

Standards for Rangeland Health and Guidelines for Grazing Administration  
Implementation Project: Allotment Assessment  
For  
**Little Wolf (4814)**

## **I. INTRODUCTION**

The Little Wolf Allotment Assessment was conducted in accordance with directions set forth in the Washington Office Instruction Memorandum No. 98-91 and Arizona State Instruction Memorandum No. 99-012 for implementation of Standards for Rangeland Health and Guidelines for Grazing Administration (Standards and Guides).

The purpose of Standards and Guides is to insure the health of public rangelands. These standards help the Bureau of Land Management (BLM), rangeland users, and interested members of the public achieve a common understanding of acceptable resource conditions, and work together to implement that vision (see appendices for a copy of the Standards and Guides).

Arizona's Standards and Guides were developed by the BLM State Standards and Guides Team and the Arizona Resource Advisory Council (RAC), a state level council appointed by the Secretary of the Interior.

The Secretary of the Interior approved the Standards and Guides in April 1997. The Decision Record, signed by the BLM State Director (April 1997) provides for full implementation of the Standards and Guides in all Arizona Land Use Plans.

This assessment was conducted by an interdisciplinary assessment team (IAT) of resource specialists from:

- BLM
- Natural Resource Conservation Service (NRCS)
- Arizona Game and Fish Department (AGFD)
- Mohave County Extension

The IAT was assisted by the Rangeland Resource Team (RRT), a diverse group of local residents formed and appointed under the RAC charter (see appendices for a list of members on both teams). The RRT may provide informal advice to the BLM Field Manager regarding implementation of Standards and Guides, and "will have opportunities to raise any matter of concern with the resource advisory council and ... to provide information and options to the council for their consideration" as provided for by regulations at 43 CFR 1784.6-2(a)(2)(iv)(A).

The BLM/RAC Implementation Strategy for Arizona states that the RRT's primary role is to assist BLM managers in assuring the Standards and Guidelines are consistently applied and technically sound. The IAT analyzed all available information in cooperation with the RRT. Based on field observations, team members determined whether rangeland conditions were meeting, progressing toward meeting, or not meeting the Standards for Rangeland Health.

The RRT, IAT, permittees and other interested parties were invited to attend an issue scoping meeting on June 11, 1998, and a field visit on May 27, 1999. At the conclusion of the field visit, the group determined the standards for rangeland health are being met.

After consultation with interested persons, permittees, and the IAT, the Authorized Officer will select the appropriate actions. The selected management actions will be analyzed through the National Environmental Policy Act (NEPA) process and a proposed decision will be issued.

## **II. GRAZING USE**

### **A. Total Grazing Privileges**

Littlewolf – Permittee: Charles W. and Sharon Dee Welch

Active Grazing Use: 328 AUMs

Suspended Non-use: 312 AUMs

**Total                      640 AUMs**

(Note: an AUM, or Animal Unit Month, is a unit of measurement indicating how much forage is eaten by a cow/calf pair in one month.)

### **B. Season(s) of Use**

55 Cattle: 6/1 to 11/30

### **C. Kind and Class of Livestock**

Cow/calf operation

### **D. Percent Federal Range**

100%

## **III. ALLOTMENT PROFILE**

### **A. Description**

The Little Wolf Allotment is located 30 miles south of St. George Utah. The allotment is bounded by Black Rock and Wolfhole Mountain Allotments to the north, on the east and south by Whiterock-Soapstone Allotments and on the west and south by Mud and Cane Springs Allotments. The Allotment Category is "M" for Maintain, as identified in the BLM's Selective Management strategy categorization process.

## B. Acreage

The allotment contains:

|              |                       |
|--------------|-----------------------|
| 7,272        | acres of federal land |
| 0            | acres of state land   |
| 0            | acres of private land |
| <b>7,272</b> | <b>total acreage</b>  |

## C. Objectives

### 1. Land Use Plan Objectives

#### Shivwits Resource Area Implementation Plan (SRAIP)

Program guidance decisions, as well as specific resource objectives for the Littlewolf Allotment, are found in the Arizona Strip Resource Management Plan (RMP) and Implementation Plan (IP), Blackrock Habitat Management Plan (HMP), and the Littlewolf/Purgatory Allotment Management Plan (AMP).

**GZ-17** Allowable use on key forage species is 50 percent on allotments with rotational grazing systems except in desert tortoise habitat.

**WS01** Manage vegetation cover towards ecological stability and sound long-term protective soil cover.

**WS22** Manage watershed areas according to watershed categorizations to achieve identified objectives.

**RR-06** Implement actions to restore and/or maintain natural conditions or appearance in all areas.

**RR-08** Manage the majority of the Resource Area for extensive recreation while maintaining its naturalness/remoteness. The exception to this is the Cedar Pockets campground.

**RR-09** Commercial recreation permits would be issued to the extent that their cumulative impacts are consistent with the overall objectives of this plan and in the public interest.

**TE01** Manage areas consistent with multiple uses to conserve candidate species and their habitats and ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered. Adverse impacts to listed species will be avoided.

**WL02** Maintain productive wildlife habitat and ensure wildlife needs and considerations are incorporated into land use planning, National Environmental Policy Act documents, and management decisions.

**WL16** Complete ecological site inventories in key areas to determine site potentials and present ecological conditions; establish desired plant community objectives for various areas and include these objectives in Allotment Management Plans (AMP), Habitat Management Plans (HMP), watershed plans, and other plans in order to prescribe management or improvement practices to achieve these objectives.

## **2. Specific Resource Objectives**

### California Condor Recovery Plan

CC-1 Provide foraging habitat for California condors.

CC-2 Maintain a healthy, self-sustaining population of California condors with a positive growth rate of at least 150 individuals with at least 15 breeding pairs.

### Black Rock HMP (1994) Objectives

**MD1** Identify factors suppressing mule deer population recovery and, if possible, the cause(s) of the decline in the HMP area by 1998. Where possible, eliminate or reduce the impacts of limiting factors to initiate herd recovery.

**MD2a1** Enhance and maintain forage, water, and cover conditions on 365,000 acres of mule deer habitat to support 2,200 deer yearlong in the HMP area by the year 2010.

**MD2a2** Identify and manage for key forage and cover species in mule deer habitat, particularly crucial summer range, based on DPC and establish key areas by 2000.

**MD3a** Increase the number of mule deer in the HMP area by at least 100 percent over the 1993 estimated population of 400 head by 2010.

**MD3b** Increase mule deer production and maintain an average fawn survival within AGFD species management guidelines for mule deer.

**MD3c** Increase and maintain post harvest buck to doe ratios within AGFD species management guidelines for mule deer.

### Wilderness Management Plan for Paiute and Beaver Dam Mountains

Grazing Management: The objective is to allow grazing to continue at existing levels while preventing any adverse impact on the wilderness resource.

