Standards for Rangeland Health and Guidelines for Grazing Administration
Implementation Project: Allotment Assessment

HIDDEN HILLS ALLOTMENT – 04825

I. Introduction

The Hidden Hills 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 ensure 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 Appendix A for a copy of the Standards and Guidelines).

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 Appendix B 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 S&G's 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 February 26, 2008, and a field visit on June 24, 2008. 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

Active Grazing Use: 1,907 AUMs
Suspended Non-use: 0 AUMs

B. Season(s) of use

281 cattle from May 16 to December 31
3 cattle from May 16 to June 16

C. Kind and class of livestock

Cow/Calf Operation

D. Percent federal range[a]

The Hidden Hills allotment is 90% federal range. State lands within the allotment boundary are not isolated or fenced and therefore are grazed in conjunction with federal lands and are a part of the allotment management plan (AMP) grazing rotation.

III. Allotment Profile

A. Description

Hidden Hills Allotment is located in Mohave County, Arizona (T. 34, and 35 N., R. 12, 13, and 14 W.) approximately 60 miles south of St. George, Utah. The allotment is located within Grand Canyon-Parashant National Monument. Elevations range

[a] The percentage of public land use determined by the proportion of livestock forage available on public lands within the allotment compared to the total amount available from public lands, private lands, and those owned or controlled by the permittee or lessee.

from 4,400' in the desert shrub lands above the Lower Grand Wash Cliffs to 6,400' atop the Hidden Rim, primarily dominated by pinyon-juniper woodland.

The allotment is categorized an "I" or improve category allotment. Criteria for the "I" category suggest one or more of the following exist: present range condition is unsatisfactory, the allotment has high or moderate resource potential and is producing near its potential, serious resource conflicts/controversy exists, opportunities exist for positive economic return from public investment, or present management is unsatisfactory.

B. Acreage

The allotment contains:

- 45,999 acres of federal land
- 3,428 acres of state land

Total: 49,427 acres

C. Objectives

1. Land Use Plan Objectives

Grand Canyon – Parashant National Monument Resource Management Plan

Objectives are labeled according to the applicable resource or resource use and sequentially numbered in the RMP. Listed here are the Desired Future Condition (DFC) decisions that will be assessed in this document. The codes associated with these objectives are as follows:

WS=Air, Water and Soils	TE=Special Status Species	WM=Designated Wilderness
VM=Vegetation	WC=Wilderness Characteristics	VR=Visual Resources
WF=Wildlife and Fisheries	RR=Recreation Resources	
GM=Livestock Grazing		

Soil Stability

DFC-VM-04 (Vegetation – All Ecological Zones)
Vegetative communities will provide sufficient plant cover and litter accumulation to protect soils from wind and water erosion and enhance nutrient cycling and productivity, even during drought years.

DFC-WS-06
The natural hydrologic functions of all watersheds will be intact.

DFC-WS-07
Soils will exhibit infiltration, permeability, and erosion rates appropriate for the soil type, climate, and landform.

Ecological Processes

DFC-VM-05 (Vegetation – All Ecological Zones)
Ecological processes and functions will be protected, enhanced, and/or restored by allowing tools that are necessary and appropriate to mitigate adverse impacts of allowable uses and undesirable disturbances, and contribute to meeting the Standards for Rangeland Health … and enhance Monument values.

DFC-WS-04
Ecological functions and processes will be intact at all seeps and springs.

DFC-WF-01
Ecological conditions will be within the range of natural variability and will be functional for dependant animal species.

DFC-WF-12
The natural biological diversity of fish, wildlife, and plant species will be maintained or, where necessary and feasible, restored throughout the Monument. Habitats will be managed on an ecosystem basis, ensuring that all parts of the ecosystem and natural processes are functional.

Invasive Plants

DFC-VM-06 (Vegetation – All Ecological Zones)
Invasive plant species will be contained, controlled, or eliminated and native species restored to meet desired plant community (DPC) objectives.

DFC-VM-38 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Management of Mohave-Great Basin Transition Ecological Zone plant communities will focus on removing invasive non-native plants, especially cheatgrass, Sahara mustard, and red brome, and preventing habitat degradation due to wildfire.

No Net Loss

DFC-VM-15 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
There will be no net loss of total acres within sagebrush communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

DFC-VM-37 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
There will be no net loss in acres of Transition plant communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

Livestock Grazing

DFC-GM-02
Livestock use and associated management practices will be conducted in a manner consistent with other resource needs and objectives to ensure that the health of rangeland resources is preserved or improved so that they are productive for all rangeland values. Where needed, public rangeland ecosystems will be improved to meet objectives.

Desired Plant Community

DFC-GM-01
Healthy, sustainable rangeland ecosystems will be maintained or improved to meet Arizona's Standards for Rangeland Health and Vital Sign Standards on NPS-administered lands, and produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.

DFC-VM-03 (Vegetation – All Ecological Zones)
Native vegetative communities will be protected. A mosaic of native perennial and non-invasive annual vegetative communities will be present across the landscape with diversity of species, canopy, density, and age class reflecting its local ecological site potential and naturally occurring habitat conditions.

DFC-VM-14 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush (primarily Artemisia tridentata) communities will consist of a healthy, diverse mosaic of different height and age structures with a thriving community of native grasses and forbs. Mosaics may include stands of young and old sagebrush, openings (ranging from bare ground to short or sparse vegetation to high-density grasslands), wet meadows, seeps, healthy streamside (riparian) vegetation, and other interspersed shrub and woodland habitats.

DFC-VM-18 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Existing stands of sagebrush will have a balance between shrub and perennial grass cover, for open to moderate shrub canopy cover (5 to 25%), and multiple height classes. This mosaic will include young, sparse stands to support Vesper sparrows and lark sparrows, and older, dense stands to benefit Brewer's sparrows, sage sparrows, black-throated sparrows, gray flycatchers, and sage thrashers.

DFC-VM-19 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include small, grassy openings to support long-billed curlews and burrowing owls.

DFC-VM-20 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include large, continuous blocks (≥300 acres) of unfragmented sagebrush habitat, including mosaics of open to moderate shrub canopy cover (5 to 25%) and multiple age and height classes to benefit sage-dependent species.

DFC-VM-21 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include openings of short vegetation surrounded by sagebrush for ground foraging by sage thrashers, loggerhead shrikes, Brewer's sparrows, and sage sparrows.

DFC-VM-22 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include openings of short vegetation (2 to 8 in.) with wide visibility to provide breeding habitat for long-billed curlews, and burrowing owls.

DFC-VM-23 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include native grass and forb cover in balance with open to moderate (5 to 25%) shrub canopy cover and within ecological site potential. Perennial grass components will be at or above 10%. Native forb composition will be at or above 5%.

DFC-VM-24 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Fragmentation of sagebrush habitat will be less than 50% of the treatment area.

DFC-VM-25 (Vegetation – Great Basin Ecological Zone – Pinyon-Juniper Communities)
Healthy, diverse woodland communities will consist of a mosaic of trees, shrubs, grasses, and forbs. Mosaic patches can include stands of young and old pinyon-juniper, openings, wet meadows, seeps, and other interspersed shrub habitats. The communities will be composed of a variety of different height structures and age classes, with a thriving understory community of native grasses, forbs, and shrubs.

DFC-VM-28 (Vegetation – Great Basin Ecological Zone – Pinyon-Juniper Communities)
Stands of pinyon-juniper will include a balance between tree, shrub, and perennial grass cover to support pinyon jay and mule deer. This mosaic will include stands of old growth pinyon-juniper to support juniper titmouse; large openings of grasses, forbs and shrubs to support mule deer and provide foraging habitat for raptors such as sharp-shinned hawk, northern goshawk, Coopers hawk, American kestrel, and red-tailed hawk; and areas of sparse to dense tree canopy cover to support pinyon jay.

DFC-VM-29 (Vegetation – Great Basin Ecological Zone – Pinyon-Juniper Communities)
Individual old growth trees will be present and will be protected during treatment implementation.

