:

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FREEDOM OF INFOMRATION ACT AND RESPONDENT'S PERSONAL PRIVACY INTERESTS: The Bureau of Land Management is soliciting comments on this Environmental Assessment. Comments, including names and street addresses of respondents, will be available for public review at the above address during regular business hours. In an effort to reduce printing and mailing, you are encouraged to review the document on-line at www.nv.blm.gov/vegas/. You may also submit comments via e-mail to Gary McFadden at Gary_McFadden@nv.blm.gov. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your comment. Such requests will be honored to the extent allowed by law. All representatives or officials of organizations or businesses will be made available for public inspection in their entirety.

United States Department of the Interior

Bureau of Land Management
Las Vegas Field Office **June 2004**

Establishment of Appropriate Management Levels for the Red Rock Wild Horse and Burro Herd Management Area

Preliminary
Environmental Assessment
NV-050-04-346

MISSION STATEMENT

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times. Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, air, scenic, scientific and cultural values

Cover Photo by Amy Torres, BLM Las Vegas Field Office

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1.0 BACKGROUND INFORMATION

1.1 Introduction

The Wild Free-Roaming Horse and Burro Act (Act), of 1971, as amended, (Public Law 92-195) directs the federal government to manage wild horses and burros as an integral part of the natural system of the public lands under the principle of multiple use. The Act and Title 43 of the code of Federal Regulations (CFR) state, in part, that:

- 4700-6 (a): *"Wild horses and burros shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat."*

- 4710.4: *"Management of wild horses and burros shall be undertaken with the objective of limiting the animals' distribution to herd areas. Management shall be at the minimum level necessary to attain the objectives identified in approved land use plans and herd management area plans."*

- 4270.1: *"Upon examination of current information and a determination by the authorized officer that an excess of wild horses or burros exist, the authorized officer shall remove the excess animals immediately…"*

The first two sections cited above indicate that the Appropriate Management Level (AML) must be such that the number of wild horses and burros does not exceed the capacity of their habitat when taken into consideration with other multiple uses. Wild horses and burros will be managed in herd management areas, and the objectives in land use plans and herd management plans must be met. The third section allows removal of the excess animals before resource degradation occurs.

The capacity of the habitat includes consideration of four components: water, space, cover, and forage. Waters must be natural public waters; water associated with private land cannot be used to determine suitability. Wild horses and burros must have sufficient open space to allow for all seasonal habitat needs and the unimpeded access to seasonal ranges. Cover must be in sufficient quantity to provide the seasonal needs (e.g. thermal cover, shade, and foaling cover). Sufficient forage must be available to maintain wild horses and burros in healthy conditions that allow for reproduction.

The Secretary of the Interior was ordered to *"manage wild free-roaming horses and burros in a manner that is designed to ach*ieve *and maintain a thriving natural ecological balance on the public lands"* (Act). The Herd Areas (HA) managed by the Las Vegas Field Office (LVFO), were established based on where horses and burros were found in 1971. Herd Management Areas (HMAs) are areas within the HA where management for wild horses and burros are a designated land use. In some instances, two or more HMAs are managed as a complex because the populations move freely between HMAs. The HAs were established in the 1970s – 1980s with public involvement through the land use

planning process. HMA boundaries can only be changed through the land use planning process. A total of nine HMAs have been established in the LVFO area (Figure 1).

The Interior Board of Land Appeals (IBLA) issued a consolidated decision (IBLA 88-591, 88-648, and 88-679) that wild horse and burro herd size must be set based on monitoring data, not for administrative convenience. This EA provides the analysis for setting the AMLs for the Red Rock HMA in conformance with the IBLA decision.

The establishment of AML includes combining several concepts. The HMA must have all of the seasonal habitat needs of the herd within its boundaries. If wild horses and burros must leave the HMA to obtain resources for survival, then the wild horses and burros are either moving into non-HMA areas (i.e. areas where wild horses and burros are not a designated land use), or moving into other HMAs.

The HMA must also be capable of providing for a viable population[1]. The calculation of a viable population is complex and has specific data requirements, but a population of 50 breeding adults is considered the minimum (Coates-Markle 2000 and Singer et al., no date) for use when the specific data required to calculate a viable population estimate are not available. Establishing the AML that is below the viable population level increases the risk that the population will face extinction due to deterministic (i.e. systematic) and stochastic (i.e. random) factors. Therefore, to allow for wild horse and burro gathers and still leave a minimum of 50 breeding-age wild horses or burros within the HMA, the minimum viable population for the purpose of this analysis is 85 wild horses or burros[2]. In addition, the AML must be within the capacity of the rangeland to support wild horses and burros in a *"thriving natural ecological balance on the public lands"* with respect to other land uses. Establishing the AML at a level that is too high increases the risk of poor wild horse and burro health and resource degradation.

The Bureau of Land Management (BLM) LVFO has already established AMLs for 5 of 9 HMAs. The primary management responsibility for one of the HMAs, the Wheeler Pass HMA, is through the USDA Forest Service (FS), Spring Mountains National Recreation Area (NRA). AML has not been set for the BLM portion of this HMA, but is scheduled to be set in 2005 via a joint effort between the BLM and the FS. AML has been set on the Gold Butte HMA (98 burros) and the Nevada Wild Horse Range (Nevada Test and Training Range) (300-500 horses). Three of the HMAs, Eldorado, Ash Meadows, and Amargosa, have an AML of zero (0) for wild horses and burros due ESA conflicts. The remaining HMAs, Red Rock, Muddy Mountain, and Johnnie, are due to have AMLs set in FY 2004 and 2005.

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[1] A viable population is defined as one that is capable of maintaining itself without significant manipulation over an agreed upon time frame with an agreed upon degree of probability (i.e. certitude). The time frame and degree of certitude are partly a matter of human choice and partly a matter of biological reality.

[2] BLM policy is to manage a wild horse and burro population over a range of values, with the upper value based on the capacity of the habitat as determined by the monitoring data. The lower value allows BLM to periodically remove wild horses and burros when they reach the upper value and still maintain a viable population (i.e. still have at least 50 breeding-age wild horses and burros within the HMA).

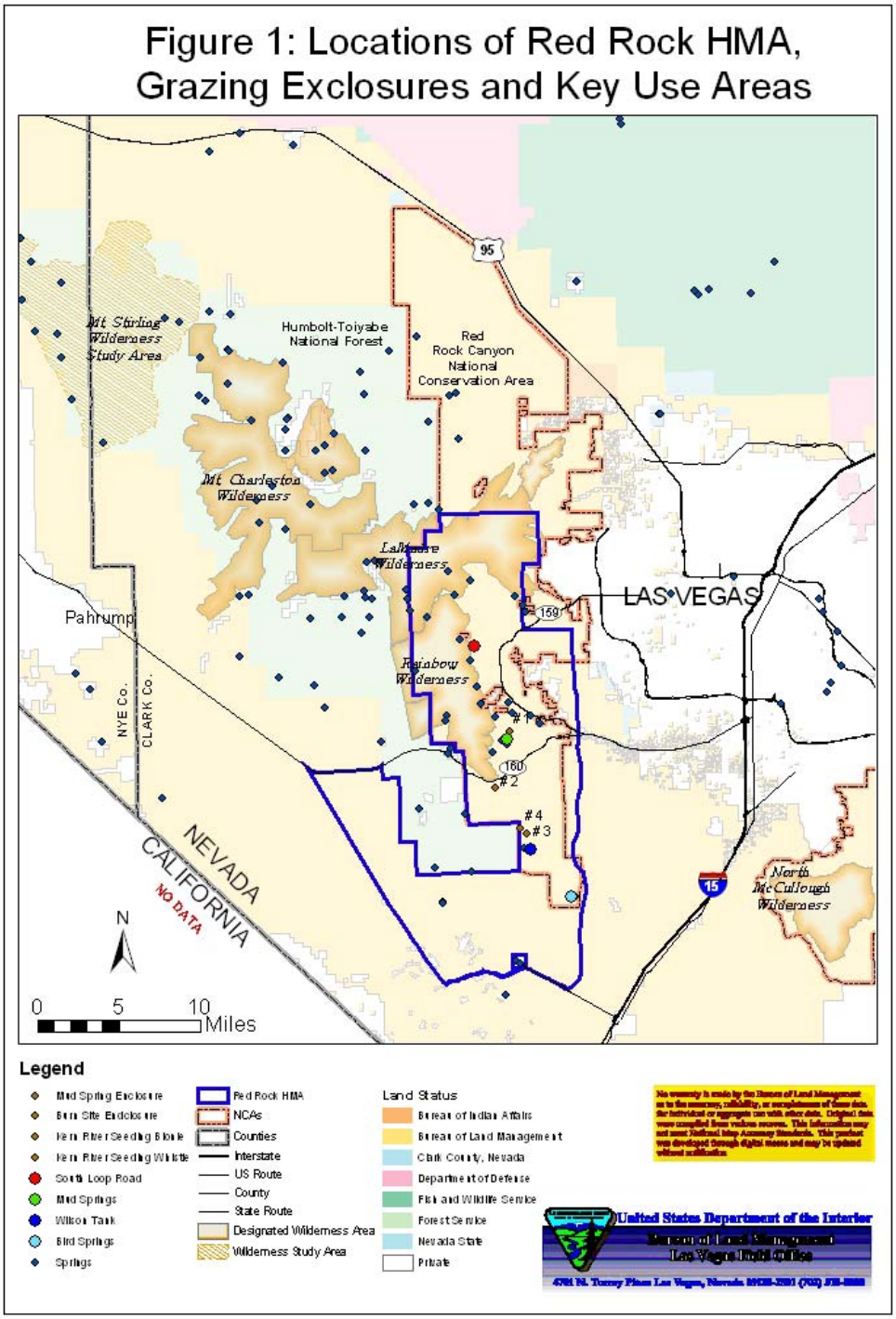


Figure 1: Locations of Red Rock HMA, Grazing Exclosures and Key Use Areas
Mt Stirling Wilderness Study Area
Humbolt-Toiyabe National Forest
Red Rock Canyon National Conservation Area
Mt. Charleston Wilderness
LaMadre Wilderness
Rainbow Wilderness
LAS VEGAS
Pahrump
NYE Co.
CLARK Co.
NEVADA
CALIFORNIA
NO DATA
North McCullough Wilderness
95
159
160
15
#1
#2
#3
#4
N
0 5 10 Miles
Legend
Mud Spring Enclosure
Burn Site Enclosure
Non Fire Seeding Blank
Non Fire Seeding Wildlife
South Loop Road
Mud Springs
Wilson Tank
Bird Springs
Springs
Red Rock HMA
NCAs
Counties
Interstate
US Route
County
State Route
Designated Wilderness Area
Wilderness Study Area
Land Status
Bureau of Indian Affairs
Bureau of Land Management
Clark County, Nevada
Department of Defense
Fish and Wildlife Service
Forest Service
Nevada State
Private
United States Department of the Interior

1.2 Project Area Description

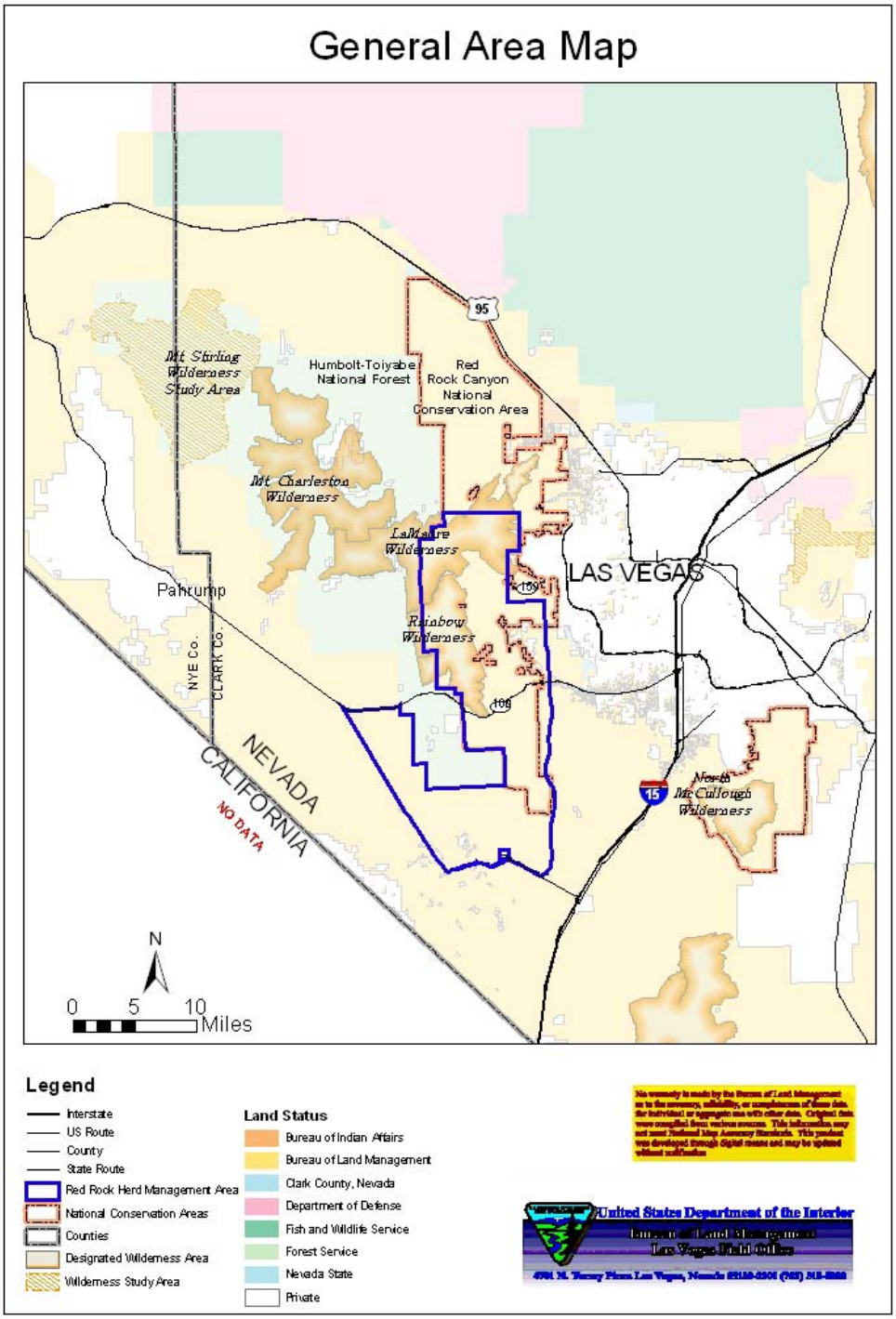
The Red Rock HMA is the focus of this Environmental Assessment (EA) and attached AML evaluation review. The HMA comprises almost 170,000 acres and is located in southern Nevada, approximately 20 miles west of Las Vegas in Clark County (General Area Map and Appendix A). The HMA is in the Mojave Desert with low precipitation levels, hot summers and cool winters. Annual precipitation varies from an average of 4 inches to greater than 15 inches depending on elevation. Evapo-transpiration is high with air temperatures varying from 20 degrees Fahrenheit (ºF) in the winter to an excess of 115 ºF in the summer. Slopes in the valleys vary from 0 to 30 percent with the majority at about 5 to 9 percent. The mountains lay in a north to south direction with variable slopes and aspects. Elevations range from 8,754 feet (ft.) on La Madre Mountain (just outside the HMA) to approximately 2, 500 ft.

Several natural water sources are not reliable throughout the year, and have a tendency to fail during the hot summer months. The extreme climate, especially harsh temperatures in the summer and large variability in the forage base from year to year, creates resource issues as well as animal humanity issues. Under the current policy, the BLM aims to anticipate wild horse and burro emergencies, and remove animals before suffering occurs. Also of concern is the unmanaged grazing by wild horses and burros outside of the HMAs, many of which have been forced to migrate into nearby cities and towns to forage on golf courses and private lawns and drink from man-made water fountains and sprinkler systems. The biggest concern for animals outside the HMAs is the safety hazards they present to themselves and motorists when they loiter along roads and highways. Approximately 125 animals have been killed since 1996 due to animal/vehicle encounters, and two human deaths have been recorded as well.

2.0 PURPOSE AND NEED

2.1 Need For Action

The need for Action is to establish wild horse and burro AMLs on the Red Rock HMA. Managing for AML would aid in achieving rangeland health by managing wild horses and burros as self-sustaining, viable populations of healthy animals in balance with other uses and the productive capacity of their habitats. This is indicated by healthy rangelands *"that provide sufficient quantities and quality of forage and water to sustain appropriate management level on a year-long basis within a herd management area"* and by wild horses and burros *"managed on a year-long basis for a condition class greater than or equal to five to allow them normal chances for survival in the* [summer or] *winter"* (Mojave/Southern Great Basin (M/S) Resource Advisory Council (RAC) Standards and Guidelines) (see Glossary for equine body condition definitions). In addition, the AML must be established to allow BLM to gather excess wild horses and burros under the Nevada Revised Tactical Plan (BLM 2001), and to develop population management plans for each HMA.


General Area Map
Mt Stirling Wilderness Study Area
Humbolt-Toiyabe National Forest
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95
Mt Charleston Wilderness
LaMadre Wilderness
LAS VEGAS
Pahrump
Rainbow Wilderness
159
NYE Co.
CLARK Co.
NEVADA
CALIFORNIA
NO DATA
North Mt Cullough Wilderness
15
N
0 5 10 Miles
Legend
Interstate
US Route
County
State Route
Red Rock Herd Management Area
National Conservation Areas
Counties
Designated Wilderness Area
Wilderness Study Area
Land Status
Bureau of Indian Affairs
Bureau of Land Management
Clark County, Nevada
Department of Defense
Fish and Wildlife Service
Forest Service
Nevada State
Private
United States Department of the Interior

2.2 Relationship to Planning

Public lands are managed under the Federal Land Policy and Management Act of 1976 (FLPMA). The FLPMA emphasizes that the public lands are to be managed to protect the quality of scenic, ecological, environmental, and archeological values; to preserve and protect public lands in their natural condition; to provide feed and habitat for wildlife and livestock; and to provide for outdoor recreation. The FLPMA also stresses harmonious and coordinated management of the resources without permanent impairment of the environment.

This Action is in conformance with BLM policies, plans, and programs. This Action is in conformance with the Las Vegas Resource Management Plan and Final Environmental Impact Statement (RMP) (October 1998), and is consistent with the Approved Interim General Management Plan the Final Environmental Impact Statement for the Red Rock Canyon National Conservation Area (NCA) (GMP) (December 2000), as well as the subsequent IBLA decision (IBLA 88-951, 88-648, and 88-679). The Las Vegas RMP Record of Decision (ROD) states in *WHB-1-a. Establish Appropriate Management Levels within Herd Management Areas*; and *WHB-1-b. Adjust the Appropriate Management Level identified for each Herd Management Area when monitoring determines the animal population, forage, water, riparian, and other ecosystem management objectives are not being met.* The Mojave/Southern Great Basin Resource Advisory Council (RAC) Standards and Guidelines for Rangeland Health state that BLM would manage for wild horses and burros in *"herd management areas based on the capability of the HMA to provide suitable feed, water, cover, and living space for all multiple uses,"* and establish AMLs *"based on the most limiting habitat factor (e.g. available water, suitable forage, living space and cover) in the context of multiple use"*. The RAC Standards also indicate that 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 the HMAs or consistent with land use plan (LUP) objectives. The AML must be based on monitoring data, as per the IBLA decision. Under the proposed action in this EA federal, state, or local law or requirement imposed for the protection of the environment will not be threatened to be violated or be violated.

2.3 Decision to Be Made

The decision by the authorized officer will establish the AML for the entire Red Rock HMA. Establishment of AMLs provides the framework for attaining and maintaining appropriate numbers of wild horses and burros within the Red Rock HMA. Establishing AMLs is only one action toward the objective to manage wild horses and burros for a thriving natural ecological balance.

The decision does not directly address multiple use conflicts; rangeland monitoring and herd monitoring would be used to adjust wild horse and burro numbers in the future as related to resource conflicts. As stated above, the decision does not change HMA boundaries; setting AML does not alter the boundary of the HMA. The HMA boundaries can only be modified through the LUP process. The decision does not authorize removal

of wild horses and burros; wild horse and burro gathers, including emergency gathers, are addressed in gather plans prepared with public review and input. Adjustments in wild horse and burro numbers would continue to be based on rangeland monitoring and the BLM decision process, based on rangeland health standards.

The proposed action does not establish any precedence for future actions with significant effects and does not represent a decision in principle about future considerations since AML has been established previously for five HMAs within the LVFO area. Further, all future wild horse actions would be subject to the same environmental assessment standards as well as an independent decision making process

2.4 Significant Issues

The primary issues for establishing AML are to manage for healthy rangelands in conformance with the M/S RAC Standards, and to manage wild horses and burros to improve and maintain wild horse and burro health and condition, as well as ecosystem health and condition. Establishing AMLs is necessary for compliance with the Act, conformance with the applicable LUPs, conformance with the BLM Nevada Revised Tactical Plan (BLM 2001), and achievement of the M/S RAC Rangeland Standards.

In addition to the general issues listed above, several issues specific to the Red Rock HMA have been articulated to the BLM that will be addressed in this document. Some of the issues include, but are not limited to: (1) the migration of horses and burros into the cities and towns surrounding the HMA; (2) the increased recreational activity and the affects on the HMA; (3) the development of artificial water sources for wild horse, burro and wildlife use; (4) the affect of the recent years drought on wild horses and burros and the rangeland; (5) the possible establishment of AMLs lower than what can sustain a healthy, viable population of horses and burros; (6) proposed energy projects and the affects on horses and burros within the HMA; and (7) horses and burros loitering along public roadways.

2.5 Public Involvement

When comments received at the last mailing of the draft Red Rock AML evaluation were reviewed, it became clear that further information was needed to accurately calculate the AML for the HMA. The draft evaluation was mailed to 373 individuals/groups. Of those that were mailed the document, 11 (8 letters and 3 e-mails) individuals/groups sent comments in response to the draft AML evaluation. Some of the issues/concerns that were common throughout the comments received were as follows:

- Establish an AML consistent with availability of forage and water during frequent and extended drought periods typical of the Mojave Desert environment.

- Establish an AML at a level consistent with improving or maintaining riparian and upland range conditions.

- In light of the ongoing drought and extreme conditions of the herds, it was requested that the BLM use data collected for the drought years 2000-2003 as part of the evaluation process.

- Introduction of mixing herds by augmentation is a questionable practice.

- Introducing artificial waters to maintain populations of horses and burros indicates that the ecosystem is not capable sustaining animals long-term.

- Range monitoring data reflecting impacts on recent drought years needs to be included before the final decision.

- The sparse occurrence of Indian Ricegrass, Stipa and Galleta has not supported wild horses during extreme and frequent drought cycles.

- Horses and burros have a negative impact upon the land and native plant and animal species.

- Previous assessments and the Persons report has suggested that these herd management areas with ephemeral issues might not be suitable long-term for horses.

3.0 PROPOSED ACTION AND ALTERNATIVES

The Action being analyzed in this EA is the establishment of AMLs on public lands administered by the LVFO for the Red Rock HMA. Two alternatives and the No Action Alternative are considered for meeting the need and are analyzed in detail. One Alternative was considered but not analyzed in detail.

3.1 Actions Common to All Alternatives

The following actions are common to all alternatives:

- Monitoring of rangeland health to assess the management of the multiple uses within the HMA.

- Adjustment of AMLs in the future would be based on monitoring data.

- Development of a wild horse and burro population management plan (PMP) for the HMA to identify management objectives and actions necessary to meet herd management objectives. The PMP would be used to establish monitoring to evaluate the herd numbers, condition, and demography over time.

- After AML is established, emergency gathers may still be required in response to the deterioration of wild horse and burro health.

3.2 Description of Alternatives

3.2.1 Alternative A – Proposed Action – Set AML Based on a Multi-Tiered Rangeland Evaluation

Alternative A is to establish AMLs for the Red Rock HMA according to available resources and current monitoring data.

A multi-tiered analysis is used to develop the proposed AML under this Alternative. The first tier consists of determining if the HMA has the four essential habitat components, forage, water, cover, and space, within the HMA boundary (see Appendix A for complete AML evaluation). Forage is determined by the utilization monitoring and use pattern mapping for the years of 1995 thru 2003 (1998 data is missing from all HMAs in the LVFO district and was subsequently excluded from this analysis). Improper utilization of riparian vegetation, upland forage (native or seeded), or other vegetation is an indication that forage resources are not sufficient to support wild horses and burros. The nature of the forage (i.e. perennial vs. annual) is also considered. Annual forage is only available during years with normal or above normal precipitation. During drought, production of perennial species is reduced, and annual grasses and forbs are not generally available. Water has to be public, natural waters (i.e. water occurring on private land is not considered). Water availability during drought conditions is also considered. Sufficient water for wild horses and burros must be available during drought to manage for "*thriving natural ecological balance and multiple-use relationships*." Cover and space are somewhat related. They include the vegetation required for seasonal needs as well as the distribution of this vegetation within the seasonal ranges. The ability of horses and burros to move unobstructed between watering and feeding areas is also considered part of the space component.

Movement out of the HMA into an adjacent HMA or to non-HMA areas for required resources is an indication that an HMA is not capable of sustaining year-long wild horse and burro use. If one or more of these components are missing, then the HMA is considered unsuitable for year-long habitation by wild horses and burros, and the proposed AML is zero wild horses and burros in the HMA. If all components are present, then the second tier in the evaluation is considered.

The second tier is to establish AML based on forage availability within the HMA and rangeland monitoring data. Monitoring data is reviewed to identify if rangeland objectives are being met. If rangeland objectives are being met, then the wild horse and burro census data is examined to determine the range of population values that have occurred in the HMA. The upper values are used to establish AML when no rangeland

Chart 1: Flow Chart for Establishing AML – Alternative 1

Tier One:
Habitat Suitability

A) All habitat components present. *Go to Tier Two, C.*

B) One or more habitat components missing or present in insufficient quantity. *Stop; establish AML at zero.*

Tier Two:
Evaluate Monitoring Data

C) Evaluation of monitoring data indicates allotment objectives and rangeland health standards are being met or progress is being made toward achieving rangeland objectives or health standards. *Set AML at the upper wild horse and burro population level for which resource issues were not occurring; go to Tier Three, E.*

D) Evaluation of monitoring data indicates that rangeland objectives and health standards are not being met or progress toward achieving allotment objectives or rangeland health standards is not occurring. Review wild horse and burro utilization studies to determine if the failure to reach objectives is due to wild horse and burro numbers/utilization/year-long use.

1) If wild horses and burros contribute to the failure to reach objectives or standards, then: *Set AML at the lower wild horse and burro population level for which resource issues were not occurring or wild horse and burro health was independently maintained; go to Tier Three, E.*

2) If wild horses and burros do not contribute to the failure to reach objectives or standards, then: *Set AML at the upper wild horse and burro population level based on census data; go to Tier Three, E.*

Tier Three:
Viable Population Determination

E) If AML set in Tier Two equals or exceeds the minimum viable population number (i.e. 50 breeding horses or burros or a total of 85 horses or burros), then: *Establish AML at the level determined in Tier Two.*

F) If AML set in Tier Two is less than the minimum viable population number (i.e. 50 breeding horses or burros or a total of 85 horses or burros), then: *HMA cannot support a viable population; establish AML at zero, or animal supplementation will be required.*

health issues occur. In HMAs where the allotment objectives are not being achieved, wild horse and burro use is examined to determine if either or both are contributing to the failure to meet objectives. The AML is set based on the estimated number of wild horses and burros present relative to the level of forage utilization that occurs, and the need for emergency wild horse and burro gathers. The resulting number is used in the third tier of the process.

The third tier is to compare the calculated AML with the minimum number of wild horses and burros considered necessary to maintain a viable population (i.e. 50 breeding wild horses and/or burros and a total population of 85 (Coates-Markle 2000)). If the calculated AML is less than the minimum viable population, the AML is either established at zero, or additional animals may need to be supplemented into the herd. If the AML exceeds the minimum viable population, the AML is established at the calculated value.

Using this multi-tiered evaluation approach, the range AML for horses would be 16-27. Horses would not be managed north of State Route 160 as the forage component of the ecosystem is lacking to sustain horse condition (see Appendix A for complete AML evaluation and calculations).

The range of AML for burros would be 29-49. Burros would only be managed north of State Route 160 due to a lack of permanent public water sources south of the State Route. Further, burros would not be managed in the area of the Blue Diamond Mine; also due to a lack of permanent public water sources (see Appendix A for complete AML evaluation and calculations). Burros may be managed in the area of the Blue Diamond Mine if permanent public water sources can be established in the future.

3.2.2 Alternative B – Manage for Burros Only

Under this Alternative, horses would not be managed within the Red Rock HMA due to the rangelands inability to sustain numbers that would be genetically viable. Genetic viability would not be maintained via augmentation of outside horses into the HMA.

Burros would be managed according to Alternative A at a range of 29-49 animals north of State Route 160, but would not be managed south of State Route 160 due to lack of permanent public water sources.

3.2.3 Alternative C - No Action – Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

Under the No Action Alternative, the Red Rock HMA would continue to use the interim AML established in the Las Vegas RMP, and manage at 50 horses and 50 burros throughout the HMA. Monitoring data would continue to be collected and evaluated to

determine if rangeland objectives and standards for healthy rangelands are being achieved at this interim AML.

3.2.4 Alternatives Considered But Not Analyzed in Detail

3.2.4.1 Alternative D – Manage for Horses in a Created Pasture Located Outside of the Red Rock HMA

In this Alternative, roughly 17,000 acres of public land east and adjacent to the HMA would be fenced (south of SR 160), where horses would be artificially managed. Water and forage would need to be provided on a regular basis as none currently exists in this new environment. Additional range inventories and NEPA analysis would be needed to determine the affect on the new area. Wild burros would be managed according to Alternative A.

This Alternative was dropped from consideration because it is not in compliance with the Las Vegas RMP or the Wild and Free Roaming Horses and Burros Act of 1971.

Table 1: Comparison of AMLs under Each Alternative considered for the Red Rock HMA.

Species	Population Estimate[3]	Alternative A AML[4]	Alternative B AML	Alternative C AML	Alternative D AML
Horses	27	16-27	0	50	Undetermined
Burros	152	29-49	29-49	50	29-49

3.3 Mitigation Measures Not Already Covered in Proposed Action or Alternatives

Regardless of the proposed AML established in the above Alternatives, fertility control may be implemented on mares and jennies. The use of contraception can increase the time needed between gathers, increase horse and burro body condition classes, and reduce the stress associated with frequent gathers and treatment. Emergency gathers would remain an option for reducing animal numbers during times of unforeseen emergency situations such as fires, or unusually adverse weather, or when there is a need for gathering nuisance animals.

4.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The critical elements of the human environment which have been considered for this EA are listed in Table 2. Elements that may be affected are further described in this EA. Rationale for determining which elements would be affected is provided in the table.

[3] Estimates are based on the latest census in March 2004.
[4] The range of values for the AML is to accommodate a 4-5 year gather cycle.

Table 2: Critical Elements of the Human Environment and Rational for Detailed Analysis

Critical Element	No Effect	May Effect	Not Present	Rationale
Air Quality	X			Establishment of AMLs would not affect air quality.
Areas of Critical Environmental Concern (ACEC)			X	There are no ACECs located within the HMA.
Cultural Resources	X			Establishment of AMLs would not affect cultural resources.
Environmental Justice	X			No minority or low income groups will be disproportionately affected.
Flood Plains	X			Establishment of AMLs will not affect flood plains.
Native American Religious Concerns	X			No issues identified at the release of the first draft of the AML evaluation (July 2003).
Non-native, Invasive Species		X		Ground disturbing and plant community changes create opportunities for non-native invasive species to establish.
Threatened and Endangered Species		X		Issue identified after the release of the first draft of the AML evaluation (July 2003).
Wastes (Hazardous or Solid)			X	No wastes (hazardous or solid) would be used or generated by the Alternatives.
Water Quality (drinking/ground)		X		Wild horses and burros use springs and creeks for watering and wells may be established.
Wetlands			X	No wetlands are present within the HMA
Riparian		X		Wild horses and burros use riparian areas.
Wild and Scenic Rivers			X	There are no Wild and Scenic Rivers occurring in the HMA.
Wilderness	X			Establishing AMLs is not anticipated to impact Wilderness or Wilderness Study Areas.

In addition to the critical elements of the human environment, the BLM must consider other resources that occur on public lands, or issues raised by the public. The potential resources, uses and issues that may be affected are listed in Table 3, along with a brief rationale for either considering or not considering the issue or resource further.