## Little Wolf AMP

The main objective is to protect natural resources by improving forage and other vegetative conditions for livestock and wildlife, and improve the watershed conditions by reducing soil erosion and improving stability

Specific vegetation objectives from the AMP

### **Key Area No. 1, Maple Spring-West Pasture**

Increase percent frequency of key species from 10% to 15%

Increase percent cover of Live Vegetation from 3% to 5%

Percent cover of litter maintain at 47%

### **Key Area No. 2, Middle Pasture**

Percent frequency of key species maintain at 82%

Percent cover of Live Vegetation maintain at 10%

Percent cover of litter maintain at 53%

### **Key Area No. 3, East Pasture**

Percent frequency of key species maintain at 62%

Percent cover of Live Vegetation maintain at 15%

Percent cover of litter maintain at 44%

### **Desired Plant Community (DPC) Objectives :Developed during this process**

DPC objectives were developed during this evaluation process by an interdisciplinary team of specialists. These DPCs are to replace the AMP specific vegetation objectives which focus on livestock forage needs. These objectives focus on the ecological site and its potential, which is a reflection of the biodiversity of the area. DPCs are expressed in terms of Composition by Weight (CBW) using the Dry Weight Ranking methodology or Ecological Site Inventory (ESI) to measure accomplishment. DPCs will be used, from this point forward, to assess effectiveness of management actions.

### **Key Area No. 1, located in the Maple Pasture (chained area)**

#### **The Ecological Site is Basalt Slopes, 13" to 17" precipitation zone**

Increase grass CBW from 9 to 25% through 2015 by

Maintaining shrub CBW between 85 to 95%

Maintaining forbs CBW between 5 to 10%

Maintain this site provides the desired mix and diversity of vegetation for mule deer and other wildlife species habitat. It provides the essential elements of vegetative cover to indicate ecological stability and meet objectives WS01 and WS22.

**Key Area No. 2, located in the Middle Pasture (chained area)**

**The Ecological Site is Loamy Upland (Gravelly), 13" to 17" precipitation zone**

Maintain seeded grass CBW between 75 to 80%

Maintain perennial forbs CBW between 05 to 10%

Maintain annual forbs CBW between 10 to 15%

Maintaining this site provides watershed protection through reducing erosion potential. It provides desired mule deer habitat conditions and it produces the desired livestock forage quantity.

**Key Area No. 3, located in the East Pasture**

**The Ecological Site is Clay Loam Upland (Gravelly), 13" to 17"; Limestone Slopes, 13" to 17" precipitation zone**

Maintain seeded grass CBW between 30 to 35%

Maintain perennial Forbs CBW between 10 to 15%

Maintain annual Forbs CBW at around 5%

Maintaining shrub CBW between 30 to 45 %

Maintaining this site provides watershed protection through reducing erosion potential. It provides desired mule deer habitat conditions and it produces the desired livestock forage quantity.

**D. Key Species**

Squirreltail, wheatgrass, cliffrose and Mormon tea

**E. Grazing System**

Summer/fall Rest-rotation grazing

In 1992, an allotment management plan (AMP) was written to set the grazing system for Little Wolf and Purgatory Allotments, Pastures within Littlewolf are used as a summer/fall pastures for this system.

Summer/fall grazing with 53 Cattle 06/01 to 11/30

**F. Other Uses**

**1. Special Status Species**

Threatened or Endangered (T/E) Species: There is no suitable habitat for any listed T/E species on this allotment. However, bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus anatum*) may occasionally fly over the area. There are no ponderosa pine forests on the allotment that would provide suitable nesting habitat for Mexican spotted owls (*Strix occidentalis lucida*), though wintering juveniles may occasionally use the area. The California condor, federally listed as endangered (10-J), occurs yearlong on the Arizona Strip and may fly over and forage for food in this

allotment.

BLM Sensitive and State Species of Concern: Terrain on these allotments is too steep and broken to serve as suitable habitat for ferruginous hawks or burrowing owls. A variety of sensitive bat species have been captured on this and neighboring allotments including Townsend's big-eared (*Corynorhinus townsendii*), spotted bats (*Euderma maculatum*), small-footed myotis (*Myotis ciliolabrum*), fringed myotis (*Myotis thysanodes*), long-legged myotis (*Myotis volans*), long-eared myotis (*Myotis evotis*), and big free-tailed bats (*Nyctinomops macrotis*). Herpetological inventories have not been done on the allotment.

## **2. Other Wildlife Species**

Other Wildlife Species: Black Rock Mountain, to the west, provides habitat for a herd of from 600 to 800 mule deer (*Odocoileus hemionus*). Deer tend to concentrate in the limited conifer and mountain shrub communities during the summer months. These areas are considered crucial summer mule deer habitat. The Littlewolf Allotment is covered primarily by pinyon-juniper woodland communities and is considered winter and yearlong range for mule deer.

Non-game wildlife found on the allotment is typical of the area, including a variety of small mammals, grassland birds, raptors, and reptiles.

## **3. Recreation**

Off Highway Vehicle (OHV) Management: Little Wolf OHV classifications: Closed and Limited to existing roads and trails

Recreational Opportunity Spectrum (ROS): The ROS classes found in the Little Wolf Allotment are: Primitive, Semi-Primitive - Non Motorized, Semi-Primitive – Motorized, and Roaded Natural.

Visual Resource Management: Little Wolf Allotment has areas classified as Classes 1 & 3.

Trails: No developed recreation trail or formal designation for any road/trail is known in this allotment.

## **4. Wilderness**

A portion of the Littlewolf Allotment (<20 percent) lies in the Coves Unit of the Paiute Wilderness.

## **G. Issues brought out in scoping**

### **1. Issues Relating to Rangeland Health**

None

### **2. Issues Not Relating to Rangeland Health and not discussed further in this document.**

#### **a. There are gullies developing from road drainages**

Options concerning this issue will be discussed with affected programs outside this process, and thus will not be carried forward.

## **IV. MANAGEMENT EVALUATION**

### **A. Purpose of Evaluation**

The purpose of this assessment is to determine if the existing soil, water, and vegetative resources are meeting/making progress toward meeting or are not meeting the Arizona Standards for Rangeland Health. These resources are managed according to RMPs, AMPs, and other activity plans, which identify terms and conditions for management on public lands within the Littlewolf Allotment. If the current livestock grazing practices are determined to be causing non-attainment of Standards then they will be modified to comply with the Guidelines for Grazing Administration.

This assessment will also evaluate and update existing Activity Plan objectives to ensure multiple use objectives are tied to the indicators for rangeland health.

### **B. Summary of Studies Data**

#### **1. Actual Livestock Use**

| <u>Year</u> | <u>AUMs</u> |
|-------------|-------------|
| 1991        | 325         |
| 1992        | 275         |
| 1993        | 297         |
| 1994        | 325         |
| 1995        | 326         |
| 1996        | 328         |
| 1997        | 384         |
| 1998        | 328         |
| 1999        | 328         |
| 2000        | 356         |
| 2001        | 318         |
| 2002        | 301         |

## 2. Precipitation

Precipitation on this allotment is best represented by the Mustang rain gauge located one half mile from the eastern allotment boundary, in T. 39 N., R. 12. W., sec. 31. Average annual precipitation is 15.27 inches. Approximately 14 percent comes in the fall, 38 percent in the winter, 19 percent in the spring, and 29 percent in the summer.