DFC-VM-34 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Endemic plant species and associated communities such as black brush, Joshua tree, Mojave yucca, and cacti will be present along with other shrubs, grasses, and wildflowers. These communities can include stands of young and old shrubs, sparse vegetation, scattered to larger expanses of black brush to various mixes of black brush, Joshua trees, pinyon-juniper, yucca, and shrub habitats.

DFC-VM-36 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Priority plant species and associated communities such as black brush, Joshua tree, Mojave yucca, and cacti will be present along with other shrubs, grasses, and wildflowers. These communities can include stands of young and old shrubs, sparse vegetation, scattered to larger expanses of black brush to various mixes of black brush, Joshua trees, pinyon-juniper, yucca, and shrub habitats.

DFC-WF-17
Mule deer habitat in pinyon-juniper woodland sites will include a healthy diverse mosaic of trees, shrubs, grasses, and forbs.

Wildlife Habitat

DFC-VM-35 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Endemic animal species such as desert tortoise, chuckwalla, and desert bighorn sheep will be present and thriving with more than adequate food, water, and cover resources.

DFC-WF-02
Native wildlife communities will be protected. A complete range of diverse, healthy, and self-sustaining populations of native animal species will occupy all available suitable habitats.

Habitat Connectivity

DFC-WF-06
Habitat connectivity and wildlife movement between ecological zones will be maintained.

Wildlife Forage Needs

DFC-WF-16
On BLM administered lands, forage in crucial winter mule deer habitat will include at least 30% palatable browse species CBW at all key areas, where consistent with site potential.

DFC-WF-30
On BLM administered lands, forage in desert bighorn sheep habitat areas will include at least 20% grasses, 20% forbs, and 20% palatable shrub species CBW, where consistent with site potential.

Fences

DFC-WF-05
Fences will be the minimum necessary for effective livestock control or other administrative purposes. Fences will be wildlife passable, consistent with the species found in the area.

DFC-WF-20
All fences in mule deer habitat will be deer passable.

Healthy Wildlife Populations

DFC-WF-03
Forage, water, cover, and space will be available to wildlife of sufficient quantity and quality to support productive and diverse wildlife populations.

DFC-WF-13
Mule deer habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-28
Desert bighorn habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-35
Desert cottontail habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-37
Migratory bird habitats will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-45
Carnivore habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

Wildlife Population Numbers

DFC-WF-14
On BLM administered lands, mule deer populations will be at or near maximum levels sustainable for the habitat.

DFC-WF-29
On BLM administered lands, desert bighorn sheep populations will be at or near maximum levels sustainable for the habitat.

DFC-WF-36
Desert cottontail rabbits will be present in sufficient quantity to provide an adequate prey base for raptors, carnivores, and other predatory species, as well as ample recreational opportunities for hunting and wildlife viewing.

DFC-WF-38
Migratory birds that nest in the Monument will have resources of sufficient quantity and quality to provide for nesting sites and to fledge young successfully.

Wildlife Waters

DFC-WF-04
All waters will be safely accessible to wildlife.

DFC-WF-18
Water sources within mule deer habitat will be safely accessible to deer and other wildlife.

DFC-WF-19
On BLM administered lands, water sources within mule deer habitat will be spaced no more than 3 miles apart.

DFC-WF-31
Water sources within bighorn sheep habitat areas will be safely accessible to bighorn and other wildlife.

DFC-WF-32
On BLM administered lands, water sources within bighorn sheep habitat will be spaced no more than 4 miles apart.

DFC-WF-43
Water sources within game bird habitats will be safely accessible by all wildlife.

Threatened and Endangered Species Habitat

DFC-TE-03
The Monument will provide a block of remote, contiguous habitat that will serve as refugia for populations of special status species.

DFC-TE-21
Habitat areas for special status raptors will provide sufficient forage and cover attributes to support thriving populations of the species.

DFC-TE-23
Potential roosting and nesting sites (for special status raptors) will be abundant.

Healthy Threatened and Endangered Populations

DFC-TE-20
Special status raptor populations will be healthy and self-sustaining throughout their range.

DFC-TE-25
Rodent populations, as a prey base (for special status raptors), within the Monument will be abundant.

No Net Loss of Threatened and Endangered Species Habitat

DFC-TE-04 and DFC-TE-08
There will be no net loss in the quality or quantity of special status species habitat throughout the Monument.

DFC-TE-16
No net loss will occur in the quality and quantity of suitable habitat for endemic amphibians and aquatic invertebrate species within the Monument.

DFC-TE-22
No net loss will occur in the quality and quantity of suitable habitat for special status raptors within the Monument.

Condors

DFC-TE-27
The experimental non-essential population of California condor will be at or above 150 individuals, viable, and stable to increasing in number.

Wilderness Characteristics

DFC-WC-02
Areas where wilderness characteristics will be maintained will be ecologically sustainable and resilient to natural and human-caused disturbances.

Recreation and Visitor Services

DFC-RR-01
Recreation and visitor services will be managed to provide varying levels of structured recreation opportunities that offer a range of specific benefits, activities, and experiences within outdoor settings.

DFC-RR-05
The excellent opportunities that exist to enjoy remote, rustic settings that provide moderate challenge and solitude in the Specialized travel management areas (TMAs) will be maintained/enhanced.

DFC-RR-06
In Backways and Specialized TMAs, recreation opportunities associated with somewhat remote settings, such as exploring backcountry roads, vehicle camping, hunting, sightseeing, recreation aviation, and picnicking will be maintained/enhanced on existing roads, provided they will be compatible with the protection and enhancement of sensitive resource values, where appropriate.

DFC-RR-07
In the Primitive TMA, high quality recreation opportunities associated more with primitive recreation experience opportunities and non-motorized uses such as camping, sightseeing, hiking, horseback riding, and hunting, will be maintained/enhanced, provided they will be compatible with the protection and enhancement of sensitive resource values, where appropriate.

Designated Wilderness

DFC-WM-01
The first and dominant goal will be to provide for the long-term protection and preservation of the areas' wilderness character under a principle of non-degradation. The areas' natural condition, opportunities for solitude, opportunities for primitive and unconfined types of recreation, and any ecological, geological, or other features of scientific, educational, scenic, or historical value present will be managed so that they remain unimpaired.

DFC-WM-06
BLM wilderness areas and NPS proposed wilderness will be managed to be ecologically sustainable and resilient to natural and human-caused perturbations (See Vegetation Management and Fire Management decisions). The NPS and BLM will

strive to preserve or restore the natural quiet and natural sounds associated with the physical and biological resources of designated wilderness.

Visual Resources

DFC-VR-01
Public lands will be managed in a manner which will protect the quality of the scenic (visual) values of these lands. (43 U.S. Code [USC] 1701, Section 102 (a) (8)).

DFC-VR-03
The region's scenic beauty, open space landscapes, and other high-quality visual resources will be maintained within the Monument.

2. Specific Resource Objectives

Arizona Strip Desert Bighorn Sheep Management Plan, as Amended (July 2006)

BS1 Enhance and maintain forage, water, and cover conditions on 720 square miles of bighorn sheep habitat so that watersheds are in proper functioning condition, ecological processes are maintained, water quality standards are met, and threatened and endangered species habitat is conserved. Manage this habitat to support an average density of no more than four sheep per square mile within each habitat area by the year 2010.

BS2 Increase populations of desert bighorn sheep to fully occupy 720 square miles of suitable habitat on the Arizona Strip at an average density of no more than four bighorn per square mile by the year 2010. Maximum populations for the four desert bighorn habitat areas would be 886 for the Virgin and Beaver Dam Mountains, 700 for the Grand Wash Cliffs, 820 for Kanab Creek, and 432 for the Paria-Vermillion Cliffs area. The maximum population for the Arizona Strip would be 2880 desert bighorn.

Allotment Management Plan (AMP)[b]

Reduce the composition of sagebrush (Artemisia tridentata) from 60% to 0-20%, and increase the composition of perennial grasses and forbs from 21% to 60-85% in the identified sagebrush treatment areas in Hidden Lake Draw on the Hidden Hills Allotment within 10 years of plan approval.