Table 3: Other Resources and Issues, and Rationale for Detailed Analysis

Resource or Issue	No Affect	May Affect	Not Present	Rationale
Lands	X			No change in land use, access, or status would occur with the establishment of AMLs.
Soils		X		Wild horses and burros may have an impact on soils.

Geology/ Minerals	X			No impact anticipated to subsurface resources.
Paleontological Resources	X			No impact anticipated to paleontological resources.
Vegetation		X		Vegetation provides forage and cover for wild horses and burros.
Livestock Grazing			X	No active grazing allotments are located within the HMA.
Wildlife (Including Migratory Birds)		X		Competition for resources affects wildlife.
Wild Horses and Burros		X		This is the focus of the Proposed Action.
Recreation		X		Wild horse and burro viewing is a recreational pursuit.
Visual Resource Management	X			No changes to the landscape are anticipated as a result of the Alternatives.
Sensitive Species		X		Sensitive species may be present at springs and creeks.
Forestry	X			Establishing AMLs is not anticipated to impact forest resources.
Socioeconomics		X		The Alternatives may have affects on local culture and economics.

Though approximately one-half of the HMA overlaps into the Red Rock Canyon National Conservation Area (RRCNCA), the establishment of this AML s consistent with the interim general management plan (GMP) (December 2000) as well as the proposed GMP. The AML will have no significant impacts on any unique characteristics of the RRCNCA.

4.1 WILD HORSES

4.1.1 Affected Environment

A brief description of the HMA and the respective herd is provided in Appendix B.

The current wild horse herd consists of approximately 27 animals. The sex ratio is nearly 50/50 not counting the current year's foals. The dominant colors are sorrel, bay, black, palomino, pinto, buckskin, dun, and cremello (white with blue eyes, not albino). The average growth rate is approximately 13% per year, with year-round foaling.

Much less is known about the burro herd in Red Rock. The current population is approximately 152 burros. Their growth rate is approximately 20% with foaling year-round. The sex ratio of the burro herd is currently unknown. Dominant colors are grey, brown, black, maltese (grey with black mask), and many varieties or pink or rose. No pinto burros have ever been found within the HMA.

4.1.2 Environmental Consequences

4.1.2.1 Alternative A - Proposed Action – Set AML Based on a Multi-Tiered Rangeland Evaluation

4.1.2.1.1 South of State Route 160

The AML for wild horses living in the southern portion of the HMA would be established at a range of 16-27 horses. This area of the HMA has all of the components to support a limited herd size. This number is considered less than what can support a healthy viable population, and therefore may need to be periodically supplemented with mares from other HMAs with similar rangeland components as the Red Rock HMA. By managing the HMA for this low range of horses, animals should not suffer due to shortages of water, forage, space, or cover. During the next gather, horse numbers should be gathered down to the low range of this AML (16 horses). During the next 4-5 years following the gather cycle, the population should be allowed to expand to the upper range of 27 horses. To insure genetically viability of this small herd, it may be necessary to introduce new mares every few years into the breeding population. Also, fertility control may be administered to mares to slow the growth rate, increase the time between gathers, and decrease the stress of frequent gathers and handling on the horses. There may be the initial stress of gathering and administering primary doses of contraceptive, but the delayed population growth with contraceptive should result in less frequent gathers and hence less stress on the horses. Currently, there are horses using a temporary water site located at the Rainbow Quarries. As this site is not a permanent public water source, it was not be used to establish this proposed AML. There is a proposal to install two water wells in the Goodsprings and Wildhorse valleys in the future to decrease use at current spring sources and better distribute animals throughout the HMA. The establishment of these water wells is not to artificially increase the AML. Setting AMLs for this area of the HMA for horses should allow BLM to gather horses before horse body conditions deteriorate to Henneke body condition class 2. Body condition of class 2 is indicative of suffering and potential for mortality (Photo 1).

AML for wild burros living in the area south of State Route 160 should be established at zero (0). The major water source for burros residing in the Potosi Mine area is the privately owned Mt. Potosi Spring. As this spring is private, it is not considered a viable source of water for wild horses and/or burros. Until a permanent public water source can be established, burros should not be managed in this area.

4.1.2.1.2 North of State Route 160

Due to these desert range sites, the area north of State Route 160 lacks the forage component to support a healthy population of wild horses. Therefore, horses should not be managed north of State Route 160.

The existing habitat within the area north of State Route 160 was determined to provide all the components necessary to manage for healthy populations of burros. Reduction of

numbers of wild burros to a range AML of 29-49 should reduce competition for forage and water resulting in improved herd health and condition. This number is not considered sufficient for the maintenance of viable populations of burros, so periodic introductions of jennies from other HMAs may be necessary to maintain genetic viability. It should also encourage burros to remain within the boundaries of the HMA and not stray onto private land looking for food and water.

Burros residing in the area of the Blue Diamond Mine were not considered in the establishment of this AML due to the privately owned water source being utilized on the mine. Until a permanent public water source can be established for the area, burros should not be managed there. The AML may be adjusted in subsequent AML evaluations with the addition of permanent public water sources.

Setting AMLs for burros would allow BLM to gather wild burros before an emergency condition occurs and animal body conditions deteriorate to Henneke body condition class 2 or lower. Body condition of class 2 is indicative of suffering and potential for mortality (Photo 1). Fertility control may be implemented for jennies in this HMA to further increase the time between gathers, increase body condition classes, and reduce the stress associated with frequent gathers.

Photo 1: Wild Horse with Henneke Body Condition Class 2.

Photo by Amy Torres, BLM Las Vegas Field Office

Establishment of AMLs for this HMA should allow the LVFO to plan for gathers to meet AML. Achieving AML is intended to reduce the suffering that occurs when wild horse and burro numbers exceed the capacity of the HMA during critical climatic periods (e.g. prolonged drought). This should allow the BLM to meet the respective RAC Standards for wild horses and burros, as well as meet the objective of the Nevada Revised Tactical Plan (BLM 2001). Based on the current estimated populations of wild horses and burros in the HMA, a total of 11 wild horses and 123 wild burros should be subject to removal from the HMA after subsequent NEPA analysis and public participation.

4.1.2.2 Alternative B – Manage for Burros Only

In this Alternative, no horses should be managed within the HMA. Rangeland conditions in the Red Rock HMA lack the forage, water, space and cover resources to sustain viable populations of horses year-long without introducing outside mares into the herd.

In this Alternative burros should be managed in accordance with Alternative A.

4.1.2.3 Alternative C - No Action Alternative – Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

Under the No Action Alternative, the current interim AML for the Red Rock HMA would continue to be 50 horses and 50 burros as established in the Las Vegas Field Office RMP, and Interim NCA GMP. The No Action Alternative does not meet the RAC Standards for wild horses and burros until an AML can be established, based on monitoring and habitat assessment, during which time, wild horses and burros may continue to suffer where the habitat is unsuitable or where current wild horse and burro numbers exceed the capacity of the resources. Management of wild horses and burros may be delayed until AML evaluations could be completed. The No Action Alternative would not achieve the objective of the Nevada Revised Tactical Management Plan (BLM 2001), which is to establish AMLs based on evaluations by the year 2005. In addition, the LVFO would be unable to meet the M/S RAC Standards for rangeland health due to the inability to adjust wild horse and burro numbers in areas of resource conflict where AML has not been established.

Administratively, the existence of HMAs without established AMLs requires that wild horse and burro health can only be addressed by emergency gathers. Emergency gathers are reactive procedures for situations where herd health has already deteriorated. Under the current policy, the BLM strives to initiate emergency gathers before wild horse and burro health deteriorates to Henneke body class condition 2 or less (Photo 1). In 2002, 60 horses, including several animals that were found dead or had to be destroyed, were gathered from the Red Rock HMA. Emergency gathers would continue to be used to maintain horse health as provided by regulation.

Under this Alternative and the March 2004 population estimation of 27 horses and 152 burros, approximately 34 more wild horses and 21 more wild burros may be present within the HMA than under Alternative A, or approximately 50 more wild horses and 21 wild burros than under Alternative B. The number of wild burros will most likely continue to increase each year. The number of wild horses may increase annually although genetic viability may be jeopardized due to the limited number in the current breeding population. This may be remedied by the periodic introduction of mares and jennies into the population from similar HMAs.

In terms of resource health, the emergency gather process is a relatively lengthy process that relies on the identification and documentation of a problem before the action can be

taken, allowing impacts to horse and burro health and/or resource degradation to continue while the process is followed. By not establishing AML, the emergency gather process is the only avenue available to the BLM to react to deteriorating wild horse and burro health and resource degradation. Emergency gathers also cause unanticipated costs that further reduce BLM's ability to establish AML for all HMAs and conduct subsequent planned gathers.

4.1.3 Mitigation and Monitoring

Fertility control may be implemented for mares and jennies residing in the HMA regardless of the Alternative chosen. Fertility control should increase the time between gathers, hence relieving the pressure in overcrowded adoption facilities. Further, contraception should increase body condition classes, and reduce the stress on horses and burros associated with frequent gathers and handling. All proposed fertility control applications will be in conformance with the Wild Horse and Burro Strategic Research Plan that was reviewed and supported by the National Wild Horse and Burro Advisory Board in August 2002 and the BLM director's Science Advisory Board in January 2003.

The horse and burro numbers resulting from AML in Alternative A, B, and C may be lower than what is considered necessary for viable populations. As a result, in order to continue to manage for horses and burros within the HMA it may become necessary to mitigate and periodically introduce mares and jennies into the Red Rock population from other HMAs. This will ensure the genetic viability of these small herds.

There is a potential concern that any new mares or jennies introduced into the local population may be carrying diseases or noxious weed seeds that may be introduced into the Red Rock environment. To counter these risks, the introduced animals should be quarantined for a period of time under the direction of an experienced veterinarian until such a time that they are determined to be healthy enough to be introduced to the local populations. During this quarantine period they should be fed weed-seed-free hay.

4.2 SOILS

4.2.1 Affected Environment

There are numerous soil associations and individual soils within the HMAs under consideration. The soils within the HMA vary widely in their potential for major land uses. Rangeland is by far the dominant land use, in terms of acreage. Soils near water sources generally have the highest production potential, but may be limited due to over utilization or accumulated salts. Production on the soils may also be limited by shallow depth to hardpan or other restrictive root barrier, slope, surface rock fragments, or depth to bedrock. Microbial crusts, a complex assortment of cyanobacteria, green algae, fungi, and other bacteria that forms in open spaces between shrubs, occurs in areas of the HMA. Microbial crusts have several functions that include, but are not limited to, retaining soil moisture, reducing wind and water erosion, contributing to soil organic matter, and discouraging annual weed growth.

4.2.2 Environmental Consequences

4.2.2.1 Alternative A - Proposed Action – Set AML Based on a Multi-Tiered Rangeland Evaluation

In general, it is anticipated that there should be an overall improvement in soil conditions as the number of horses and burros in the HMA decreases. Surface disturbance by hoof action can impact soil biological crusts, bulk density, and increase susceptibility to wind and water erosion.

Increases in soil bulk density as a result of compaction by hoof action are of particular concern in riparian zones. Bulk density increases if moist soil is compacted. Increased bulk density inhibits root exploration and root growth, as well as water holding capacity.

Disturbance to the soil surface increases the potential for wind and water erosion by loosening the soil particles. This is especially important on steep slopes where runoff water velocities are greater and there is an increased potential for erosion.

These impacts are more common where wild horses and burros use is spatially concentrated and occurs over extended periods of time, such as near water sources or preferred foraging areas. In addition, most of the springs in the HMA should exhibit improvement in soils associated with the riparian areas.

Management of 16-27 horses and 29-49 burros in the HMA should reduce the potential for direct impacts to soils. Further, impacts to the areas around the Rainbow Quarries, Potosi Mine and Blue Diamond Mine should be reduced due to the cessation of all yearlong grazing activities by wild horses and burros, until such a time that permanent public water sources can be established for their utilization.

4.2.2.2 Alternative B- Manage for Burros Only

The impacts to soils north of State Route 160 under this Alternative should be similar to those described for Alternative A, and the magnitude for improvement should be greater than that of the No Action Alternative.

All grazing activity by wild horses for the area South of State Route 160 should cease so it is anticipated that impacts to soils in this area should be reduced.

4.2.2.3 Alternative C - No Action Alternative – Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

The impacts to soils may continue and increase under this Alternative until AML is established. Wild horse and burro populations may remain at or above the current estimated populations that are creating impacts to all soils especially those associated with riparian areas.

4.2.3 Mitigation and Monitoring

No mitigation has been identified for any of the Alternatives.

Monitoring as identified in Section 2.0 is sufficient for soils resources.

4.3 VEGETATION

4.3.1 Affected Environment

A brief description of the HMA, including dominant vegetation is provided in Appendix B. Major plant communities for the HMA are also included in Appendix A and B.

4.3.2 Environmental Consequences

4.3.2.1 Alternative A - Proposed Action – Set AML based on Multi-Tiered Rangeland Evaluation

The purpose of establishing AML for wild horses and burros is to determine the number of wild horses and burros that can be sustained by the habitat within the HMA. Because forage is one of the habitat components, and is also the habitat component for which there is competition among all herbivores (i.e. wildlife, wild horses and wild burros) on the range, the establishment of wild horse and burro AMLs should allow the BLM to reduce resource conflict with regard to vegetation use. Implementation of Alternative A should provide a framework from which BLM can manage wild horses and burros in an effort to achieve the M/S RAC Standards for healthy rangelands. Therefore, the anticipated impact to vegetation is one of improvement toward healthy rangelands where rangeland standards are not currently being achieved. The degree of improvement is partially dependent on the difference between the current wild horse and burro population in the HMA and the proposed AML. Where these two numbers are different, more improvement in the vegetation resource is anticipated. Where the current population and the proposed AML are similar, the changes in vegetation may not be readily discernable, except in riparian or areas burned by wildfires.

Under this Alternative it is anticipated that vegetative use by wild horses and burros should decreased due to the overall decrease in numbers. In the areas of the Rainbow Quarries, Potosi Mine and Blue Diamond Mine all grazing activities should cease reducing the impacts to upland and riparian vegetative resources.

4.3.2.2 Alternative B – Manage for Burros Only

Horses should not be managed south of State Route 160 decreasing the vegetative impacts to the upland and riparian areas. AMLs for burros in the Potosi Mine may be created in the future if permanent public water sources can be established. Additional

NEPA documentation would be required prior to the establishment of any new water sources and/or the establishment of a new AML.

Vegetative impacts to the area north of State Route 160 should be the same as the impacts outlined in Alternative A.

4.3.2.3 Alternative C - No Action Alternative - Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

Wild horse and burro populations may continue to increase until emergency conditions justify a gather. Resource conflicts, including over utilization of vegetation and water resources in some areas may continue or increase in magnitude during this time period. Vegetative resource condition may continue to decline with heavy utilization with the possibility of eradicating some native species from their historical range, increasing disturbance of native vegetation and increasing the likelihood of invasion by non-native noxious weeds. This impact to the vegetative community could have serious impacts to other wildlife species that utilize similar forage resources.

4.3.3 Mitigation and Monitoring

No mitigation has been identified for any of the Alternatives.

Monitoring as identified in Section 2.0 is sufficient for this resource.

4.4 NON-NATIVE, INVASIVE SPECIES (INCLUDING NOXIOUS WEEDS)

4.4.1 Affected Environment

Non-native, invasive species include noxious weeds, such as Russian knapweed and salt cedar, and undesirable species, such as Cheatgrass and red brome occur in areas throughout the HMA. These species generally establish in areas where surface disturbance has occurred or where native plant species are stressed. Riparian areas that are not in proper functioning condition and disturbed native rangelands are prime areas for establishment of these species.

4.4.2 Environmental Consequences

4.4.2.1 Alternative A - Proposed Action – Set AML based on Multi-Tiered Rangeland Evaluation

Establishing AML in the HMA should reduce the potential for non-native, invasive species establishment by reducing the number of wild horses and burros that use native range, springs, and riparian areas. If the AML for wild horses residing south of SR 160 is set to a range of 16-27, the potential for seeds to be transported by wild horses and relocated through fecal piles should be reduced. In the northern portion of the HMA, the potential for spread of non-native, invasive species may still exist due to the movement of

burros throughout the area, although reduced due to the limited numbers of burros in this portion of the HMA.

In the areas of the Rainbow Quarries, Potosi Mine, and Blue Diamond Mine wild horses and burros should not be managed. The spread of invasive species via wild horse and burro use may be completely eliminated for these areas.

4.4.2.2 Alternative B – Manage for Burros Only

Under this Alternative, in the area south of State Route 160, the spread of invasive species due to wild horse use should be completely eliminated because horses would not be managed in this area.

The impacts to the rangeland from the spread of non-native species by wild burros should be the same as in Alternative A.

4.4.2.3 – Alternative C - No Action Alternative Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

The current population of wild horses and burros may continue to exist and increase within the HMA until the animals are in such a state that an emergency gather is needed. During this period, the HMA may continue to be at risk for establishment of non-native, invasive species. Where wild horses and burros currently contribute to non-functioning riparian systems, such as the area south of SR 160, the potential for establishment of non-native, invasive species may continue to increase. Where these populations are in excess of the proposed AML, the potential exists for the increased establishment and spread of non-native, invasive species. This Alternative has the greatest potential for impacts resulting from non-native, invasive species establishment.

4.4.3 Mitigation and Monitoring

There is a potential for the spread of new non-native species if mares and jennies from other HMAs are periodically introduced into the Red Rock HMA to compensate for the minimal genetic viability of small local herds. Any horses or burros introduced into the local populations should be required to be quarantined for disease and fed weed-seed-free hay under the direction of an experienced veterinarian prior to their introduction into the HMA.

4.5 SPECIAL STATUS SPECIES (FEDERALLY LISTED, PROPOSED OR CANIDATE THREATENED OR ENDANGERED SPEICES, AND STATE SENSITIVE SPECIES

4.5.1 Affected Environment

There are two federally listed wildlife species within the Red Rock HMA is the threatened desert tortoise (*Gopherus agassazii*), and the endangered Pahrump poolfish

(*Empetrichthys latos*) (See Table 4 5 and 6). Habitat for the desert tortoise is typified by the presence of a creosote-bursage dominated vegetation community. This community is distributed throughout the HMA in areas generally below 4, 200 ft. in elevation. Habitat for the endangered poolfish is limited to a single fenced spring located within the Spring Mountain State Park but is included in this analysis because actions within the HMA have the potential to affect this spring.

In addition, the BLM recognizes special status species as those species either considered Species of Concern by the US Fish and Wildlife Service (FWS), or are state protected species. The BLM also recognizes those designated as sensitive by the BLM State Director, and in the Las Vegas Field Office, the BLM is signatory to the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and has committed to ensure protection for 78 covered species. The HMA supports 40 FWS species of concern, 4 state protected species, 28 sensitive species, and 23 MSHCP covered species.

Special status wildlife species within the HMA can be typically categorized by the sensitivity of the habitats within which they are found with mesquite/acacia woodlands and spring and seeps, encompassing the habitat typified by the majority of the sensitive species. Springs are located at various locations throughout the HMA. Springs provide essential habitat for the special status bats and invertebrates such as the endemic springsnails. Mesquite/acacia woodlands are typically found in upland drainages and wash systems. They provide essential habitat to species such as the vermillion flycatcher, phainopepla, blue grosbeak, and summer tanager. Habitat for the banded Gila monster centers on desert wash, and spring and riparian habitats that correlate primarily with complex rocky landscapes of upland desert scrub. This habitat can be found dispersed throughout the HMA with emphasis on areas along the western boundary and north of State Route 160. Chuckwallas are typically found in rocky outcrops, which are also distributed throughout the HMA. Habitat for the burrowing owl closely resembles that of the desert tortoise.

The HMA contains habitat designated as both crucial and winter range for the desert bighorn. This habitat is associated with several mountain ranges in the area including the Red Rock/La Madre ranges and the South Spring/Bird Spring ranges.

In addition, there are 2 sensitive plant species that occur on the HMA, the Candidate Blue Diamond Cholla (*Oppuntia whipplei var. multigenicualta*) and the Red Rock Canyon aster (*Ionactis caelestis*) that is a species of concern.

Table 4: Special Status Wildlife Species: Vertebrates

Genus species	Common Name	Status
(02) Federally Listed Species		
*Gopherus agassazii**	Desert tortoise	Threatened
*Empetrichthys latos**	Pahrump poolfish	Endangered
(21) Nevada Special Status Species[2]		
Idionycteris phyllotis	Allen's big-eared bat	FWS & BLM
Myotis ciliolabrum	Western small-footed myotis (bat)	FWS & BLM
Myotis thysanodes	Fringed myotis	FWS & BLM
*Myotis volans**	Long-legged myotis	FWS & BLM
Euderma maculatum[3]	Spotted bat	FWS & State
*Myotis evotis**	Long-eared myotis	FWS & BLM
Myotis yumanensis[1]	Yuma myotis	FWS & BLM
Plecotus townsendii pallescens	Townsend's big-eared bat	FWS & BLM
Myctinomops macrotis	Big free-tailed bat	FWS & BLM
Tamias palmeri[3]*	Palmer's chipmunk	FWS
Accipiter gentiles	Northern goshawk	FWS & State
*Phainopepla nitens**	Phainopepla	BLM
Heloderma suspectum cinctum	Banded gila monster	FWS & State
*Sauromalus obesus obesus**	Western chuchwalla	FWS & BLM
Eumops perotis californicus	Greater western mastiff	FWS
Myotis velifer	Cave myotis	FWS
Athene cunicularia hypugaea	Western burrowing owl	FWS & State
Falco peregrinus	Peregrine falcon	FWS
*Guiraca caerulea**	Blue grosbeak	FWS
*Piranga rubra**	Summer tanager	FWS
Ovis canadensis	Desert bighorn sheep	BLM
(3) Clark County MSHCP Covered Species		
Pyrocephalus rubinus	Vermillion flycatcher	Covered
Coleonyx variegates	Banded gecko	Covered
Dipsosaurus dorsalis	Desert iguana	Covered
MSHCP – Multiple Species Habitat Conservation Plan; * = Covered Species		
[1] - Potosi Spring reports (USFS) indicate high probability of HMA occurrence.		
[2] - Nevada Special Status Species: FWS= FWS Species of Concern; State = State Protected; BLM = BLM Nevada Sensitive Species.		
[3] - Report solely based on heard vocalizations, not direct observation.		

Table 5: Special Status Wildlife Species: Invertebrates

Genus Species	Common Name	Status
(09) Nevada Species of Concern[1]		
Pyrgulopsis sp. Nov.1a* [RRCNCA endemic]	Springsnail nov.1a	BLM
Pyrgulopsis sp. Nov.58* [RRCNCA endemic]	Springsnail nov.58	BLM
Limenitus weidemeyerii nevadae [Southern NV endemic]	Nevada admiral (burrerfly)	FWS & BLM
Chlosyne acastus[2] [Spring Range endemic]	Spring Mtn. acastus checkerspot (burrerfly)	FWS & BLM
Euphilotes enoptes ssp.[2] [Spring Range endemic]	Dark blue butterfly	FWS & BLM
Euphydryas anicia morandi[2] [Spring Range endemic]	Morand's checkerspot	FWS
Hesparia comma ssp.[2]	Spring Mtns. Comma skipper	FWS & BLM

[Spring Range endemic]		
Plebejus icarioides ssp.[2] Spring Range endemic	Spring Mtns icarioides blue butterfly	FWS & BLM
Speyeria zerene carolae[2] [Spring Range endemic]	Carole's silverspot butterfly	FWS
* - Covered Species, Multiple Species Habitat Conservation Plan.		
[1] - Nevada Species of Concern = FWS List + BLM Nevada Sensitive Species List.		
[2] - Unconfirmed in Red Rock Canyon.		

Table 6: Endemic and/or Special Status Plant Species

Genus Species	Endemisim	Special Status
Opuntia whipplei var. multigeniculata[1]	RRNCA	Candidate –T&E Species List
Ionactis caelestis[1]		Species of Concern – FWS & BLM
Angelica scabrida[1]	Spring Range	Species of Concern – FWS & BLM
Astragalus remotus[1]		Species of Concern – FWS & BLM
Astragalus aequalis[1]		Species of Concern – FWS & BLM
Penstemon bicolor ssp. bicolor[2]	Southern Nevada	Species of Concern – FWS & BLM
Salvia dorrii var. clokeyi[1]		Species of Concern – FWS & BLM
Townsendia jonesii var. tumulosa[1]		Species of Concern – FWS
Eriogonum heermannii var clokeyi[2]		Species of Concern – BLM
Pedicularis semibarbata charlestonesis[1]		Species of Concern – FWS
Erigeron uncialis var. conjugans[1]		Clark County MSHCP
Penstemon thompsoniae var. jaegeri[1]		Clark County MSHCP
Phacelia hastate var. charlestonensis		None [3 Status Potential]
Arctomecon meriamii[1]	Non-Local	Species of Concern – FWS
Calochortus striatus[1]		Species of Concern – FWS & BLM
Glossopetalon pungens var. glabra[1]		Species of Concern – FWS & BLM
Ivesia jaegeri[1]		Species of Concern – FWS & BLM
Astragalus mohavensis v. hemigyrus[2]		Species of Concern – FWS
Viola purpurea v. charlestonensis[1]		Clark County MSHCP
Castellija martini var. clokeyi[1]		Clark County MSHCP
Coryphantha vivipara ssp. rosea[3]		Clark County MSHCP
Selaginella utahensis[3]		Clark County MSHCP
Penstemon bicolor ssp. roseus[3]		Clark County MSHCP
Ferocactus acanthoides v. lecontei[3]		Clark County MSHCP
Cryptantha tumulosa[3]		Clark County MSHCP
MSHCP = Multiple Species Habitat Conservation Plan [1] Covered Species [2] Evaluation Species [3]Watch List Species		

4.5.2 Environmental Consequences

4.5.2.1 Alternative A - Proposed Action – Set AML based on Multi-Tiered Rangeland Evaluation

The range AML for horses south of State Route 160 should be established at 16-27. Burros should not be managed in this portion of the HMA. The AML for burros should be established at 29-49.

The majority of this area contains Blackbrush vegetation upwards in elevation to pinion-juniper woodlands. Historical triangle transect data collected for estimating desert tortoise population densities have indicated that this area of the HMA supports low to very low densities of tortoises. Affects to the desert tortoise include trampling of burrows or individuals, and modification of native vegetation communities necessary for

forage or cover through over-utilization. In the area north of State Route 160, similar affects to desert tortoises may be expected with potential for greater impacts to covered species from over-utilization because burros tend to use shrubs as much or more than perennial grasses. Due to the minimal populations of horses to be managed, the incorporation of monitoring data to maintain rangeland conditions, limited dietary overlap, and the low densities of desert tortoise within this area, conflicts between wild horses and desert tortoises are expected to be very minimal or unlikely.

Impacts to the Pahrump poolfish could result form the breeching of spring fencing from the BLM managed burros into the Spring Mountain State Park and potential impacts to the spring source from the installation of additional water sources in the HMA. Impacts from installation of additional water sources are strongly dependent on details such as location and amount of water withdrawn which will not be available until specific sites are proposed. These sources would be subject to separate NEPA documentation.

Special status species dependent on springs and seeps may be most affected by the proposed action through modification of physical condition of the spring source and surrounding vegetation from trampling. By incorporating monitoring data for springs and rangeland conditions into the AML decision, impacts to these areas are likely to be reduced from their current state. Restoration of these sites, either naturally or with manipulation, should have a beneficial affect to riparian and spring-dependent sensitive species.

Impacts to mesquite-acacia woodland species are expected to be unlikely as these areas receive limited concentration due to the lack of above-ground water sources.

Impacts to desert bighorn include competition with wild horses and burros for limited forage and water within the HMA. Reducing the AML below current standards, though competition may still occur, is likely to reduce the degree of competition to below current conditions.

A decision to establish an AML of 16-27 horses and 29-49 burros is lower than what is occurring under existing conditions. This Alternative will reduce the potential for conflicts between wild horses and threatened and endangered species. Similarly, under this Alternative, it is anticipated that no significant or adverse impacts would result to T&E species.

4.5.2.2 Alternative B – Manage for Burros Only

Impacts to the desert tortoise should be similar to Alternative A north of State Route 160. Similarly, as the majority of springs sites occur north of State Route 160, affects to spring dependent species are expected to be similar to Alternative A.

Competition with desert bighorns may continue within the populations north of State Route 160 but should be reduced with the reduction of the number of burros in that area from current population sizes. Improvements to availability of water and forage should

correspond to the reduction in numbers of burros in the area. Competition with horses should be alleviated south of State Route 160 and with recovery of abundance and diversity of native plants following removal of horses, habitat conditions for desert bighorn will improve in this area.

4.5.2.3 Alternative C – No Action Alternative - Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

The greatest impacts to all special species within the HMA may result from a modification to the perennial plant communities through continued over-utilization of particular species and concentration of use at spring sites. This creates a loss or modification to cover, forage, nest sites and other habitat components, increased competition over limiting resources such as water, and complete loss of habitat or decreased habitat size resulting from trampling of springs and riparian areas. Should Alternative C be chosen, degradation of rangeland health is likely to continue. Over time, the ability for the environment to recover during episodic rain events or following emergency gathers may decrease as seed banks are depleted and food sources desirable to horses and burros are grazed to a level beyond natural recovery.

4.5.3 Mitigation and Monitoring

In accordance with the Endangered Species Act, section 7 consultation with the US Fish and Wildlife Service for the federally listed desert tortoise will be addressed programmatically associated with consultation for the Red Rock Canyon NCA General Management Plan. It is anticipated that this consultation will be complete by summer 2004. Mitigation measures identified through that consultation process should be incorporated into any management actions implemented associated with wild horse and burro management. In addition, the consultation may identify conservation recommendations that the Service feels are necessary to ensure protection of special status species. These conservation recommendations would also be incorporated into wild horse and burro management actions where appropriate and feasible.

For all Alternatives, protection of riparian habitat and spring sources through fencing could be conducted to reduce impacts from year-long grazing by wild horses and burros. In addition, BLM Standard monitoring methods for utilization and PFC assessment should provide information on the condition of the habitat and degree of impacts or improvements to habitat that are occurring.

4.6 WILDLIFE (INCLUDING MIGRATORY BIRDS)

4.6.1 Affected Environment

In addition to the desert bighorn, mule deer, and elk, are competing with wild horses and burros for forage, water, cover and space in this HMA. Also, a variety of bird (including those protected under the migratory bird treaty act), mammal, reptile, invertebrate and amphibian species use the riparian areas as well as uplands.

4.6.2 Environmental Consequences

4.6.2.1 Alternative A - Proposed Action – Set AML based on Multi-Tiered Rangeland Evaluation

Removal of all wild burros and managing wild horses at a range AML of 16-27 south of State Route 160 and managing a range of 29-49 burros in the area north of State Route 160 should reduce the impacts to wildlife that occur under existing wild horse and burro populations. Improvement in riparian habitats (i.e., Bird Springs, Mud Springs and Wilson Tank), availability of water, and better rangeland health may result in both indirect and indirect impacts to wildlife.

The primary impact to wildlife in the HMA may be the change in condition of the riparian areas, especially Bird Springs and Wilson Tank in the southern portion of the HMA and Mud Springs and Mormon Green Spring in the northern portion of the HMA. In addition, improvement in riparian vegetation is anticipated at all springs especially those springs where animal numbers may be reduced or extirpated. Also, unfenced springs on private lands should demonstrate improvement (Potosi Spring). These riparian areas, when at PFC, provide important nesting habitat for migratory birds, foraging and cover for many small mammals, feeding sites for bats and essential habitat for aquatic invertebrates and amphibians. The riparian vegetation also provides mule deer and elk habitat.

4.6.2.2 Alternative B – Manage for Burros Only

Under this Alternative, the area south of State Route 160 should not be managed for horses. Wildlife is expected to benefit from the removal of horses due to the decreased competition, and increased forage and water availability as well as overall improved rangeland health.

The affects of this Alternative to the area north of State Route 160 should be the same as those examined in Alternative A.

4.6.2.3 Alternative C - No Action Alternative - Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

Wildlife habitats may continue to be impacted in terms of condition and availability until AML can be established through the AML evaluation/BLM decision process. Horse and burro numbers may increase until the range could no longer sustain their use and their body condition classes were reduced to Hennke Condition Level 2 or lower. By this time the range is usually compromised to the point that wildlife is also suffering. The heavy and severe use of vegetation at riparian areas and in habitats near water may increase during this period as wild horse and burro population's increase. Non-achievement of standards for rangeland health may be reflected in the composition and stability of wildlife populations for species such as mule deer, elk, and desert bighorn sheep.