## 3. Utilization

Utilization is the proportion or degree of current year's plant production that is consumed or removed by animals. Utilization levels during the analysis period have ranged between 35 percent and 50 percent for cool season grasses, and 43 percent to 56 percent for browse. The overall average is 46 percent.

Little Wolf utilization studies

| Year       | Cool Season grass | Warm Season grass | Browse | Weighted average |
|------------|-------------------|-------------------|--------|------------------|
| Pasture #1 |                   |                   |        |                  |
| 1991       | 35                |                   | 43     | 41               |
| 1993       | 50                |                   | 48     | 50               |
| Pasture #2 |                   |                   |        |                  |
| 1990       | 45                |                   | 56     | 46               |
| 1992       | 43                |                   | 56     | 46               |
| Pasture #3 |                   |                   |        |                  |
| 1991       | 28                |                   | 49     | 32               |
| 1993       | 27                |                   | 36     | 29               |
| 2001       | 38                |                   | 55     | 43               |

## 4. Trend

The vegetation monitoring data is collected at different points in time on the same site (key area), reading and recording these studies every few years and then comparing these back to the original or baseline data to detect any change. A trend up, down or static, refers to the direction of change to the plant frequency, at the key area.

Of the three key areas, all three showed upward trend. In 2004 all three showed downward trend, most likely due to drought.

| Year       | % Key Species | Live Vegetation. | Litter | Total |
|------------|---------------|------------------|--------|-------|
| Pasture #1 |               |                  |        |       |
| 1990       | T             | 3                | 34     | 37    |
| 1993       | 6             | 1                | 56     | 63    |
| 2004       | 11            | 5                | 57     | 73    |
| Pasture #2 |               |                  |        |       |
| 1990       | 100           | 7                | 52     | 159   |
| 1993       | 133           | 11               | 51     | 195   |
| 2004       | 92            | 5                | 37     | 134   |
| Pasture #3 |               |                  |        |       |
| 1990       | 116           | 7                | 48     | 171   |
| 1993       | 136           | 18               | 49     | 203   |
| 2004       | 52            | 6                | 27     | 79    |

## 5. Ecological Site Inventory

Ecological condition is the present state of the vegetation on the ecological site in relation to the potential natural community (PNC) for the site. Ecological status is also defined in terms of different seral stages. Seral stages are developmental stages of ecological succession. The ecological status classes correspond to a similarity percentage of the PNC.

Early Seral (0-25%)

Mid Seral (26-50%)

Late Seral (51-75%)

PNC (>76%)

Key area # 1 is in mid seral (47%), #2 is in early seral (14%) and #3 is in mid seral (35%). DPC Objectives are developed from data collected using ecological site inventory, dry weight rank and the range site guides developed by the NRCS during this evaluation process.

## 6. Special Status Species

- Bald Eagle

The bald eagle is currently listed as threatened, but is expected to be delisted soon. It is a seasonal migrant that forages in and along the winter range area below the conifer forest of the Kaibab Plateau. During the winter, migrant bald eagles are both scavengers and predators. No effect to this species is expected, and no further discussion will follow.

- California Condor

The re-introduced condor population overall is doing well and is increasing. Approximately ten captive reared additional young condors are released annually. In addition, over the last four years the condors have produced five chicks that have successfully fledged in Arizona. Condors are monitored daily, if possible.

Condors currently range across the entire Arizona Strip, throughout the Grand Canyon, into adjacent Utah and Nevada, and south of the Grand Canyon in Arizona. Many of the 58 condors have been recently outfitted with satellite GPS transmitters which plot an individual bird's location up to 12 times per day. These new transmitters have already shown that the condors are making much more use of the entire Arizona Strip than previously believed.

- BLM Sensitive and State Species of Concern

There are no monitoring programs in place to document changes in abundance of ferruginous hawks or western burrowing owls. Bats are monitored annually at livestock waters across the Arizona Strip. No indications of declining populations were detected for any of these species, though there is no widely accepted methodology for monitoring bat populations. Townsend's big-eared bat typically comprise 15-20 percent of captures in the area. No red bats have been captured on this allotment.

## **7. Wildlife Habitat**

Mule deer tend to concentrate on crucial summer ranges on Black Rock Mountain, to the west, during the warmer months. Some animals may use the lower elevation pinyon-juniper habitat on Wolfhole Mountain, to the east. Throughout the remainder of the year, most mule deer are widely distributed at low densities. Areas above 6,000 feet elevation and wildlife waters were managed as crucial mule deer habitat in accordance with HMP objectives. While there are three waters designed for mule deer on this allotment, none of the habitat is considered crucial summer range.

Mule deer populations are monitored annually by the AGFD. While there is no estimate of mule deer numbers available specifically for these allotments, population trends should parallel data collected for Game Management Unit 13B (see appendices). AGFD records indicate the population suffered numerous fluctuations and an overall decline in numbers from 1986 through 1992. From the early 1990s through 2001, mule deer populations have been gradually increasing. The 1993 AGFD population estimates placed the Black Rock deer herd (which includes this allotment) at approximately 400 animals. Population estimates for 2000 suggest the herd is somewhere between 600 and 800 animals. Despite wide fluctuations, AGFD considers the mule deer population in the habitat area to be stable and gradually increasing.

Long term declines in mule deer populations have been observed throughout the Southwest U.S. A variety of causes for these declines have been suggested including disease, predation, and poor habitat condition. Within these allotments, there has been little or no

evidence of a serious disease problem. However, AGFD track surveys indicate a high density of mountain lions in the area. Predation on mule deer has been recorded on numerous occasions on these allotments.

As with most allotments, non-game wildlife forage and cover needs have not been specifically addressed in applicable management plans, including those pertaining to wildlife habitat. No monitoring programs have been established that would identify trends in non-game wildlife populations. It is typically assumed that management actions that provide for healthy rangelands will benefit most non-game species. This is particularly true where there is a mosaic of habitat types separated by edge or transitional communities.

Rodent populations provide an abundant food source for many larger wildlife species. Many rodents, as well as small reptiles, utilize debris piles for cover. Woody debris is relatively common in the pinyon-juniper woodland forest on this allotment.

## **8. Riparian/Fisheries Habitat**

There is one small seep located on this allotment. However, it is not of sufficient size or flow to provide habitat for fish.

## **9. Wild Horse and Burro Habitat**

This allotment is outside of any Herd Management Area; there are no Wild Horses nor Burros on this allotment.

## **10. Geological Resources**

### **a. Lithology**

The Littlewolf Allotment consists of outcrops of the various members of the Moenkopi Formation (gypsite, mudstone, sandstone, siltstone, and limestone). A small amount of Kaibab limestone outcrops in the lower canyons at the extreme north edge. Small areas of basalt cap steep Moenkopi hills in the west half. Alluvium from these formations fills small valley bottoms.