Reduce the combined composition of pinyon-juniper and sagebrush from 83% to 2-35%, and increase perennial grasses, forbs, and browse composition from 21% to 32-90% in the identified treatment area of the Gulch Point pasture by 2002.

[b] Current frequency objectives found in the allotment management plan will be analyzed in this assessment; however, they are being replaced by Desired Plant Community objectives which will be analyzed in this (and future) assessments.

Maintain the vegetation diversity of the Hidden Hills chaining area to produce future multiple-use benefits.

Desired Plant Community (DPC) Objectives

DPC objectives were developed during this evaluation process by an interdisciplinary team of resource specialists. The species composition objectives were developed by consulting the Ecological Site Guides, developed by the Natural Resource Conservation Service, and site specific information of the potential of the site to produce vegetation. These objectives focus on the ecological sites and their potentials, which reflect the vegetative diversity of the area. DPC objectives are expressed in figures of Composition by Weight (CBW). Composition data is collected using the Dry Weight Rank sampling method.

Key Area #1 – Overnight Pasture
Rangesite: Loamy Upland, Gravelly13-17" precipitation zone (p.z.)

- Maintain perennial grass composition between 30-50% through 2030 by:
  - Maintaining squirreltail CBW at between 5-10%
  - Maintaining blue grama CBW at between 15-20%
  - Maintaining western wheatgrass CBW at between 2-8%
- Maintain shrubs CBW to between 25-45% by 2030.
- Maintain forb CBW at between 5-10% through 2030.
- Maintain tree CBW at between 1-5% through 2030.
- Maintain ground litter at between 15 and 30% through 2030.
- Maintain basal cover at between 5 and 10% through 2030.

Rationale: This key area is within the Great Basin Ecoregion identified in the Grand Canyon-Parashant National Monument (GCPNM) Resource Management Plan (RMP). The RMP directs the ecoregion to be managed for a vegetation community with mosaic patches of trees, shrubs, grasses and forbs.

The grass species listed individually are components of the ecological site and are recognized as key species. The site guide allows from 5 to 10 % CBW for squirreltail, 15 to 20% for blue grama, and 10 to 15% for western wheatgrass. In this semi-arid climate, maintaining basal cover at between 5 and 10% is realistic under normal weather conditions. Even though the percentage of litter at key areas can be very dynamic, past monitoring data suggests DPC values for the litter are within the expected range for this climate. In general, forbs are very important for wildlife, but forb CBW varies widely depending on the season of the year, weather, and other factors.

Key Area #2 – Overnight Pasture
Rangesite: Clay Loam Upland, Gravelly13-17" p.z.

- Maintain perennial grass composition between 20-30% through 2030 by:
  - Maintaining squirreltail CBW at between 1-5%
  - Maintaining blue grama CBW at between 15-25%

Maintaining muttongrass CBW at between 2-8%

- Maintain shrubs CBW to between 40-55% by 2030.
- Maintain forb CBW at between 1-10% through 2030.
- Maintain tree CBW at between 5-15% through 2030.
- Maintain ground litter at between 20 and 30% through 2030.
- Maintain basal cover at between 2 and 8% through 2030.

Rationale: This key area is within the Great Basin Ecoregion, identified in the RMP to be managed for a vegetation community with mosaic patches of trees, shrubs, grasses and forbs.

The grass species listed individually are components of the ecological site and are recognized as key species. The site guide allows up to 10 % CBW for squirreltail, 25 to 49% for blue grama, and up to 25% for muttongrass. In this semi-arid climate, maintaining basal cover at between 2 and 8% is realistic under normal weather conditions. Even though the percentage of litter at key areas can be very dynamic, past monitoring data suggests DPC values for the litter are within the expected range for this climate. In general forbs are very important for wildlife, but forb CBW varies widely depending on the season of the year, weather, and other factors.

Key Area #6 – Overnight Pasture

Rangesite: Shallow Loamy 10-14" p.z.

- Maintain perennial grass composition between 40-65% through 2030 by:
  Maintaining squirreltail CBW at between 5-10%
  Maintaining blue grama CBW at between 45-55%
  Maintaining sand dropseed CBW at between 1-5%
- Maintain shrubs CBW to between 15-35% by 2030.
- Maintain forb CBW at between 5-10% through 2030.
- Maintain tree CBW at between 2-10% through 2030.
- Maintain ground litter at between 15 and 30% through 2030.
- Maintain basal cover at between 5 and 10% through 2030.

Rationale: This key area is within the Great Basin Ecoregion, identified in the RMP to be managed for mosaics of multiple age and height classes of the existing vegetation community.

The grass species listed individually are components of the ecological site and are recognized as key species. The site guide allows from 5 to 10 % CBW for squirreltail, 5 to 15% for blue grama, and 1 to 5% for sand dropseed. In this semi-arid climate, maintaining basal cover at between 5 and 10% is realistic under normal weather conditions. Even though the percentage of litter at key areas can be very dynamic, past monitoring data suggests DPC values for the litter are within the expected range for this climate. Forbs are acknowledged as being very important for wildlife, but forb CBW varies widely depending on the season of the year, weather, and other factors. Past and current monitoring data suggests achievement of these DPC objectives is attainable and within the potential of the site.

Key Area #7 – Gulch Point Pasture
Rangesite: Shallow Loamy/Breaks transition 10-14" p.z.

- Maintain perennial grass composition between 5-15% through 2030 by:
  - Maintaining squirreltail CBW at between 1-5%
  - Maintaining muttongrass CBW at between 1-5%
- Maintain shrubs CBW to between 60-85% by 2030.
- Maintain Mormon tea, CBW at between 1-5% by 2030.
- Maintain cliffrose, CBW at between 30-40% by 2030.
- Maintain forb CBW at between 5-10% through 2030.
- Maintain tree CBW at between 2-10% through 2030.
- Maintain ground litter at between 15 and 30% through 2030.
- Maintain basal cover at between 2 and 5% through 2030.

Rationale: This key area is within the Great Basin Ecoregion, identified in the RMP to be managed for mosaics of multiple age and height classes of the existing vegetation community.

The grass species listed individually are components of the ecological site and are recognized as key species. The site guide allows from 0 to 5 % CBW for squirreltail and 5 to 15% for muttongrass. In this semi-arid climate, maintaining basal cover at between 2 and 5% is realistic under normal weather conditions and given that it is a shrub dominated site. Even though the percentage of litter at key areas can be very dynamic, past monitoring data suggests DPC values for the litter are within the expected range for this climate. Forbs are acknowledged as being very important for wildlife, but forb CBW varies widely depending on the season of the year, weather, and other factors. Past and current monitoring data suggests achievement of these DPC objectives is attainable and within the potential of the site.

Key Area #8 – Middle Bench Pasture
Rangesite: Shallow Sandy Loam, calcareous 10-14" p.z.

- Maintain perennial grass composition between 2-10% through 2030 by:
  - Maintaining squirreltail CBW at between 1-5%
  - Maintaining Indian ricegrass CBW at between 1-5%
- Maintain shrubs CBW to between 60-85% by 2030.
- Maintain cliffrose CBW at between 10-20% by 2030.
- Maintain Mormon tea CBW at between 1-5% by 2030.
- Maintain forb CBW at between 5-10% through 2030.
- Maintain tree CBW at between 1-10% through 2030.
- Maintain ground litter at between 15 and 30% through 2030.
- Maintain basal cover at between 2 and 8% through 2030.

Rationale: This key area is within the Great Basin Ecoregion, identified in the RMP to be managed for a mosaic of shrubs with diverse age classes.

The grass species listed individually are components of the ecological site and are recognized as key species. The site guide allows from 0 to 5 % CBW for squirreltail and 0 to 5% for other perennial grasses of which Indian ricegrass would be included. In this semi-arid climate, maintaining basal cover at between 2 and 8% is realistic under normal weather conditions and given that it is a shrub dominated site. Even though the percentage of litter at key areas can be very dynamic, past monitoring data suggests DPC values for the litter are within the expected range for this climate. Forbs are acknowledged as being very important for wildlife, but forb CBW varies widely depending on the season of the year, weather, and other factors. Past and current monitoring data suggests achievement of these DPC objectives is attainable and within the potential of the site.