Suitable nesting habitat for migratory birds and year-long habitat for invertebrates and amphibians may not improve during this period.

4.6.3 Mitigation and Monitoring

For all of these Alternatives, protection of riparian habitat and spring sources through fencing could be conducted to reduce impacts from year-long grazing by wild horses and burros.

4.7 WATER QUALITY

4.7.1 Affected Environment

Twenty springs and seeps have been identified on public lands within Red Rock HMA (Appendix A Table 6, 7 and 8). In addition, there are 3 water sources on private lands within the HMA (Potosi Spring, Rainbow Quarries, and Blue Diamond Mine). Most of the water discharged at these springs and seeps is sourced from precipitation that infiltrates at higher elevations of the Spring Mountains. Discharge at some springs and seeps also is sourced from storm-water runoff that infiltrates through ephemeral washes or perched ground-water tables that are recharged by localized precipitation. Ambient water quality of springs and seeps in Red Rock HMA is largely a function of the mineralogical composition of geologic formations through which ground water flows. Carbonate rocks, sandstone, and evaporates (such as gypsum) are the primary geologic materials in Red Rock HMA. In general, water discharged at springs and seeps in Red Rock HMA is characterized by moderate total dissolved solids concentrations, moderately alkaline pHs, and variable concentrations of inorganic constituents such as calcium, magnesium, bicarbonate, sulfate, silica, sodium, chloride, and potassium. High concentrations of nitrate, ammonia, phosphorus, and bacteria in some springs and seeps have been attributed to animal wastes from wild horses and burros. Excessive rates of sediment transport and deposition can occur at some spring and seep areas during storm-water runoff events or at other areas where riparian vegetation has been heavily grazed by wild horses and burros and other wildlife.

4.7.2 Environmental Consequences

4.7.2.1 Alternative A - Proposed Action – Set AML based on Multi-Tiered Rangeland Evaluation

Approximately 11 wild horses and 121 wild burros should be removed from public lands within this HMA. Reducing the number of animals using larger springs, such as Mud Spring, Grapevine Spring, Mormon Green Springs, Ash Spring, and Calico Spring, and smaller springs and seeps within Red Rock HMA shouldl improve water quality by decreasing the amount of animal waste deposited in and near these water sources. Reduced amounts of animal waste may lower concentrations of nitrate, ammonia, phosphorus, and bacteria in springs and seeps. Smaller herd sizes also may help achieve or maintain PFC of riparian areas at springs and seeps within Red Rock HMA by

increasing the density, diversity, and vigor of vegetation. Adequate and healthy riparian vegetation can improve water quality by reducing soil erosion, facilitating sediment deposition, bioaccumulating undesirable chemicals in plant tissues, and reducing water temperatures.

Wilson Tank and Bird Springs are artificial water developments that currently lack riparian areas; However, Bird Springs does have a strong riparian potential. Although riparian areas do not currently exist at these sites, water quality is expected improve with decreased utilization by wild horses because the amount of animal waste deposited near these water sources should decrease. Some animal waste may continue to be deposited by wildlife and domestic stock at these water sources.

Water quality at Potosi Spring, although privately owned, may improve without the impact of wild burro use as previously discussed. Wildlife may continue to deposit animal waste at the spring and it may continue to be impacted by recreational use. The impacts of recreation on Potosi Spring are currently unknown.

4.7.2.3 Alternative B – Manage for Burros Only

Impacts under this Alternative are anticipated to be the same as those in Alternative A. Wild horses should no longer utilize Wilson Tank and Bird Springs, although deposit animal waste near these water sources may continue via wildlife and domestic stock use.

4.7.2.4 Alternative C - No Action Alternative - Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

Severe and heavy utilization of vegetation associated with water sources may continue or increase in magnitude until AML could be established through the AML evaluation/BLM decision process, except where and when emergency gathers should be conducted to alleviate stress to wild horses and burros (see Tables 11 and 12 in Appendix A). Riparian systems that are either not at PFC or that are at risk may not improve. Water quality and quantity issues may not be resolved under this Alternative during the time required for AML to be established.

4.7.3 Mitigation and Monitoring

Under these Alternatives, protection of riparian habitat and spring sources through fencing could be conducted on several springs within the HMA to reduce impacts from year-long grazing by wild horses and burros.

No monitoring beyond that identified as common to all Alternatives in Section 2 should be required.

4.8 RIPARIAN RESOURCES

4.8.1 Affected Environment

The description of the affected environment for Riparian Resources is the same as described for Water Quality of Section 4.7.1. Water quality and riparian systems are intricately related and, as stated above, water quality is a function of the health of the riparian systems.

4.8.2 Environmental Consequences

4.8.2.1 Alternative A - Proposed Action – Set AML based on Multi-Tiered Rangeland Evaluation

Approximately 11 wild horses and 121 wild burros should be removed from public lands within Red Rock HMA. Reducing the number of animals within the HMA could decrease the intensity and duration of utilization of riparian ecosystems. As a result of this action, PFC may be achieved or maintained for many of these riparian areas as vegetation, soil, and water-quality conditions improve.

The density, vigor, and diversity of riparian vegetation at larger springs such as Mud Spring, Grapevine Spring, Mormon Green Spring, Ash Spring and Calico Spring and smaller springs and seeps within Red Rock HMA should improve as the number of animals utilizing these riparian areas is decreased. Reduced surface disturbance of soils on upland areas may decrease sediment transport by water and wind to riparian areas. Water-quality conditions also should improve as the amount of animal waste deposited in these areas decreases and greater amounts of vegetation decrease erosion potentials and increase bioaccumulation uptake of undesirable chemical constituents.

The condition of Potosi Spring, although private, is anticipated to improve without the impact of wild burro use. It may, however, continue to be impacted by wildlife utilization and recreational use.

4.8.2.2 Alternative B – Manage for Burros Only

Impacts under this Alternative are anticipated to be the same as those in Alternative A. Wilson Tank and Bird Springs should receive no wild horse use increasing the condition of the uplands around the springs. All remaining available water may be allocated for wildlife and recreational uses.

4.8.2.3 Alternative C - No Action Alternative - Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

The impacts to riparian systems that have been attributed to wild horses and burros in the monitoring data could continue or increase in magnitude under this Alternative until AML can be established through the AML evaluation/BLM decision process. Wild horse

and burro populations may remain above the productivity of the land and water systems for this HMA.

4.8.3 Mitigation and Monitoring

Under all of the Alternatives, protection of the riparian habitat and spring sources through fencing could be conducted to reduce impacts from year-long grazing by wild horses and burros.

4.9 RECREATION

4.9.1 Affected Environment

Nearly half of the HMA overlaps into the Red Rock Canyon National Conservation Area (NCA) which receives over 1.2 million visitors every year. Most of the remainder of the HMA falls within the designated Las Vegas Valley and Jean/Roach Lake Special Recreation Management Areas. These areas allow for extensive off-highway vehicle use. Designated roads and trails within the NCA support motor-touring, mountain biking, hiking, and recreational horseback riding. Competitive and non-competitive events are also permitted.

Other forms of recreation include: horse endurance events, commercial and casual trail rides, mountain biking, hiking, hunting, rock climbing and hounding, commercial motorized OHV guided tours, and amateur and professional photography. In addition, commercial still photography, video and major motion picture filming are common activities.

The affects of recreation on springs, seeps, and streams within the HMA are unknown. As a result, damages to riparian areas are usually blamed solely on wild horse and burro use. Complete removal of wild horses and burros away from riparian areas may not result in the satisfactory rehabilitation expected with their removal. It is well known that recreational horseback riders with their domestic stock use these riparian areas. Impacts to these springs by recreationists can only be documented when wild horses and/or burros are removed from the sites.

4.9.2 Environmental Consequences

4.9.2.1 Alternative A - Proposed Action – Set AML based on Multi-Tiered Rangeland Evaluation

This Alternative may result in an improvement in riparian and upland vegetation, which may enhance recreation activities such as wildlife viewing and hunting. However, the removal of 11 horses and 121 burros from the HMA may reduce the opportunities to view wild horses and burros especially south of State Route 160. Improvement of rangeland health, especially to riparian areas as discussed in Section 4.8.2.1, may enhance the recreational opportunities, such as hiking, wildlife viewing, and hunting.

4.9.2.2 Alternative B – Manage for Burros Only

Improvement in riparian and upland vegetation in anticipated in the area south of State Route 160 where zero wild horses and burros may be managed. However, wild horse and burro viewing opportunities could be eliminated from this area, but other recreational activities, such as hiking, hunting, and wildlife viewing could be enhanced.

Recreational opportunities for the area north of State Route 160 should be similar to those in Alternative A

4.9.2.3 Alternative C - No Action Alternative - Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

Under the No Action Alternative, vegetation in riparian and uplands is anticipated to continue to receive heavy to severe utilization where wild horse and burro populations exceed the productive capability of the HMA, thus detracting from recreational activities, until the AMLs can be established through the AML evaluation/BLM decision process. Recreational opportunities, except for wild horse and burro viewing, may not improve during this period.

4.9.3 Mitigation and Monitoring

No mitigation has been identified for these Alternatives.

No monitoring beyond that identified as common to all Alternatives in Section 2 should be required.

4.10 SOCIOECONOMICS

4.10.1 Affected Environment

The social aspects of wild horse and burro management are evident by the variety of strongly held view points and emotional interest associated with wild horses and burros. The health of wild horses and burros is the primary social issue; the law requires that BLM manage the wild horses and burros in *"order to preserve and maintain a thriving natural ecological balance and multiple-use relationships"* in recognition of this social issue.

The competition for forage among wildlife, and wild horses and burros is also an economic and emotional issue when allocation of resources is the issue.

The intent of the Standards and Guidelines for Rangeland Health is to maintain rangelands in a healthy condition that provides resiliency and options. Healthy rangelands have the resiliency to recover after disturbances, such as drought, wildfire, or insect outbreaks, and are more resistant to infestation by non-native invasive species.

Healthy rangelands also provide options and flexibility for land uses that are not available when the rangelands are in a degraded condition.

Establishing an appropriate management level of zero within any portion of this HMA as analyzed within Alternatives A, B, and C would likely be highly controversial based upon public input during the initial review process. Conversely, not establishing an AML and managing wild horses and burros on an emergency basis only is highly controversial as well. However, the proposed action to establish an AML for the HMA will have no significant impact to the quality of the human environment.

4.10.2 Environmental Consequences

4.10.2.1 Alternative A - Proposed Action – Set AML based on Multi-Tiered Rangeland Evaluation

A portion of tourism based business and the local public will hire professional tour guides to locate and watch wild horses and burros within the HMA. The decreased numbers of wild horse and burros throughout the HMA may decrease the quality and quantity of this tourism as horses and burros become harder to find. In contrast, there is a portion of tourist based business and the local public that will hire professional tour guides to see wildlife. With the decrease in wild horse and burro numbers it is anticipated that overall rangeland health should increase, which may encourage the wildlife population to recover as well. This could provide for an increase in the quality and quantity of wildlife viewing for the HMA. It is anticipated that the decrease in wild horse and burro viewing and an increase in wildlife viewing should have a neutral impact on the professional tourism industry that utilized the HMA for profit.

4.10.2.2 Alternative B – Manage for Burros Only

The impacts of this Alternative are the same as in Alternative A, with the exception that there may be no wild horse and burro viewing south of State Route 160. Wildlife viewing may increase with the overall improvement of rangeland health.

4.10.2.3 Alternative C - No Action Alternative - Continue to Manage Horses and Burros at the Current Interim AML of 50 Horses and 50 Burros

Under the No Action Alternative, wild horse and burro health may continue to decline until the AMLs can be established through the AML evaluation/BLM decision process. Wild horses and burros should remain on public lands within the HMA during this period and emergency gathers would be likely to continue where wild horse and burro numbers exceed the resources available on the HMA. A decrease in horse and burro body condition classes may have a negative impact on wild horse and burro viewing and tourism as horses and burros at a body condition class 2 or lower are not the best quality to look at, and tourists and the public alike do not want to see suffering animals.

4.10.3 Mitigation and Monitoring

No mitigation has been identified for the Alternatives.

No monitoring beyond the monitoring identified as common to all Alternatives in Section 2 should be required.

4.11 CUMULATIVE IMPACTS

According to the BLM handbook *Guidelines for Assessing and Documenting Cumulative Impacts* (BLM 1994), the cumulative analysis should be focused on those issues and resource that are of major importance. The two major issues identified for this environmental analysis were to manage for healthy rangeland in conformance with the M/S RAC Standards, and to manage for healthy, viable wild horse and burro herds as mandated by the Act.

Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency or person undertakes such actions. Cumulative impacts could result from individually minor, but collectively significant actions taking place over a period of time. The cumulative impacts assessment area for this EA is the Red Rock Wild Horse and Burro Herd Management Area.

4.11.1 Past Actions

During the 1500s the Spanish explorers brought the modern horse with them from Spain and the rest of Europe. Many of these animals became feral and roamed the grassland of the plains, as well as isolated mountain ranges of the west where the Spanish had explored or settled. As additional settlers arrived in the western United States, they brought many breeds of horses with them; each breed was developed for unique tasks or purposes. As these settlers passed through Nevada or settled in Nevada, some of these horses became feral or were purposely turned loose on the range and used as a commodity. The wild horses of southern Nevada are descendants of ranch stock, mining draft horses, Calvary mounts, and other various breeds.

From the late 1800s until the 1930s many horses were produced on the range for use in the Calvary remount program. Many Arabian and thoroughbred stallions were released on the range to reproduce with wild mares in order to obtain progeny that had endurance and other characteristics required by the military. Wild horses on the rangelands were periodically gathered by private individuals. The young wild horses were sold to the military, and the undesirable stallions and mares were destroyed to eliminate there characteristics from the gene pool. After the end of the Calvary remount program, many wild horses were captured to be sold for rendering profits. Wild horses were viewed as a nuisance and/or commodity. Many “mustangers” operated in southern Nevada, capturing wild horses and selling them for slaughter, or keeping a few for personal use.

Mustangs and burros are believed to have been introduced to rangelands comprising the HMA by early Spanish Explorers around 1750. Later, immigrants traveled to the area establishing early settlements along the historic Old Spanish Trail during the 1830s. Late in the 1850s, miners and homesteaders built permanent homes and ranches in the area. Horses and burros frequently escaped or were released by these early inhabitants, and thrived in their ability to adapt to the Southern Nevada climate. These historic herds are the likely ancestors of today's Red Rock Canyon HMA wild horses and burros.

From the 1850's until the late 1960's wild horses and burros were unprotected resources. Some were gathered by cowboys and Native Americans to be used for transportation or working livestock; while others were gathered by local ranchers because they competed with sheep and cattle for range forage. These latter horses and burros were often sold to slaughterhouses.

There is a similar story for southern Nevada burros. Burros were brought to the west through the westward expansion and exploration into Nevada. Burros were heavily used for mining operations and pack animals during the 1800s. When a mine was booming, burros were usually gathered from the rangelands and used until the mine busted. Burros were usually sold for slaughter then or returned to the rangeland and to their feral state. Being extremely adaptable in the arid conditions of southern Nevada, burro populations flourished.

In 1934, Congress passed the Taylor Grazing Act establishing grazing districts and the Grazing Service. This act was the first step in regulation of grazing use on the public lands. In 1946 the Grazing Service was merged with the General Land Office and the BLM was formed. Range improvements and fences to control livestock movements were constructed to improve rangeland conditions. Wild horses and burros were not federally protected and individuals that claimed ownership or mustangers with permission from the BLM continued to use the wild horses and burros for commercial purposes.

In 1971, in response to public outcry at the inhumane treatment that wild horses and burros received, Congress enacted the Wild and Free-Roaming Horse and Burro Act (PL 92-195). In addition to other requirements, this Act makes it a federal crime for anyone to harass or capture wild horses and burros without proper authority. The U.S. Department of Interior, through the BLM, has primary responsibility and authority for management of wild horses and burros and their HMAs.

Herd Areas were identified in 1971 as areas occupied by wild horses and burros. The HMAs were established in the late 1980s through the land use planning process as areas where wild horses and burro management was a designated land use. Since the mid-1980s, AML have been established on 5 of 9 HMAs through the AML evaluation/BLM decision process within the LVFO area, based on higher priorities and higher resource values/issues. Three HMAs, Amargosa, Eldorado, and Ash Meadows, have an established AML of zero due to the lack of rangeland suitability and year-long habitat to support populations of wild horses and burros as was evidence by extremely poor wild horse and burro condition.

The Wild and Free-Roaming Horse and Burro Act was amended in 1978 through the Public Range Improvement Act, by allowing the Secretary to place excess wild horses and burros into private ownership or adopt these animals to the citizenry of the United States in order to improve the condition of the public lands through wild horse and burro removals where AMLs have been established.

Further, the LVFO, no longer manages livestock grazing within any of the existing HMAs, so wild horses and burros use does not conflict with livestock management in this area.

Due to these laws and subsequent court decisions, integrated wild horse and burro management and removals have occurred periodically within the 5 HMAs in the LVFO area where AMLs have been established. Wild horses and burros have been removed when over-populated and horse and burro health have reached a point where an emergency gather was justified on HMAs with or without established AML. Since 1987, 241 burros and 85 horses have been removed from the Red Rock HMA via nuisance and/or emergency gathers.

Today, management of wild horses and burros is a controversial issue. Wild horses and burros represent an important social and recreational resource to the general public. Viewing wild horses and burros in their historic habitat remains one of the key recreational values to tourists and local visitors to RRCNCA. Strong public support for maintaining historic herds in the Red Rock HMA is a significant political element influencing BLM wild horse and burro policy. Likewise, strong political viewpoints exist for the removal or widespread reduction of horse and burro herds in the HMA. As such, the BLM must balance the dynamics of competing interests through a sound program of multiple use resource management.

The Mojave/Southern Great Basin RAC developed standards and guidelines for rangeland health that have been the basis for managing wild horse and burro grazing within the LVFO area. Adjustments in numbers, season of use, grazing season, and allowable use are based on evaluation progress toward reaching the standards.

4.11.2 Present Actions

Currently, the Red Rock HMA has an estimated population of 27 horses and 152 burros. Resource damage is occurring throughout most of the HMA and some burros residing north of State Route 160 are moving to non-HMA areas due in part to excess animals and in part to missing year-long habitat components in the HMA. These burros have to be trapped regularly as they have been found loitering along HWY 215 and in housing areas. Several burros have been killed on the 215 in the past few years, and the incidents have been featured by the local news media.

Most of the horses that were residing on the range were removed in an emergency gather in June 2002. The average body condition class of the 60 animals gathered was class 2 or

lower. Several animals were found dead or had to be euthanized due to their extreme conditions. Of the 60 horses gathered, 27 horses were held at the Oliver Ranch Temporary Holding Facility located within Red Rock Canyon pending the recovery of the range from drought. After two years of holding and monthly range monitoring, the decision was made that the drought was unrelenting and the range had not received the precipitation it needed to recover enough to release the horses. These horses were subsequently adopted on February 7, 2004. There are an estimated 27 horses remaining on the range that were not removed in the 2002 emergency gather. The average body condition class of these horses as of early spring 2004 is 4.

Public interest in the welfare and management of these wild horses and burros is currently higher than it has ever been in part to the extreme conditions of the horses gathered in the 2002 gather, and the high profile of this HMA being located in such close proximity to a city the size of Las Vegas. Volunteers have be very active in the monitoring and care of horses and burros within this HMA, as well as their habitat, and are quick to notify BLM personnel of any recent horse and burro incidents, and current wild horse and burro condition.

4.11.3 Reasonably Foreseeable Future Actions

The BLM should manage wild horses and burros within a population range for future established AMLs, while maintaining genetic diversity, age structure, and sex ratios. Natural selection may not be the preferred method for managing wild horses and burros in the future. Wild horse and burro AMLs should be expressed as a range in the future as well as the present as a result of the LVFO Resource Management Plan process.

Fertility control may be implemented on mares and jennies within the HMA in accordance with the final draft of the Wild Horse and Burro Strategic Research Plan reviewed and supported by the National Wild Horse and Burro Advisory Board in August 2002 and the BLM Director's Science Advisory Board in January 2003. Additional NEPA documentation should be required prior to implementation of any fertility control on these horses and burros.

There is a proposal for the installation of water wells in the Goodsprings and the Wildhorse Valleys south of State Route 160. The purpose of these wells is to better distribute horses located within this portion of the HMA, not to artificially increase the AML. It is anticipated that with the installation of these water wells, there should be a decrease is use of Bird Spring and Wilson Tank, hence increasing the availability of water at these springs for wildlife and promoting the recovery of forage species. The State Route 159 Right of Way (ROW) will be fenced to reduce the number of animal/vehicle collisions and the related animal/human injuries and deaths. The entire eastern boundary of the herd north of State Route 160 will be fenced reducing the chance of nuisance and/or emergency gathers due to urban encroachment

Future management should focus on an integrated ecosystem approach with the basic unit of analysis being the watershed. Wild horses and burros should continue to be a

component of the public lands, managed within a multiple use concept. Riparian areas and springs will continue to be fenced when needed to achieve PFC. Mitigation resulting from Section 7 ESA consultation accomplished in the Red Rock GMP.

While there is no expectation that there will be amendments to the Act that would change the way wild horses could be managed on the public lands, the Act has been amended twice since 1971. Therefore, there is potential for an amendment as a reasonably foreseeable future action. However, if changes in the Act that relate to the disposal of excess wild horses and burros or sanctuaries outside of the United States are authorized, gathers and removals should become more predictable due to the facility space. This should increase stability of gather schedules, which would result in gathers on the HMA every four years. If there are no future amendments to the Act, and no changes in funding levels for the wild horse and burro program, then few changes in on-the-ground management should occur. The LVFO should continue to conduct monitoring to assess progress toward meeting rangeland standards.

4.11.4 Impacts

Past actions regarding the management of wild horses and burros have resulted in the current wild horse and burro populations within the Red Rock HMA. Wild horse and burro management has contributed to the present resource condition and wild horse and burro herd structure within the HMA.

Cumulatively, under Alternative A the proposed high value of 27 horses makes up almost 100% of the current population on the range. By gathering down to the low range for the population of 16 horses (11 horses gathered) in the next scheduled AML gather, compliance with the rangeland standards and guidelines should be assured for horses. Under this Alternative for burros, the proposed high value AML of 49 animals is 310% less than the current population of 152 burros. In order to meet rangeland standards and guidelines for sound rangeland management for this HMA, 123 burros need to be gathered to meet the lower range AML of 29 burros.

Cumulatively, under Alternative B horses and burros should not be managed south of State Route 160. Approximately 27 horses and 30 burros will need to be removed from this area in the next scheduled gather. The area north of 160 would have the same cumulative impacts as in Alternative A.

Cumulatively, under Alternative C, the No Action Alternative, progress toward achieving the Standards may not begin until an AML could be established. This Alternative is most likely to contribute to excessive utilization at riparian and upland areas throughout the HMA.

Under all of the Alternatives, wild horses and burros should continue to be one of the multiple uses of the public lands. In addition, the establishment of an AML has been completed for 5 other HMAs in the LVFO area without any cumulatively significant

impacts occurring. Therefore, the proposed action does not have any highly uncertain or involve any unique or unknown risks

These Alternatives are intended to improve horse and burro health and condition by establishing AML within the capacity of the HMA to provide year-long suitable habitat. Rangeland, as well as horse and burro health would continue to be an issue under the No Action Alternative until AMLs can be established through the AML evaluation/BLM decision process.

The combination of the past, present, and reasonably foreseeable future actions, along with the Alternatives, should improve the health of wild horses and burros and the ecosystem. While the overall number of wild horses and burros may be reduced from the current populations, the remaining wild horses and burros should be managed at a population level that is appropriate for the productivity of the HMA, given all other multiple uses. Cumulatively, no beneficial or adverse impacts to the human environment, public health and/or safety are anticipated due to the establishment of this AML.

5.0 CONSULTATION AND COORDINATION

5.1 Persons, Groups and Agencies Consulted

5.2 List of Preparers

This EA was prepared by Bureau of Land Management, Las Vegas Field Office Staff. The following is a list of individuals responsible for preparation of this EA.

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6.0 GLOSSARY AND ACRONYMS

GLOSSARY

Animal Unit Month (AUM) – The amount of forage required to support one animal unit (e.g., cow-calf pair) for one month.

Allowable Use Level (AUL) – Utilization levels specified for key species in order to meet Rangeland Standards.

Climate – The average or prevailing weather conditions of a place over a period of years.

Cover – (1) The combined aerial parts of plants and mulch, and (2) shelter and protection for mammals and birds (BLM Manual 4400).

Deterministic – Pertaining to a series of systematic processes.

Equine body condition – Henneke Standards

1. Poor. Extremely emaciated; spinal processes, ribs, tail head, tuber cozae and ischii projecting prominently, no fatty tissue can be seen.

2. Very Thin. Emaciated; slight fatty covering over base of spinal processes; transverse processes of lumbar vertebrae feel rounded; spinal processes, ribs, tail head, tuber cozae and ischii prominent; withers, shoulders, and neck structure faintly discernible.

3. Thin. Fat buildup about halfway on spinal processes; transverse processes cannot be felt; slight fat covering over ribs; spinal processes and ribs easily discernible; tail head prominent; but individual vertebrae cannot be identified visually; tuber cozae not discernible; withers, shoulders and neck not obviously thin.

4. Moderately Thin. Slight ridge along back; faint outline of ribs discernible; tail head prominence depends on conformation – fat can be felt around it; tuber cozae not discernible; withers, shoulders and neck not obviously thin.

5. Moderate. Back is flat (no crease or ridge); ribs not visually distinguishable but easily felt, fat around tail head area beginning to feel spongy; withers appear rounded over spinal processes; shoulders and neck blend smoothly into body.

6. Moderately Fleshy. May have slight crease down back; fat over ribs spongy; fat around tail head soft; fat beginning to be deposited along the side of withers behind shoulders, and along sides of neck.

7. Fleshy. May have crease down back; individual ribs can be felt, but noticeable filling between ribs with fat; fat around tail head soft; fat deposited along withers, behind shoulders, and along neck.

8. Fat. Crease down back; difficult to feel ribs; fat around tail head very soft; area along withers filled with fat; area behind shoulder filled with fat; noticeable thickening of neck; fat deposited along inner thighs.

9. Extremely Fat. Obvious crease down back; patchy fat appearing over ribs; bulging fat around tail head, along withers, behind shoulders, and along neck; fat along inner thighs may rub together, flank filled with fat.

Distribution (Grazing) – The dispersion of grazing animals within a management unit or area.

ESA – Endangered Species Act

Forage – The plant material actually consumed by (or available to) grazing animals.

Frequency – The ration between the number of sample units that contain a species and the total number of sample units. It is 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 (BLM Technical Reference 440-4).

Guidelines – Guidelines are livestock management practices (e.g. tools, methods, strategies and techniques) designed to achieve healthy public lands as defined by Standards and portrayed by Indicators. Guidelines are designed to provide direction, yet offer flexibility for local implementation through activity plans and grazing permits. Activity plans may add specificity to the Guidelines based on local goals and objectives as provided for in adopted manuals, handbooks and policy. Not all Guidelines fit all circumstances. Monitoring or site specific evaluation will determine if significant progress is being made towards achieving the Standards, and if the appropriate Guidelines are being applied.

Habitat – The natural abode of a plant or animal, including all biotic, climatic, and edaphic factors affecting life.

Herd Area – Historical range where wild horses were found in 1971.

Herd Management Area – An area within the Herd Area defined through a public planning process where wild horses are managed.

Intensity (Grazing) – A reference to grazing density per unit of time.

Land Use Plan – Land use plan means a resource management plan, developed under the provisions of 43 CFR part 1600, or management framework plan. These plans are developed through public participation in accordance with the provisions of the Federal Land Policy and Management Act of 1976 and establish management direction for resource uses of public lands (43 CFR 4100.5).

Management Objective – The objectives for which rangeland and rangeland resources are managed which include specified uses accompanied by a description of the desired vegetation and the expected products and/or values.

Management Plan – A program of action designed to reach a given set of objectives.

Monitoring – The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives (BLM Technical Reference 440-7). Monitoring means the periodic observation and orderly collection of data to evaluate: (1) Effects of management actions; and (2) Effectiveness of actions in meeting management objectives (43 CFR 4100.5).

Multiple Use – The management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people. Relative values of the resources are considered. Multiple uses does not necessarily result in the combination of uses that will give the greatest potential economic return or the greatest unit output, nor does it mean that every use will occur on every acre. Multiple use management includes management for traditional uses such as mining and livestock grazing, as well as management of other resources, scenic, scientific and historical values (Federal Land Policy and Management Act).

Proper Functioning Conditioning (PFC) – Riparian-Wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bed load, and aid floodplain development; improve flood-water retention and ground-water recharge; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity (BLM Technical Reference 1737.9).

Range Improvement – Range improvement means an authorized physical modification or treatment that is designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; restore, protect and improve the condition of rangeland ecosystems to benefit livestock, wild horse, and fish and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical devices or modifications achieved through mechanical means.

Riparian – Referring to or relating to areas adjacent to water or influenced by free water associated with streams or rivers on geologic surfaces occupying the lowest position of a watershed.

Self-sustaining – The process whereby established populations are able to persist and successfully produce viable offspring that shall, in turn, produce viable offspring, and so on over generations. The absolute size that a population must attain to achieve a self-sustaining condition varies based on the demographic and sociological features of the herd (and adjoining herds), and these aspects should be evaluated on a case by case basis. In many cases it is not necessary that populations be isolated genetic units, but both naturally-occurring and management-induced ingress and egress activity can be considered, in order to maintain sufficient genetic diversity within these populations.

Stochastic – Pertaining to a series of random processes

Trend – The direction of change in ecological status or resource value rating observed over time. Trend in ecological status should be described as *toward*, or *away from* the potential natural community, or as not apparent (BLM Technical Reference 4400.4).

Utilization – The proportion of current year's forage production that is consumed or destroyed by grazing animals. This may refer either to a single species or to the vegetation as a whole.

Viable Population – A population capable of maintaining itself, without significant manipulation.

ACRONYMS

ACEC – Areas of Critical Environmental Concern

AML – Appropriate Management Levels

AUL – Allowable Use Levels

BLM – Bureau of Land Management

EA – Environmental Assessment

EIS – Environmental Impact Statement

FMUD – Final Multiple Use Decision

GMP – General Management Plan

HA – Herd Area

HMA – Herd Management Area

IBLA – Interior Board of Land Appeals

LVFO – Las Vegas Field Office

LUP – Land Use Plan

MFP – Management Framework Plan

MSHCP – Multiple Species Habitat Conservation Plan

M/S RAC Standards – Mojave/ Southern great Basin Resource Advisory council Standards and Guidelines for Rangeland Health

NEPA – National Environmental Policy Act

PMP – Population Management Plan

RAC – Resource Advisory Council

RMP – Resource Management Plan

RRCNCA – Red Rock Canyon National Conservation Area

SOP – Standard Operating Procedures

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8.0 APPENDICIES

8.1 Appendix A – Red Rock Wild Horse and Burro Herd Management Area Appropriate Management Level Evaluation

8.2 Appendix B – Bureau of Land Management, Las Vegas Field Office, Wild Horse and Burro Program – Red Rock Herd Management Area Description

8.3 Appendix C – Red Rock HMA External Range Condition Assessment

8.4 Appendix D – Red Rock Herd Management Area: Vegetation Monitoring for the Proposed Release of Wild Horses Being Held at the Oliver Ranch Holding Facility Per the Memorandum of Understanding Between the Bureau of Land Management and the National Wild Horse Association

Appendix A

Red Rock Wild Horse and Burro Herd Management Area Appropriate Management Level Evaluation

RED ROCK HERD MANAGEMENT AREA APPROPRIATE MANAGEMENT LEVEL EVALUATION REPORT

Bureau of Land Management Las Vegas Field Office

May 2004

1.0 Introduction

Since passage of the Wild Free-Roaming Horse and Burro Act in 1971 (and its implementing regulations), the Bureau of Land Management (BLM) and the United States Forest Service (USFS) have been responsible for the stewardship of wild horses and burros on designated public lands (P.L. 92-195). This stewardship responsibility requires the agencies to provide for viable, healthy herds while ensuring balanced management of the range resources upon which they depend. Over the years, decisions regarding allocation of forage and water resources on public lands have been hotly debated. Competing and conflicted interests of those who advocate for, or derive benefits from, public lands, such as environmentalists, ranchers, wild horse and burro advocacy groups, hunters, and recreation enthusiasts, require federal agencies to carefully consider the needs of multiple stakeholders when developing land use plans (LUPs) and issuing land use decisions. Further, the National Environmental Policy Act (NEPA) requires federal agencies to follow a formal process in their decision-making functions (P.L. 91-190). This report contains information necessary to inform BLM resource management decisions regarding appropriate numbers of wild horses and burros in the Red Rock Herd Management Area (HMA). Copies of the report will be made available to interested stakeholders as part of BLM's multiple use decision process.