### **b. Soils**

#### Littlewolf Allotment Soil Map Units (SCS,1993)

- 20 Dermalama-Guyana-Rock Outcrop complex, 10 to 40 percent slopes (mesa scarp) basalt; Basalt Slopes, 13" to 17"
- 21 Disterheff-Natank-Yumtheska complex, 2 to 15 percent slopes (hills) Virgin/lower red; Disterheff and Natank-Clay Loam Upland (Gravelly), 13" to 17"; Yumtheska-Limestone Slopes, 13" to 17"
- 25 Goesling loam, 1 to 5 percent slopes (stream terrace), Moenkopi; Loamy Upland (Gravelly), 13" to 17"

- 45 Mellenthin-Rock Outcrop-Torriorthents complex, 10 to 70 percent slopes (mesa, hill) Kaibab; Mellenthin-Shallow Loamy, 9" to 13"; Torriorthents-Breaks, 9" to 13"
- 72 Springerville-Delenbaw complex, 3 to 25 percent slopes (mesa) basalt; Springerville and Delenbaw-Clay Loam Upland (gravelly), 13" to 17"
- 80 Tsezhin fam-Ashfork fam-RO complex, 10 to 70 percent slopes (mesa) basalt/Moenkopi; Tsezhin and Ashfork-Basalt Slopes, 13" to 17"
- 93 Yumtheska-Katzine-Rock Outcrop complex, 2 to 30 percent slopes (hills) limestone; Yumtheska-Limestone Slopes, 13" to 17"; Katzine-Loamy Upland (gravelly), 13" to 17"

### **C. Information and/or Data Pertaining to Issues (from III.G.1.)**

#### **1. Issues Relating to Rangeland Health**

None

## **V. CONCLUSIONS**

### **A. Pertaining to Objectives**

#### **1. Land Use Plan Objectives**

##### Shivwits Resource Area Implementation Plan

**WS01** *Manage vegetation cover towards ecological stability and sound long-term protective soil cover*

This has been accomplished in this allotment. The objective has been met. Departure from soil and hydrologic site descriptions/function (rills, flow patterns, pedestals, bare ground, gullies, wind scour, litter movement and amount, resistance to erosion, soil loss, compaction and infiltration) are none to slight.

**WS22** *Manage watershed areas according to watershed categorizations to achieve identified objectives.*

This is a Category II allotment. This means that the watershed units are in satisfactory erosion condition, but are susceptible to wind and water erosion following disturbance. Management has been successful in minimizing erosion. This allotment will remain in Category II.

**RR-06** *Implement actions to restore and/or maintain natural conditions or appearance in all areas.*

This objective is being met. This objective is a process that is an on-going effort

based on observations of range and other specialists and restoration actions are evaluated through the planning and NEPA process for interdisciplinary input and review.

***RR-08*** *Manage the majority of the Resource Area for extensive recreation while maintaining its naturalness/remoteness.*

This objective is being met. Visitors to the allotment engage in hunting, camping, sightseeing, and indulge in a variety of legitimate recreation activities and are monitored to see that the area's values are not degraded by overuse.

***RR-09*** *Commercial recreation permits would be issued to the extent that their cumulative impacts are consistent with the overall objectives of this plan and in the public interest.*

This objective is being met. As new requests for commercial Special Recreation use permits are received they are evaluated and reviewed for consistency with this objective and processed accordingly.

***TE01*** *Manage areas consistent with multiple uses to conserve candidate species and their habitats and ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered. Adverse impacts to listed species will be avoided.*

Met. No actions which might contribute to the need to list candidate species are known to have occurred or are proposed. No adverse impacts to listed species are known.

***WL02*** *Maintain productive wildlife habitat and ensure wildlife needs and considerations are incorporated into land use planning, National Environmental Policy Act documents, and management decisions.*

This objective is being met. All proposed actions with potential to impact wildlife species are reviewed through the NEPA process. Biological evaluations would be prepared to document the effects of any proposed action on listed or proposed species.

***WL16*** *Complete ecological site inventories in key areas to determine site potentials and present ecological conditions; establish desired plant community objectives for various areas and include these objectives in Allotment Management Plans, Habitat Management Plans, watershed plans, and other plans in order to prescribe management or improvement practices to achieve these objectives.*

This objective has been met. ESIs have been recently conducted in the three key areas to determine site potentials. This information will be included as plans are

updated.

## 2. Specific Resource Objectives

### Wilderness Management Plan for Paiute and Beaver Dam Mountains

*Grazing Management: The objective is to allow grazing to continue at existing levels while preventing any adverse impact on the wilderness resource.*

No adverse impacts from grazing on wilderness resource values were identified for this allotment as an issue or concern

### Black Rock HMP (1994) Objectives

- MD1 Identify factors suppressing mule deer population recovery and, if possible, the cause(s) of the decline in the HMP area by 1998. Where possible, eliminate or reduce the impacts of limiting factors to initiate herd recovery.*
- MD2a1 Enhance and maintain forage, water, and cover conditions on 365,000 acres of mule deer habitat to support 2,200 deer yearlong in the HMP area by the year 2010.*
- MD3a Increase the number of mule deer in the HMP area by at least 100 percent over the 1993 estimated population of 400 head by 2010.*
- MD3b Increase mule deer production and maintain an average fawn survival within AGFD species management guidelines for mule deer.*
- MD3c Increase and maintain post harvest buck to doe ratios within AGFD species management guidelines for mule deer*

These objectives are not being met because they are unrealistic. Factors suppressing mule deer population recovery have been identified and include limited summer range, lack of precipitation, high predation, and unrealistic estimates of the carrying capacity of the area for deer. While fawn survival has approached or exceeded 50 fawns per 100 does in unit 13B, typical fawn to doe ratios are closer to 35. This unit is considered to be a low productivity area for mule deer, primarily due to dry conditions and encroachment by pinyon and juniper communities. It is doubtful that the area could ever support 2,200 mule deer without long term intensive and costly manipulation of the habitat.

- MD2a2 Identify and manage for key forage and cover species in mule deer habitat, particularly crucial summer range, based on DPC and establish key areas by 2000.*

This objective is being met. Plant species crucial for mule deer are included in DPC objectives. With mule deer populations slowly increasing, habitat condition (rangeland health) does not appear to be a limiting factor for mule deer at this time.

## California Condor Recovery Plan

### *CC-1 Provide foraging habitat for California condors.*

Foraging habitat is available for condors. Due to recent concerns raised about the condors eating contaminated food, leaving dead livestock on the range for the condors is not being encouraged. Condors are especially vulnerable to lead poisoning and carcasses possibly containing lead should be removed from the range. There is no evidence that the habitat is limiting or restricting condor population growth.

### *CC-2 Maintain a healthy, self-sustaining population of California condors with a positive growth rate of at least 150 individuals with at least 15 breeding pairs.*

While this objective has not yet been met, the condor population appears to be stable and is increasing. Recent reports of at least two successful nests indicate that the birds are beginning to make progress towards self-sustaining populations. The condors at the Vermilion Cliffs are still very young birds, with many having just recently reached sexual maturity. It may still be many years before the population objective reaches 150 individuals and at least 15 breeding pairs. There is no evidence that rangeland health on this allotment would inhibit the condor population from reaching this objective.

## Little Wolf AMP

*The main objective is to protect natural resources by improving forage and other vegetative conditions for livestock and wildlife, and improve the watershed conditions by reducing soil erosion and improving stability*

Based on studies conducted on the allotment these values or needs are being met.