Key Area #11 – Overnight Pasture
Rangesite: Clay Loam Upland, Gravelly13-17" p.z.

- Maintain perennial grass composition between 60-80% through 2030 by:
  - Maintaining crested wheatgrass CBW at between 20-35%
  - Maintaining intermediate wheatgrass CBW at between 30-40%
  - Maintaining junegrass CBW at between 1-5%
  - Maintaining squirreltail CBW at between 2-8%
  - Maintaining sand dropseed CBW at between 1-5%
- Maintain shrubs CBW to between 20-40% by 2030.
- Maintain forb CBW at between 1-10% through 2030.
- Maintain tree CBW at between 2-10% through 2030.
- Maintain ground litter at between 20 and 30% through 2030.
- Maintain basal cover at between 5 and 8% through 2030.

Rationale: This key area is within the Great Basin Ecoregion, identified in the RMP to be managed for mosaic patches of trees, shrubs, grasses, and forbs. This key area is within the Hidden Hills chain and seed treatment and is identified in the AMP as having high forage and cover value for wildlife. The objective is to maintain this treatment in such an approach so that it remains a plant community with a high species diversity.

The grass species listed individually are components of the ecological site and are recognized as key species. The site guide allows up to 25 % CBW for junegrass, up to 5% CBW for squirreltail, up to 5% CBW for sand dropseed, and up to 25% CBW for muttongrass. In this semi-arid climate, maintaining basal cover at between 5 and 8% is realistic under normal weather conditions. Even though the percentage of litter at key areas can be very dynamic, past monitoring data suggests DPC values for the litter are within the expected range for this climate. In general forbs are very important for wildlife, but forb CBW varies widely depending on the season of the year, weather, and other factors.

D. Key Species

Management of the allotment is based on a selection of key species. These species are selected for their similarity to other grasses and browse species that occur in the allotment. The definition of key species is: (1) Forage species of sufficient abundance and palatability to justify its use as an indicator to the *degree of use* of associated species; and (2) Those species which must, because of their importance, be considered in the management program. Key species for this allotment are:

Plant Category	Common Name	Scientific Name
Cool Season Grasses	Squirreltail	*Elymus elymoides*
	Indian ricegrass	*Achnatherum hymenoides*
	Seeded wheatgrass	*Agropyron* spp.
Warm Season grasses	Blue grama	*Bouteloua gracilus*
	Sand dropseed	*Sporobolus cryptandrus*
Browse species	Cliffrose	*Cowania mexicana*

E. Grazing System

The Hidden Hills Allotment is managed as a cow-calf operation. Hidden Hills is a six and one-half month summer/fall allotment operated in conjunction with the Pakoon Allotment as the winter/spring range. Cattle are moved to the Pakoon Allotment approximately January 1 and remain there until May 15. At this time, cattle are allowed to drift into the Bench Pasture and make use of that pasture for two to three weeks as they move toward summer pastures. Cattle are generally in the Gulch Point Pasture by June 1-15 and remain there until July 1. The Overnight Pasture is the main summer pasture which is used from July through October. As late fall approaches cattle are rotated through the Gulch Point and Bench pastures back to the Pakoon Allotment. A more detailed livestock rotation schedule can be found in the Hidden Hills AMP (1997).

F. Other uses

1. Special Status Species (Plants and Animals)

Threatened and Endangered Species

The California condor (*Gymnogyps californiianus*) may either fly over or forage on carrion found within these allotments at any time of year. The condor is currently listed as endangered under the Endangered Species Act (ESA). A reintroduction program began on the BLM's Arizona Strip District in 1996. This reintroduced population has been designated experimental, non-essential, as defined under Section

10(j) of the ESA. They are a scavenger by nature and can fly hundreds of miles in their searches for carrion. They do not nest (or roost) in these allotments.

The Mexican spotted owl (*Strix occidentalis lucida*) was listed as threatened on April 15, 1993. This species is known to nest in Zion and Grand Canyon National Parks near Arizona Strip BLM lands. To date, no spotted owls have been found to nest on the Arizona Strip District, although a confirmed sighting of an owl occurred in 2007 just north of Colorado City.

The Mojave desert tortoise (*Gopherus agassizii*) was listed as threatened on April 2, 1990. Critical habitat was designated for the Mojave population on February 24, 1994. Although this species is not known to be found on this allotment, a small portion of land on the far west edge of the allotment (less than 1,000 acres) is designated critical habitat for this species. This critical habitat is part of the Gold Butte-Pakoon Critical Habitat Unit (CHU).

BLM Sensitive Species, Wildlife Species of Concern, and Migratory Birds

Sensitive species are usually rare within at least a portion of their range. Many are protected under certain State and/or Federal laws. A species listed as sensitive by the BLM will typically consist of small and widely dispersed populations; inhabit ecological refugia or specialized or unique habitats; could become endangered or extirpated from the State or within a significant portion of its range; is under status review by the U.S. Fish and Wildlife Service (USFWS); or is State-listed, but may be better conserved through application of BLM sensitive species status. Arizona wildlife species of special concern are ones whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Arizona Game and Fish Department's (AGFD) listing of Wildlife of Special Concern in Arizona. Table 1 lists the sensitive animal species that may occur within the Hidden Hills Allotment.

Table 1. Sensitive and/or Special Status Species that are Known to Occur or have the Potential to Occur* in the Allotments

Species	Hidden Hills	BLM Sensitive	Arizona Wildlife Species of Concern
Bald eagle (*Haliaeetus leucocephalus*)	potential	no	yes
American peregrine falcon (*Falco peregrinus*)	verified	yes	yes
Ferruginous hawk (*Buteo regalis*)	potential	yes	yes
Western burrowing owl (*Athene cunicularia hypugea*)	potential	yes	no
Swainson's hawk (*Buteo swainsoni*)	potential	yes	no

Spotted bat (*Euderma maculatum*)	verified	yes	yes
Small-footed myotis (*Myotis ciliolabrum*)	verified	yes	no
Fringed myotis (*Myotis thysanodes*)	verified	yes	no
Big free-tailed bat (*Nyctinomops macrotis*)	verified	yes	yes

* "Potential to occur" means that suitable habitat exists, but species presence has not been verified.

Executive Order 13186 requires the BLM and other Federal agencies to work with the USFWS to provide protection for migratory birds. These species are protected by legislation and it is important to maintain habitat for these species so migratory patterns are not disrupted. All migratory birds are protected under the 1918 Migratory Bird Treaty Act (16 USC 703), which prohibits the taking of any migratory birds, their parts, nests, or eggs, except as permitted by regulations (50 CRF Subchapter B). Additional protection is provided by the Neotropical Migratory Bird Conservation Act of 2000 (16 USC Chapter 80).

Bald and golden eagles are protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). This law, enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs.

2. Other Wildlife Species

The Hidden Hills Allotment is inside the AGFD's Game Management Unit (GMU) 13B. There is some potential for desert bighorn sheep (*Ovis canadensis nelsoni*) presence in suitable areas of the allotment. Mule deer (*Odocoileus hemionus*) may be found throughout the allotment.

Nongame wildlife found on the allotment is typical of the area, including a variety of small mammals such as desert cottontail rabbits, birds including raptors, amphibians, reptiles, and invertebrates. Predators include coyotes, bobcats, and mountain lions.

3. Recreation

General Management: This allotment is located within GCPNM. The allotment's recreational values derive from its geology, scenic viewsheds, and remoteness. General recreation activities that could occur in this allotment include sightseeing, horseback riding, hiking, backpacking, camping, hunting, photography, bird watching and nature study.