1.1 Background

The BLM defines Appropriate Management Level (AML) for wild horses and burros as the *"optimum number of animals to be managed within a specific HMA that will support achievement of multiple use resource management objectives, while maintaining a thriving, natural ecological balance within the region."* Establishing AMLs through a formal evaluation process is a national priority for BLM. HMAs cannot be placed on national herd gather schedules until a formal AML is established using actual monitoring data in accordance with BLM policy. At the local level, conducting formal evaluations and setting AMLs for wild horse and burro herds is also necessary to determine whether or not the BLM Las Vegas Field Office (LVFO) is accomplishing multiple use resource management objectives for public land use in accordance with the *Las Vegas Resource Management Plan* and *Final Environmental Impact Statement* (RMP) (*October 1998*); the *Interim General Management Plan* and *Final Environmental Impact Statement for the Red Rock Canyon National Conservation Area (December 2000*); and the *Proposed General Management Plan and Final Environmental Impact Statement for Red Rock Canyon National Conservation Area (December 2000).*

Since the 1989 Interior Board of Land Appeals (IBLA) ruling directing wild horse and burro herd numbers to be set using actual monitoring data, BLM has implemented a policy of establishing "monitoring based" AMLs using the best available data. The process of setting AMLs utilizes a range of established resource monitoring techniques combined with the land use planning process. As with other federal land use planning efforts, full disclosure and public participation in accordance with NEPA is part of the AML decision process. The AML recommended as a result of this evaluation will be presented to stakeholders and other interested publics for review and comment. Comments received during the review period are considered by BLM prior to issuance of a final AML decision.

1.2 Replacing Estimated AML

The 1998 RMP identified estimated AMLs for all HMAs under the jurisdiction of the LVFO. In accordance with the RMP planning process, these estimates served as temporary management targets. Estimated AMLs were derived from the best available data. Estimated AMLs are intended to be replaced by AMLs calculated from resource monitoring data collected over several years. BLM policy recommends that AML evaluations be accomplished using 3-5 year data cycles. Annual range utilization data are used to monitor the condition of vegetative resources in response to grazing pressure and other events of recent occurrence within the HMA. Annual monitoring data, taken over time, are used to evaluate long-term conditions and trends within the HMA and to formally set AMLs.

The estimated AML for the Red Rock HMA identified in the 1998 RMP was 50 horses and 50 burros. This AML evaluation document is the first formal analysis of long-term monitoring data to determine optimum numbers of wild horses and burros for the Red Rock HMA. The AML proposed in this document is based upon the evaluation of forage utilization and use pattern mapping data corresponding to the years 1995, 1996, 1997, 1999, 2000, 2001, and 2002. Forage utilization data are not available for the year 1998 and were, therefore, not included in this analysis. Data from eight years are evaluated in comparison with multiple use resource management objectives, as defined in the 1998 RMP.

1.3 Future AML Evaluations

Current range conditions, projections of future drought impacts and BLM's current drought management policy recommendations have been taken into consideration in the development of the proposed AML for this evaluation period.

The next formal AML evaluation report is scheduled to be completed in 2009. Any future adjustments to AML would be based upon the results of ongoing and future range and herd monitoring studies; baseline resource inventory studies; Ecological Site Inventory (ESI) data; analysis of competing resource uses or conflicts; changes in resource management objectives and/or

consultation and coordination with interested or affected stakeholders. In addition, AML may need to be adjusted to address HMA-specific management objectives as these are developed as part of a future comprehensive wild horse and burro Population Management Plan (PMP) for the Red Rock HMA.

2.0 RELATIONSHIP OF AML TO RESOURCE MANAGEMENT PLAN OBJECTIVES

Public lands are managed under the Federal Land Policy and Management Act of 1976 (FLPMA). The FLPMA emphasizes that the public lands are to be managed to protect the quality of scenic, ecological, environmental, and archeological values; to preserve and protect public lands in their natural condition; to provide feed and habitat for wildlife and livestock; and to provide for outdoor recreation. The FLPMA also stresses harmonious and coordinated management of the resources without permanent impairment of the environment.

This Action is in conformance with BLM policies, plans, and programs. This Action is in conformance with the Las Vegas Resource Management Plan and Final Environmental Impact Statement (RMP) (October 1998), and the Interim General Management Plan and Final Environmental Impact Statement for the Red Rock Canyon National Conservation Area (NCA) (GMP) (December 2000), as well as the subsequent IBLA decision (IBLA 88-951, 88-648, and 88-679). The Las Vegas RMP Record of Decision (ROD) states in *WHB-1-a. Establish Appropriate Management Levels within Herd Management Areas*; and *WHB-1-b. Adjust the Appropriate Management Level identified for each Herd Management Area when monitoring determines the animal population, forage, water, riparian, and other ecosystem management objectives are not being met.* The Mojave/Southern Great Basin (M/S) Resource Advisory Council (RAC) Standards and Guidelines for Rangeland Health state that BLM would manage for wild horses and burros in *"herd management areas based on the capability of the HMA to provide suitable feed, water, cover, and living space for all multiple uses,"* and establish AMLs *"based on the most limiting habitat factor (e.g. available water, suitable forage, living space and cover) in the context of multiple use"*. The RAC Standards also indicate that 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 the HMAs or consistent with land use plan (LUP) objectives. The AML must be based on monitoring data, as per the IBLA decision.

3.0 LOCATION OF THE RED ROCK HMA

The Red Rock HMA is located in southern Nevada approximately 20 miles west of the center of metropolitan Las Vegas (see Appendix 1, Figure 1). Comprised of 164,684 acres of public land, the HMA is easily accessible from State Routes 159 and 160. The boundaries of the HMA were established based upon herd use patterns within the historic range of resident wild horses and burros. Approximately half of the HMA is located within the Red Rock Canyon National Conservation Area (NCA), with portions extending beyond the NCA south to the town of Good Springs, Nevada. Most of the HMA's eastern boundary is bordered by Las Vegas urban development, while a majority of the western boundary is defined by the Spring Mountain Range escarpment and the administrative boundaries of the Humboldt-Toiyabe National Forest. The town

of Pahrump, Nevada is located approximately 15 miles from the HMA's western boundary. The town of Blue Diamond; Bonnie Springs Ranch and Spring Mountain Ranch State Park are within the HMA boundary.

4.0 EXISTING ENVIRONMENT

As recently as 1990, lands within Red Rock Canyon NCA and the HMA were considered a rural retreat, attracting locals and tourists seeking day trip excursions from urbanized development. With the completion of the Summerlin Parkway in the early 1990's and other improved road networks, the HMA is now only 20 minutes from downtown Las Vegas. Today, rapid expansion of the communities of Summerlin, the Lakes, and others, along with the associated growth of commercial and residential services, has pushed urban Las Vegas to the doorstep of Red Rock Canyon NCA and the HMA. This once rural area now experiences heavy traffic flows along State Routes 159 and 160 from commuters and tourists, and receives approximately 1.2 million visitors each year. According to the U.S. Census, Clark County grew from 741,459 residents in 1990 to 1,375,765 in 2000, representing an 85.5% increase in growth. Long-term population growth projections by the University of Nevada Las Vegas Center for Business and Economic Research indicate the population will continue to increase rapidly over the next several decades with an estimated 2,120,940 residents by 2015.

The tremendous influx of people to the region has resulted in a corresponding increase in recreational demands on the public lands within the NCA and HMA. Because of sparse, erratic precipitation, wide variations in temperature and delicately balanced species interactions, desert systems are considered fragile and subject to permanent degradation if not properly managed. Surface disturbances caused by excavation, trail use or off-highway vehicle travel can take as long as 100 years to recover dependent upon degree of soil compaction and level of restoration effort. Therefore, decisions regarding resource allocation and access to desert lands must be carefully weighed against long-term and cumulative resource damage.

4.1 Meteorological Conditions

The Red Rock HMA is within the Mojave Desert ecosystem and is characterized by low precipitation levels, cool winters, and hot summers. Table 2 shows the monthly climate summary compiled from data collected by the Western Regional Climate Center located at Spring Mountain Ranch State Park (elevation 3,778 ft) within the NCA/HMA boundary. These data provide a 29-year baseline from which to compare current climatic conditions. Evapo-transpiration is high with average air temperatures ranging from 30 °F in the winter to summer temperatures in excess of 97 °F in July. Although desert systems are typically characterized by less than 4 inches of rain per year, a majority of the Red Rock HMA is located at elevations above 3,500 feet (ft), resulting in higher levels of precipitation. Average annual precipitation for the HMA is 12.76 inches. Average monthly precipitation levels range from a low of 0.16 inches in June to a high of 2.23 inches in March. Most precipitation occurs during the winter and early spring months (December-March) and in late summer (July-August). The driest months are typically May, June, September and October.

Table 7. RMP Resource Management Objectives Related to AML for Wild Horse and Burro Management.

Affected Resource	RMP Objective	Description	Role of AML
Wild Horses & Burros	WHB-1	*In HMAs not constrained by desert tortoise restrictions, manage for healthy, genetically viable herds of wild horses and/or burros in a natural, thriving ecological balance with other rangeland uses.*	Meets Objective
	WHB-1-a	*Establish AMLs within each HMA.*	Meets Objective
	WHB-1-c	*Limit utilization of current year's production by wild horses and burros on key perennial forage species within the HMA to 50% for grasses and 45% for shrubs and forbs.*	Meets Objective
Fish, Wildlife, and Special Status Species*	FW-1	*Maintain or improve approximately 869,800 acres of current and potential bighorn sheep habitat toward full ecological potential. Through management and habitat enhancement projects, allow desert bighorn sheep populations to reach levels consistent with the carrying capacity of their habitat, and consistent with other BLM policy. Make adjustments to the population estimates as needed, based on results of monitoring.*	Supports Objective
	FW-1-a	*Maintain and improve bighorn sheep habitat by maintaining existing water developments, constructing additional water developments, and* ***protecting/improving springs, seeps and riparian habitat,*** *consistent with BLM policy for the management of wilderness study areas** in the following areas: Arrow Canyon/Elbow Range; South Spring/Bird Spring Range; Gold Butte/Virgin Mountains; Muddy Mountains; Spring range; Eldorado/Newberry Range; Specter Range/Last Chance Range/Bare Mountains McCullough Range/Highland Range/Crescent Peak.* ***Limit competition between bighorn, livestock, and wild horses and burros around spring sources by providing***	Supports Objective
	FW-3	*Support viable and diverse native wildlife populations by providing and maintaining sufficient quality and quantity of food, water, cover, and space to satisfy needs of wildlife species using habitats on public land.*	Supports Objective
	SS-1	*Manage Special Status Species habitat at the potential natural community or desired plant community, according to the need of the species.*	Supports Objective
	SS-2	*Manage habitat to further sustain the populations of Federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing*	Supports Objective

	SS-3	*Manage desert tortoise habitat to achieve the recovery criteria defined in the Tortoise Recovery Plan (USFWS 1994) and ultimately to achieve delisting of the desert tortoise.*	Supports Objective
Water Resources	WT-3	*Ensure availability of adequate water to meet management objectives including the recovery and/or re-establishment of Special Status Species.*	Supports Objective
Riparian Resources	RP-1	*Provide widest variety of vegetation and habitat for wildlife, fish, and watershed protection; ensure that all riparian areas are in proper functioning condition by achieving an advanced ecological status, except where resource management objectives require an earlier successional stage. Manage vegetation consistent with VG-1*	Supports Objective
	RP-1-c	*Ensure that the minimum requirement of Proper Functioning Condition on all riparian areas is maintained or achieved.*	Supports Objective
Vegetation Resources	VG-1	*Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community.*	Supports Objective
Soil Resources	SL-1	*Reduce erosion and sedimentation while maintaining or where possible enhancing soil productivity through the maintenance and improvement of watershed conditions.*	Supports Objective
Recreation	RC-1	*Ensure that a wide range of recreation opportunities are available for recreation users in concert with protecting the natural resources on public lands that attract users.*	Supports Objective

* Special Status Species include all plant and animal species that are federally listed as "threatened or endangered" under the Endangered Species Act of 1973, as amended, Candidate species under the Endangered Species Act, State listed species, or species otherwise identified by the BLM State Director.
**Wilderness study areas as referenced in the 1998 Las Vegas RMP were changed by Act of Congress, construction and maintenance of water developments within these areas may either be subject to that Act or wilderness study area management. Those areas released from wilderness study area (WSA) status by the Act would no longer be subject to WSA management policy.

Table 8. Average Monthly Climate Summary 1961-1990.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max Temperature (°F)	52.7	57.3	63.5	72.2	80.5	91.8	**97.1**	94.0	87.2	76.6	60.9	54.6	**74.2**
Average Min. Temperature (°F)	**30.4**	34.0	39.8	46.0	53.2	64.0	70.8	67.8	59.3	48.5	36.5	31.0	**48.6**
Average Total Precipitation (in)	1.64	1.93	**2.23**	0.84	0.33	**0.16**	1.09	1.84	0.44	0.37	0.86	1.03	**12.76**

*From Western Regional Climate Center Station #266691, Spring Mountain Ranch State Park, Nevada.

Table 3 shows the average annual precipitation and temperature data for the HMA during the AML evaluation period (1995-2003).

Table 9. Average Annual Precipitation and Temperature Data For the Red Rock HMA (1995-1999).

Year	Annual Precipitation	High Temperature (°F)	Low Temperature (°F)
1995	12.28	71.82	45.31
1996	8.58	75.98	48.75
1997	8.87	74.50	47.18
1998	17.65	71.01	44.24
1999	6.67	75.88	46.88
2000	8.87	72.96	48.32
2001	10.75	75.97	46.46
2002	4.49	72.98	45.36
2003	7.5	78.27	49.02
Average Values	**9.52**	**74.37**	**46.84**

*From Western Regional Climate Center Station #266691, Spring Mountain Ranch State Park, Nevada.

During the evaluation period, average minimum temperature was slightly lower than the 29-year average, and the average maximum temperature was almost equal to the 29-year average, while precipitation was 3.24 inches below normal, representing a 25% decrease. In 2002 the area registered only 4.49 inches total annual precipitation, representing an almost 65% decrease from the 29-year average. In reviewing precipitation data from the years 1977 through 2003 (Appendix 2), average annual precipitation has ranged from a low of 4.49 inches in 2002 to a high of 23.89 inches in 1983. A drought in 1989, resulting in annual precipitation of 2.34 inches, was the only other year

since 1977 that annual precipitation fell below 6 inches. Eight years out of the past 26 years (approximately 30%) have registered annual precipitation less than 8 inches.

Short and long-term drought conditions have a direct and sometimes prolonged affect on water resource availability and forage plant condition. As such, these factors have been taken into consideration for purposes of determining the AML established in this document. According to the National Weather Service, as of the date of this document, southern Nevada remains in "severe drought" status. This data may be an early indication that the HMA will experience closer to average precipitation in 2004.

4.2 Soils and Land Forms

The HMA is comprised of mountainous areas and lowlands. The mountains lay in a north to south direction with variable slopes and aspects. Slopes in the valleys vary from 0% to 40% with the majority at about 5% to 9%. Wild horses and burros typically do not use areas with slopes greater than 30%. Elevations range from 8,754 feet (ft) on La Madre Mountain (just outside the HMA) to approximately 2,500 ft in the outer boundary areas. The following information on soils was taken from the Proposed General Management Plan and Final Environmental Impact Statement for Red Rock Canyon National Conservation Area (December 2000):

"Under arid conditions, rocks tend to break down by disintegration rather than by decomposition. Mechanical breakdown (spalling) is more common than chemical action. As a result, mountains are covered with a thin veneer of rock fragments. Cloudbursts and showers sweep large quantities of this material into ravines and valleys, forming alluvial fans of the coarser material. Finer grained sediments are washed into the lowlands. Wind-blown sand is also common, with the greatest accumulations found in the lower valleys.

Organic matter in most desert soils is far less than the average 3 to 5 percent by weight contained in soils formed in humid regions. Even in a wet year when spring annuals are abundant, much of the vegetal matter is oxidized by the summer heat before it can be turned into humus. A gravelly surface, referred to as 'desert pavement,' can be found in many areas. This surface is stable and resistant to erosion. The sparse cover of vegetation does little to reduce wind and water velocities. During the high-intensity, short duration thunderstorms that are common in the region, raindrop impact tends to destroy soil aggregates, enhance sheet and rill erosion, and encourage considerable transportation by splashing. A hard crust often develops upon drying. This crust impedes seedling emergence, greatly reduces infiltration for the next storm, and limits the possibilities for vegetative shielding which, by absorbing the energy of rain impact, prevents the loss of both water and soil and reduces degranulation to a minimum."

Wild horses and burros travel and congregate in small bands of animals (5-8). Their daily feeding and watering habits result in the creation of well-used trails within the HMA. Soil disturbance and compaction along these trails prevent desert plants from re-establishing. Horse and burro trails are often adopted by other off-road recreational users, such as hikers, equestrian users, cyclists and motorcycle riders. As the trails become more widely used, they become wider and deeper and in

some cases become unusable to the animals. This evolution, and in some case proliferation, of trails has created conflicts for multiple-use managers. In the NCA, motorized and mechanized vehicles are strictly regulated to designated roads and trails. Within the HMA outside of the NCA, motorized and mechanized vehicles are restricted to "existing roads, trails and dry washes". However, without official designation, the definition and enforcement of the "existing trails" requirement becomes more difficult, as wild horses and burros may continue to create new trails in response to changing conditions.

4.3 Vegetation, Ecological Sites and Condition Assessment

The term "ecological site" refers to a classification system used to define land types based on their potential to sustain specific plant communities. The potential to sustain various plant communities will vary from site to site depending on the physical characteristics of the area, including soil chemistry, precipitation, geology and elevation. The ecological sites and corresponding plant species that dominate the landscape of the HMA are listed in Table 4. The HMA primarily consists of sites dominated by desert shrubs, with low percentages of perennial herbaceous plants. Short-lived ephemeral–type forbs and grasses may be periodically abundant when favorable climatic conditions result in "desert bloom". Joshua trees, Spanish daggers and other cactus and succulents are also common. Wild horses and burros forage on the following key grass and browse species: Galleta grass, Indian Ricegrass, Stipa spp., White Bursage, Winter Fat, and Spiny Menodora.

The purpose of an ecological condition assessment is to help the resource manager predict the extent and direction of changes that may occur in a plant community as a result of applying specific treatments or management actions, such as grazing. The impact of land uses, including grazing, on range resources can be better evaluated when the condition of areas being monitored can be compared to known ecological sites. Ecological condition assessments yield an ecological expression of the relative degree to which the types, proportions and quantities of plants in the present plant community resemble that of the site's *potential natural community* (PNC). PNC is defined as the stable biotic community that would become established on an ecological site under present environmental conditions if all successional stages were completed in the absence of human interference.

Locations selected to measure ecological condition must be representative of the key areas used to describe larger geographic units and must also include, where appropriate, sites supporting unique features such as springs, seeps and canyons. Though it is recognized that wild horses and burros roam freely throughout the HMA, certain areas (key areas) are used more heavily than others due to factors such as limited water distribution, geographical barriers and urban interface (see Appendix 1, Figure 1). For purposes of this evaluation, key areas in the Red Rock HMA are locations regularly used by horses and burros and are generally located between three-quarters of a mile to almost two miles from relatively reliable water sources. By monitoring key areas, the resource manager will obtain an estimation of the use occurring overall within the HMA. Long-term (15-20 years) ecological condition monitoring provides the resource manager with feedback on the trends in vegetative community response to treatments and actions. If BLM management objectives for range health are consistently not achieved in the key areas, then management actions and/or treatments must be modified, such as reducing grazing pressure by reducing the number of grazing animals.

Table 10. General Ecological Sites and Associated Vegetation.

Ecological Site Name	Annual Precipitation (inches)	Dominant Plant Species
Coarse Gravelly Loam	5-7	Blackbrush *(Coleogyne ramossossima),* Big Galleta *(Hilaria rigida),* Spiny Menodora (*Menodora spinescens*), Winterfat (*Cerotoides lanata*)
Shallow Gravelly Loam and Slope	7-9	Blackbrush, Big Galleta, Black Grama (*Bouteloua eriopoda*)
Shallow Gravelly Loam	8-10	Blackbrush, Desert Needlegrass (S*tipa speciosa*)
Shallow Gravelly Loam	5-7	Blackbrush, Big Galleta
Shallow Gravelly Slope	5-7	Blackbrush
Shallow Limestone and Slope	5-8	Blackbrush
Limy Fan	5-7	Big Galleta, Creosote Bush (*Larrea tridentata*), White Bursage *(Ambrosia dumosa)*
Gravelly Fan	5-7	White Bursage, Big Galleta

In the fall of 1999 and spring of 2000, an interdisciplinary team of BLM personnel established four key areas within the HMA to assist in monitoring the utilization of key forage species by horses and burros and to determine changes to vegetation over time that may occur from grazing activity. The four established key areas, Potosi Springs, Wilson Tank, Mud Springs, and South Loop Road were selected based on their "correspondence" of herd use occurring over larger range areas. Maps 2-5 illustrate wild horse and burro grazing use (forage utilization) patterns in the HMA relative to established key areas. These use pattern maps are used to calculate the overall range condition and to determine the percentage of forage utilization. The approximate center of each key area is represented on the map by a large colored dot. Each key area encompasses a radius approximately 5-8 miles in all directions from the center of the dot. These use pattern maps are evaluated by BLM to determine grazing impacts to range resources and performance in meeting resource management objectives.

4.4 Grazing Exclosures and Vegetative Trend Monitoring

Grazing exclosures allow resource managers to better understand impacts of management actions on ecological sites within the HMA. Exclosures are constructed of fencing materials designed to keep wild horses and burros out, while allowing access for most wildlife species. Four 1-acre grazing exclosures were constructed in the HMA between 1990 and 1991 to monitor wild horse and burro impacts to vegetation by comparing the condition and trend in grazed versus ungrazed areas within three ecological sites (Appendix 1, Figure 1). The four exclosures are identified as Mud Spring (#1), Burn Site (#2), and Kern River Seeding Blondie (#3) and Kern River Seeding Whistle (#4).

Vegetative trend data is considered long term information (15+ years), and will be used in future evaluations to verify if limits established for forage utilization are sufficient to meet plant physiological requirements and vegetation resource management objectives. Baseline trend and condition studies were conducted inside and outside of the four exclosures at the time of establishment. The frequency of occurrence of all plant species within 200 nested plots was recorded to measure vegetation change at each study location. Parallel frequency plots were established at each key area to allow one of the duplicate plots at each key area to be fenced to exclude wild horse and burro use. This approach allows a direct side-by-side comparison over time of the status of the vegetative trend between the grazed and the ungrazed plots. Baseline ecological site, ecological condition, trend, and vegetative cover data have been recorded for each exclosure. This data will be compared to future trend monitoring data to determine changes over time. The results of the baseline monitoring studies are displayed in Table 5.

In late 2002, exclosures #3 and #4 were removed to accommodate the installation of the Kern River II natural gas pipeline. However, the LVFO constructed two new exclosures within the HMA in 2003. Data from these new exclosures will be used in future AML evaluations.

4.5 Water/Riparian Resources & Key Use Areas

Water and associated riparian resources are especially important in desert ecosystems and are typically the limiting factor in species distribution and abundance. Sound conservation practices must be implemented to maintain the integrity and viability of water/riparian resources for thehealth of the desert ecology. Management practices, including allocation of water/riparian resources to wildlife, wild horses and burros, riparian vegetative communities and recreational users must be consistent with resource management objectives identified in the RMP (see Table 1).

Seeps and springs are located throughout the HMA. Figure 2 (Appendix 1) illustrates the locations of the primary springs within the HMA, relative to four established wild horse and burro key use areas. Tables 6-8 summarize physical and biological information associated with the primary springs occurring within each key use area. BLM is still in the process of inventorying spring resources within the NCA and HMA. These tables include current information on elevation, estimated flow rates, Proper Functioning Condition (PFC) status, presence of endemic species and information related to the presence/absence of fences and diversions. A brief description of each spring, including information on biological species of interest, is contained in Appendix 3.

As a result of the dramatic decrease in precipitation in 2002, many springs within the Red Rock HMA had reduced flow and forage growth was retarded. Severe reductions in spring flows resulted in horses and burros concentrating at spring sources. Variations and reductions in precipitation also restricted animal forage use patterns to areas in the immediate vicinity of reliable water, resulting in overgrazing, shortages of forage within access to water, and herd movement to areas outside the HMA boundary. These conditions threatened the survival of wild horses. Burros in the HMA fared better than the horses due to their ability to forage on more diverse plant species and their adaptation to desert conditions. As a result, in June 2002, the BLM LVFO conducted emergency gathers of wild horses from the Red Rock HMA as well as other HMAs in southern Nevada. Although an attempt was made to gather all horses from the Red Rock HMA, approximately 25 horses could not be captured and were left on the range. Of the 60 horses gathered, 32 were shipped to BLM holding facilities in Ridgecrest, California and 26 were held at the BLM Oliver Ranch facility in Red Rock Canyon NCA, pending improvements to range conditions. In December 2003, the final decision was made to not release any of the horses being held at the facility due to unimproved forage and water conditions on the range (Hall et. al. 2003). All of the horses being held at the facility were adopted in February 2004.

Table 11. Ecological Sites, Condition, and Trend Data for Exclosures 1-4.

Exclosure	Ecological Site	Aspect Vegetation	Ecological Condition	Vegetative Trends	Vegetative Cover	Location
Mud Spring #1 (Established May 1, 1990)	Coarse Gravelly Loam 5-7 30XB107NV	Blackbrush Big Galleta Winterfat Spiny Menodora	Late Seral	No Apparent Trend or Static	Inside Exclosure 29.3%	Within 1 mile of Mud Springs
				No Apparent Trend or Static	Outside Exclosure 30.6%	
Burn Site #2 (Established May 3, 1990)	Shallow Gravelly Loam 8-10 29XY077NV	Cheatgrass Red Brome Brittle Brush (*Encilia actoni*)	Early Seral (Burned 1980, 1993)	Downward Trend Due to another fire in June 1993	Inside Exclosure 3%	Adjacent to SR 160 near the Goodsprings Road
					Outside Exclosure 5.7%	
Kern River Seeding Blondie #3 (Established Dec. 1991)	Shallow Limestone Slope 5-8 30XB030NV	Blackbrush	Seeding Inside Early Seral	Upward	13.8%	In Wildhorse Valley on the Kern River Natural Gas Pipeline
			Seeding Outside Early Seral	Upward	9%	
			Native Inside PNC	No Apparent Trend or Static	39%	
			Native Outside PNC	No Apparent Trend or Static	28%	
Kern River Seeding Whistle #4 (Established Dec. 1991)	Coarse Gravelly Loam 5-7 30XB107NV	Blackbrush Big Galleta Winterfat Spiny Menodora	Seeding Inside Early Seral	Upward	16%	In Wildhorse Valley on the Kern River Natural Gas Pipeline
			Seeding Outside Early Seral	Upward	9%	
			Native Inside PNC	No Apparent Trend or Static	39%	
			Native Outside PNC	No Apparent Trend or Static	28.60%	

4.6 Wildlife Resources

Some limited use by big game wildlife species (Bighorn Sheep, deer, elk) occurs within the HMA. Utilization studies reflect general utilization by all species inhabiting the area, including wild horses and burros, deer, bighorn sheep, rabbits and other herbivorous wildlife. The allocation of a maximum of 50% grasses and 45% forbs and shrubs to wild horses and burros was established to help ensure adequate resources were provided to wildlife populations. Common reptilian wildlife expected to occur within the project area include: the western whiptail (*Cnemidophorous tigris*), zebra-tail lizard (*Callisaurus draconoides*), side-blotched lizard (*Uta stansburiana*), long-nose leopard lizard (*Gambelia wislizenii*), Great Basin collared lizard (*Crotaphytus insularis bicinctores*), red coachwhip (*Masticophis flagellum piceus*), gopher snake (*Pituophis catenifer*), and speckled rattlesnake (*Crotalus mitchelli*). Common avifauna in the HMA include: black-throated sparrow (*Amphispiza belli*), black-tailed gnatcatcher (*Poiloptila nigriceps*), northern mockingbird (*Mimus polyglottos*), Common raven (*Corvus corax*), and red-tailed hawk (*Buto jamaicensis*). Other common wildlife include the Coyote (*Canis latrans*), desert cottontail (*Sylvilagus auduboni*), black-tailed jackrabbit (*Lepus californicus*), Kit fox *(Vulpes macrotus*).

The twofederally-listed species per the Endangered Species Act (ESA) that may occur within the project areas are the threatened desert tortoise (*Gopherus agazassii*). Other sensitive species that may occur within the HMA are: chuckwalla (*Sauromalus obesus*), banded Gila monster (*Heloderma suspectum cinctum*), and Spring Mountain spring snail (*Pyrgulopsis deaconi*).

Table 12. South Loop Key Area Water Sources.

Spring Name	Elevation (feet)	Fenced	Diversion	Proper Functioning Condition (PFC)	Sensitive/ Endemic Species	Horses/ Burros (H/B)	Water Hauled	HMA Status	Flow Rate (gpm)
Red Spring	3620	Yes	_	PFC	*Pyrgulopsis sp.* *Calochortus sp.*	B	_	Out	7.5
Calico Spring	3920	_	_	PFC	*Arctomecon sp.*	B	_	Out	0.5
Ash Spring	3740	_	_	PFC	_	B	_	In	1.0
La Madre Spring	5550	_	_	PFC	*Pyrgulopsis sp.*	_	_	In	1.5
South Fork Spring	5680	_	_	PFC	_	_	_	In	7.9
First Creek	4080	_	_	PFC	*Angelica sp.*	H & B	_	In	10
Lost Creek Spring	4480	_	_	PFC	*Pyrgulopsis sp.* *Angelica sp.*	_	_	In	49
Pine Creek	4200	_	_	PFC	*Angelica sp.*	H & B	_	In	25
Oak Creek	4220	_	_	PFC	*Angelica sp.*	H & B	_	In	30
Willow Spring	4510	Yes	Spring source is a cemented trough	Functional at-risk with upward trend	*Pyrgulopsis sp.*	_	_	In	4.5
White Rock Spring	4760	_	Water piped from source to trough	Non-functioning	_	_	_	In	0.5

Table 13. Wilson Tank Key Area Water Sources.

Spring Name	Elevation (feet)	Fenced	Diversion	Proper Functioning Condition (PFC)	Sensitive/ Endemic Species	Horses/ Burros (H/B)	Water Hauled	HMA Status	Flow Rate (gpm)
Tunnel Spring	4400	–	90% of flow is piped to trough	Non-functioning	–	H	Yes	In	1.0
Bird Spring	4380	–	90% of flow is piped to trough	Non-functioning	–	H	Yes	In	0.1

Table 14. Mud Springs Key Area Water Sources.

Spring Name	Elevation (feet)	Fenced	Diversion	Proper Functioning Condition (PFC)	Sensitive/ Endemic Species	Horses/ Burros (H/B)	Water Hauled	HMA Status	Flow Rate (gpm)
Mormon Green II	3720	–	–	PFC	–	H & B	–	In	.2
Mormon Green I	3600	–	–	PFC	–	H & B	–	In	1.1
Wheeler Camp Spring	3550	Yes	Spring is partially piped from source	PFC	–	H & B	–	In	16
Lone Grapevine	4200	Yes	Portion of spring is piped to a trough	PFC	–	H & B	–	In	0.5
Shovel Spring	4340	Yes	–	Functional at-risk with upward trend	–	H & B	–	In	0.5
Lone Willow Spring	4003	–	–	Non-functioning	–	H & B	–	In	0.1

Mud I	3862	Yes	Portion of spring is piped to a trough	Non-functioning	_	H & B	Yes	In	1.5
Mud II	3790	_	_	Non-functioning	_	H & B	_	In	0.03

4.7 Wild Horses and Burros

The current wild horse herd consists of approximately 27 animals. The sex ratio is nearly 50/50 not counting the current year's foals. The dominant colors are sorrel, bay, black, palomino, pinto, buckskin, dun, and cremello (white with blue eyes, not albino). The average growth rate is approximately 13% per year, with year-round foaling.

Much less is known about the demographics of the burro herd in Red Rock. The current population is approximately 152 burros. There growth rate is approximately 20% with foaling year-round. The sex ratio of the burro herd is currently unknown but it is suspected that the percentage of males is much higher than the percentage of females. Dominant colors are grey, brown, black, maltese (grey with black mask), and many varieties or pink or rose. No pinto burros have ever been found within the HMA.