Specific vegetation objectives from AMP

### **Key Area No. 1, Maple Spring-West Pasture**

*Increase percent frequency of key species from 10% to 15%*

*Increase percent cover of Live Vegetation from 3% to 5%*

*Percent cover of litter maintain at 47%*

Based on studies conducted on the allotment all parts of this objective are being met or exceeded.

### **Key Area No. 2, Middle Pasture**

*Percent frequency of key species maintain at 82%*

*Percent cover of Live Vegetation maintain at 10%*

*Percent cover of litter maintain at 53%*

The percent key species is being met, the live vegetation was being met until the drought reading of 2004 and the same is true for litter.

### **Key Area No. 3, East Pasture**

*Percent frequency of key species maintain at 62%*

*Percent cover of Live Vegetation maintain at 15%*

*Percent cover of litter maintain at 44%*

All parts of this objective were being met until the 2004 reading when not one of the three met the objective, which reflected the changes caused by drought.

### **DPC Objectives :Developed during this process**

#### **Key Area No. 1, located in the Maple Pasture (Treated area)**

**The Ecological Site is Basalt Slopes, 13" to 17" precipitation zone**

*Increase grass CBW from 9 to 25% through 2015*

*Maintain shrub CBW between 85 to 95%*

*Maintain forbs CBW between 5 to 10%*

These objectives were developed during this process and will be monitored to determine if they are being met.

#### **Key Area No. 2, located in the Middle Pasture (Treated area)**

**The Ecological Site is Loamy Upland (Gravelly), 13" to 17" precipitation zone**

*Maintain seeded grass CBW between 75 to 80%*

*Maintain perennial forbs CBW between 05 to 10%*

*Maintain annual forbs CBW between 10 to 15%*

These objectives were developed during this process and will be monitored to determine if they are being met.

**Key Area No. 3, located in the East Pasture**

**The Ecological Site is Clay Loam Upland (Gravelly), 13" to 17"; Limestone Slopes, 13" to 17" precipitation zone**

*Maintain Seeded grass CBW between 30 to 35%*

*Maintain Perennial Forbs CBW between 10 to 15%*

*Maintain Annual Forbs CBW between at around 5%*

*Maintaining shrub CBW between 30 to 45 %*

These objectives were developed during this process and will be monitored to determine if they are being met.

**B. Pertaining to Issues**

**1. Issues Relating to Rangeland Health**

None

**The following is added for conclusions relative to implementation of the Standards for Rangeland Health and Guidelines for Grazing Administration**

Based on the analyses and supporting documentation referenced herein, resource conditions on the allotment:

☒ [X] Meet all applicable standards for rangeland health

☐ [ ] Are making significant progress toward meeting the applicable standards for rangeland health

Do not meet the standards for rangeland health for:

☐ [ ] No. 1: Upland sites

☐ [ ] No. 2: Riparian-Wetland sites

☐ [ ] No. 3: Desired Resource Conditions

☐ [ ] Have not been sufficiently documented to make a specific determination, but there is no reason to believe that current management would preclude meeting the standards for rangeland health.

**VI. RECOMMENDATIONS**

1. Renew the 10 year permit and continue to graze Littlewolf as a summer/fall pasture as part of the Littlewolf/Purgatory AMP.
2. Continue documenting the vegetative trends and utilization by collecting study data.

**AUTHORIZED OFFICER CONCURRENCE:**

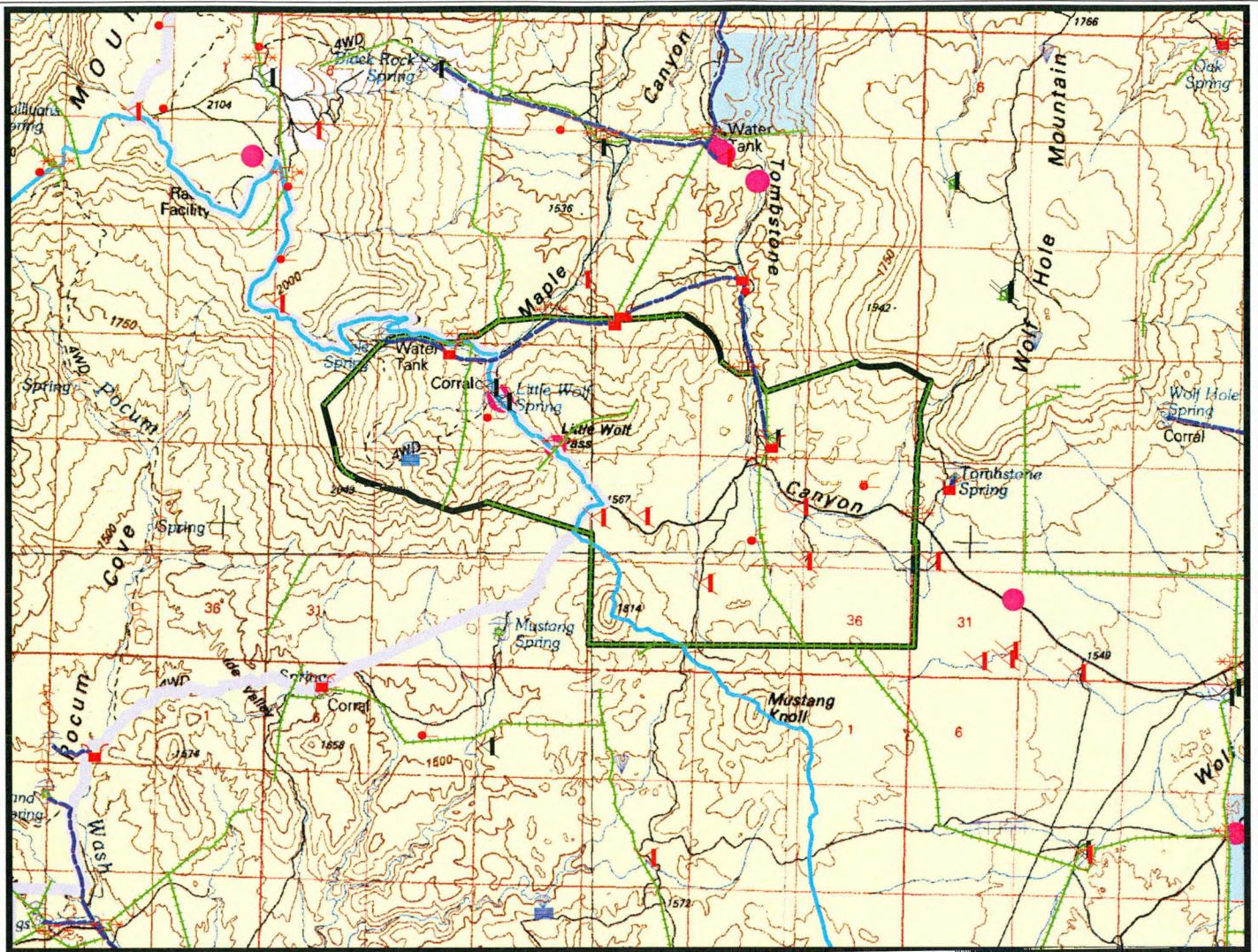
X I concur with the conclusions and recommendations as written.

\_\_\_\_\_ I do not concur.