Recreational Settings: The allotment is within the Parashant Special Recreation Management Area (SRMA) and the western portion of the allotment is within the Parashant Wildlands Recreation Management Zone (RMZ). The eastern portion of the allotment is within the Shivwitz Frontier RMZ. The primary strategy for the

Parashant SRMA is to target a demonstrated undeveloped recreation-tourism market demand from local communities and regional/national visitors for trophy hunting opportunities, guided backcountry tours, hiking, viewing and appreciating wildland landscapes and cultural sites, canyoneering and motorized/mechanized/non-mechanized exploring. This demand is supported by the area's distinctive remote, rugged landscape; its proximity to the Grand Canyon; its vast size; and the largely open and undeveloped character of its recreation settings. Regional and local recreation-tourism visitors value this area for the distinctive kinds of dispersed recreation it produces.

The Shivwits Frontier RMZ is managed for sustainable access for scenic, natural, open-space appreciation, and exploration recreation adventure somewhat close to nearby communities. The Parashant Wildlands RMZ is managed for extreme, world class, deep wildlands exploration in remote and rugged Grand Canyon country.

The Hidden Hills Allotment contains portions of three Travel Management Areas (TMAs): Backways, Specialized, and Primitive. TMAs describe areas delineated for varying types of access. The Backways and Specialized TMAs provide for a variety of motorized, non-motorized, and mechanical travel modes to serve existing and future recreational, traditional, casual, commercial, and private needs in remote, rustic settings, but not to the detriment or exclusion of the protection of resources. They are characterized by low to moderate densities of improved roads and primitive roads. In the Primitive TMA, high quality recreation opportunities associated with more primitive recreation experience opportunities and non-motorized uses such as camping, sightseeing, hiking, horseback riding, and hunting, will be maintained/ enhanced, provided they will be compatible with the protection and enhancement of sensitive resource values, where appropriate.

Trails: The southern trailhead and a small portion of the Middle Bench Trail, a non-motorized trail through the Grand Wash Cliffs Wilderness occurs in the allotment. No national or scenic trails occur in this allotment.

Off Highway Vehicle (OHV) Management: The OHV area designations in this allotment are: closed to motorized/mechanized travel within the wilderness area; and limited to designated roads and trails outside designated wilderness.

Visual Resource Management (VRM): Three VRM classes occur in this allotment: Class I within the wilderness area; Class II in the western one-third of the allotment outside designated wilderness; and Class III in the eastern two-thirds of the allotment. The objectives for the VRM classes are:

Class 1 - The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change of the characteristic landscape should be very low and must not attract attention.

Class II - The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III - The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Wild & Scenic Rivers: No eligible or suitable wild and scenic river segments occur within the allotment.

Wilderness Characteristics: Approximately one-third of the southwestern portion of the allotment is managed to protect wilderness characteristics.

4. Wilderness

The extreme southeastern portion of the Grand Wash Cliffs Wilderness is within the Hidden Hills Allotment. This wilderness area is wild and very remote. Many rugged canyons, scenic escarpments, miles of cliffs, and sandstone buttes mark the transition between the Colorado Plateau and Basin and Range provinces in this wilderness.

G. Issues brought out in scoping.

1. Issues relating to Rangeland Health

a. Invasive species and noxious weeds

b. Long term maintenance of the chaining

c. Fire recovery on Grand Gulch Bench

d. Maintain the vigor, percent composition, and overall health of cliffrose in the Gardner Breaks portion of the Gulch Point Pasture

2. Issues not relating to Rangeland Health, and not discussed further in this document.

a. Lack of wildlife water in the Gardner Breaks area

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 the GCPNM RMP, allotment management plan, and other activity plans, which identify terms and conditions for management on public lands within the Hidden Hills 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. Livestock Actual Use

Actual use was determined from licensed use. Total active preference for the allotment is 1,907 AUMs.

Grazing Year	AUMs Used	% of Authorized AUMs Used
1991	1,701	89%
1992	1,424	75%
1993	1,801	94%
1994	1,771	93%
1995	1,605	84%
1996	1,774	93%
1997	1,711	90%
1998	1,506	79%
1999	1,687	88%
2000	1,430	75%
2001	1,397	73%
2002	946	50%
2003	Allotment in non-use due to drought conditions	
2004	1,210	63%
2005	1,102	58%
2006	1,048	55%
2007	1,183	62%
2008	1,159	61%
2009	1,037	54%

2. Precipitation

The Poverty Mountain and Alcorn rain gauges are used to interpret annual rainfall amounts on the allotment (see Appendix C). The Alcorn rain gauge is located in

T35N, R10W, Sec. 30, approximately 3 miles east of the allotment boundary. Average precipitation is ~12.23" annually. Approximately 13% (1.64") comes in the fall, 31% (3.83") in the winter, 17% (2.13") in the spring and 38% (4.63") in the summer.

The Poverty Mountain rain gauge is located in T35N, R12W, Sec.33, on the north end of the allotment. Average precipitation is 15.31" annually. Approximately 15% (2.3") comes in the fall, 37% (5.59") in the winter, 18% (2.78") in the spring, and 30% (4.65") in the summer. Even though the two rain gauges differ in the amount of annual rain fall, seasonal distribution of the precipitation is very similar.

3. Utilization

Utilization is defined as the portion or amount of a key plant species current year's growth that is consumed or destroyed by grazing animals. The Key Species Grazed Class method was used to collect the data. Utilization is read at or around the designated key area for each pasture. ND = No data collected, NU = Non-use, meaning livestock did not graze the pasture. Utilization data, shown as %, from 1998-2009 has been compiled for this evaluation (see Tables 2 - 4).

Table 2. Percent Utilization of Key Species at Key Area #11 (Overnight Pasture)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Agropyron Spp.	33	47	44	ND	42	NU	35	33	33	39	28	ND
Gambel oak	22	23	21	ND	15	NU	15	11	22	23	29	ND
Cliffrose	25	36	48	ND	47	NU	33	28	10	8	15	ND

Utilization levels on key species in the Overnight Pasture did not exceed the 50% allowable during the evaluation period from 1998 through 2009. The highest overall use in the Overnight pasture occurred in 2000 at 48%. Overall average key species utilization in the pasture for the evaluation period was 28%.

Table 3. Percent Utilization of Key Species on Rim seeding (Gulch Point Pasture)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Agropyron Spp.	35	37	44	33	31	NU	26	NU	39	41	31	ND
Blue grama	14	21	36	13	16	NU	11	NU	23	30	17	ND
Cliffrose	28	39	14	19	22	NU	27	NU	38	37	14	ND

Key species utilization in the Gulch Point Pasture did not exceed the 50% allowable during the evaluation period. The highest overall use in the Gulch Point Pasture was also in 2000 at 44%. Overall key species utilization in the pasture for the evaluation period was 27%.

Table 4. Percent Utilization of Key Species at Key Area #8 (Middle Bench Pasture)												
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Squirreltail	22	30	35	31	NU	NU	39	12	32	33	34	ND
Cliffrose	9	19	24	30	NU	NU	29	12	26	19	21	ND

Utilization on key species at Key Area #8 in the Middle Bench Pasture did not exceed the 50% allowable during the evaluation period from 1998 through 2009. The highest overall use at Key Area #8 occurred in 2004 at 39%. Combined overall utilization on key species for the evaluation period was 25%.

4. Trend

The trend of an area may be judged by noting changes in vegetation attributes such as species composition, density, cover, production, and frequency. Vegetation data is collected at different points in time on the same key area, and the results are then compared to detect change.

Trend monitoring was collected using the Pace-Frequency method, which measures the occurrence frequency of forage and non-forage vegetative species. Cover data, which determines the percent of bare ground, litter, rock and live basal vegetation, is also collected. Ground cover is determined by dividing the total number of hits for all categories except bare ground by the total number of hits (including bare ground) – see page 73 of TR 1734-4 (*Sampling Vegetation Attributes*). In addition, the occurrence frequency of all plant species is collected. The first readings established a baseline for comparison to all future readings. Trend is considered up when the species increases by 10+ points from the first reading to the last shown reading. The trend of a species is static if it shows a change of 0 to 10 or 0 to -10 from the first to the last reading. Down trend is a reading of more than -10 from the first reading.