Wild horses and burros are present year-round within the HMA. As a result of population growth and increased tourism, direct human interactions with horses and burros and indirect interactions from recreational uses within the HMA have increased substantially in recent years. The development of the Red Rock Canyon Country Club, increased visitation in the north side of Cottonwood Valley, Spring Mountain State Park, and Bonnie Springs Ranch and development in the town of Blue Diamond and Calico Basin have all resulted in increased human/animal interactions, as well as increased horse and burro use outside of the HMA.

Aerial census data from 1995, 1997 and 2004 are presented in Table 9. Normally, the number of animals sited (actual visual) was increased by a factor of 50% (adjusted values) to compensate for observer error. For example, for horses surveyed in 1995:

41 horses x 50% (0.5) = 20.5 horses
41 horses + 20.5 = 61.5 horses (rounded up to 62).

For burros, the actual census data in 1995 were adjusted using the Lincoln-Petersons Index. This adjustment factor is used in conjunction with a BLM-approved mark/recapture technique. This technique was used in only one survey year because it is costly and significantly more dangerous to perform.

Table 15. Actual and Adjusted Aerial Census Numbers for Wild Horses and Burros.

Date	Horses		Burros		Total	
	Actual	Adjusted	Actual	Adjusted	Actual Total	Adjusted Total
Sep-95	41	62	125*	134*	166	196
Sep-97	42	62	62	93	104	156
Mar-04	18	27	101	152	119	179

*Lincoln-Peterson Index was used to calculate actual population numbers for burros in 1995.

Table 10 provides information on the numbers of horses and burros gathered and removed from the HMA since 1987. A total of 241 burros and 85 horses were removed from the HMA in response to emergency drought conditions, a reduction in water availability or to address nuisance animal problems. In addition to BLM removals, 125 horses and burros have been reported killed since 1996 as a result of collisions with motor vehicles. Accurate data on the death numbers due to natural causes are not available.

Table 16. Red Rock HMA Animal Gather/Removal History.

Year	Number Burros	Number Horses
1987	0	0
1988	11 (Nuisance)	0
1992	1 (Nuisance)	0
1993	20 (Nuisance)	0
1996	106 (Nuisance)	15 (Emergency)
2000	103 (Emergency)	10 (Emergency)
2002	0	60 (Emergency)
2003	0	0
Total	**241**	**85**

4.8 Livestock Use

The area of evaluation has been closed to livestock grazing for over 30 years.

4.9 Recreational Use

Over half of the HMA is within the popular Red Rock Canyon NCA, which receives over 1.2 million visitors each year. Most of the remainder of the HMA falls within the designated Las Vegas Valley and Jean/Roach Lake Special Recreation Management Areas. These areas allow for extensive off-highway vehicle use. Designated roads and trails within the NCA support motor touring, mountain biking, hiking, and recreational horseback riding. Competitive and non-competitive events are also permitted.

Other forms of recreation include: horse endurance events, commercial and casual trail rides, mountain biking, hiking, hunting, rock climbing and hounding, commercial motorized OHV guided tours, and amateur and professional photography. In addition, commercial still photography, video, and major motion picture filming are common activities.

4.10 Wilderness Resources

Portions of the HMA are within the boundaries of two recently established Wilderness Areas, La Madre Mountain and Rainbow Mountain. These Wilderness Areas were designated by Public Law 107-282, the Clark County Conservation of Public Land and Natural Resources Act of 2002. Wild horses and burros do not typically utilize these areas. Regulations governing wilderness management restrict the use of motorized and

non-motorized vehicles. Other restrictions apply to the general use of mechanized equipment within wilderness areas; however, allowances have been made to provide for the use of aircraft or other vehicles for the management of wildfires, wildlife, and wild horses and burros by state and federal agencies. Allowable recreational activities include: hiking, horseback riding, bird watching, backpacking, photography, camping, and hunting/fishing pursuant to State regulations. The level and type of allowable uses will be addressed in wilderness management plans to be developed for these areas over the next several years.

7.0 ANALYSIS, INTERPRETATION AND EVALUATION OF MONITORING DATA

7.1 Multi-Tiered Analysis

A multi-tiered analysis was used to develop the proposed AML. The first tier consisted of determining if the HMA has the four essential habitat components, forage, water, cover, and space, within the HMA boundary. Food was determined by the utilization monitoring and use pattern mapping. Improper utilization of riparian vegetation, upland forage (native or seeded), or other vegetation was used as an indication that forage resources were not sufficient to support wild horses and burros. The nature of the forage was also considered. Much of the herbaceous forage is unpredictable with respect to availability and quantity. During drought, production of perennial species is greatly reduced, and annual grasses and forbs are not generally available. In order to be considered, water sources had to be public, natural waters (i.e. private water developments were not considered). Water availability during drought conditions was also considered. Sufficient water for wild horses and burros must be available during drought to manage for "*thriving natural ecological balance and multiple-use relationships.*" Movement out of the Red Rock HMA to non-HMA areas for required resources on a seasonal basis was used as an indication that the HMA was not capable of sustaining year-long wild horse and/or burro use. If one or more of these components were missing, then the HMA was considered unsuitable for year-long habitation by wild horses and/or burros, and the proposed AML was zero for horses and/or burros in the HMA. If all components were present, then the second tier in the evaluation was considered.

The second tier was to establish AML based on monitoring data. Monitoring data was reviewed to identify if rangeland management objectives were being met. Key forage utilization and use pattern mapping were the primary data used in the analysis, but frequency (trend) data was also considered. If rangeland management objectives were being met, then the wild horse and burro census data was examined to determine the range of population values that have occurred in the HMA. The upper values were used to set AML when no range health issues occurred. The AML was also set based on the range of census data relative to the level of range utilization that has occurred, and the need for past emergency wild horse and burro gathers. The need for emergency wild horse and burro gathers indicated that wild horse and burro numbers at the time of the gather were too high for the capacity of the HMA.

The third tier was to compare the calculated AML with the minimum number of breeding-age animals considered necessary to maintain a viable population (i.e. 50 breeding-age horses or burros). To allow BLM the flexibility to periodically gather wild horses and burros when the population reaches or exceeds the upper level, and still leave 50 breeding-age animals, the AML must be at least 85 (Coates-Markle, 2000). This allows for foals and yearlings to be part of the population. Therefore, the minimum number of wild horses or burros considered as a viable population would be 85. If the calculated AML is less than the minimum viable population, the AML should be set as zero, or additional management considerations such as periodically introducing mares from other HMAs with genetically similar populations may be required to create a genetically viable population. If AML exceeds the minimum viable population, the AML should be set at the calculated value.

7.1.1 Tier 1 – Analysis of Forage, Water, Cover, and Space

Various monitoring studies are employed to determine AML and whether RMP objectives are being met within the HMA. Data from monitoring studies are used to determine if any changes in management actions are required to achieve a thriving ecological balance. These studies include animal census, key forage plant utilization and use pattern mapping, evaluation of ecological condition, and vegetative trend studies. All monitoring studies are established and conducted in conformance with BLM's Nevada Rangeland Monitoring Handbook (September, 1984).

Grazing use (% utilization) of several key forage species is estimated and recorded along transects within the key areas, as well as, several other locations throughout the HMA. This recorded data, along with additional ocular estimates, are grouped into use patterns that are delineated on a map of the HMA. These use patterns are represented by six use categories: (1) no measurable use, (2) slight, (3) light, (4) moderate, (5) heavy, and (6) severe. These categories correspond to use levels of approximately 0%, 10%, 30%, 50%, 70% and 90%, respectively. These are the midpoints of respective ranges of use (0%-20%; 20%-40%, etc.) Data from use pattern mapping conducted between 1995 and 2002 are summarized in Table 11 and displayed on Figures 3-9 (Appendix 1).

Areas that were not included in the survey for that particular year are also depicted as "acres not measured." Most of the areas not surveyed are portions of the HMA that are currently not utilized by wild horses and burros. This may be due to disbursement of water sources or natural geographic barriers that restrict movement into these areas. Approximately 2,272 acres of the HMA were not included in the use pattern calculations because they are located in areas with slopes of 30% or greater. Wild horses and burros seldom utilize hillsides with slopes of 30% or greater. An additional 1,522 acres were not included in the use calculations because the relative distance to water excludes use of these areas by wild horses and burros (see Table 11, and Appendix 1, Figures 3-9).

Table 17. Use Pattern Mapping for the HMA (in Acres and Percent of HMA Surveyed).

Year		No Use	Slight	Light	Moderate	Heavy	Severe	Acres Not Measured
2002	Acres	0	90,242	24,255	10,048	22,680	2,195	11,470
	Percent	0%	56%	15%	6%	14%	1%	7%
2001	Acres	0	97,789	25,430	9304	17,948	0	10,419
	Percent	0%	59%	15%	6%	11%	0%	6%
2000	Acres	0	130,217	0	15,969	3234	0	11,470
	Percent	0%	79%	0%	10%	2%	0%	7%
1999	Acres	0	69,501	12,609	8,712	984	0	69,084
	Percent	0%	42%	8%	5%	1%	0%	42%
1997	Acres	0	71,257	10,759	8,577	1,214	0	69,083
	Percent	0%	43%	7%	5%	1%	0%	42%
1996	Acres	43,897	22,521	9,332	12,333	3,722	0	69,085
	Percent	27%	14%	6%	7%	2%	0%	42%
1995	Acres	50,075	25,319	1,573	15,716	2,234	0	65,973
	Percent	30%	15%	1%	10%	1%	0%	40%

***Total acreage for the HMA = 164,684 acres.**

****Total acreage not included because slope is 30% or greater = 2,272 acres (1% of HMA).**

***** Total acreage not suitable for utilization because of distance from water = 1,522 acres (1% of HMA).**

7.1.1.1 South of State Route 160

The southern portion of the HMA lacks sufficient range to support a large population of wild horses and burros year-long without regular emergency gathers (Table 10). Heavy forage utilization occurs within the Wilson Tank and Bird Springs key areas that are primarily used by wild horses, as well as surrounding areas. The installation of water wells in the Wildhorse valley and Goodsprings valley could benefit wild horses when the range recovers from the current drought and past high horse numbers (Hall et. al. 2003). During the recovery period, however, this range will only support minimal numbers of wild horses.

There are 2 public, water sources south of SR 160 available for wild horse use (Tunnel Springs and Bird Springs). One of these springs, Tunnel Spring, is ephemeral, has a history of failing during the hottest part of the year, and has had to be artificially filled on a regular basis. During the summer 2002, Bird Spring, a perennial water source during most years, also failed, leaving 30 horses without water for days before they could be rescued. Several horses died of dehydration before they could be gathered from this area. In addition, the BLM has a verbal agreement with the Rainbow Quarries, a mining operation, to haul water to a makeshift trough for the use of approximately 10 wild horses in the Rainbow Quarries area of the Goodsprings valley. This is a temporary arrangement, however, so this water source was not considered for the establishment of this AML.

Potosi Springs typically supports a herd of 30-40 burros year-long, and has not failed; however, it is located on private land and cannot be considered as a reliable water source for the establishment of AMLs. As a result, the AML for the Potosi area for burros should be zero (0) until additional public water sources can be established.

Burros south of State Route 160 are utilizing a private spring as their only source of water, therefore, although the forage, cover, and space component exists, the water component is lacking, and will not be analyzed in Tier 2 of this evaluation. Until a permanent public water source can be provided, the recommended AML for this portion of the HMA for burros is zero (0).

The area south of State Route 160 that supports horses has the forage, water, space and cover components, needed to sustain a small population of wild horses. The water and forage components are limited, however, due to the continued drought, so only a small population of horses can be supported by these limited resources. The AML for horses in this portion of the HMA will be discussed in Tier 2.

7.1.1.2 North of State Route 160

The northern portion of the HMA has sufficient range to support a healthy population of wild burros. Gathers of burros in this portion of the HMA have been mostly nuisance gathers because of animals being killed on State Route 159 and 160, not due to lack of forage, water, space or cover.

The area north of State Route 160 has many reliable perennial spring sources to support current burro populations. Of these springs two Mud and Grapevine Springs have failed and Mud Spring was artificially filled. No animals have died of dehydration around these springs. Burros utilizing the area of the Blue Diamond Mine, however, rely exclusively on privately owned water sources located on the mine, and therefore, cannot be considered in the establishment of this AML. If public water sources are provided in the future, however, the AML may be adjusted.

The drought, along with heavy past utilization by wild horses and burros has almost excluded the forage component needed by horses in certain areas north of SR 160. The area does, however, have the browse component needed for burros throughout the area.

The portion of the HMA north of State Route 160 lacks the forage component needed for the survival of horses, and will not be evaluated in Tier 2 of this evaluation. Therefore, the recommended AML for horses in this area of the HMA is zero (0).

The majority of this area of the HMA has suitable forage, water, cover and space requirements to support a herd of wild burros. The one exception is the area around the Blue Diamond mine which sustains a herd of approximately 80 burros. The main water source on the mine is privately owned and cannot be considered as a permanent source of water for burros. Until a permanent public water source can be established, burros

should not be managed in the area of the mine. The AML for burros for the area north of State Route 160 will be discussed in Tier 2 of the evaluation.

7.1.2 Tier 2 – Establish AML Based on Monitoring Data

Calculation of AML

Transects recorded each year that fall within the key areas boundaries are used in calculating weighted utilization for key areas. When use pattern mapping was only available for a particular year, the pattern(s) mapped in each key area were substituted for transect data for that year. The highest average reading for any one key species along any transect was used to derive the "Actual Percent Weighted Utilization" for each key area. This figure is used to calculate the AML for each key area. Using the highest reading for any key species rather than an average of all key species is a conservative approach for estimating forage utilization. This conservative approach was adopted to help ensure animal and habitat health during drought conditions and to allow estimation error to benefit resource protection. Actual Percent Weighted Utilization for key areas is shown in Table 12.

Table 18. Actual Percent Weighted Utilization for Key Areas within the Red Rock HMA.

Grazing Year	Estimated Percent Weighted Utilization For All Key Species For Key Areas Within The Red Rock HMA			
	Bird Springs	**Wilson Tank**	**Mud Springs**	**South Loop Road**
2003	85%**	85%**	90%**	60%**
2002	85%*	70%*	70%*	70%*
2001	85%*	66%	70%	65%*
2000	85%*	63%	70%	65%*
1999	65%*	59%	60%	60%*
1998	**Data Missing From This Year**			
1997	60%*	39%	24%	50%
1996	50%*	70%*	50%*	50%*
1995	50%*	68%	56%	50%*

***Percentages are estimates calculated from actual use pattern maps and not from data sheets**.
**Percentages were extrapolated from the Dec. 4, 2003 Range Monitoring Report produced by the Red Rock HMA Range Assessment Team (Hall et. Al. 2003) (Appendix C).

The mathematical "Desired Stocking Rate Equation", published in BLM Technical Reference 4400-7, Appendix 2, pages 54-56, was used to calculate AML:

$$\frac{\text{Actual Wild Horse and Burro Use}}{\text{Actual \% Utilization}} = \frac{\text{Desired AML}}{\text{Desired \% Utilization}}$$

Annual percent weighted utilization figures from Table 12were used as "Actual % Utilization" in the equation. Animal numbers used to represent "Actual Wild Horse & Burro Use" for each key area were estimated from aerial census data (Table 9), field observations, and historical gather data for each year.

The Desired AML for each year was then averaged for each key area to come up with the Desired AML for that key area. Desired AMLs for each of the key areas were then summed to calculate a total AML for the HMA. The results of this analysis appear in Table 13 and 14.

For example, using the data presented in Table 14 to calculate Desired AML for horses at the Wilson Tank key area for the year 1999, the equation is applied as follows:

"Actual Wild Horse & Burro Use" = 16 horses
"Actual % Utilization" = 59% or 0.59
"Desired % Utilization" = 50% or 0.50 (from Section 2.0; RMP Objective WHB-1-c)

$$\frac{16 \text{ horses}}{0.59} = \frac{\mathbf{14 \text{ horses}}}{0.50}$$

Using simple algebra it is calculated that the Desired AML (Optimum Number) for the Wilson Tank key area during the year 1999 is 14 horses.

Table 19. Calculation of optimal numbers for the area north of State Route 160.

Grazing Year	Key Areas	Burro Use	Desired % Utilization	Actual % Utilization	Optimal Number
1995	Mud Spring	20	0.5	0.56	18
	South Loop Rd.	50	0.5	0.5	50
1996	Mud Spring	20	0.5	0.5	20
	South Loop Rd.	45	0.5	0.5	45
1997	Mud Spring	12	0.5	0.24	25
	South Loop Rd.	45	0.5	0.5	45
1999	Mud Spring	22	0.5	0.6	18
	South Loop Rd.	48	0.5	0.6	40
2000	Mud Spring	9	0.5	0.7	6
	South Loop Rd.	25	0.5	0.65	19
2001	Mud Spring	10	0.5	0.7	7
	South Loop Rd.	25	0.5	0.65	19
2002	Mud Spring	10	0.5	0.7	7
	South Loop Rd.	30	0.5	0.7	21
2003	Mud Spring	20	0.5	0.9	11

	South Loop Rd.	43	0.5	0.6	36
Average optimal number for these two key areas for the years of 1995-2003:				Mud Spring	14
				South Loop Road	34
The optimal number for burros north of SR 160 is :					**49**

Table 20. Calculation of optimal numbers for the area south of State Route 160.

Grazing Year	Key Areas	Horse Use	Desired % Utilization	Actual % Utilization	Optimal Number
1995	Wilson Tank	20	0.5	0.68	15
	Bird Spring	22	0.5	0.5	22
1996	Wilson Tank	15	0.5	0.7	11
	Bird Spring	24	0.5	0.5	24
1997	Wilson Tank	16	0.5	0.39	21
	Bird Spring	17	0.5	0.6	14
1999	Wilson Tank	16	0.5	0.59	14
	Bird Spring	16	0.5	0.65	12
2000	Wilson Tank	18	0.5	0.63	14
	Bird Spring	19	0.5	0.85	11
2001	Wilson Tank	15	0.5	0.66	11
	Bird Spring	20	0.5	0.85	12
2002	Wilson Tank	20	0.5	0.7	14
	Bird Spring	21	0.5	0.85	12
2003	Wilson Tank	6	0.5	0.85	4
	Bird Spring	10	0.5	0.85	6
Average optimal number for these two key areas for the years of 1995-2003:				Wilson Tank	13
				Bird Springs	14
The optimal number for horses south of SR 160 is:					**27**

7.1.2.1 South of State Route 160

The area south of State Route 160 has had extremely heavy past use with an obvious over population of horses. However, the area does have suitable forage, water, space and cover resources to sustain a minimal numbers of horses year-round. The privately owned water source provided by the Rainbow Quarries cannot be counted in the establishment of this AML because it is not a reliable, public water source. It is recommended that this portion of the HMA be managed with a range of numbers determined by taking the optimal number, or 27 horses as the upper limit AML and 40% of the optimal number, or 16 horses, as the lower range (Coates-Markle 2000).

Potosi spring is a private water source that is not at PFC and cannot be considered for providing permanent water for wild burros utilizing the Mt. Potosi area. Until permanent public water can be provided for animals in this area, burros should not be managed in this portion of the HMA.

The area south of State Route 160 has suitable forage, water, cover and space to sustain a range of 16-27 horses year-round.

As stated in section 7.1.1.1, burros rely on the privately owned Potosi Spring and should not be managed in this area of the HMA until a permanent public water source can be established. Therefore the AML for burros south of State Route 160 is zero (0).

7.1.2.2 North of State Route 160

Due to the adequate supply of water as well as adequate space, cover and forage, the area north of SR 160 is suitable as burro habitat. Resource issues are limited to high utilization near spring sources and the unsuitability of certain plant communities, such as Winterfat, for year-long use for high numbers of burros. The area around Blue Diamond Mine cannot be considered for the establishment of AML until a permanent public water source can be established. Therefore, all animals currently utilizing the area around the mine will not be counted and will need to be removed in the next scheduled gather.

Continuing emergency gathers where horses gathered had a Henneke Body Condition Class of 1-3 indicate that this portion of the HMA cannot support wild horses. Therefore, horses should not be managed within the northern portion of the HMA.

With the exception of the Blue Diamond Mine area of the HMA north of State Route 160 where burros should not be managed because they rely on a private water source, the area has forage, water, space and cover to support a range of 29-49 burros year-long. This AML range was established using the same methods used to find the AML range for horses south of State Route 160 (Section 7.1.2.1).

As stated in section 7.1.1.2., this area lacks the forage component critical for the survival of horses
in this portion of the HMA. Therefore, horses should not be managed north of State Route 160. It is recommended that the AML for horses north of State Route 160 be zero (0).

7.1.3 Tier 3 – Viable Populations

7.1.3.1 South of State Route 160

The AML range in the portion of the HMA south of State Route 160 of 16-27 horses is less than the recommended number for the genetic viability of the herd. However, measures will be taken to lessen the impacts of potential inbreeding, by periodically introducing mares from other HMAs with similar habitat components.

7.1.3.2 North of State Route 160

The AML of 29-49 burros does not meet the minimum viable population recommendation. Periodically, Jennies will need to be introduced into the burro herd to insure maximum genetic viability.

7.1.4 AML Summary

The area south of State Route 160 has a recommended AML of 16-27 horses and zero (0) burros.

The area north of State Route 160 has a recommended AML of zero (0) horses and 29-49 burros.

For both areas, mares and jennies will need to be introduced periodically from other HMAs to insure maximum genetic viability is achieved.

8.0 FUTURE WILD HORSE AND BURRO MANAGEMENT

Once AML is established, a four to five-year gather cycle will be implemented. During the first AML gather, animals will be gathered down to the lower range of the established AML for horses and burros. The populations will then be allowed to increase to the upper range of the AML over the four to five-year evaluation cycle. This policy is used for BLM in the state of Nevada and has been established from population modeling done by the University of Nevada, Reno with Nevada wild horse and burro population data. This model assumes a 50/50 split of males and females, with a 20% recruitment rate. Also, in support of National Wild Horse and Burro Program objectives, the LVFO plans to include the Red Rock wild horse and burro herd in fertility control trials in the near future. If implemented, this program will provide for a slower growth rate in the herd, and will extend the timeframe between gathers and reduce the frequency of disturbance on the animals.

Monitoring data (i.e., utilization, trend, condition, and use pattern mapping) will be collected at established key areas annually. An Ecological Site Inventory is currently under way and will be completed in the near future. Also, trend and condition studies will be included for all key areas. This will assist in the evaluation of resource data in future AML evaluations. Any changes in management objectives could also result in studies being added. Census data will be collected on a three-year cycle with the next census to be conducted in 2007. Monitoring studies will be conducted throughout the gather cycle to confirm the existing AML, as well as, identify the need for any additional studies.

BLM is committed to managing viable populations of wild, free-roaming horses and burros on the public lands while maintaining the integrity of other resource values for conservation and multiple use management is a challenging task.

Though data gathered thus far on ecological condition and trend are premature and inconclusive, there is no indication, at this time, that trend or condition would be negatively impacted with the implementation of this AML for wild horse and burro herds in the Red Rock HMA.

Water and forage are the limiting factors, which has resulted in distribution problems causing some areas to sustain heavy use. This current evaluation addresses these conditions and adjusts the target populations accordingly.

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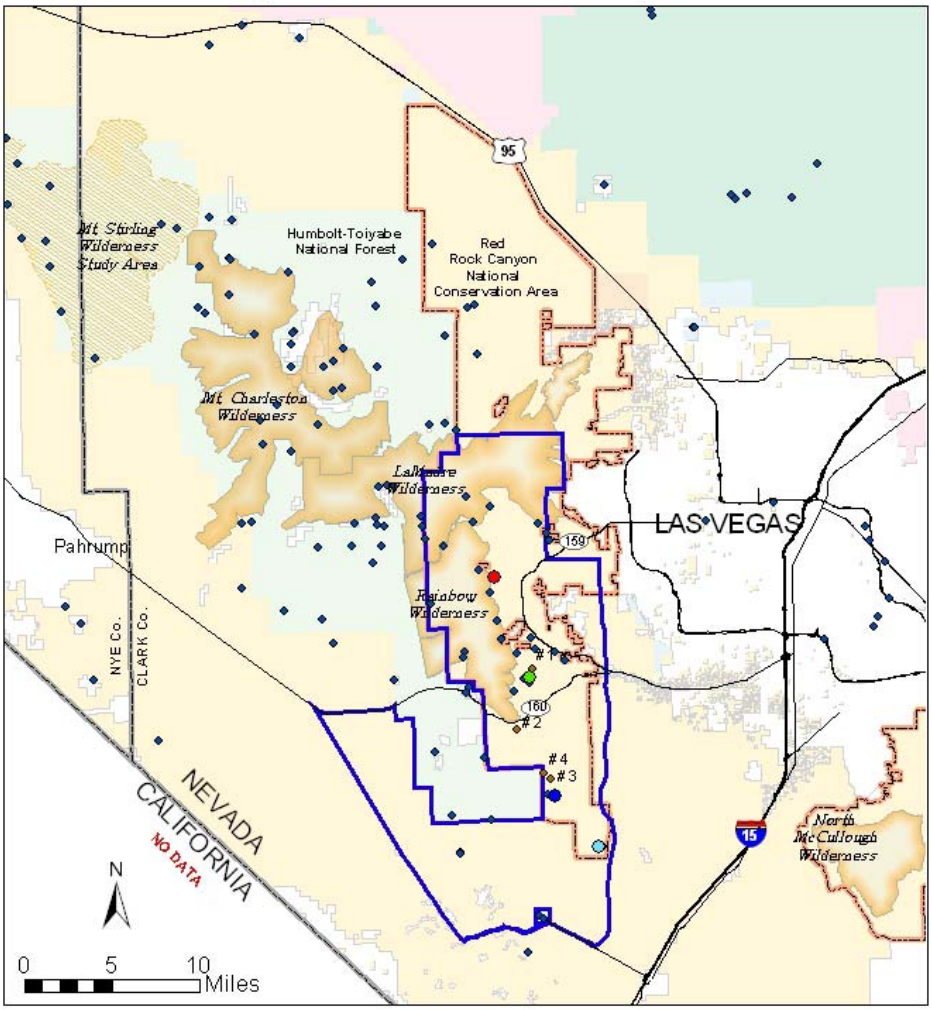
Appendix 1

Red Rock Wild Horse and Burro Herd Management Area Evaluation

Figure 1: Locations of Red Rock HMA, Grazing Exclosures and Key Use Areas



Legend

- Mud Spring Exclosure
- Burn Site Exclosure
- Nem River Seeding Blonde
- Nem River Seeding Wildlife
- South Loop Road
- Mud Springs
- Wilson Tank
- Bird Springs
- Springs
- Red Rock HMA
- NCAs
- Counties
- Interstate
- US Route
- County
- State Route
- Designated Wilderness Area
- Wilderness Study Area

Land Status

- Bureau of Indian Affairs
- Bureau of Land Management
- Clark County, Nevada
- Department of Defense
- Fish and Wildlife Service
- Forest Service
- Nevada State
- Private

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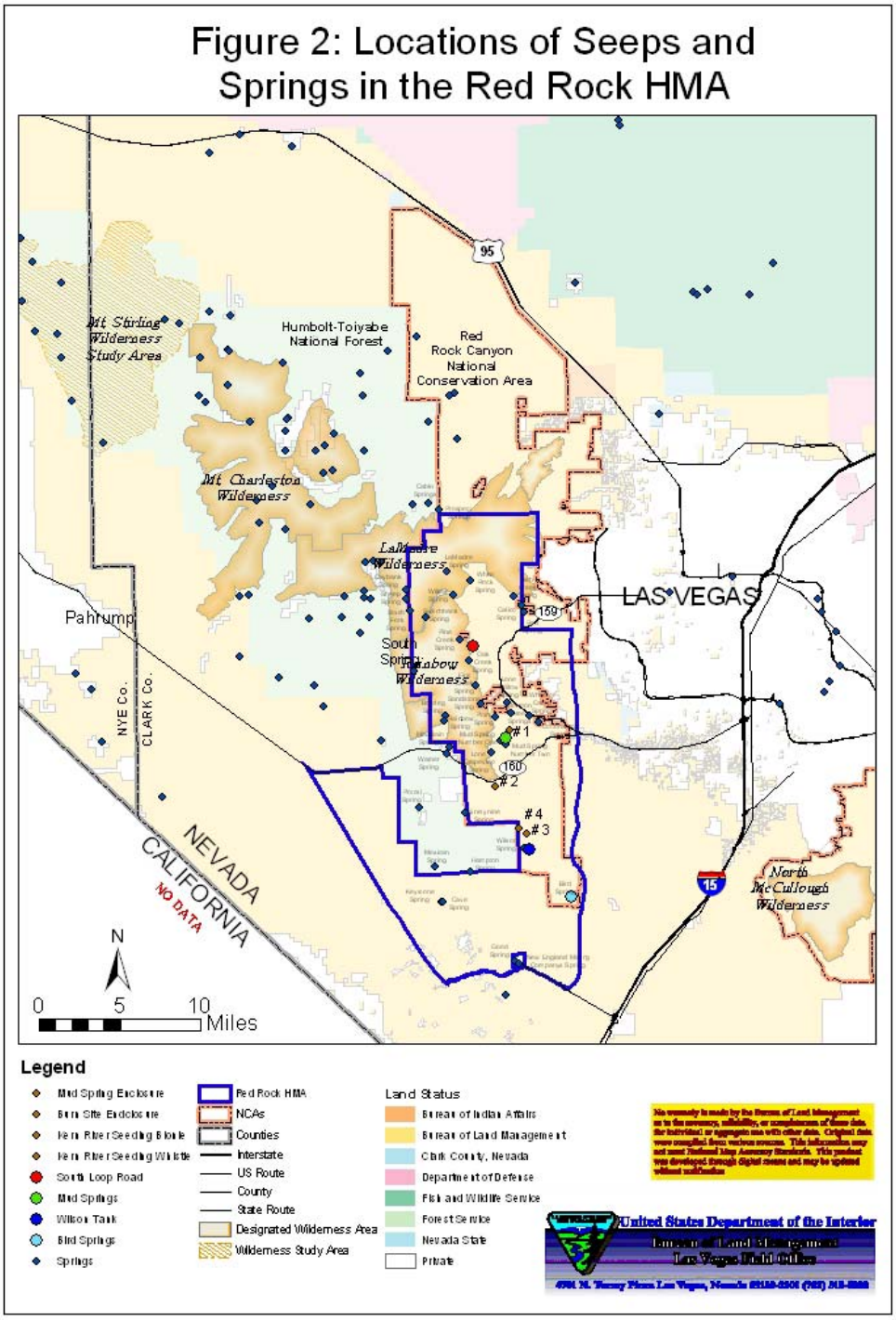


Figure 2: Locations of Seeps and Springs in the Red Rock HMA
Mt Stirling Wilderness Study Area
Humbolt-Toiyabe National Forest
Red Rock Canyon National Conservation Area
Mt Charleston Wilderness
LaMoine Wilderness
Pahrump
South Spring
Rainbow Wilderness
LAS VEGAS
NYE Co.
CLARK Co.
NEVADA
CALIFORNIA
NO DATA
North McCullough Wilderness
95
159
160
15
#1
#2
#3
#4
N
0 5 10 Miles
Legend
Mud Spring Enclosure
Burro Site Enclosure
Near River Seeding Bloole
Near River Seeding Wildlife
South Loop Road
Mud Springs
Wilson Tank
Bird Springs
Springs
Red Rock HMA
NCAs
Counties
Interstate
US Route
County
State Route
Designated Wilderness Area
Wilderness Study Area
Land Status
Bureau of Indian Affairs
Bureau of Land Management
Clark County, Nevada
Department of Defense
Fish and Wildlife Service
Forest Service
Nevada State
Private
United States Department of the Interior