\_\_\_\_\_ I concur, with the following modifications:

Decky J. Hammond  
Field Manager  
Arizona Strip Field Office

November 1, 2006  
Date



# Littlewolf Allotment

Bureau of Land Management  
Arizona Strip Field Office



1:100000



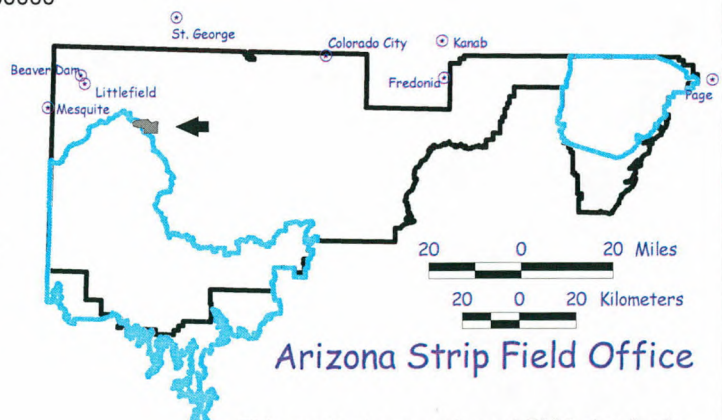
- Noxious Weeds
- Livestock Catchment
- Key Area

- Fence
- Pipeline

- Monument Boundary
- Allotment Boundary
- Wilderness Boundary

- Ownership
- BLM
  - Forest Service
  - Indian Reservation
  - National Park
  - Private
  - Recreation Area
  - State

- Fenced Reservoir
- Trough
- Undeveloped Spring
- Unfenced Reservoir
- Water Storage Tank
- Well
- Wildlife Catchment
- Wildlife Drinker
- Windmill
- Cattleguard
- Corral
- Developed Spring



Arizona Strip Field Office

This product may not meet BLM standards for accuracy and content. Different data sources and input scales may cause some misalignment of data layers.

Produced by  
Linda Price  
September 14, 2004

# **Appendix A**

## **ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION**

# ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION

## INTRODUCTION

The Department of the Interior's final rule for Grazing Administration, issued on February 22, 1995, and effective August 21, 1995, requires that Bureau of Land Management (BLM) State Directors develop State or regional standards and guidelines for grazing administration in consultation with BLM Resource Advisory Councils (RAC), other agencies and the public. The final rule provides that fallback standards and guidelines be implemented, if State standards and guidelines are not developed by February 12, 1997. Arizona Standards and Guidelines and the final rule apply to grazing administration on public lands as indicated by the following quotation from the Federal Register, Volume 60, Number 35, page 9955.

"The fundamentals of rangeland health, guiding principles for standards and the fallback standards address ecological components that are affected by all uses of public rangelands, not just livestock grazing. However, the scope of this final rule, and therefore the fundamentals of rangeland health of §4180.1, and the standards and guidelines to be made effective under §4180.2, are limited to grazing administration."

Although the process of developing standards and guidelines applies to grazing administration, present rangeland health is the result of the interaction of many factors in addition to grazing by livestock. Other contributing factors may include, but are not limited to, past land uses, land use restrictions, recreation, wildlife, rights-of-way, wild horses and burros, mining, fire, weather, and insects and disease.

With the commitment of BLM to ecosystem and interdisciplinary resource management, the standards for rangeland health as developed in this current process will be incorporated into management goals and objectives. The standards and guidelines for rangeland health for grazing administration, however, are not the only considerations in resolving resource issues.

The following quotations from the Federal Register, Vol. 60, No. 35, page 9956, February 22, 1995, describe the purpose of standards and guidelines and their implementation:

"The guiding principles for standards and guidelines require that State or regional standards and guidelines address the basic components of healthy rangelands. The Department believes that by implementing grazing-related actions that are consistent with the fundamentals of §4180.1 and the guiding principles of §4180.2, the long-term health of public rangelands can be ensured.

"Standards and guidelines will be implemented through terms and conditions of grazing permits, leases, and other authorizations, grazing-related portions of activity plans (including Allotment Management Plans), and through range improvement-related activities.

"The Department anticipates that in most cases the standards and guidelines themselves will not be terms and conditions of various authorizations but that the terms and conditions will reflect the standards and guidelines.

"The Department intends that assessments and corrective actions will be undertaken in priority order as determined by BLM.

"The Department will use a variety of data including monitoring records, assessments, and knowledge of the locale to assist in making the "significant progress" determination. It is anticipated that in many cases it will take numerous grazing seasons to determine direction and magnitude of trend. However, actions will be taken to establish significant progress toward conformance as soon as sufficient data are available to make informed changes in grazing practices."

## **FUNDAMENTALS AND DEFINITION OF RANGELAND HEALTH**

The Grazing Administration Regulations, at §4180.1 (43 Code of Federal Regulation [CFR] 4180.1), Federal Register Vol. 60, No. 35, pg. 9970, direct that the authorized officer ensures that the following conditions of rangeland health exist:

(a) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

(c) Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives such as meeting wildlife needs.

(d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This Committee defined Rangeland Health ". . . as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." This committee emphasized ". . . the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The Committee also recommended that "The determination of whether a rangeland is healthy, at risk, or unhealthy should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

Standards describe conditions necessary to encourage proper functioning of ecological processes on specific ecological sites. An ecological site is the logical and practical ecosystem unit upon which to base an interpretation of rangeland health. Ecological site is defined as:

". . . a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management" (Journal of Range Management, 48:279, 1995). Ecological sites result from the interaction of climate, soils, and landform (slope, topographic position). The importance of this concept is that the "health" of different kinds of rangeland must be judged by standards specific to the potential of the ecological site. Acceptable erosion rates, water quality,

productivity of plants and animals, and other features are different on each ecological site.

Since there is wide variation of ecological sites in Arizona, standards and guidelines covering these sites must be general. To make standards and guidelines too specific would reduce the ability of BLM and interested publics to select specific objectives, monitoring strategies, and grazing permit terms and conditions appropriate to specific land forms.

Ecological sites have the potential to support several different plant communities. Existing communities are the result of the combination of historical and recent uses and natural events. Management actions may be used to modify plant communities on a site. The desired plant community for a site is defined as follows: "Of the several plant communities that may occupy a site, the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum." (Journal of Range Management, 48:279, 1995.)

Fundamentals (a) and (b) define physical and biological components of rangeland health and are consistent with the definition of rangeland health as defined by the Committee on Rangeland Classification, Board on Agriculture, National Research Council, as discussed in the paragraph above. These fundamentals provide the basis for sustainable rangelands.

Fundamentals (c) and (d) emphasize compliance with existing laws and regulation and, therefore, define social and political components of rangeland health. Compliance with Fundamentals (c) and (d) is accomplished by managing to attain a specific plant community and associated wildlife species present on ecological sites. These desired plant communities are determined in the BLM planning process, or, where the desired plant community is not identified, a community may be selected that will meet the conditions of Fundamentals (a) and (b) and also adhere to laws and regulations. Arizona Standard 3 is written to comply with Fundamentals (c) and (d) and provide a logical combination of Standards and Guidelines for planning and management purposes.