Trend monitoring was conducted at six key areas on the allotment. Because of the size and variation in vegetation, the Overnight Pasture has four key area locations. The Gulch Point and Middle Bench pastures each have one key area where trend data is collected. Key areas #1, #2, #6, #7, and #8 were established in 1982. Key Area #11 was established in 1986 following the implementation of a land treatment project.

The following tables show the key species frequency, which is the ratio between the number of sample units that contain key species and the total number of sample units. Trend is shown at the right side of the table and is the direction of change in frequency observed between the initial reading (1982 or 1986). More detailed vegetation monitoring data can be found in Appendix D.

Table 5. Hidden Hills Allotment Trend Data			
Plant Species	**% Frequency in 1982**	**% Frequency in 2006**	**Trend**
Key Area #1 Rangesite: Loamy Upland (Gravelly), 13-17 p.z.			
Blue grama	73	57	Down
Squirreltail	30	35	Static
Western wheatgrass	1	4	Static
Key Area #2 Rangesite: Clay Loam Upland (Gravelly) 13-17" p.z.			
Blue grama	18	28	Up
Muttongrass	34	9	Down
Squirreltail	17	3	Down
Key Area #6 Rangesite: Shallow Loamy 10-14" p.z.			
Blue grama	71	84	Up
Squirreltail	23	26	Static
Key Area #7 Rangesite: Shallow Loamy/Breaks Transition 10-14" p.z.			
Squirreltail	1	1	Static
Muttongrass	1	1	Static
Mormon tea	3	8	Static
Cliffrose	15	36	Up
Key Area #8 Rangesite: Shallow Sandy Loam, calcareous 10-14" p.z.			
Squirreltail	10	6	Static
Cliffrose	19	14	Static
Mormon tea	1	2	Static
Key Area #11 Rangesite: Clay Loam Upland (Gravelly) 13-17" p.z.			
Wheatgrass species	35	115	Up
Junegrass	18	13	Static
Squirreltail	5	2	Static
Sand dropseed	1	3	Static

5. Ecological Site Inventory

The "Dry Weight Rank" vegetative sampling method was used to measure composition, which is the proportion (percentage) of various plants in relation to the total at a particular area. This vegetation attribute is also used to describe ecological sites. An ecological site is a distinctive kind of land with specific physical

characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. It is the product of all the environmental factors responsible for its development. Ecological sites have developed a characteristic kind and amount of vegetation. The natural plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in annual production (*Ecological Site Inventory,* BLM, 2001). While the natural plant community of a particular ecological site is recognized by characteristic *patterns* of species associations and community structure, the *specific species* present from one location to another may exhibit natural variability - the natural plant community is not a precise assemblage of species for which the proportions are the same from place to place, or even in the same place from year to year. Variability is the rule rather than the exception.

The distinctive plant communities associated with each ecological site (including the variability which frequently occurs) can be identified and described, and are called ecological site descriptions. These ecological site descriptions (or guides) are provided by the Natural Resource Conservation Service. The ecological site's potential for change in composition over time was considered along with other vegetation attributes to quantify desired plant community objectives for each key area. The potential composition is determined by the applicable soil type and precipitation zone. These potentials are described in Ecological Site Guides provided by the Natural Resources Conservation Service, and are used to set DPC objectives.

Ecological status is the present state of the vegetation at an ecological site in relation to the potential natural community (PNC). A PNC is "the biotic community that would become established if all successful sequences were completed without interferences by humans under the present environmental conditions". It may include "naturalized non-native species" (*Interpreting Indicators of Rangeland Health*, BLM, 2005 and *Ecological Site Inventory*, BLM, 2001). This differs from "historic climax plant community" in that an historic climax plant community is "the plant community that existed before European immigration and settlement" (*Ecological Site Inventory*, BLM, 2001). The BLM uses "potential natural community" terminology rather than "historic climax plant community" because PNC recognizes past influences by man. It is an expression of the relative degree to which the kinds, proportions, and amount of plants in a plant community resemble that of the PNC for the site. It is a coefficient of community similarity, which gives an ecological rating of the plant community.

Ecological status expresses the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the potential natural plant community for the site. Ecological status changes slowly for most of the sites in this area; it is reported in the following four classes, or seral stages, which are the developmental stages of ecological succession (and corresponds to percent similar to the PNC):

- **Early Seral:** 0-25% of the expected potential natural community exists.
- **Mid Seral:** 26-50% of the expected potential natural community exists.
- **Late Seral:** 51-75% of the expected potential natural community exists.
- **PNC:** 76-100% of the expected potential natural community exists.

Table 6 displays ecological site inventory data for the Hidden Hills Allotment.

Table 6. Ecological Site Inventory Data

KA #1 Plant Spp.	Site Guide Allowable Composition	1989 Composition	2006 Composition	Desired Composition Objective
Grasses				
Blue grama*	15-20%	26	26	15-20%
Squirreltail*	5-10%	4	6	5-10%
Burro grass		26	0	
Western wheatgrass*	10-15%	0	4	2-8%
Red three-awn	1-5%	0	2	
Sand dropseed	1-5%	0	2	
Ring muhly	1-5%	0	<1	
Forbs				
Locoweed	1-3%	0	2	
Aster	0-1%	0	3	
Spike dropseed		0	<1	
Erigeron	1-3%			
Penstemon	1-3%	0	16	
Perennial Forbs	1-3%	0	4	1-10%
Shrubs				
Utah juniper	0-2%	0	<1	0-2%
Big sagebrush	10-30%	31	23	10-30%
Broom snakeweed	1-3%	9	12	
Buckwheat	1-5%	T	<1	
Yellow rabbitbrush	1-5%	4	<1	1-5%
Key Area #1, Loamy Upland Gravelly, 13-17" p.z. 66% similar to PNC (Late Seral)				

KA #2 Plant Spp.	Site Guide Allowable Composition	1989 Composition	2006 Composition	Desired Composition Objective
Grasses				
Blue grama*	25-49%	12	18	15-25%

Muttongrass*	2-10%	3	5	2-8%
Squirreltail*	2-10%	4	1	1-5%
Junegrass	2-10%	3	3	1-5%
Forbs				
Perennial Forbs	1-5%	0	3	1-5%
Annual Forbs				1-5%
Shrubs				
Low sagebrush		52	50	30-50%
Big sagebrush	2-10%	12	1	2-10%
Broom snakeweed	1-10%	3	<1	
Utah juniper	1-10%	11	15	2-10%
Pinyon pine	1-10%	0	4	1-5%
Key Area #2, Clay Loamy Upland, Gravelly 13-17" p.z., 56% similar to PNC (Late Seral)				
KA #6 Plant Spp.	**Site Guide Allowable Composition**	**1989 Composition**	**2006 Composition**	**Desired Composition Objective**
Grasses				
Blue grama*	5-15%	42	69	45-55%
Squirreltail*	5-10%	8	16	5-10%
Indian ricegrass	5-10%	0	T	
Sand dropseed	1-5%	2	1	1-5%
Red three-awn	1-5%	0	<1	
Forbs				
Perennial Forbs	1-5%	0	6	1-5%
Annual Forbs	1-5%			1-5%
Shrubs				
Big sagebrush	5-30%	39	4	5-25%
Broom snakeweed	5-10%	9	2	5-10%
Buckwheat	1-5%			1-5%
Utah juniper	5-10%	0	2	1-5%
Key Area #6, Shallow Loamy, 10-14" p.z. 42% similar to PNC (Mid Seral)				