Figure 3: 1995 WH&B Use Pattern

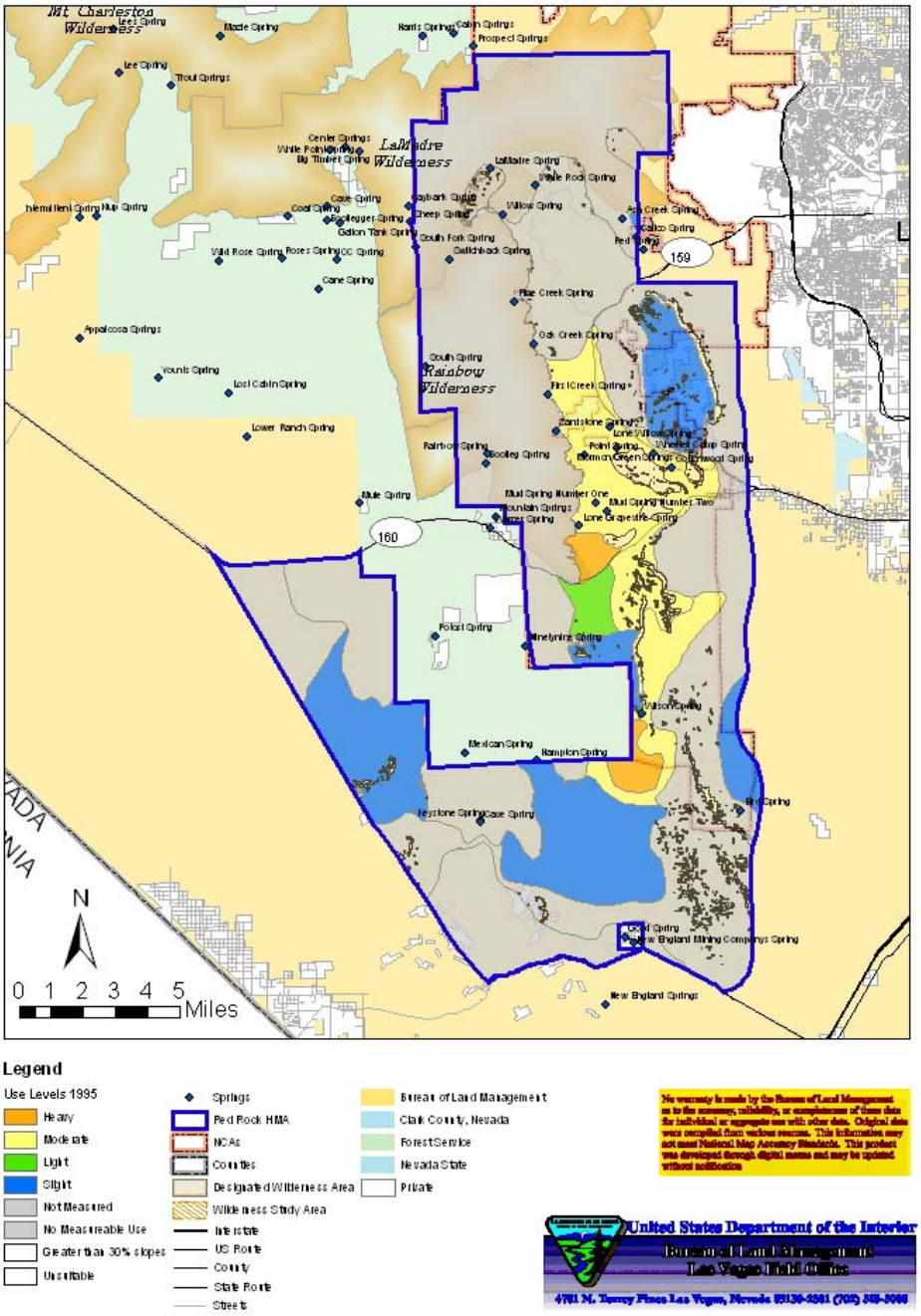
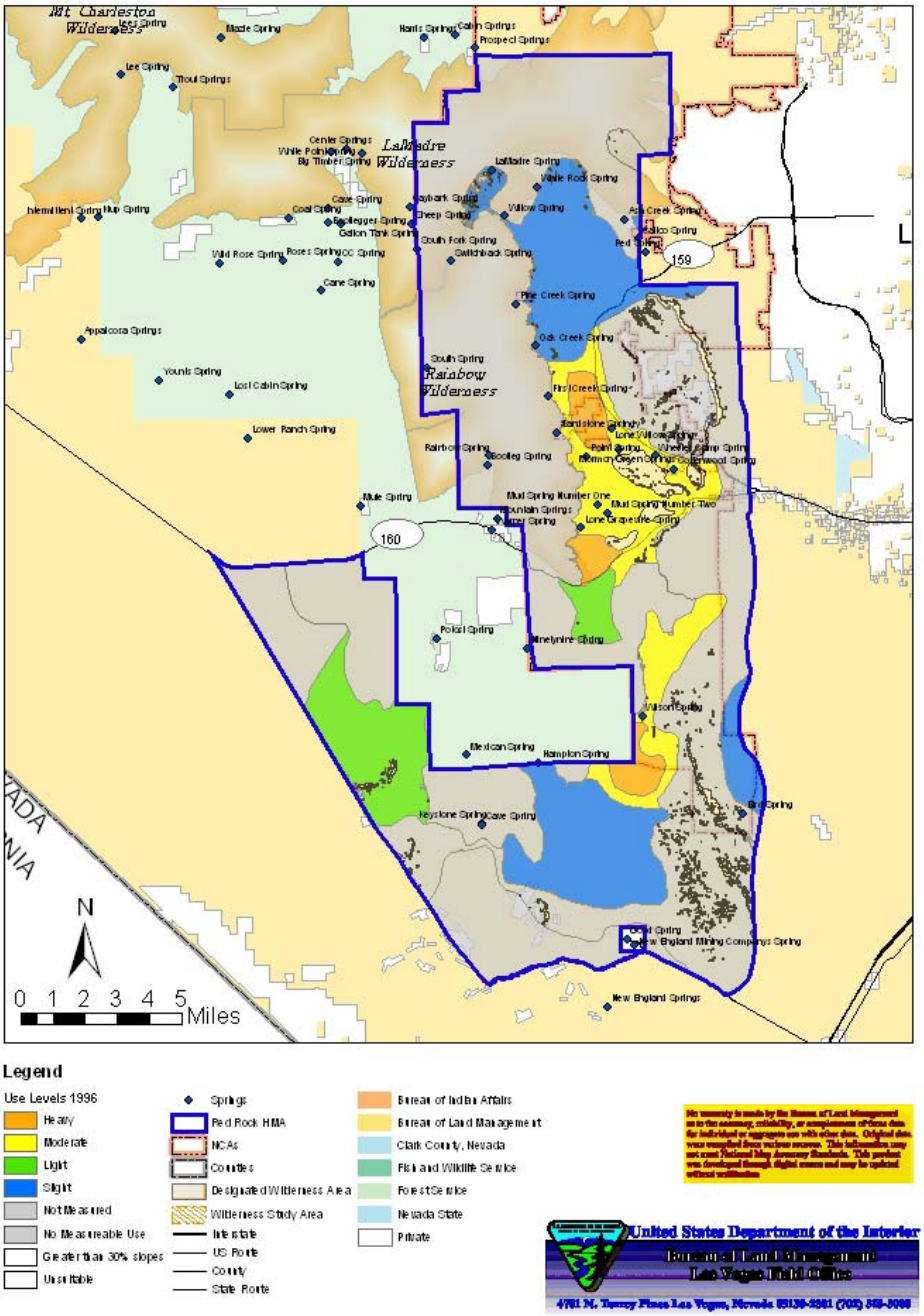


Figure 4: 1996 WH&B Use Pattern



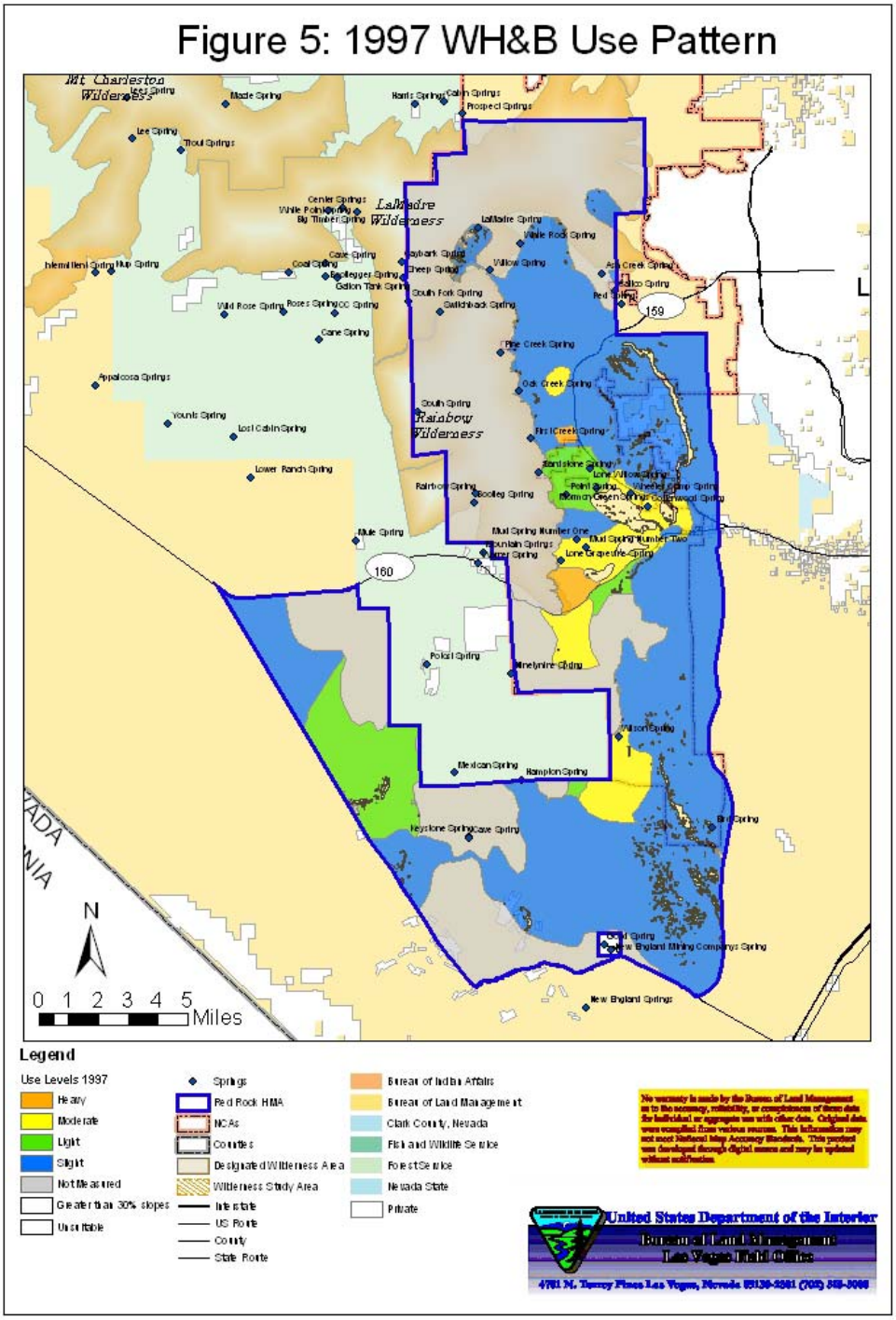


Figure 5: 1997 WH&B Use Pattern
Mt Charleston Wilderness
LaMadre Wilderness
Rainbow Wilderness
159
160
N
0 1 2 3 4 5 Miles
Legend
Use Levels 1997
Heavy
Moderate
Light
Slight
Not Measured
Greater than 30% slopes
Unsuitable
Springs
Red Rock HMA
NCAs
Counties
Designated Wilderness Area
Wilderness Study Area
Interstate
US Route
County
State Route
Bureau of Indian Affairs
Bureau of Land Management
Clark County, Nevada
Fish and Wildlife Service
Forest Service
Nevada State
Private
United States Department of the Interior

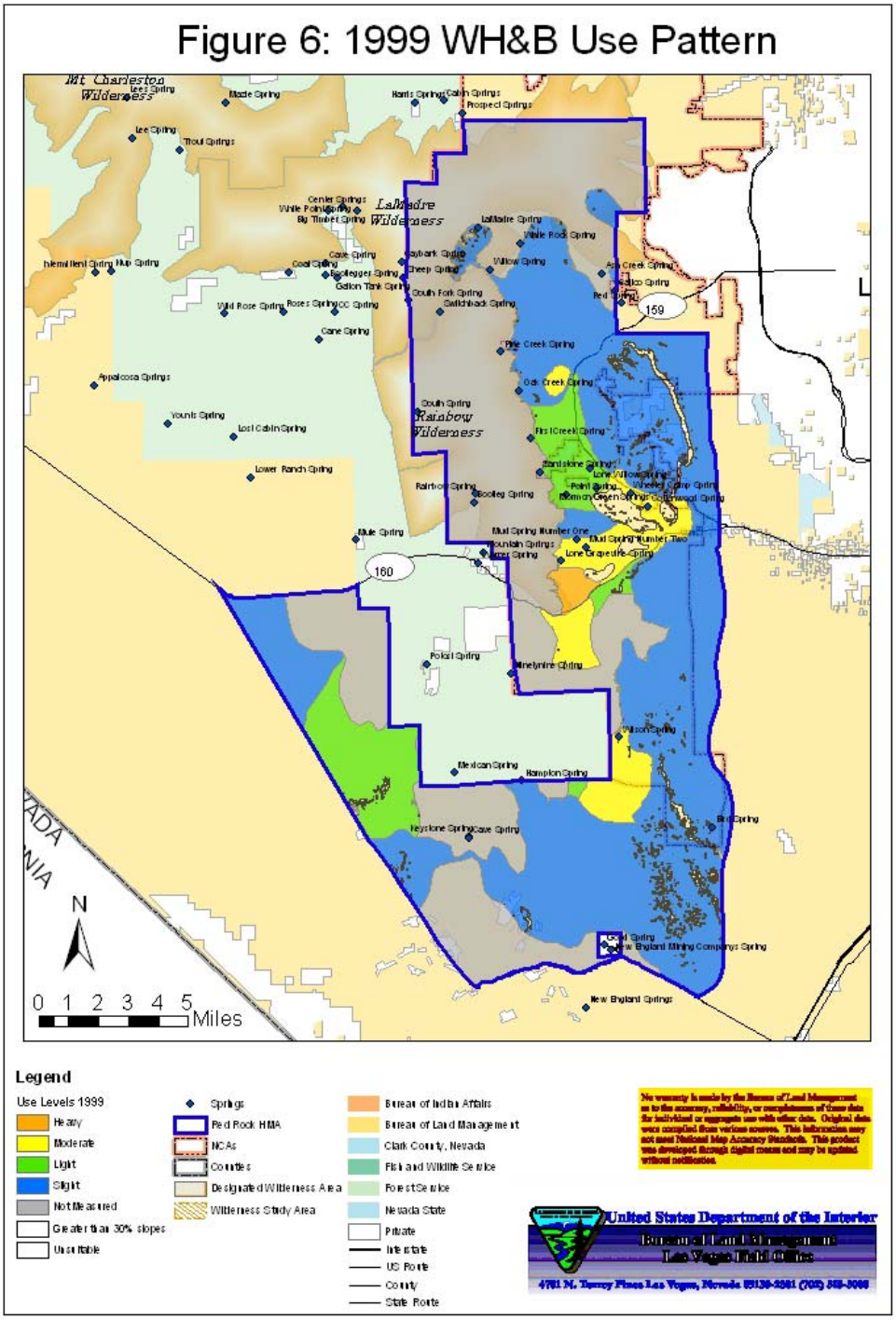


Figure 6: 1999 WH&B Use Pattern
Mt Charleston Wilderness
LaMadre Wilderness
Rainbow Wilderness
159
160
N
0 1 2 3 4 5 Miles
Legend
Use Levels 1999
Heavy
Moderate
Light
Slight
Not Measured
Greater than 30% slopes
Unsuitable
Springs
Red Rock HMA
NCAs
Counties
Designated Wilderness Area
Wilderness Study Area
Bureau of Indian Affairs
Bureau of Land Management
Clark County, Nevada
Fish and Wildlife Service
Forest Service
Nevada State
Private
Interstate
US Route
County
State Route
United States Department of the Interior

Figure 7: 2000 WH&B Use Pattern

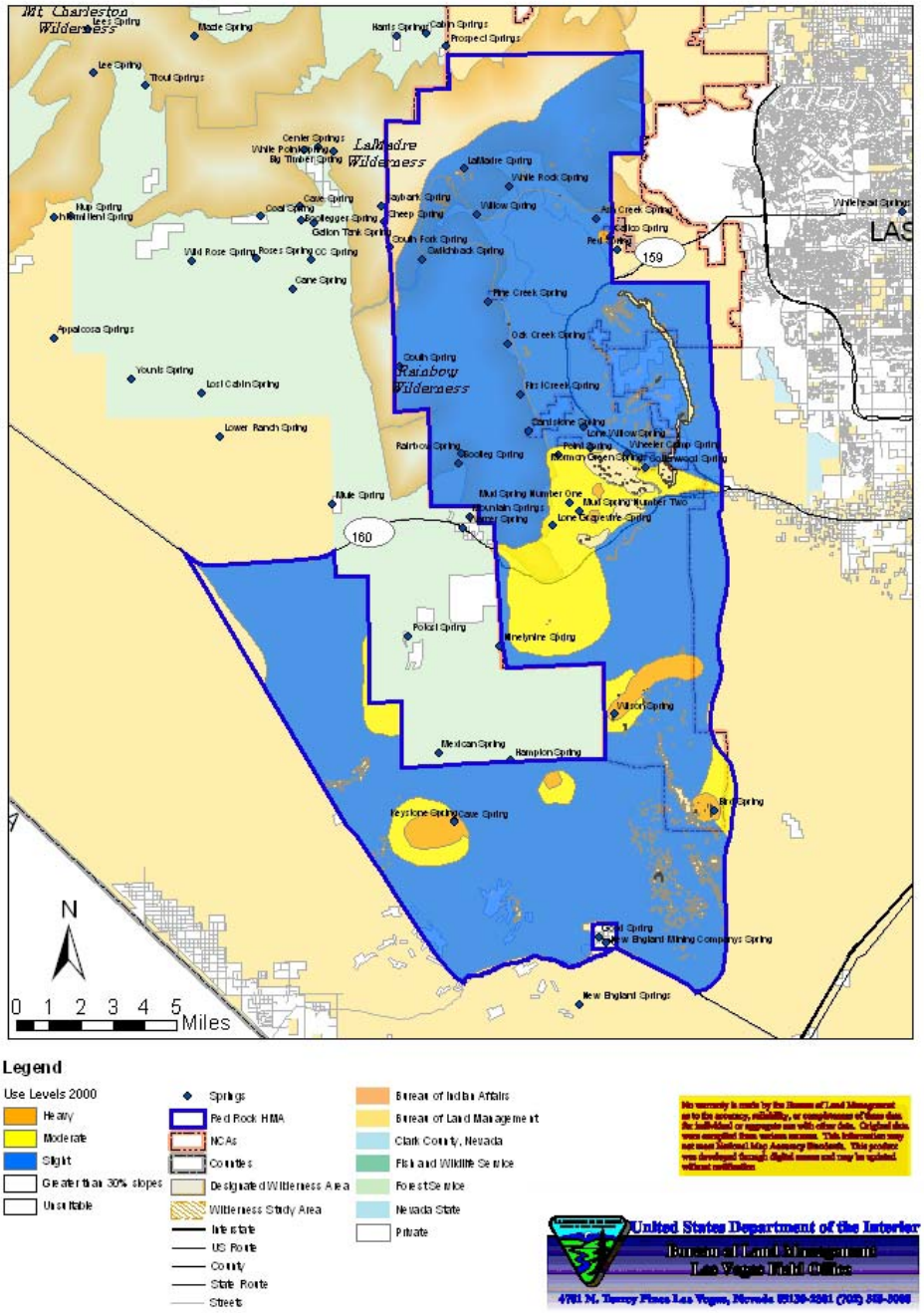
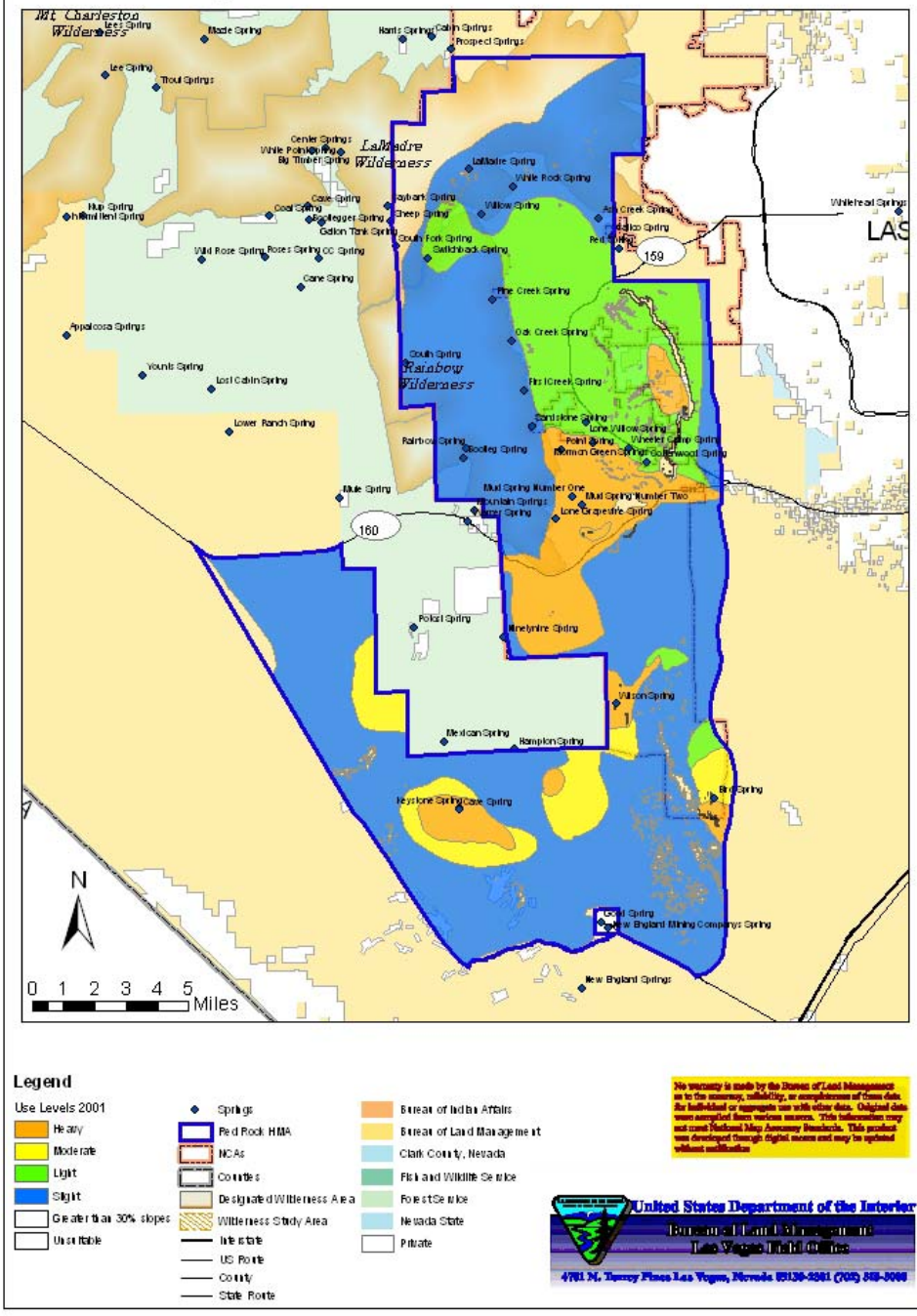


Figure 8: 2001 WH&B Use Pattern



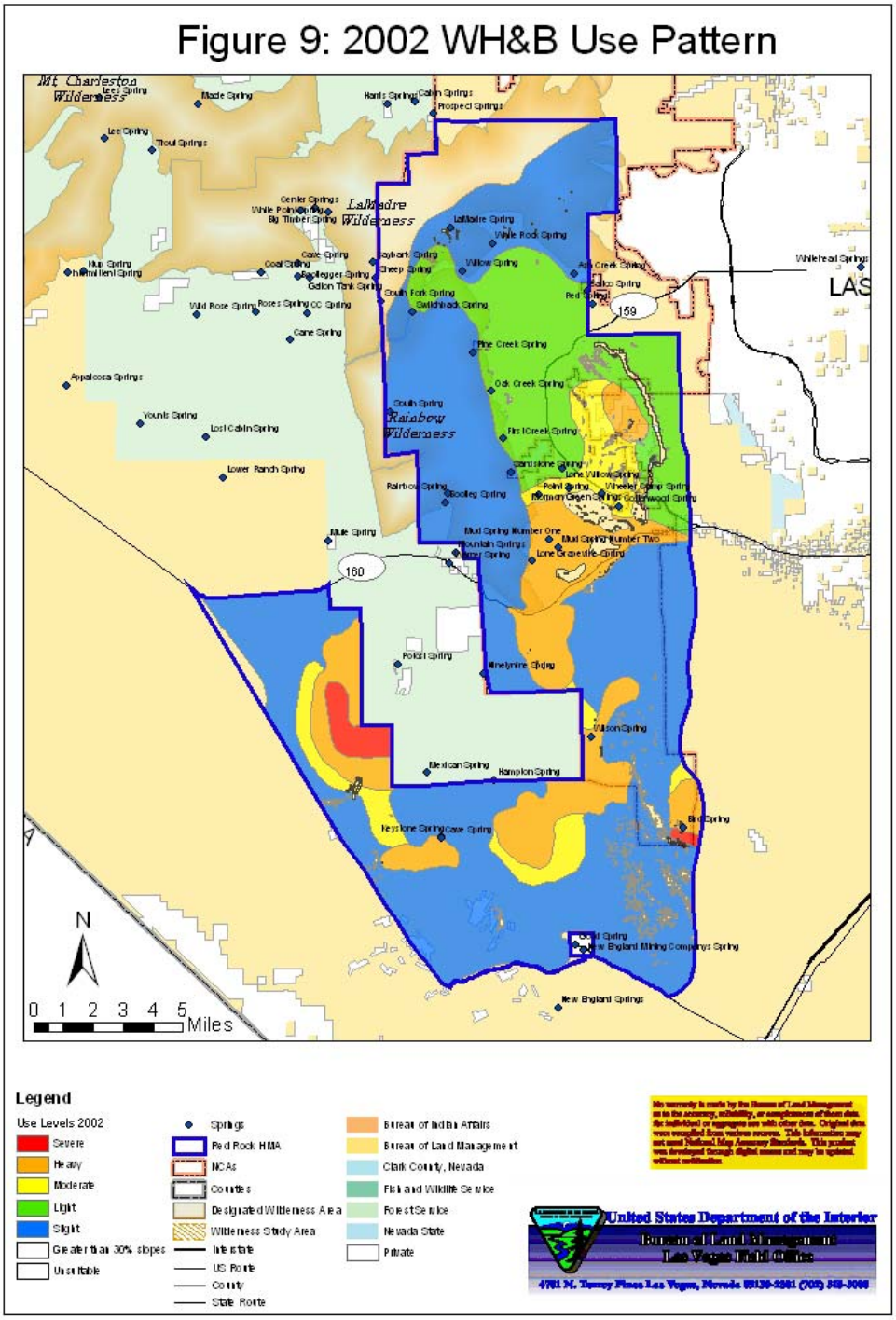


Figure 9: 2002 WH&B Use Pattern
Mt Charleston Wilderness
LaMadre Wilderness
Rainbow Wilderness
159
160
N
0 1 2 3 4 5 Miles
Legend
Use Levels 2002
Severe
Heavy
Moderate
Light
Slight
Greater than 30% slopes
Unsuitable
Springs
Red Rock HMA
NCAs
Counties
Designated Wilderness Area
Wilderness Study Area
Interstate
US Route
County
State Route
Bureau of Indian Affairs
Bureau of Land Management
Clark County, Nevada
Fish and Wildlife Service
Forest Service
Nevada State
Private
United States Department of the Interior

Appendix 2

Monthly Climate Data for the Red Rock Herd Management Area

RED ROCK CANYON ST PK, NEVADA

Monthly Total Precipitation (inches)

(266691)

File last updated on Mar 31, 2004
*** Note *** Provisional Data *** After Year/Month 200312
a = 1 day missing, b = 2 days missing, c = 3 days,..etc..,
z = 26 or more days missing, A = Accumulations present
Long-term means based on columns; thus, the monthly row may not
sum (or average) to the long-term annual value.
MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5
Individual months not used for annual or monthly statistics if more than 5 days are missing.
Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

Year	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC		ANN
1977	0	z	0	z	0	z	0	z	1		0.2		0.7		2.3		0.9		0.5		0.1		2.5		8.16
1978	3.3		3.2		4.3		3.2		0.7		0		0.1		0.5		0.2		0.7		1.8		0	z	17.9
1979	4.3		0.9	b	3.1		0.1		0.2		0		1.6		2.3		0		0		0.1		0.3		12.9
1980	4.7		4.6		2.5		0.2		0.7		0		2.7		0.1		0	b	0.1		0		0		15.5
1981	0.8		0.4		3.4		0.5		0.8		0		0		0.4		0.9		0.9		1.2		0		9.24
1982	1.7	a	0.8		2.8		1.4		0.3		0		2.2		3.5		0.5		0.5	a	1.4		2.9		17.9
1983	2.5		2.1	a	4.9	a	0.8		0.1		0		0.1		9		0.6		0.6		1.5		1.6		23.9
1984	0		0	z	0	z	0.1		0		0		3.6		3		0		0.1		2.7		3	c	12.4
1985	0.9		0	b	0	z	0.5		0.2		0		2.6		0.4		0.9		0		1.4		0.1		6.89
1986	0.8		1.5		7		0		0		0		0.7		0		0.1		0.4		0	z	0		10.5
1987	0.8		0	b	0.8		1.2		0		0.5		0.9		0.4		0.2		1		2.4		1.4	a	9.55
1988	1.9		0.1		0		1.9		0.3	a	0.1		0.4		2.3		0.1		0		0.8		0	a	7.96
1989	0.2		1		1.1		0		0		0		0		0		0		0		0		0		2.34
1990	1.1		1.6		0		0.1		0.2		0.6		1.9		1		0.8		0		0.1		0		7.45
1991	0		0.9		4.1	a	0		0.1		0.1		0.2		0.4	a	0.2		0		0.6		0.7		7.3
1992	1.4	a	4.1		7.1		0.1		0.1		0		0.6		0		0		1.9		0		1.4		16.5
1993	5.7	c	5.2		0.7	a	0		0.1		0.5		0		0.2		0		0		0.5		0.8		13.7
1994	0.1		1.8		0.7		0.2	a	0.1		0		0.3		0		0.8		0		1		1.4		6.35
1995	5.6	a	1.2		3.1		0.3		0.5		0.1		0	z	1.1		0		0		0		0.4		12.3
1996	0		4.7		0.3		0		0.6		0		0		0		0		0.6		1.5		1		8.58
1997	2.6		0.6		0		0		0		0.1		0.3		0.5		3.5		0.1		1.1		0.1		8.87
1998	0.7		7.3		2.8		0.5		1.5		0.9		0.1		1.2		2.1		0.4		0.2		0.1	b	17.7
1999	0	z	0.3		0		2		0.1		0.5		2.7		0		1.2		0		0		0		6.67
2000	0.3	a	5.2	a	0.6		0.6		0.1		0	z	0		0.9		0		1.3		0		0.1	a	8.87
2001	2.6		3.2		0.8		1.3		0		0		1.5		0.6		0		0.2		0.5		0.2		10.8
2002	0.2		0		0.2		0.1		0		0		1.7	a	0	z	0		1	a	0.1		1	b	4.49
2003	0		2.9		1.7		0.9		0	z	0		0.2		0.7	a	0		0		1.1		2	a	9.53
2004	0.2		1.9	m	0.3	l	0	z	0	z	0	z	0	z	0	z	0	z	0	z	0	z	0	z	0.17

Period of Record Statistics																									
MEAN	1.6		2.1		2.2		0.6		0.3		0.1		1		1.2		0.5		0.4		0.8		0.8		11.6
S.D.	1.8		2		2.1		0.8		0.4		0.2		1.1		1.9		0.8		0.5		0.8		1		5.37
SKEW	1.1		0.9		0.9		1.7		1.6		1.7		0.9		3		2.5		1.4		0.8		1		0.57
MAX	5.7		7.3		7.1		3.2		1.5		0.9		3.6		9		3.5		1.9		2.7		3		23.9
MIN	0		0		0		0		0		0		0		0		0		0		0		0		2.34
NO YRS	26		25		24		26		26		26		26		26		27		27		26		26		17

RED ROCK CANYON ST PK, NEVADA

Monthly Average Maximum Temperature (Degrees Fahrenheit)

(266691)

File last updated on Mar 31, 2004
*** Note *** Provisional Data *** After Year/Month 200312
a = 1 day missing, b = 2 days missing, c = 3 days, ..etc..,
z = 26 or more days missing, A = Accumulations present
Long-term means based on columns; thus, the monthly row may not
sum (or average) to the long-term annual value.
MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5
Individual months not used for annual or monthly statistics if more than 5 days are missing.
Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