## STANDARD AND GUIDELINE DEFINITIONS

**Standards** are goals for the desired condition of the biological and physical components and characteristics of rangelands. Standards:

- (1) are measurable and attainable; and
- (2) comply with various Federal and State statutes, policies, and directives applicable to BLM Rangelands.

**Guidelines** are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

- (1) typically identify and prescribe methods of influencing or controlling specific public land uses;
- (2) are developed and applied consistent with the desired condition and within site capability; and
- (3) may be adjusted over time.

## IMPLEMENTING STANDARDS AND GUIDELINES

The authorized officer will review existing permitted livestock use, allotment management plans, or other activity plans which identify terms and conditions for management on public land. Existing management practices, and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet, or are making significant progress toward meeting, the standards and are in conformance with the guidelines. The review will be interdisciplinary and conducted under existing rules which provide for cooperation, coordination, and consultation with affected individuals, federal, state, and local agencies, tribal governments, private landowners, and interested publics.

This review will use a variety of data, including monitoring records, assessments, and knowledge of the locale to assist in making the significant progress determination. Significance will be determined on a case by case basis, considering site potential, site condition, weather and financial commitment. It is anticipated there will be cases where numerous years will be needed to determine direction and magnitude of trend.

Upon completion of review, the authorized officer shall take appropriate action as soon as practicable but no later than the start of the next grazing year upon determining that the existing grazing management practices or level of use on public land are significant factors contributing to failure to achieve the standards and conform with the guidelines that are made effective under 43 CFR 4180.2. Appropriate action means implementing actions that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with guidelines.

Livestock grazing will continue where significant progress toward meeting standards is being made. Additional activities and practices would not be needed on such allotments. Where new activities or practices are required to assure significant progress toward meeting standards, livestock grazing use can continue contingent upon determinations from monitoring data that the implemented actions are effective in making significant progress toward meeting the standards. In some cases, additional action may be needed as determined by monitoring data over time.

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

## ARIZONA STANDARDS AND GUIDELINES

Arizona Standards and Guidelines (S&G) for grazing administration have been developed through a collaborative process involving the Bureau of Land Management State S&G Team and the Arizona Resource Advisory Council. Together, through meetings, conference calls, correspondence, and Open Houses with the public, the BLM State Team and RAC prepared Standards and Guidelines to address the minimum requirements outlined in the grazing regulations. The Standards and Guidelines, criteria for meeting Standards, and indicators are an integrated document that conforms to the fundamentals of rangeland health and the requirements of the regulations when taken as a whole.

Upland sites, riparian-wetland areas, and desired resource conditions are each addressed by a standard and associated guidelines.

### **Standard 1: Upland Sites**

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).

#### **Criteria for meeting Standard 1:**

Soil conditions support proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including appropriate amounts of vegetative cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the potential of the site.

Ground cover in the form of plants, litter or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

#### **As indicated by such factors as:**

##### Ground Cover

- litter
- live vegetation, amount and type (e.g., grass, shrubs, trees, etc.)
- rock

##### Signs of erosion

- flow pattern
- gullies
- rills
- plant pedestaling

#### **Exceptions and exemptions (where applicable):**

none

#### **Guidelines:**

1-1. Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites within management units. The ground cover should maintain soil organisms and plants and animals to support the hydrologic and nutrient cycles, and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

1-2. When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

## **Standard 2: Riparian-Wetland Sites**

Riparian-wetland areas are in properly functioning condition.

### **Criteria for meeting Standard 2:**

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large woody debris is present to dissipate stream energy associated with high water flows.

Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetative, soil and erosion-deposition factors. BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as indicated by the results of the application of the appropriate checklist.

The checklist for riparian areas is in Technical Reference 1737-9 "Process for Assessing Proper Functioning Condition." The checklist for wetlands is in Technical Reference 1737-11 "Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas." These checklists are reprinted on the pages following the Guidelines for Standard 3.

### **As indicated by such factors as:**

- Gradient
- Width/depth ratio
- Channel roughness and sinuosity of stream channel
- Bank stabilization
- Reduced erosion
- Captured sediment
- Ground-water recharge
- Dissipation of energy by vegetation

### **Exceptions and exemptions (where applicable):**

Dirt tanks, wells, and other water facilities constructed or placed at a location for the purpose of providing water for livestock and/or wildlife and which have not been determined through local planning efforts to provide for riparian or wetland habitat are exempt.

Water impoundments permitted for construction, mining, or other similar activities are exempt.

**Guidelines:**

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.

2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

2-3. The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

**Standard 3: Desired Resource Conditions**

Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

**Criteria for meeting Standard 3:**

Upland and riparian-wetland plant communities meet desired plant community objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species, and the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and appropriate laws, regulations, and policies.

Desired plant community objectives will be developed to assure that soil conditions and ecosystem function described in Standards 1 and 2 are met. They detail a site-specific plant community, which when obtained, will assure rangeland health, State water quality standards, and habitat for endangered, threatened, and sensitive species. Thus, desired plant community objectives will be used as an indicator of ecosystem function and rangeland health.

**As indicated by such factors as:**

Composition  
Structure  
Distribution

**Exceptions and exemptions (where applicable):**

Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical.

**Guidelines:**

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native

species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

3-2. Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance or restoration of their habitats.

3-3. Management practices maintain, restore, or enhance water quality in conformance with State or Federal standards.

3-4. Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant community objectives.

3-5. Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

- ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;

- sufficient surface and subsurface soil moisture exists for continued plant growth;

- serviceable waters are capable of providing for proper grazing distribution;

- sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and

- monitoring is conducted during grazing to determine if objectives are being met.

3-6. Management practices will target those populations of noxious weeds which can be controlled or eliminated by approved methods.

3-7. Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites and plants of significance to Native American peoples.

# **Appendix B**

## Interdisciplinary Assessment Team

|                |                                                                   |
|----------------|-------------------------------------------------------------------|
| Linda Price    | Project Coordinator (BLM)                                         |
| Mike Small     | Wildlife Biologist (BLM)                                          |
| Larry Gearhart | Wilderness/Recreation Specialist (BLM)                            |
| LD Walker      | Vegetation/Grazing Administration (BLM)                           |
| Robert Smith   | Soils and Watershed(BLM)                                          |
| Luke Thompson  | Wildlife Manager (Arizona Game and Fish Department)               |
| Kyle Spencer   | Soils and Vegetation (Natural Resource Conservation Service)      |
| Rob Grumbles   | Vegetation and Social Economics (Mohave County Extension Service) |

## Rangeland Resource Team

### Commodity Interests

|                                                    |                                                    |
|----------------------------------------------------|----------------------------------------------------|
| Bill Gubler,<br>Grazing<br>Rancher, St. George, UT | Kent McComb,<br>Grazing<br>Retired, St. George, UT |
|----------------------------------------------------|----------------------------------------------------|

### Non-Commodity Interests

|                                                                        |                                                         |                                                                          |
|------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------|
| Scott Hansen,<br>Environmental Conservation<br>Retired, St. George, UT | Spence Esplin,<br>Historical<br>Retired, St. George, UT | Phil Squire,<br>Dispersed Recreation/Wildlife<br>Retired, St. George, UT |
|------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------|