KA #7 Plant Spp.	Site Guide Allowable Composition	1989 Composition	2006 Composition	Desired Composition Objective
Grasses				
Squirreltail*	0-5%	0	T	1-5%
Muttongrass*	5-15%	5	T	1-5%
Forbs				
Perennial Forbs	5-20%	4	11	2-10%
Annual Forbs	5-20%	0	1	1-5%
Shrubs				
Big sagebrush	5-10%	64	27	20-35%
Mormon tea*	1-10%	0	10	1-10%
Cliffrose*	1-5%	23	35	30-40%
Utah juniper	10-20%	0	12	5-10%
Opuntia	1-5%	4	1	
Broom snakeweed	5-10%	0	3	
Key Area #7, Shallow Loamy/Breaks transition, 10-14" p.z. 51% similar to PNC (Late Seral)				
KA #8 Plant Spp.	**Site Guide Allowable Composition**	**1989 Composition**	**2006 Composition**	**Desired Composition Objective**
Grasses				
Indian ricegrass*	0-5%	0	1	1-5%
Squirreltail*	0-5%	0	1	1-5%
Forbs				
Perennial Forbs	1-10%	18	4	1-10%
Annual Forbs	1-10%			1-10%
Shrubs				
Broom snakeweed	2-5%	24	23	
Yellow rabbitbrush	0-3%	19	20	
Banana yucca	3-7%	0	2	
Cliffrose*	3-10%	39	13	10-20%
Mormon tea*	3-8%	0	2	1-5%
Buckwheat	0-10%	0	25	
Anderson wolfberry	0-10%			
Desert almond	0-10%			
Skunkbush	0-10%	0	1	1-5%
Desert snowberry	0-10%	0	2	1-5%
Big sagebrush	0-10%	0	6	5-10%
Key Area #8, Shallow Sandy Loam calcareous, 10-14" p.z. 34% similar to PNC (Mid Seral)				

KA #11 Plant Spp.	Site Guide Allowable Composition	1989 Composition	2006 Composition	Desired Composition Objective
Grasses				
Crested wheatgrass*	NA	39	28	20-35%
Intermediate wheatgrass*	NA	15	39	30-40%
Smooth Brome	NA	7	3	1-5%
Junegrass*	2-10%	0	4	1-5%
Squirreltail	2-10%	10	1	2-8%
Sand dropseed*	1-5%	0	1	1-5%
Blue grama	25-49%	1	2	1-10%
Muttongrass	2-10%	0	2	1-5%
Indian ricegrass	1-5%	1	<1	1-5%
Forbs				
Perennial Forbs	1-10%	3	2	1-10%
Annual Forbs	1-10%	0	<1	1-10%
Shrubs				
Big sagebrush	2-10%	3	12	10-20%
Broom snakeweed	1-10%	21	4	
Utah juniper	1-10%	0	<1	1-5%
Gambel oak*	1-5%			1-5%
Cliffrose	1-5%	0	<1	1-10%
Buckwheat	1-5%	0	1	
Pinyon pine	1-5%			
Opuntia	1-5%			
Key Area #11, Clay Loam Upland gravelly, 13-17" p.z. 33% similar to PNC (Mid Seral)				

6. Special Status Species

Threatened and Endangered Species

California condor: The California Condor was listed as endangered in 1967. In the late 1970s, the species was reduced to a population of less than 25 birds. The decision was made to bring all of the wild condors into captivity to begin a captive breeding program, the last wild condor was secured in April of 1987. In 1996, California condors were re-introduced into Arizona in the Vermilion Cliffs, under the ESA's 10J rule (non-essential experimental population). Additional releases in 1998 and 1999 of 16 condors occurred in 1998 and 1999 from the Hurricane Cliffs northeast of Diamond Butte. The reintroduction continues annually as captive-reared birds are released along the Vermilion Cliffs. Each released condor is

equipped with radio telemetry or GPS satellite transmitters and numbered wing tags to allow observers to track their movements. As of April 2, 2009, there were 72 condors in the wild in northern Arizona. The reintroduced population as a whole appears to be stable and is increasing.

Condors range widely, easily covering over 100 miles in a day, and their current range includes the entire Arizona Strip, throughout the Grand Canyon, into adjacent Utah and Nevada, and south of the Grand Canyon in Arizona. Condors are most commonly observed near the release site on the Vermilion Cliffs, at Navajo Bridge near Marble Canyon, on the Kaibab Plateau, and the South Rim of the Grand Canyon. They have also been seen flying over Fredonia. Condors are strictly scavengers and prefer to eat large, dead mammals such as mule deer, elk, pronghorn, bighorn sheep, cattle, and horses. While the condors now find much of their food on their own, carcasses of dairy calves are provided near the Vermilion Cliffs release site in order to provide carrion which is contaminant free.

Mexican spotted owl: As stated previously on page 18 of this assessment, the Mexican spotted owl was listed as threatened on April 15, 1993. The range of the Mexican spotted owl extends from the southern Rocky Mountains in Colorado and the Colorado Plateau in central and southern Utah, southward through Arizona and New Mexico and into northern Mexico. Although the Mexican spotted owl's entire range covers a broad area of the southwestern United States and Mexico, it does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, uneven-aged forests, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico. Steep slopes and canyons with rocky cliffs characterize much of the owl's habitat on the Colorado Plateau (which includes the majority of the Arizona Strip). The Arizona Strip District is surrounded by areas where Mexican spotted owls have been detected, including Grand Canyon, Zion, and Canyonlands national parks, and Grand Staircase-Escalante National Monument.

Designated critical habitat was established for this species in 2001 and revised in 2004. No designated critical habitat occurs on this allotment. A tool for predicting suitable canyon habitats that may have higher potential for species occupancy and nesting birds than other nearby canyons is the Mexican Spotted Owl Habitat Model (Willey, 2001, and 1997). The model uses terrain parameters to determine depth and width of canyons (owls need cooler microsites for nesting and roosting) and other features (such as distance to water and north facing cliff sites). The model predicts the canyons most likely to support nesting owls; from this it can then be determined if any "higher quality" habitat (according to the model) exists. It is important to note that any model is only an analysis tool, and experience with the current owl model has shown it to be accurate in some cases, but not in others (such as delineating cliff faces outside of canyons as high potential owl habitat). For canyon habitats, the primary constituent elements of habitat include one or more of the following

attributes: (1) cooler and often more humid conditions than the surrounding area, (2) clumps or stringers of trees and/or canyon walls with crevices, ledges or caves, (3) high percent of ground litter and woody debris, and (4) riparian or woody vegetation. The primary constituent elements related to forest structure include (1) a range of tree species, (2) a shade canopy created by the tree branches covering 40 percent or more of the ground, and (3) large dead trees with a trunk diameter of at least 12 inches.

No spotted owls have been observed on Arizona Strip BLM-managed lands. The Hidden Hills Allotment contains a total of 66 acres of habitat considered suitable by the model, split into five separate polygons. The likelihood of this small amount of habitat being used by spotted owls far from any recorded sightings of the species is very small. The BLM is currently assessing and field verifying habitat characteristics of areas designated by the habitat model across the Strip; this has not yet been completed for the Hidden Hills Allotment.

Mojave desert tortoise: Although this species is not known to be found on this allotment, a small portion of land on the far western edge of the allotment, less than 1,000 acres, is designated critical habitat for this species. This critical habitat is part of the Gold Butte-Pakoon Critical Habitat Unit (CHU). The CHUs may contain both "suitable" and "unsuitable" habitat. Suitable habitat can be generally defined as areas that provide the primary constituent elements of desert tortoise critical habitat:

- Sufficient space to support viable populations within each of the six recovery units and provide for movements, dispersal, and gene flow;
- Sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species;
- Suitable substrates for burrowing, nesting, and overwintering;
- Burrows, caliche caves, and other shelter sites;
- Sufficient vegetation for shelter from temperature extremes and predators; and
- Habitat protected from disturbance and human-caused mortality.

The Hidden Hills Allotment does not contain any suitable habitat. Additionally, it is geographically separated from Pakoon Basin, which contains suitable critical habitat and tortoises, by the Lower Grand Wash Cliffs.

BLM Sensitive Species, Migratory Birds, and Wildlife Species of Concern

Bald eagle: The bald eagle was delisted from the Federal ESA in June 2007. This species is not known to nest anywhere on the BLM's Arizona Strip District. The bald eagle is a seasonal (winter) migrant that forages in and around the Kaibab Plateau. Bald eagles are both scavengers and predators.