Year	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC		ANN
1977	-----	z	-----	z	-----	z	-----	z	71.5		94.3		97.8	a	94.9	a	85.3	c	79.7		67.1	a	58.7		81.2
1978	51.2		56.8	a	63.8		66.6		78.7	e	92	a	97.37	a	95.3	c	85.4	b	81.1	b	59.4		-----	z	75.2
1979	44.5		52.9		60.4		70.5		81		91.6		97.57	a	91		93.1		79.9		60.8		58		73.5
1980	54.8		58.2		58.7		76.6	h	75.8		90.4		97.23		97.8	h	88.6	k	78.4		66.2		62.7	b	71.4
1981	58.8		59.2		60.3		75.2		80.4		96.2		99.67	a	98.1		88.9		71.6		65.9		58.4	a	76
1982	51.7		57.3		59		69		80.6		88.8		94.58		93.7		85		72.2		57.7		51.5		71.7
1983	54.9		55.4		59.8		63.2		79.5		89.9		95.42		89.1		88.8		74.7		61.7		54.3		72.2
1984	55.3		58.5		65.8		69.7		88.4		90.6		95.16		90		89.3		70.6		60.9		48.7		73.6
1985	52.4		54.8		-----	z	77.2		83.8		96		98.74		97.3		82.5		75.9		58.6		57		75.8
1986	61.5		60.5		68.5	c	72.4		84.6		96.2		95.03		98.7		82		73.4		-----	z	53.8		77
1987	50.6		56.5		60.8		77.2	a	80.4		93.3		93.39		94.5		89.7		80.5		59.2		47		73.6
1988	50.7		60.6		64.1		70.5		80.2		91.6		99.23		93.5		87.3		84.1		62.3		52.3		74.7
1989	49.7		55.3		68		79.8		81		90.8		100		93.9		88		75.6		66.9		58.8		75.7

1990	52.2		54.4		67		75		78.4		90.7	a	97.26		92.1		88.7		78.3		63.3		50		74
1991	51.6		64.5		54.7		69.1		75.7		86.6		96		94.2		87.8		79.6		61.2		53.6		72.9
1992	51.6		57.4		59.5		75.4		83		88.1		93.16		95.7		89.5		78.4		58.4		46.6		73.1
1993	49		52.2		64.4		72		82.1		87.2		94.03		94		88.5		75.5		58.8		52.8		72.5
1994	56.8		51.6		69		72		79.7		94.3		99.16		98.1		88.2		72.7		52.8		53.2	a	74
1995	48.1		64.8		60.1		67.6		74.3		84.8		-----	z	95.4		90.1		77.8		70.3		56.9		71.8
1996	57.4		62		66.2		73.6		82.3		93.4		99		98.8		87.1		74.8		63.6		53.7		76
1997	51.6		58.4		71.6		70.6		86.7		89.4		94.71		97.7		85.4		73.8		63.2		50.9		74.5
1998	54.5		51.1		61.5		64.3		73		83.7		98.45		96.7		83.5		71.2		60.3		53.9		71
1999	-----	z	59.1		67		63.6		78.9		88.7		92.13		92.6		87.5		80.6		68.4		56.2		75.9
2000	56.8		56.8		63		74.6		84.8		-----	z	96.48		95		88.5		72.7		56.1		57.9		73
2001	50.9		52.6		65.8		68.9	a	89.3		93.9		94.68		97.9		91.6		79.7		64.2	f	50.4		76
2002	53.4		59.9		62		75.7		81.5		94.8		100.1		-----	z	88.2		73.3		63.2		50.5		73
2003	61.6	j	56.3		62.9		65.9		81.4	e	92.3	e	99.87		93.3		89.9		84.2		55.7		52.8	e	75.9
2004	53	f	51.4	m	71	k	-----	z	-----	z	-----	z	-----	z	-----	z	-----	z	-----	z	-----	z	44	z	9999

Period of Record Statistics																									
MEAN	52.9		57.2		63.4		71.2		80.6		91.1		96.78		94.9		87.7		76.7		61.7		53.9		73.7
S.D.	3.73		3.64		3.99		4.49		4.26		3.38		2.37		2.67		2.62		3.89		4.23		3.95		1.46
SKEW	0.19		0.26		0.06		-0.09		-0.09		-0.38		-0.23		-0.35		-0.4		0.2		0.09		0.13		0.09
MAX	61.5		64.8		71.6		79.8		89.3		96.2		100.1		98.8		93.1		84.2		70.3		62.7		76
MIN	44.5		51.1		54.7		63.2		71.5		83.7		92.13		89.1		82		70.6		52.8		46.6		71
NO YRS	24		26		25		25		27		26		26		25		26		27		25		26		16

RED ROCK CANYON ST PK, NEVADA

Monthly Average Minimum Temperature (Degrees Fahrenheit)

(266691)

File last updated on Mar 31, 2004
*** Note *** Provisional Data *** After Year/Month 200312
a = 1 day missing, b = 2 days missing, c = 3 days, ..etc..,
z = 26 or more days missing, A = Accumulations present
Long-term means based on columns; thus, the monthly row may not
sum (or average) to the long-term annual value.
MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5
Individual Months not used for annual or monthly statistics if more than 5 days are missing.
Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

Years	JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC		ANN
1977	-----	z	-----	z	-----	z	-----	z	47.8		67.1		75.4	b	69.74	d	59.7	d	53.6		39.7	a	38.7	a	56.5
1978	34.7		36.8	a	43.8		43.3	b	49.5	f	64	d	71.2	a	66.89	d	56.7	c	54.2	b	37	a	-----	z	50.9
1979	26.9	a	30.5	a	39.3	a	46.6		52.3		62.2	a	71.2	a	65.65		62.6	a	50.1		35.7		32.9		48
1980	35		38.8		37.6		45.3		48.4		62.3		70.5		68.45		60		49.7		40.3		37.3	b	49.5
1981	36.4		37.6		39.6		51.3		56.4		71.4		77.2	a	72.19		64.6		48.1		42.5		36.2	a	52.8
1982	32		35.3		39		46.4		53.1		61.6		69.2		68.74		58.6		44.2		35.4		30.7		47.9
1983	32.8		35.9		40.4		39.5		52.1		63.2		69		64.52		63.7		48.7		38.3		32.3		48.4
1984	29.9		31.9		39.7		42.5		59.8		61.1		66.6		63.77		59.7		40.1		35.9		28.9		46.7
1985	27.4		28.5	a	-----	z	48.1		54.4		65.8		70.6		70.42		55.5		47.2		35		31.6		48.6
1986	35.8		36.9		41.4	c	44.2		54.5		66.5		67.7		71.47	a	56.1		45.8		-----	z	30.3		50.1
1987	27.1		31.9		36.2		46.9	a	52		63.5		66.2		67.58		59.2		50.5		36.4		26.2		47
1988	28		31.7		37.4		45.2		50.7		61.5		74.9		67.16		57.1		52.7		39		27.9		47.8

1989	24.7		30.6		43.3		50.2		56.7		64		73		68.35		58.2		46.4		35.4		27.5		48.2
1990	27.3		28.4		40.5		47.4		53.8		65		70.8		67.58		60.7		47.5		35.5		21.8		47.2
1991	28.2		35.4		34.8		43.4		48.9		60.9		66.8		67.1		58.6		50.1		36.1		29.7		46.7
1992	27.2		35.5		39.7		49		56.5		62.6		68		70.55		61.1		50.1		31.7		26.8		48.2
1993	29.7		33.9		38		45.4		55.1		57.2		68.9		65.29		57.8		47.5		31.2		26.7		46.4
1994	29.1		28		39.4		46.6		52.7		70.1		72.5		72.19		61.2		45.4		28.9		28		47.8
1995	32.1		36.7		37.4		41.1		48.9		54.2		-----	z	73.13		60.9		44.9		38.3		30.8		45.3
1996	30.7		35.1		39.2		43.9		55.7		64.8	a	74.4		69.84		59.9		44		37		30.6		48.8
1997	32.1		31.4		38		44		58	a	64.6		62.8		71	a	59.3		43.2		36		25.9		47.2
1998	30.3		32.2		34.8		38.3		46.8		55.6		67.2		67.74		55.8	b	42.3		32.7		27.2		44.2
1999	-----	z	30.9		36.7		37.6		49.5	c	62.5		67.7		63.55		57		46.4		36.5		27.6		46.9
2000	31.9	a	34.4	a	36.1	b	47.8	a	57.5		-----	z	71.5		70.07	a	58.3		46.8	a	28.7	c	29.6	f	48.3
2001	27.7	b	31.5		38.1		42.8	a	56.4	a	65.2	b	67	f	67.03	a	59.1	b	49.2		36.6	f	27.5	e	46.5
2002	25.8		27.8		33.2		50		53.8		65.1		72.7		-----	z	59.3		46.5		35.5		29.2		45.4
2003	32	j	33.6		37.8		41.2	d	52.5	g	63.8	e	73.7	f	70.81	e	59.6		51.8		33.6		27.9	e	46.7
2004	24.8	f	28.4	m	42.4	k	-----	z	-----	z	-----	z	-----	z	-----	z	-----	z	-----	z	-----	z	26	z	9999

Period of Record Statistics																									
MEAN	30.1		33.1		38.5		44.9		53.3		63.3		70.3		68.49		59.3		47.7		35.7		29.6		47.8
S.D.	3.27		3.17		2.47		3.59		3.5		3.78		3.39		2.64		2.24		3.43		3.28		3.77		1.73
SKEW	0.37		-0.08		0.1		-0.26		-0.17		-0.38		0.05		-0.18		0.44		-0.04		-0.35		0.72		0.97
MAX	36.4		38.8		43.8		51.3		59.8		71.4		77.2		73.13		64.6		54.2		42.5		38.7		52.8
MIN	24.7		27.8		33.2		37.6		46.8		54.2		62.8		63.55		55.5		40.1		28.7		21.8		44.2
NO YRS	24		26		25		26		25		26		24		26		27		27		25		25		17

Appendix 3

Information on Springs in the Red Rock Canyon NCA

Springs in Red Rock Canyon NCA and Their Relation to Horse and Burro

Red Spring (Fenced)
Red Spring is located in Calico Basin at an elevation of 3620'. The spring run below the source is approx. 1000' in length with an average discharge of 7.5 gallons per minute. The majority of the spring and its run are fenced, however the spring source is not. There is a population of *Calochortus striatus* (Mariposa lily) found at the upper end of the spring and Pyrgulopsis deaconi (Spring Mountain spring snail) is found at the source. There are heavy impacts from burro around the outside of the fence enclosure as well as at the source. This spring is not in the Red Rock Canyon NCA HMA. There is also heavy recreational use in the area that impacts the spring source. Current conditions at the spring are as follows:

- **PFC**
- Restoration plan in progress
- Burro impacts are heavy at the spring source
- Heavy visitor use
- High bank stability with a high % ground cover
- High % emergent cover
- Located outside of the current BLM HMA

Calico Spring (Not fenced)
Calico Spring is located in Calico Basin at an elevation of 3920' and has no protective fencing. The spring run below the source is approx. 300' with an average discharge of 0.5 gallons per minute. There is a small population of *Arctomecon meriamii* (White bearpoppy) on the north facing slopes of the spring. On 4-18-2002, a rare aquatic lichen (*Dermatocarpon luridum*), was found within the spring itself. Impacts from burro grazing are light. Calico Spring may become dry in extreme drought conditions. Current conditions at the spring are as follows:

- **PFC**
- A recreational trail parallels the banks of the spring
- Burro impacts are light
- Moderate visitor use
- High bank stability with a high % ground cover
- High % emergent cover
- Located outside of the current BLM HMA

Ash Spring (Not fenced)
Ash Spring is located in Calico Basin at an elevation of 3740'. The stream run below the spring can be greater than 1000' in length with an average discharge of 1 gallon per minute. There is no protective fencing at the spring source or its run. There is a population of *Calochortus striatus* (Mariposa lily) found at the upper end of the spring. A portion of the spring is located within the BLM HMA and is frequented by burros. This water source is also used by *Orvis canadensis* (Big horn sheep). In recent years the

OHV use at this site has increased, causing resource damage. Large portions of Ash Spring may go dry in extreme drought conditions. Current conditions at this spring are as follows:

- **PFC**
- Portion of spring is within the HMA
- Burro impacts are light
- OHV impacts are increasing
- High bank stability with a high % ground cover
- High % emergent cover

White Rock Spring (Not fenced)

White Rock Spring is located off of the scenic loop drive at an elevation of 4760'. The spring consists of a pipe, taped underground at the source, delivering water to a cemented receiving trough at a rate of 0.5 gallons per minute. There is no protective fencing at the spring as well as no grazing from horse or burro. *Orvis canadensis* use this spring as a water source and *Bufo punctatus* (red spotted toad) breed in the spring tank. White Rock Spring has historically had a population of introduced gold fish. There have been many unsuccessful attempts to eradicate them from the spring. Current conditions at the spring are as follows:

- **Non-functioning condition**
- Spring is restricted to cement trough
- Introduced gold fish population
- Moderate visitor use
- No impacts due to horse or burro
- No bank stability and no ground cover
- Low % emergent cover

La Madre Spring (Not fenced)

La Madre Spring is located off of Rocky Gap road which is off of the scenic loop drive at an elevation of 5550'. The stream run below the spring is greater than 2000' with an average discharge of 1.5 gallons per minute. Approximately half way down from the source is a small dam that forms a pool. There is no protective fencing as well as no grazing from horse or burro. *Orvis Canadensis* use the spring as a water source, *Bufo punctatus* and *Pseudacris regilla* (Chorus frog) breed in the pool. There is a population of the endemic *Pyrgulopsis turbatrix* (Spring mountain spring snail) found from the source to the pool. A hiking trail runs adjacent to the stream and there is moderate impact from recreational users. Current conditions at the spring are as follows:

- **PFC**
- Small cement dam
- There is a current study to identify sensitive butterfly species at this spring.
- No impacts due to horse or burro
- Low visitor use
- High bank stability with a high % ground cover
- High % emergent cover

South Fork Spring (Not fenced)
South Fork Spring is located off of Rocky Gap Road off of the scenic loop drive at an elevation of 5680'. The stream run below the spring is greater than 2000' with an average discharge of 7.9 gallons per minute. There is no protective fencing as well as no grazing from horse or burro. *Orvis Canadensis* use the spring as a water source, *Bufo punctatus* and *Pseudacris regilla* (Chorus frog) breed in pools along its run. *Angelica scabrida* (Rough angelica) is found from the source to where the stream cuts the road. A hiking trail runs adjacent to the stream and there is slight impact from recreational users. Current conditions at the spring are as follows:

- **PFC**
- There is a current study to identify sensitive butterfly species at this spring.
- No impacts due to horse or burro
- Low visitor use
- High bank stability with a high % ground cover
- High % emergent cover

Willow Spring (Fenced)
Willow Spring is located off of the scenic loop drive at an elevation of 4510'. The spring source is piped to a cemented basin that over flows and forms a small stream with an average discharge of 4.5 gallons per minute. A portion of the spring is fenced for protection from visitors impacts, there are no horse or burro impacts and *Orvis Canadensis* use the spring as a water source. Prior to the fencing project (1998, Tim Rash), populations of both *Pyrgulopsis turbatrix* and *Pyrgulopsis deaconi* were thought to have been extirpated. On May 15, 2002 Patrick Putnam confirmed that a *Pyrgulopsis sp.* population had survived and was present. The area is a popular picnic spot and is heavily impacted by recreational users. Current conditions at the spring are as follows:

- **Functioning at-risk with an upward trend**
- Spring source is piped to a cement basin
- No impacts due to horse or burro
- High visitor use
- Moderate bank stability with a moderate % ground cover
- High % emergent cover

Lost Creek Spring (Fenced)
Lost Creek Spring is located off of the scenic loop drive at an elevation of 4480'. The stream run below the spring is greater than 1000' in length and has an average discharge of 49 gallons per minute. A portion of the stream is fenced to alleviate visitor impacts and a viewing boardwalk was built in 2001 (Tim Rash). A large population of *Pyrgulopsis turbatrix* are found in the boardwalk area of the stream. *Angelica scabrida* (Rough angelica) is found along the upper portions of the creek. There is no impact from horse or burro at this site. A very popular hiking trail parallels the stream to its waterfall. Current conditions at the spring are as follows:

- **PFC**
- No impacts due to horse or burro
- High visitor use

- High bank stability with high % ground cover
- High percent emergent cover

Pine Creek (Not fenced)
Pine Creek is located off of the scenic loop drive at an elevation of 4200'. The stream run below the spring is greater than 2000' and has an average discharge of 25 gallons per minute. There is no protective fencing and only moderate impacts from horse and burro. *Orvis Canadensis* use the spring as a water source, *Bufo punctatus* and *Pseudacris regilla* (Chorus frog) breed in pools along its run. *Angelica scabrida* (Rough angelica) is found along the upper portions of the creek. A very popular hiking trail parallels the stream and visitors commonly can be found recreating along its banks. Current conditions at the spring are as follows:

- **PFC**
- Moderate impacts from horse and burro use
- High visitor use
- High bank stability with high % ground cover
- High percent emergent cover

Oak Creek (Not fenced)
Oak Creek is located off of the scenic loop drive at an elevation of 4220'. The stream run below the spring is greater than 2000' and has an average discharge of 30 gallons per minute. There is no protective fencing and only moderate impacts from horse and burro. *Orvis Canadensis* use the spring as a water source, *Bufo punctatus* and *Pseudacris regilla* (Chorus frog) breed in pools along its run. *Angelica scabrida* (Rough angelica) is found along the upper portions of the creek. A very popular hiking trail parallels the stream and visitors commonly can be found recreating along its banks. Current conditions at the spring are as follows:

- **PFC**
- Moderate impacts from horse and burro use
- High visitor use
- High bank stability with high % ground cover
- High percent emergent cover

First Creek (Not fenced)
First Creek is located off of HWY 159, past the exit to the scenic loop drive, at an elevation of 4080'. The stream run below the spring is greater than 2000' and has an average discharge of 10 gallons per minute. There is no protective fencing and only moderate impacts from horse and burro. *Orvis Canadensis* use the spring as a water source, *Bufo punctatus* and *Pseudacris regilla* (Chorus frog) breed in pools along its run. *Angelica scabrida* (Rough angelica) is found along the upper portions of the creek. There is a population of *Pyrgulosis turbatrix* at the spring source that may be in danger due to the introduction of *Pasifastacus lenisculus* (Crayfish). The crayfish population is currently only in the lower portion of the stream and not at the source. A popular hiking trail parallels the stream and visitors commonly can be found recreating along its banks. Current conditions at the spring are as follows:

- **PFC**

- Presence of introduced predator species (*Pasifastacus leniscculus*)
- Moderate impacts from horse and burro use
- High visitor use
- High bank stability with high % ground cover
- High percent emergent cover

Lone Willow Spring (Not Fenced)
Lone Willow Spring is located off of Bonnie Springs road, a quarter of a mile from the junction of Bonnie Springs road and HWY 159 at an elevation of 4000'. The spring is unfenced and appears as a seep with a discharge of less than 0.1 gallons per minute. The area is heavily impacted by horse and burros. There are no known sensitive species associated with this spring. The current conditions at the spring are as follows:

- **Non-functioning condition**
- High impacts from horse and burro
- Low visitor use
- Low bank stability with low % ground cover
- Low percent emergent cover

Mormon Green II Spring (Not Fenced)
Mormon Green II Spring is located off of HWY 159 behind Oliver Ranch at an elevation of 3720'. The stream run below the spring is greater than 2000' with an average discharge of 1.1 gallons per minute. There is no protective fencing and only moderate impacts from horse and burro. *Bufo punctatus* and *Pseudacris regilla* (Chorus frog) breed in pools along its run. The current conditions at the spring are as follows:

- **PFC**
- Moderate impacts from horse and burro
- Low visitor use
- High bank stability with high % ground cover
- Moderate percent emergent cover

Mormon Green I Spring (Not fenced)
Mormon Green I Spring is located off of HWY 159 behind Oliver Ranch at an elevation of 3600'. The stream run below the spring is less than 600' with an average discharge of 0.2 gallons per minute. There is no protective fencing and only moderate impacts from horse and burro. *Bufo punctatus* and *Pseudacris regilla* (Chorus frog) breed in pools along its run. The current conditions at the spring are as follows:

- **PFC**
- Moderate impacts from horse and burro
- Low visitor use
- High bank stability with high % ground cover
- Moderate percent emergent cover

Wheeler Camp Spring (Fenced)
Wheeler Camp Spring is located off of HWY 159 east of the Oliver Ranch turnoff at an elevation of 3550'. The stream run below the spring is less than 200' with an average

discharge of 16 gallons per minute. The spring source and most of its run are fenced. The lower portion has been left open to serve as a water source for horse and burro. *Bufo punctatus* and *Pseudacris regilla* (Chorus frog) breed in pools along its run. The current conditions at the spring are as follows:

- **PFC**
- Slight impacts from horse and burro
- Low visitor use
- High bank stability with high % ground cover
- High percent emergent cover

Mud I Spring (Fenced)

Mud Spring I is located at an elevation of 3862' and was fenced in 1996. The spring brook length is approx. 200' with a discharge of 1.5 gallons per minute. The associated riparian area was heavily grazed and trampled by horse and burro prior to the fencing project. Current conditions at the spring are as follows:

- Approx. 70% of riparian area is fenced
- Spring source is **not** fenced
- A portion of the spring flow is diverted to a trough downstream.
- **Non-Functioning Condition**
- Low bank stability with low % ground cover
- Low percent emergent cover

Mud II Spring (Not fenced)

Mud Spring II is located at an elevation of 3790' and is not fenced. The spring and riparian area are heavily impacted by horse and burro. The spring is located in a wash and is subject to flash floods resulting in a scouring of the riparian area. Current conditions at Mud Spring II are as follows:

- Spring flow is represented by small seeps resulting in small pooled areas
- **Non-Functioning Condition**
- Low bank stability with low % ground cover
- Low percent emergent cover

Lone Grapevine Spring (Not Fenced)

Lone Grapevine Spring is located at an elevation of 4037' and was fenced in 1996. The associated riparian area was heavily grazed by horses prior to fencing project. Current conditions at the spring are as follows:

- Approx. 50% of riparian area is fenced
- A portion of the spring flow is diverted to a trough down hill from spring source
- **Proper Functioning Condition**
- High bank stability with high % ground cover
- High % emergent cover

Shovel Spring (Fenced)
Shovel Spring is located at an elevation of 4029' and was fenced in 1997. The spring was heavily grazed by horse and burro prior to the fencing project. Current conditions at the spring are as follows:

* Entire riparian area is fenced
* **Functional-at risk with an upward trend**.
* Low bank stability with a Low % ground cover
* High % emergent cover

Tunnel Spring (Not fenced)
Tunnel Spring is piped from the source to a head box and than to a guzzler. There is no associated riparian area. The guzzler is used by horses. The approximate flow rate of the spring is 1 gallon per minute. Current conditions at the spring are as follows:

- **Non-functioning condition**
- **Some horse activity**

Table 1: Physical Characteristics of springs in Red Rock Canyon NCA in relation to horse and burros

Spring Name	Key Area	Elevation	Fenced/Not fenced	Diversion	PFC	Gallons/ minute
Red Spring	South Loop	3620'	Fenced	No	PFC	7.5 gpm
Calico Spring	South Loop	3920'	Not fenced	No	PFC	0.5 gpm
Ash Spring	South Loop	3740'	Not fenced	No	PFC	1 gpm
White Rock Spring	South Loop	4760'	Not fenced	Water piped from source to trough	Non-functioning	0.5 gpm
La Madre Spring	South Loop	5550'	Not fenced	No	PFC	1.5 gpm
South Fork Spring	South Loop	5680'	Not fenced	No	PFC	7.9 gpm
Willow Spring	South Loop	4510'	Fenced	Spring source is a cemented trough	Functional at-risk with upward trend	4.5 gpm
Lost Creek Spring	South Loop	4480'	Human fencing	No	PFC	49 gpm
Pine Creek	South Loop	4200'	Not fenced	No	PFC	25 gpm
Oak Creek	South Loop	4220'	Not fenced	No	PFC	30 gpm
First Creek	South Loop	4080'	Not fenced	No	PFC	10 gpm
Lone Willow Spring	Mud Springs		Not fenced	No	Non-functioning	0.1 gpm

Mormon Green II	Mud Springs	3720’	Not fenced	No	PFC	.2 gpm
Mormon Green I	Mud Springs	3600’	Not fenced	No	PFC	1.1 gpm
WheelerCamp Spring	Mud Springs	3550’	Fenced	Spring is partially piped from source	PFC	16 gpm
Mud I	Mud Springs	3862’	Fenced	Portion of spring is piped to a trough	Non-functioning	1.5 gpm
Mud II	Mud Springs	3790’	Not fenced	No	Non-functioning	0.03 gpm
Lone Grapevine	Mud Springs	4200’	Fenced	Portion of spring is piped to a trough	PFC	0.5 gpm
Shovel Spring	Mud Springs	4340’	Fenced	No	Function at-risk with upward trend	0.5 gpm
Tunnel Spring	Wilson Tank		Not fenced	90% of spring flow is piped to trough	Non-functioning	1.0 gpm
Bird Spring	Wilson Tank		Not fenced	90% of spring flow is piped to trough	Non-functioning	0.1 gpm

Table 2: Biological characteristics of springs in Red Rock Canyon NCA in relation to horse and burros

Spring Name	**Key Area**	**Sensitive/ Endemics**	**Horse/ burros**	**Water Suppl.**	**PFC**	**HMA status**
Red Spring	South Loop	*Pyrgulopsis sp.* *Calochortus sp.*	Burros	No	PFC	Out
Calico Spring	South Loop	*Arctomecon sp.*	Burros	No	PFC	Out
Ash Spring	South Loop	No	Burros	No	PFC	In
White Rock Spring	South Loop	No	No	No	Non-functioning	In
La Madre Spring	South Loop	*Pyrgulopsis sp.*	No	No	PFC	In
South Fork Spring	South Loop	No	No	No	PFC	In
Willow Spring	South Loop	*Pyrgulopsis sp.*	No	No	Functional at-risk with upward trend	In
Lost Creek Spring	South Loop	*Pyrgulopsis sp.* *Angelica sp.*	No	No	PFC	In
Pine Creek	South Loop	*Angelica sp.*	Horse burro	No	PFC	In
Oak Creek	South Loop	*Angelica sp.*	Horse burro	No	PFC	In

First Creek	South Loop	*Angelica sp.*	Horse burro	No	PFC	In
Lone Willow Spring	Mud Springs	No	Horse burro	No	Non-functioning	In
Mormon Green II	Mud Springs	No	Horse burro	No	PFC	In
Mormon Green I	Mud Springs	No	Hose burro	No	PFC	In
WheelerCamp Spring	Mud Springs	No	Horse burro	No	PFC	In
Mud I	Mud Springs	No	Horse burro	Yes	Non-functioning	In
Mud II	Mud Springs	No	Horse burro	No	Non-functioning	In
Lone Grapevine	Mud Springs	No	Horse burro	No	PFC	In
Shovel Spring	Mud Springs	No	Horse burro	No	Function at-risk with upward trend	In
Tunnel Spring	Wilson Tank	No	Horse	Yes	Non-functioning	In
Bird Spring	Wilson Tank	No	Horse	Yes	Non-functioning	In

Appendix B

Bureau of Land Management, Las Vegas Field Office, Wild Horse and Burro Program – Red Rock Herd Management Area Description

Bureau of Land Management
Las Vegas Field Office
Wild Horse and Burro Program
Red Rock Herd Management Area

1.0 Red Rock Herd Management Area General Description

The Red Rock Herd Management Area (HMA) is located in southern Nevada, approximately 20 miles west of Las Vegas in Clark County (see General Area Map). The HMA comprises approximately 164,684 acres, of which, approximately 96,608 acres are located within the Red Rock Canyon National Conservation Area (RRCNCA). The HMA is within the Mojave Desert ecosystem, characterized by low precipitation levels, cool winters, and hot summers. Annual average precipitation for the HMA is 12.76 inches. Evapo-transpiration is high with air temperatures averaging 30 °F in the winter to summer temperatures in excess of 90 °F. Average precipitation, and high and low temperatures were determined using data collected during the years 1961-1990 at a weather station maintained by the Western Regional Climate Center, located at Spring Mountain Ranch State Park, within the HMA boundary.

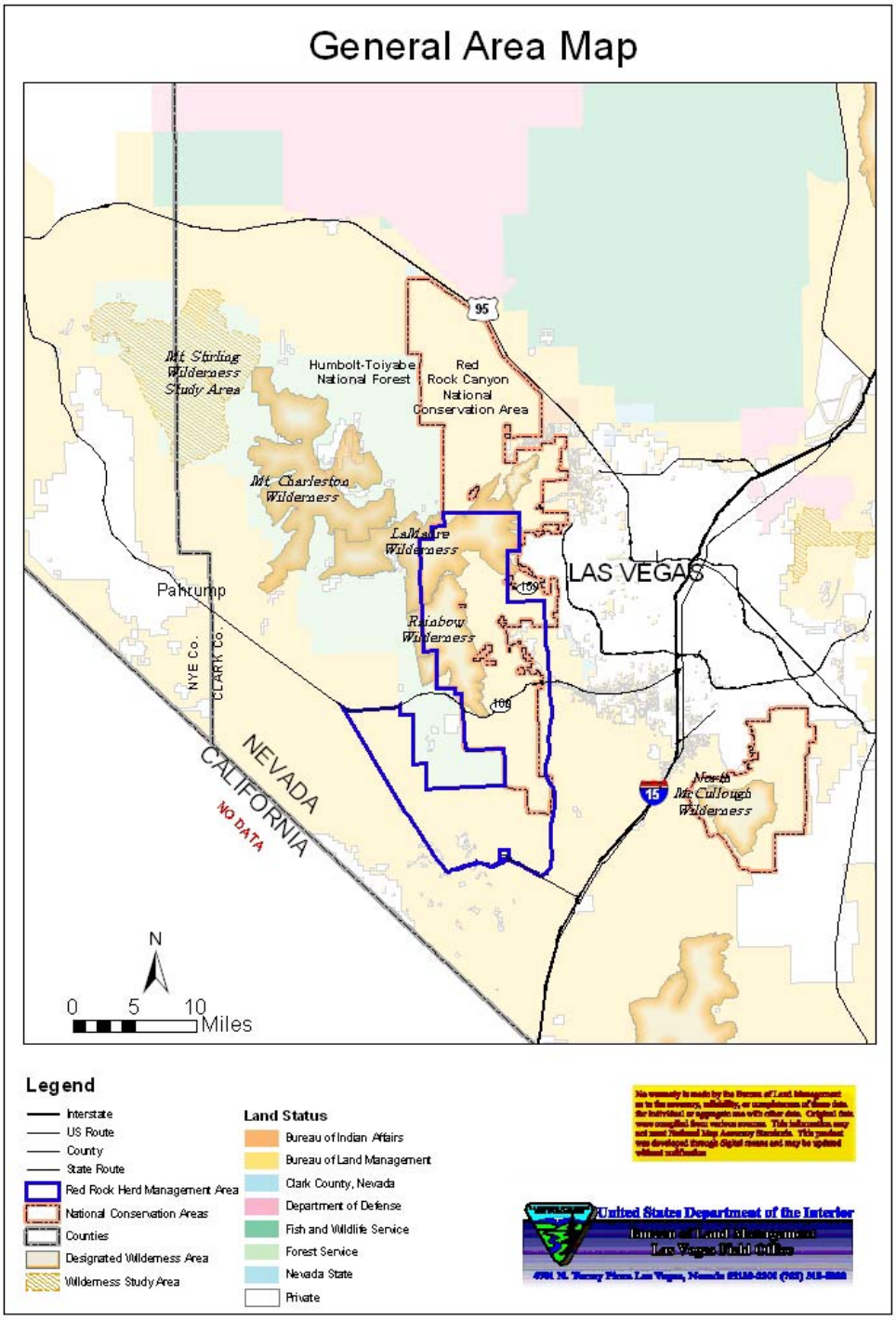
Ecological Sites and Associated Vegetation

The ecological sites and the plant species that dominate those sites comprising most of the acreage in HMA are listed in Table 1.

Table 1. Ecological Sites and Associated Vegetation.