### Local Area Interests

|                                                            |                                                           |                                                                       |
|------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------|
| Frank Malan,<br>Public-at-Large<br>Retired, St. George, UT | Roger McPeck<br>Public at Large<br>Retired, St. George UT | Dennis Becenti<br>Native American Interests<br>Hopi and Navajo Tribes |
|------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------|

### Alternates

|                                       |                                        |
|---------------------------------------|----------------------------------------|
| Maggie Sacher,<br>Commodity Interests | Paul Weaver<br>Non-Commodity Interests |
|---------------------------------------|----------------------------------------|

# **Appendix C:**

## Precipitation Data

# Historical Precipitation Report

Field Office 010

Rain Gauge Name: Mustang

Rain Gauge Number: 21

| Seasonal Precipitation Amounts |      |        |        |        |        | Annual Average |        |        |        |        | Percent of Normal |        |        |        |        |
|--------------------------------|------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|-------------------|--------|--------|--------|--------|
| Year                           | Fall | Winter | Spring | Summer | Annual | Fall           | Winter | Spring | Summer | Annual | Fall              | Winter | Spring | Summer | Annual |
| 1978                           | 2.73 | 13.95  | 3.43   | 1.75   | 21.86  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 127%              | 239%   | 118%   | 40%    | 143%   |
| 1979                           | 4.57 | 7.00   | 4.61   | 4.12   | 20.30  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 212%              | 120%   | 158%   | 94%    | 133%   |
| 1980                           | 0.86 | 10.46  | 2.90   | 3.84   | 18.06  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 40%               | 179%   | 100%   | 88%    | 118%   |
| 1981                           | 1.44 | 2.43   | 5.43   | 5.00   | 14.30  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 67%               | 42%    | 186%   | 114%   | 94%    |
| 1982                           | 1.89 | 4.29   | 4.50   | 5.41   | 16.09  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 88%               | 74%    | 154%   | 124%   | 105%   |
| 1983                           | 5.13 | 5.73   | 4.00   | 4.85   | 19.71  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 238%              | 98%    | 137%   | 111%   | 129%   |
| 1984                           | 2.65 | 1.76   | 0.82   | 4.75   | 9.98   | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 123%              | 30%    | 28%    | 109%   | 65%    |
| 1985                           | 1.86 | 7.36   | 1.84   | 3.20   | 14.26  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 86%               | 126%   | 63%    | 73%    | 93%    |
| 1986                           | 3.93 | 2.25   | 4.00   | 4.44   | 14.62  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 183%              | 39%    | 137%   | 102%   | 96%    |
| 1987                           | 2.22 | 5.02   | 4.50   | 4.02   | 15.76  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 103%              | 86%    | 154%   | 92%    | 103%   |
| 1988                           | 4.50 | 2.31   | 2.68   | 3.58   | 13.07  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 209%              | 40%    | 92%    | 82%    | 86%    |
| 1989                           | 0.89 | 4.00   | 1.34   | 2.91   | 9.14   | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 41%               | 69%    | 46%    | 67%    | 60%    |
| 1990                           | 0.82 | 3.70   | 2.00   | 4.00   | 10.52  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 38%               | 63%    | 69%    | 92%    | 69%    |
| 1991                           | 1.50 | 4.72   | 1.85   | 4.25   | 12.32  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 70%               | 81%    | 64%    | 97%    | 81%    |
| 1992                           | 0.96 | 5.50   | 6.46   | 2.15   | 15.07  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 45%               | 94%    | 222%   | 49%    | 99%    |
| 1993                           | 2.50 | 15.75  | 3.50   | 3.75   | 25.50  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 116%              | 270%   | 120%   | 86%    | 167%   |
| 1994                           | 2.88 | 4.62   | 2.75   | 12.50  | 22.75  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 134%              | 79%    | 94%    | 286%   | 149%   |
| 1995                           | 2.68 | 12.32  | 5.25   | 3.50   | 23.75  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 124%              | 211%   | 180%   | 80%    | 156%   |
| 1996                           | 0.50 | 5.12   | 0.63   | 3.25   | 9.50   | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 23%               | 88%    | 22%    | 74%    | 62%    |
| 1997                           | 3.13 | 5.62   | 1.38   | 10.37  | 20.50  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 145%              | 96%    | 47%    | 237%   | 134%   |
| 1998                           | 1.31 | 7.94   | 3.50   | 8.25   | 21.00  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 61%               | 136%   | 120%   | 189%   | 138%   |
| 1999                           | 3.13 | 1.62   | 3.00   | 2.00   | 9.75   | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 145%              | 28%    | 103%   | 46%    | 64%    |
| 2000                           | 0.00 | 4.87   | 0.60   | 3.78   | 9.25   | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 0%                | 83%    | 21%    | 87%    | 61%    |
| 2001                           | 2.68 | 6.57   | 1.38   | 2.99   | 13.62  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 124%              | 113%   | 47%    | 68%    | 89%    |
| 2002                           | 0.75 | 1.87   | 0.63   | 1.88   | 5.13   | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 35%               | 32%    | 22%    | 43%    | 34%    |
| 2003                           | 1.88 | 4.87   | 2.75   | 3.00   | 12.50  | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 87%               | 83%    | 94%    | 69%    | 82%    |
| 2004                           | 0.75 |        |        |        |        | 2.15           | 5.83   | 2.91   | 4.37   | 15.27  | 35%               |        |        |        |        |

# **Appendix E:**

Wildlife Data

Arizona Game and Fish Mule Deer Counts for Game Management Unit 13B.

| Year | Number of Animals Surveyed | Bucks / 100 does | Fawns / 100 does | Population Estimate |
|------|----------------------------|------------------|------------------|---------------------|
| 1985 | 108                        | 30               | 50               | 1,000 - 1,500       |
| 1986 | 41                         | 29               | 18               | 1,000 - 1,500       |
| 1987 | 63                         | 31               | 44               | 1163                |
| 1988 | ---                        | No Data          | No Data          | No Data             |
| 1989 | 112                        | 71               | 31               | 900                 |
| 1990 | 63                         | 68               | 32               | 900                 |
| 1991 | 85                         | 27               | 37               | 900                 |
| 1992 | 31                         | 24               | 59               | <1,000              |
| 1993 | 117                        | 126              | 52               | 800-1,000           |
| 1994 | 143                        | 69               | 52               | No Estimate         |
| 1995 | 88                         | 183              | 79               | No Estimate         |
| 1996 | 154                        | 87               | 33               | No Estimate         |
| 1997 | 64                         | 77               | 29               | No Estimate         |
| 1998 | 156                        | 43               | 45               | No Estimate         |
| 1999 | 145                        | 51               | 35               | No Estimate         |
| 2000 | 155                        | 49               | 36               | No Estimate         |
| 2001 | 275                        | 34               | 67               | No Estimate         |
| 2002 | 118                        | 46               | 20               | No Estimate         |
| 2003 | Unknown                    | 29               | 46               | No Estimate         |

Fixed wing surveys were flown in December - January for all of Game Management Unit 13B from 1985 through 1997. Helicopter surveys were used from 1998 through 2001.