Ecological Site Name	Dominant Plant Species
Coarse Gravelly Loam (5-7" depth)	Blackbrush *(Coleogyne ramossissima)*, Big Galleta *(Hilaria rigida)*, Spiny Menodora (*Menodora spinescens*), Winterfat (*Cerotoides lanata*)
Shallow Gravelly Loam and Slope (7-9" depth)	Blackbrush, Big Galleta, Black Grama (*Bouteloua eriopoda*)
Shallow Gravelly Loam (8-10" depth)	Blackbrush, Desert Needlegrass (*Stipa speciosa*)
Shallow Gravelly Loam (5-7" depth)	Blackbrush, Big Galleta
Limy Fan (5-7" depth)	Big Galleta, Creosote Bush *(Larrea tridentata)*, White Bursage *(Ambrosia dumosa)*
Gravelly Fan (5-7" depth)	White Bursage (*Ambrosia dumosa*), Big Galleta
Shallow Gravelly Slope (5-7" depth)	Blackbrush

Wash sites and a number of woodland sites are dominated by Pinion or Juniper, co-dominant Pinion and Juniper, or Ponderosa Pine. Joshua tree is a common aspect species component of the Blackbrush ecological sites. Other highly palatable grasses located in



the area are Indian Ricegrass (*Oryzopsis hymenoides*) and Bush Muhly (*Muhlenbergia porteri*).

2.0 Wild Horse and Burro Program Management

The Bureau of Land Management (BLM), Las Vegas Field Office (LVFO), manages wild horses and burros within this HMA pursuant to multiple-use resource management requirements established by the *BLM Las Vegas Resource Management Plan (May, 1998),* the *Red Rock Canyon National Conservation Area Interim General Management Plan (December, 2000)*, BLM policies, and implementing regulations under the Wild and Free-Roaming Horse and Burro Act of 1971 (Public Law 92-195).

Historic Background

Mustangs and burros are believed to have been introduced to rangelands comprising the HMA by early Spanish Explorers around 1750. Later, immigrants traveled to the area establishing early settlements along the historic Old Spanish Trail during the 1830s. Late in the 1850s, miners and homesteaders built permanent homes and ranches in the area. Horses and burros frequently escaped or were released by these early inhabitants, and thrived by their ability to adapt to the Southern Nevada climate. These historic herds are the likely ancestors of today's Red Rock HMA wild horses and burros.

From the 1850's until the late 1960's wild horses and burros were unprotected resources. Some were gathered by cowboys and Native Americans to be used for transportation or working livestock; while others were gathered by local ranchers because they competed with sheep and cattle for range forage. These latter horses and burros were often sold to slaughterhouses.

In 1971, in response to public outcry at the inhumane treatment that wild horses and burros received, Congress enacted the Wild and Free-Roaming Horse and Burro Act (PL 92-195). In addition to other requirements, this Act makes it a federal crime for anyone to harass or capture wild horses and burros without proper authority. The U.S. Department of Interior, through the BLM, has primary responsibility and authority for management of wild horses and burros and their HMAs.

Today, management of wild horses and burros is a controversial issue. Wild horses and burros represent an important social and recreational resource to the general public. Viewing wild horses and burros in their historic habitat remains one of the key recreational values to tourists and local visitors to RRCNCA. Strong public support for maintaining historic herds in the Red Rock HMA is a significant political element influencing BLM wild horse and burro policy. Likewise, strong political viewpoints exist for the removal or widespread reduction of horse and burro herds in the HMA. As such, the BLM must balance the dynamics of competing interests through a sound program of multiple use resource management.

Wild Horse & Burro General Use Patterns

Horses tend to reside in areas of the HMA south of State Route (SR 160), while burros tend to reside in areas north of SR 160. During the hot months of the year, burros

occupy areas characterized by ravines that supply shade, while horses tend to occupy open country near water sources. During the cooler season, wild horses and burros utilize a larger portion of the HMA. Wild horses and burros tend to not utilize areas of the HMA that have slopes of 30% or greater. Large areas of the HMA lack permanent water sources, which tend to restrict horse and burro distribution to a few water sources located at lower elevations. As water sources are few and far between, wildlife and wild horses and burros tend to utilize the same water sources year-round. Several of these limited water sources go dry during parts of the year, causing stress to wildlife, wild horses and burros. Horses and burros can travel up to five miles and back every day for water during the drier part of the year, and must drink at least once each day during the hotter part of the year, but can survive by drinking every second day during the winter and early spring. Typically, the average daily water requirement for wild horses and burros is approximately 10 gallons per animal. Horses generally graze on a limited diet of grasses and certain shrubs species, while burros have a more varied diet, eating a variety of grasses, forbs, and shrubs depending on the season and the time of year.

Wild Horse and Burro Population Management

The current Appropriate Management Level (AML) for this HMA is 16-27 horses and 29-49 burros. This estimate is based on a recent evaluation of forage use during the years 1995 through 2003, as presented in *Red Rock Herd Management Area Appropriate Management Level (AML) Evaluation, May, 2004*. Current population levels are estimated at 27 horses and 152 burros. Herd populations are monitored and controlled using the following program sequence: ground census (on a continuing basis); use pattern mapping (annually); aerial population census (every 3 years); herd reduction gathers (every 4-5 years) and determination of AML (every 5 years). Ground censuses are accomplished through direct field observations by BLM staff and National Wild Horse Association (NWHA) volunteers. Implementation of aerial censuses and herd gathers are dependent upon funding availability and priority need across the state. Aerial censuses for the HMA were conducted in 1995, 1997, and 2004. Results of these censuses are presented in Table 9 of the AML evaluation. The next aerial census and gather is scheduled for 2007. Periodically, the planned program cycle is disrupted in order to conduct emergency gathers deemed necessary as a result of extended drought conditions that impact availability of water and/or forage, or to reduce safety hazards associated with human/animal conflicts.

Professional contractors are used to conduct aerial censuses and herd gathers. These contractors are selected and awarded work through a national contract administered by BLM's National Wild Horse and Burro Program Office in Washington D.C. A single helicopter is typically used to conduct aerial censuses and the gathering of wild horses and burros. The helicopter contractor also provides experienced cowboys, 4-wheel drive vehicles, and stock trailers for transporting animals to holding facilities. Local BLM staff provides technical direction and management oversight to the contractor. Volunteers from the NWHA provide assistance and observation during routine and emergency gathers.

Helicopters provide an efficient means to gather and herd animals safely toward wing-type traps that are used to capture horses and burros by funneling them to holding pens. These temporary traps occasionally create localized soil and plant disturbances. Every effort is made to locate trap sites in previously disturbed areas; however, trap site locations are highly dependent upon the logistics surrounding the location of the herds at the time of the gather and the number of animals to be removed. Any significant surface disturbance resulting from herd gathers are restored.

Gather operations are based out of the Oliver Ranch temporary holding facility located within the HMA boundary. These facilities (corrals, pens and loading chutes) are located on previously disturbed land. Oliver Ranch was a private working ranch until 1993, when BLM purchased the property.

Range Monitoring

Vegetation studies (use pattern mapping) are performed by a multidisciplinary team of BLM staff including the wild horse and burro staff) on a yearly basis and are usually done during late winter or early spring before the current growing season begins. Use pattern mapping is an evaluation of the previous year's growth and utilization and is conducted to help ensure adequate forage exists to support healthy populations of wild horses, burros, and wildlife (See Tables 11-14 and Figures 3-9 of the 2004 AML evaluation). There are 4 exclosures located within the HMA to aid in monitoring forage utilization and trend data (see Table 5 of the 2004 AML evaluation). Two of these exclosures, Kern River #3 and #4, were removed in late 2002 due to the Kern River 2003 Expansion Project, and two new exlosures were constructed in late 2003. Data gathered from these new exlosures will be used in subsequent evaluations. Herd area distribution patterns are carefully monitored to analyze herd area use and to evaluate the functionality of the existing HMA boundary. Trail and parking areas are surveyed and monitored to identify and analyze conflicts between recreational users and wild horses and burros. Riparian areas are monitored for proper functioning condition and adequate water supplies for wild horse, burro, and wildlife use during drought conditions.

Summary of Issues Related to Proposed New Well Installations

The *Red Rock Canyon National Conservation Area Interim General Management Plan (December, 2000)* allows for the development of water sources to benefit wildlife, wild horses and burros. Two water wells are proposed for future development to ease congestion and habitat disturbance at existing riparian areas and to facilitate even distribution of forage utilization by horses and burros in the southern portion of the HMA. The two wells, with associated storage tanks, pipelines and troughs are expected to result in a combined total disturbance of 1.31 acres; total pipeline disturbance would be 1.21 acres. The wells are expected to be 600 to 800 ft deep, constructed of 4" steel casing, with water lines constructed of 2" polyvinyl chloride (PVC) pipe. All water lines would be buried.

An increased number of water sources would allow wild horses, burros, and wildlife to

disperse more widely from their current use areas. Increased dispersion of horse and burro herds in the Red Rock HMA would enhance natural resource protection efforts by reducing use around fragile spring riparian areas and encouraging herds to utilize a larger portion of the HMA. Increased herd dispersion would allow impacted areas to regenerate and recover more quickly, resulting in healthier rangelands and riparian areas.

The new wells would benefit wildlife by providing separate wildlife watering sources near each well location. New wells would ease competition between wildlife and wild horses at currently crowded water sources, as well as, provide additional and more reliable water sources for all animals in the area. The new wells would provide multiple benefits for wild horses, wildlife (large and small), rangeland, and riparian health; as well as, increase viewing opportunities for recreational users.

The proposed wells were addressed in *Environmental Assessment #NV-052-00-062A* that was distributed for public review and comment on April 27, 2001 and May 8, 2001. Comments to the EA are currently being reviewed and a final decision record is expected in the near future.

Public Outreach and Interaction

One of the primary goals of the National Wild Horse and Burro Program is to increase public awareness and adoptions of wild horses and burros. In support of this goal, the LVFO works closely with NWHA volunteers to increase the public's opportunities to learn about the national wild horse and burro adoption program. Local BLM staff and NWHA volunteers conduct three wild horse and burro pre-adoption training clinics each year, just prior to the annual adoption held each October. BLM and NWHA provide transportation assistance from the adoption site to the adopter's home if adopters need assistance. Following the annual adoption event, monthly post-adoption training clinics are offered to the public at Oliver Ranch to assist people in learning how to domesticate newly-adopted animals. Transportation assistance is offered by the BLM and NWHA volunteers for people who have difficulty loading/unloading or transporting newly-adopted animals to and from the clinics. This intensive outreach program helps to ensure safe and successful adoption results and would not be possible without the dedicated assistance of NWHA volunteers.

In addition to running the local adoption and outreach program, the BLM staff is responsible for responding to any complaints in the RRCNCA area concerning wild horses and burros. Responding to complaints and concerns from residents of Calico Basin, Blue Diamond, Bonnie Springs Ranch, Spring Mountain Ranch, and visitors to the RRCNCA are the direct responsibility of BLM staff.

Visitor outreach programs for schools, Red Rock Canyon Visitor's Center and in the field are organized and executed by BLM staff with assistance from NWHA volunteers to support public education and better understanding of wild horse and burro programs. This effort includes conducting training sessions for all front desk volunteers at the Red Rock Canyon Visitor's Center for better public outreach and to help control the illegal

feeding and harassment of wild horses and burros that often leads to animals being killed on the highways.

Emergency Actions

Destruction of animals hit and injured by vehicles or those that are sick or lame, and the subsequent removal of carcasses, is the responsibility of BLM staff. BLM staff also conducts investigations, as necessary, into causes of death.

BLM staff and NWHA volunteers provide support to emergency gather operations by hauling water and feed, on an interim basis, as emergency supplementation for wild horses and burros during severe environmental conditions until emergency gathers can be implemented. BLM also constructs and maintains temporary feed traps for use in gathering individual nuisance animals.

3.0 National Wild Horse and Burro Program Goals & Future Planning Objectives

A Population Management Plan (PMP) will be prepared for the Red Rock HMA based on an interdisciplinary approach to herd management. Although the intent is to begin work on the plan soon, no funding is currently available. In the interim, herd population management will follow BLM policy, as described above.

Appendix C

Red Rock HMA External Range Condition Assessment

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Las Vegas Field Office
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130-2301

December 4, 2003

To: Field Manager, Las Vegas Field Office

From: Red Rock HMA Range Assessment Team (Ron Hall, Wild Horse and Burro Specialist, National Program Office; Valerie Metscher, Rangeland Management Specialist, Tonopah Field Station; Paul Podborny, Lead Natural Resource Specialist, Ely Field Office; Duane Wilson, Rangeland Management Specialist, Nevada State Office)

Subject: Condition of the Rangeland and Wild Horses within the Red Rock HMA

This team of Bureau specialists was asked to evaluate the current condition of the rangeland and the wild horses within the Red Rock HMA. WE were asked to determine the number of wild horses the HMA could support without supplemental waters. WE were also asked to look at the condition class of the existing wild horses in the HMA. We reviewed existing monitoring data collected in the HMA, and toured the areas currently being used by the wild horses.

Extensive efforts to preserve the wild horses in the Red Rock HMA have been made by the National Wild Horse Association, BLM and others. All involved are to be commended for their concern, dedication, and resolve on behalf of these animals.

This team did not consider the social-political issues involved with managing wild horses in close proximity to Las Vegas. We were only concerned with rangeland health and the wellbeing of the wild horses in the long-term. IN accordance with the wild horse regulations, we considered whether wild horses could be "managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat." Listed below are our findings and recommendations.

VEGETATION RESOURCE

Findings

1. The area around the proposed Wild Horse Valley Well Pipeline in a limy 5"-7" range site dominated by creosote bush and white Bursage with less than 10 percent perennial grasses at potential natural community (PNC). Normal year production for all vegetation would be about 300 pounds per acre.

During our field tour, we observed less than one percent perennial grasses in the plant community, primarily big Galleta. Estimated stocking rate (at 50 percent utilization based on allowable use level (AUL) in the RMP) for a normal year would be approximately 520 acres per AUM; for a dry year it would be 780 acres per AUM.

2. The Bird Springs area including the Galleta flat east of the spring is a Shallow Gravelly Loam 5”-7” range site dominated by Blackbrush. WE estimated there is less than five percent big Galleta in the plant community. Normal year production for al vegetation would be about 350 pounds per acre. There appeared to be no forage available this year due to heavy and severe use in the past few years with only 8-10 wild horses and the current drought conditions. No green-up was observed. There is no forage value left in the dry grass plants. Drought and heavy/severe use has resulted in numerous dead or dying grass plants.

3. The large Galleta flat near the proposed Wild Horse Valley Well is a Gravelly Fan 5”-7” range site with up to fifty percent perennial grasses at PNC. Normal year production for all vegetation would be about 600 pounds per acre. We observed moderate use of the Galleta which is the AUL in the RMP. This area only covers about 300 acres which would mean there would only be about 38 AUMs of forage available in a dry year (at 50 percent use). However, proper range management would suggest an AUL of only 30 percent.

4. The area around Tunnel Spring is a Blackbrush range site with little perennial grass similar to the area around Bird Spring. There was no forage observed in the immediate area around the spring. The main forage area is the Galleta flat near the proposed Wild Horse Valley Well.

5. The southern portion of the HMA near Rainbow Quarry is a Shallow Gravelly Loam 8”-10” range site almost completely dominated by Blackbrush and yucca. Normal year production for all vegetation would be about 500 pounds per acre with 15 percent perennial grasses at PNC. There is a burned area that has more perennial grass, mostly Indian Ricegrass and some big galleta, than unburned sites. There was a small amount of Winterfat observed with light to moderate use. Use on Indian Ricegrass was severe. We found many plants with dead crowns and only some live growth around the edges. There was some recent green-up. (This was the only area where we saw any green-up except on annual grasses.) There were 12 wild horses observed in the area. The only available water is being hauled by the mine company.

6. Most of the area north and south of Highway 160, including the Cottonwood Valley Burn, is a Shallow Gravelly Loam 8”-10” range site. Normal year production for all vegetation would be about 500 pounds per acre with 15

percent perennial grass in PNC. The only perennial grass observed (Indian Ricegrass) was inside the study exclosure. This area burned in the seventies, and the exclosures shows limited recovery even with thirteen years of rest. No forage is available outside the exclosure. Potential for recovery of this site is there based on the exclosure, but the area would require years of rest form grazing.

7. The area immediately around the Mud Springs Exclosure No. 1 north of Highway 160 is a Coarse Gravelly Loam 5”-7” range site with 45 percent perennial grass in PNC. We observed only a trace of perennial grasses outside the exclosure which appeared to be dying because of the drought. More grass was observed inside the exclosure where there is no grazing, but it too was dying because of the drought. There was no forage presently available for wild horses.

Summary

Majority of the range sites in the HMA have low potential for perennial grasses. Most of the sites currently have little to no perennial grasses present. Currently little to no forage is available because of past and current heavy to severe use and present drought conditions.

Potential to recover/restore these range sites is limited because of the low precipitation. It is even more limited with continued overgrazing by wild horses. Even with no grazing, these sites would not recover much because there is only a trace of perennial grasses in the plant communities at the present time. Sites with any potential for recovery are very small in size and are also degraded.

There appears to be no reason to develop water (Wild Horse Valley Well and Goodsprings Well) because there is essentially no forage available for wild horses in these areas.

WATER RESOURCE

Findings

1. Water is currently being hauled to several locations (i.e., Tunnel Springs, Rainbow Quarry and Bird Spring) to supplement marginal water sources.

2. The tanks at Bird Springs were nearly full and the estimated use by wild horses is only 4-5 animals. Historically this spring produces .1 gallon per minute. The present number of wild horses is taking all the water being produced and not diminishing storage capacity.

3. Tunnel Spring is non-functional and water is being hauled to the site periodically. Present use level is estimated at less than 3-5 animals.

4. The Rainbow Quarry site is not a traditional watering area, but is presently the concentration area for the majority of the wild horses in the HMA. Water is being hauled by the "good will" of the mine company. The pond was nearly dry on 12/2/03 and completely dry on 12/3/03. Reportedly the truck had mechanical problems. ON 12/3/03 the tanker was parked at the edge of the mine and water was running from a drain valve onto the ground. No catchment/trough was provided; however, tracks indicate wild horses are watering at a shallow depression in the ground where water puddles.

Summary – The present population of ~25 wild horses would not survive at this time without supplemental water.

ANIMAL CONDITION

Findings

1. Three wild horses were observed in the vicinity of Bird Spring. One was in Henneke Condition Class 4, and the other two were not classified.

2. Fifteen animals were observed in the vicinity of Rainbow Quarry in Henneke Condition Class 4-5 with one in Condition class 3 and one in condition class 6.

Summary – All wild horses observed were in good condition probably because of the low number of animals, supplemental feeding that is occurring (although we do not know how excessive this is), and moving into areas not traditionally used.

HUMAN CONTACT

Findings

1. Recreational use (bicycle riding and horseback riding) within the HMA in the vicinity of Highway 160 is heavy and has resulted in increased conflicts between humans and wild horses especially with regard to use of underpasses and trails.

2. The existing population is located as far from recreation use as resources will allow. All horses north of Highway 160 were removed in 2002.

3. Wild horses are very approachable because of the constant contact with humans.

4. The underpasses on Highway 160 are available for wild horses to use; however, if animals are not familiar with underpasses they may not be used in the future.

5. Wild burros have adapted very well to human activities in the HMA and all animals observed were in good condition.

Summary – Conflicts between wild horses and humans have occurred mainly at the underpasses and on trails used by mountain bikers and horseback riders. These conflicts will only increase especially as Las Vegas expands to the edge of the HMA.

RECOMMENDATIONS

1. It is our recommendation that the 22 wild horses currently being held at Oliver Ranch not be released back into the HMA. Forage and water are not adequate to maintain the existing population of wild horses in the HMA let alone these additional animals. In addition, these horses have been held for over a year. Releasing them back into the HMA would be inhumane.

2. It is our recommendation that wild horses should not be managed within the Red Rock HMA. Whether existing water sources are supplemented or not, or new waters developed, there is not sufficient forage available to maintain any wild horses in the HMA on a yearlong basis. The vegetative resource has already been severely impacted, and continued grazing by wild horses would not maintain rangeland health and a thriving natural ecological balance within the area. We do feel the HMA can be managed for burros.

3. It is our recommendation that the wild horses presently in the HMA be removed. These horses are only being maintained because of water hauling. If this stops these horses will deteriorate quickly. In addition, forage is in poor condition and limited, and there may not be enough to carry these animals into the next growing season. If the drought continues into next year, there will definitely not be enough forage for these ~25 animals to prevent these animals from losing body condition.

Appendix D

Red Rock Herd Management Area: Vegetation Monitoring for the Proposed Release of Wild Horses Being Held at the Oliver Ranch Holding Facility Per the Memorandum of Understanding Between the Bureau of Land Management and the National Wild Horse Association

RED ROCK HERD MANAGEMENT AREA

VEGETATION MONITORING FOR THE PROPOSED RELEASE OF WILD HORSES BEING HELD AT THE OLIVER RANCH HOLDING FACILITY PER THE MEMORANDUM OF UNDERSTANDING BETWEEN THE BUREAU OF LAND MANAGEMENT AND THE NATIONAL WILD HORSE ASSOCIATION

September 9, 2003

INTRODUCTION

This report has been prepared in support of the wild horse and burro (WH&B) emergency care measures in the Memorandum of Understanding, signed December 3, 2002, between the Bureau of Land Management (BLM) and the National Wild Horse Association (NWHA). This range condition survey was conducted on August 27, 2003 on regular use areas for wild horses and burros (WH&Bs) in the Red Rock Herd Management Area (HMA). This survey is necessary to analyze current range conditions to determine the feasibility of releasing 26 horses being held at the Oliver Ranch Temporary Holding Facility back into the HMA.

STUDY AREAS AND METHODS

All monitoring was performed in accordance with BLM methodologies using the Nevada Rangeland Monitoring Handbook (1984). This is the standard method of measuring vegetative re-growth and utilization on rangelands. The areas surveyed were: Mud Springs, Bird Springs, Tunnel Springs (Wilson Tank), and the surrounding areas of these springs up to an 8-mile radius in known, accessible and utilizable areas. Data on vegetative re-growth, utilization, and water production at spring sites, as well as precipitation and temperature were collected.

RESULTS

Vegetative Re-Growth and Utilization

The areas surveyed displayed patchy growth and use patterns due to the extreme mosaic of precipitation that has fallen in the HMA in recent months. Utilizable species in most of the HMA had patchy production and a few were still green, though reproduction seemed to be minimal (a majority of plants did not go to seed). This contrasts with the majority of the HMA which had brown, brittle and senescent utilizable plant species with little or no growth or reproduction.

Non-utilizable species such as Red Brome, Cheatgrass, Fluffgrass, and Shizmus were currently past their green and were dry and brittle throughout the HMA. Indian Ricegrass (*Oryzopsis hymenoides*) was difficult to find in the use areas within the HMA. The few Indian Ricegrass plants observed within the HMA looked like they never greened up this

year, as was evidenced by the lack of production, seed heads, and brittle, dry appearance. However, the species did green up and set seed in the burn area of Cottonwood Valley (approximately 100 acres) area near SR 160 (near the exclosure), although production was minimal on a per acre basis. There was no utilization on surveyed Ricegrass in this 100 acre area. Reasons for the plant growth in this area were that it received early moisture and currently, there are no WH&Bs in the area. This species was the only cool season grass observed on the range during monitoring, and was only observed in the (100 acre) area indicated above. Mormon Tea (*Ephedra trifurca*) looked to be dried out and had a brownish appearance and was slightly brittle in the majority of the areas surveyed. Utilization was slight to light on Ephedra. Bursage (*Ambrosia dumosa*) was approximately 25% green with a majority of plants in skeletal form (no foliage). Utilization was slight on Bursage. Approximately 20% of Galleta grass (*Hilaria rigida*) was green with slight to moderate utilization on the minimal growth for the year. There was new utilization in the Galleta flat just north of Tunnel Springs that previously had minimal use which may be a result of an expanded search for food. The Galleta flat near Bird Springs had a very dry and brown appearance with no green blades or any sign of reproduction during the year. Stipa grass (*Stipa sp.*) was present in non-utilized areas of the HMA and was ungrazed but brown and dry. There was no evidence of Bush Muhly (*Muhlembergia porteri*) in the areas surveyed.

Galleta Flat near Bird Springs (8/27/03)

Moderate utilization on Galleta flat north of Tunnel Spring (8/27/03)

Galleta flat near Bird Spring (8/27/03)

Range near old corral in Bird Spring Valley (8/27/03)

Overall there was minimal herbaceous production of cool and warm season species for the growth year. Also, plant density appears to have been reduced due to the drought and past use by WH&Bs. All of the areas that displayed any green plants were areas with little to no current use by WH&Bs and or areas that historically were ungrazed and had stored root reserves.

Water Production at Springs Sites

All troughs surveyed are on a float system that prevents run-over. Gallons Per Minute (gpm) was surveyed in functional years in the past and is used in this report.

Tunnel Springs (Wilson Tank)

This spring is piped directly from the ground into two 1500-gallon holding tanks. Ninety percent of the spring flow is piped to a trough. The spring source is fenced and the GPM for this spring is historically 1.0 gpm. The riparian area is currently non-functioning. This spring has a tendency to fail during hot summers and needs to be artificially filled periodically; at this time, the trough and tanks have been filled four times since July 2003 (July 11 and 26, and August 5 and 26) with the assistance of the BLM Interagency Fire Crew. The initial fill was in response to a call from the recreation permittee, Desert Fox Tours, which reported three horses dying of thirst around the trough. Upon further investigation, there was a buckskin mare, a cremello (white with blue eyes) colt and a palomino filly all suffering from extreme dehydration at the trough. The animals' skin was much wrinkled, pale and tucked up into their abdomens. The filly could not stand before water was forced into her. All three recovered well after the trough was filled. At this time, Tunnel Springs does not have sufficient recharge under current demand/use to sustain the 8-10 animals that are utilizing it.

Bird Springs

This spring is piped directly from the ground into two 1500-gallon holding tanks. As with Tunnel Springs, 90% of the spring flow is piped to the trough. The spring source itself is fenced to protect it, and the GPM for this spring is historically 0.1 gpm. The

riparian area is currently non-functional. This spring is typically functional during the summer months; however, it was necessary to artificially haul to this spring on July 4, 2002 due to extreme drought. The trough has not been artificially filled since that time, and currently one tank is completely full and the other is at 1100 gallons. At this time, Bird Springs seems to have sufficient recharge under current demand/use to sustain only the 7-10 animals that are currently utilizing it.

Mud Springs

This spring is currently fenced at its source. The riparian area is currently non-functional and the GPM for this spring is 1.5 gallons. Only a portion of the spring is piped to the trough. Historically, this spring has failed only occasionally during summer months, and water has been artificially hauled to fill the trough. At this time the system is non-functional. The trough had been dry several times during the last two months, but the head box was full. This fact suggests that there is a mechanical problem with the system. Las Vegas BLM maintenance personnel and NWHA volunteers have been working on the problem, and it may be fixed by as early as one week after the date of this report. Fortunately, the burros currently utilizing this spring have alternative water sources available (Wheeler Camp Spring and Mormon Green Spring). When the system is fixed, Mud Springs should have sufficient water under current demand/use to sustain only the 10-12 burros that are currently utilizing it.

Precipitation and Temperature

According to the National Climatic Data Center Station's (NCDC) Historical Listing for the National Weather Service (NWS) Cooperative Network's Red Rock Canyon State Park (Spring Mountain Ranch State Park) (Western Regional Climate Center, www.wrcc.dri.edu) Weather Monitoring Facility, the following climatic conditions for 2003 exist within the HMA (See Appendix 1):

	January		February		March		April		May		June		July		Totals to Date	
	2003	Yearly Ave	2003	Yearly Ave	2003	Yearly Ave	2003	Yearly Ave	2003	Yearly Ave	2003	Yearly Ave	2003	Yearly Ave	2003	Yearly Ave
Precip. (in)	0.00	1.69	2.93	2.14	1.74	2.16	0.95	0.59	0.00	0.28	0.00	0.14	0.09	0.99	**5.71**	**7.99**
Max Temp. (Deg F)	61.57	52.90	55.71	57.17	62.90	63.36	66.65	71.41	81.38	80.62	No Data	91.09	98.33	96.66	**71.09**	**73.32**
Min Temp. (Deg F)	32.00	30.11	33.29	33.11	37.84	38.45	41.35	45.07	52.54	53.27	60.81	63.27	72.33	70.25	**47.17**	**47.65**

CONCLUSIONS

Currently, there is only adequate forage for the 25 wild horses present on the range to maintain an average body condition class of 4-5. In analyzing existing animal health in comparison to current range conditions (vegetative re-growth and utilization), it is determined that there is adequate forage for the 25 animals currently on the range.

However, water is the limiting resource, and without artificial water hauling, there would not be adequate water to support these 25 free-ranging animals. Current spring status is as follows:

1.	TUNNEL SPRING	STATUS:	DRY AND NOT RELIABLE
2.	GRAPEVINE SPRING	STATUS:	MINIMAL PRODUCTION NOT RELIABLE
3.	MINE TROUGH	STATUS:	NOT RELIABLE
4.	MUD SPRING	STATUS:	MINIMAL PRODUCTION NOT RELIABLE
5.	BIRD SPRING	STATUS:	MINIMAL PRODUCTION FOR 10 HEAD

The mine trough is currently being filled by a water hauler via verbal contract from the Rainbow Quarries. This source is not reliable due to the fact that hauling may cease at any time. Historically, Grapevine Spring has not been reliable during the summer months, and was not producing for the last several months. Although the problem was found to be mechanical and was fixed, the spring is only minimally producing at this time and is not reliable.

According to the NCDC, total precipitation from January to July 2003 is 5.71 inches. The average precipitation for the same months from the years 1977 to 2003 is 7.99 inches. The HMA is 2.28 inches below the average for precipitation from January to July 2003. The average maximum temperature from January to July 2003 is 71.09 degrees Fahrenheit (°F). The average maximum temperature for the same months from the years 1977 to 2003 is 73.32 °F. The HMA is 2.23 °F cooler than the average for the maximum temperature from January to July 2003. The average minimum temperature from January to July 2003 is 47.17° F. The average minimum temperature for the same months from the years 1977 to 2003 is 47.65°F. The HMA is 0.48 °F cooler than the average for the minimum temperature from January to April 2003.

All of the springs surveyed seem to be producing less than maximum water levels, facilitating the need for frequent water hauls (2/month) at Tunnel Springs. Bird Springs is also producing less than maximum keeping one of the 1500 gallon tanks down to 1100 gallons since June 2003. The capacity of water flowing from Mud Spring will not be known until the problem with the water system is fixed. Vegetative production is low for utilizable species and reflects the mosaic of precipitation. This has resulted in areas with highly variable plant condition and production, from green plants with seed heads to plants that are completely dead in the HMA. Utilization on vegetation is slight to moderate for all utilizable species, with utilization being heaver closer to water.

Although the precipitation from January 2003 to July 2003 already exceeds the total precipitation that the area received in 2002, springs are producing at less than maximum rates and forage conditions, though improved from 2002, are still in less than desirable condition.

The Las Vegas Resource Management Plan and Final Environmental Impact Statement directs the LVFO to manage the range with WH&Bs allocated 45% of shrubs and forbs and 50% grasses produced (WHB-1-c) during “normal” years (in the form of average precipitation). Currently the estimated AML of 50 head would utilize the HMA at this

level. Research recommendations for range recovery during drought is that utilization of the range be reduced by at least 40% below "normal" utilization levels (50 % herbaceous RMP) for the HMA (Holechek, Pieper, and Herbel 1998). Utilization levels for wild horses on the range should be reduced to approximately 30% of forage produced during drought years to promote range recovery. The current number of 25 animals is a sufficient number of horses utilizing the range to satisfy the parameters of this drought recovery program. In support of this action is the fact that "rangelands conservatively grazed during drought recover faster after drought than do those receiving heavy use (Holechek, Pieper and Herbel 1998)".

The 25 horses currently on the range are only in good health at this time because of current water supplementation. To insure their health conditions, and the recovery of the range, it is recommended that no horses from the Oliver Ranch Temporary Holding Facility be released back into the HMA. These recommendations are in accordance with sound range management practices and are critical components of rangeland recovery and to protect the health of WH&Bs.

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Galleta in the Triangle (9/30/03).

Galleta near Bird Springs (9/30/03).

Ephedra near Bird Springs (9/30/03).

Ephedra near Bird Springs (9/30/03).

Galleta in the Triangle (9/30/03).

Galleta in the Triangle (9/30/03).

View from Cottonwood Valley Road towards Rainbow Quarry (9/30/03).

View from Bird Springs towards Red Rock (9/30/03).

Green Galleta in the Triangle (9/30/03).

View from Galleta Flat near Bird Springs (9/30/03).