Peregrine falcon: Optimum peregrine falcon habitat is considered to be steep cliffs overlooking woodlands, riparian habitats or other areas supporting abundant avian prey species. Peregrines return to breeding areas in Arizona from mid-February to mid-March. Egg laying occurs from mid-March through mid-May, and the young

can fledge from May through August. This allotment contains areas considered suitable for peregrine falcon nesting habitat. However, peregrines have not been known to nest in the Hidden Hills Allotment.

Ferruginous hawk: Typical habitat requirements of open country with pinyon-juniper or woodland periphery are present on the BLM's Arizona Strip District, but the area is at the edge of this species' breeding range. There are probably only 5-10 known nesting pairs in Arizona. There have not been studies or data collected on ferruginous hawks on the Arizona Strip. To date, this species has not been observed nesting, roosting, foraging, or flying over this allotment.

Western burrowing owl: Burrowing owls are occasionally observed on the Arizona Strip but are uncommon. Habitat requirements for this species exist in this allotment with the exception of an abundance of suitable burrows. To date, this species has not been observed in this allotment.

Swainson's hawk: Swainson's hawks are summer residents of western North America. Their food habits are similar to other hawks in breeding season, preferring small mammals, reptiles and amphibians. However, they focus primarily on insects as prey the rest of the year. Records of this species in the Hidden Hills allotment are not available.

Some of the migratory bird species typical of the habitat in this allotment include black-throated sparrow, horned lark, rock wren, raven, Say's phoebe, western kingbird, spotted towhee.

7. Wildlife Habitat

The Hidden Hills Allotment contains a variety of mule deer habitat areas as defined by the AGFD. Approximately 69 percent of the allotment is identified as summer habitat, 28 percent as winter crucial habitat, two percent as yearlong habitat, and one percent as summer crucial habitat. Deer population data, as with all game species, is not collected specifically for this allotment, but is collected for the GMU as a whole. GMU 13B encompasses lands west of the Hurricane Cliffs. (See Appendix D for unit data.) Despite low deer densities throughout the GMU, good numbers of deer can typically be found in the higher elevations, generally over 4,000 feet. Survey data indicates that the GMU 13B mule deer population is static.

Habitat, categorized by the AGFD, as suitable for bighorn sheep lies on the western portion of this allotment, approximately 34 percent of the allotment.

8. Riparian/Fisheries Habitat

There is no riparian or fisheries habitat on this allotment.

9. Wild Horse and Burro Habitat

There are no wild horses or burros on this allotment.

10. Lithology and Soils

Lithology

The Hidden Hills Allotment is a combination of fan terraces, escarpments, benches, mountains, cliffs, mesas, scarps, hills and canyons, composed of limestone, mudstone, and basalt. Slopes vary from nearly level to up to seventy percent.

Soils

14 Boquillas family-Showlow complex, 25 to 50 percent slopes, (basalt mesas), basalt, shale; Basalt Slopes, 13" to 17"
18 Childers-Rizno association, 4 to 15 percent slopes, (plateaus), limestone and sandstone; Childers=Shallow Upland (calcareous), 9" to 13"ppt
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"
34 Hindu-RO-Gypill complex, 35 to 70 percent slopes, (cliffs, scarps, mtns), gyp, LS, SS, CG; Hindu=Limestone Hills, 6" to 9"; Gyphill=Gypsum Hills, 6" to 9"
45 Mellenthin-Rock outcrop-Torriorthents complex, 10 to 70 percent slopes (hills) Kiabab; Mellenthin=Shallow Loamy, 9" to 13"; Torriorthents=Breaks, 9" to 13"
46 Mellenthin-Strych Complex, 4 to 25 percent slopes, cool, (plateaus, mesas), limestone; Mellenthin=Shallow Loamy, 9" to 13"; Strych=Loamy Upland, 9" to 13"
52 Meriwhitica-RO-Strych complex, 35 to 70 percent slopes, warm, (scarps, cliffs, canyon walls), basalt, limestone, sandstone, gypsite, shale, conglomerates; Meriwhitica=Breaks (calcareous), 9" to 13"; Strych=Loamy Upland (calcareous), 9" to 13"
59 Padilla silt loam, 1 to 5 percent slopes, (fan terrace), mixed sedimentary; Clay Loam Upland, 9" to 13" ppt
61 Pocum-Spenlo complex, 1 to 10 percent slopes, (mesa), basalt; Pocum=Basalt Upland, 9" to 13"; Spenlo=Loamy Upland, 9" to 13" ppt
63 Radnik loam, 1 to 5 percent slopes (floodplain) mixed; Loamy Bottom, 9" to 13" ppt
69 Showlow-Thunderbird complex, 2 to 25 percent slopes, (basalt mesas), basalt;Clay Loam Upland (gravelly) PJ-Woodland, 13" to 17"
76 Tassi-Risno complex, 5 to 35 percent slopes, (benches), limestone, sandstone; Tassi=Shallow Upland (calcareous), 9" to 13" ppt

93 Yumtheska-Katzine-Rock Outcrop complex, 2 to 30 percent slopes (hills) limestone; Yumtheska=Limestone Slopes (PJ-Woodland), 13" to 17"; Katzine=Loamy Upland (gravelly) PJ-Woodland, 13" to 17"

95 Yumtheska- Natank complex, 10 to 45 percent slopes (plateau, mesa), limestone; Yumtheska=Limestone Slopes (PJ-Woodland), 13" to 17"; Natank=Clay Loam Upland (gravelly) PJ-Woodland, 13" to 17"

Paired Plots Erosion Study

A 200 X 100 yard study exclosure was built on the Hidden Hills chain and seed site, on soil map unit 21, in September, 1987, to compare the runoff and erosion rates of grazing versus no grazing. The study plots, in and out of the exclosure, were installed in November, and became operational in December, 1987. Budget constraints did not allow for placing plots in the untreated pinyon-juniper forest. Sedimentation data was collected at the end of each water year in October, until the gages rusted out in late 1991.

The data shows that over the 4 years, the outside average erosion was about 5 times that of the inside plots. The outside plots averaged about 2.5 times the amount of runoff of the inside plots. The soil loss tolerance for these soils is 1 ton/acre/year for Yumtheska and 2 tons/acre/year for Natank and Disterheff. The average erosion rate for the outside plots is about 0.24 ton/acre/year and for the inside plots, about 0.05 ton/acre/year. The study showed that the outside erosion rate was much more than the inside erosion rate, but much less than the safe erosion limit for these soils. Grazing did increase runoff and erosion, but not to the point of having a detrimental effect on the soils.

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

1. Issues relating to Rangeland Health

a. Invasive species and noxious weeds

There are three known areas where Scotch thistle is present on the allotment. All three are small, less than 0.10 acre in size. Two areas are located along roads and one is located inside a catchment exclosure.

All three areas have received chemical and hand treatment in the past. These areas, as with others, are monitored annually and treated if weeds are detected. At present, weeds are found in these three areas; however, they have not increased in size nor advanced beyond the areas of initial detection. The weeds receive continued treatment efforts in an effort to completely eradicate them.

Red brome, an invasive species, such as red brome, occurs over a broad area during wet years; 2005, an extremely wet year, had a large amount of red brome. However, on normal to dry years (see Appendix D precipitation data) little red brome grows.

b. Long term maintenance of the chaining

Maintaining the vegetation diversity in the Hidden Hills chaining treatment through timely maintenance is of concern to the RRT, BLM, AGFD, and the permittee. The current mix of diverse vegetation is desirable for all resource values and is reflected by the DPC objectives identified for the key areas. The Hidden Hills treatment is relatively young (1983), and presently needs little maintenance, however, vegetation diversity of similar, older age class treatments has decreased due to lack of timely maintenance.

c. Fire recovery on Grand Gulch Bench

A portion of the Tank Fire (2005) occurred on the extreme north and western edge of the Hidden Hills Allotment. Most of the fire was north of the allotment on the Lower Grand Wash Cliffs. The area burned was located in the Mohave-Great Basin transition zone and consists of scattered pinyon-juniper, sagebrush, and cliffrose.

Seed was applied on portions of burn in the winter of 2006. The seeded portion within the Hidden Hills Allotment was not grazed until the winter of 2009 and only received slight use prior to the burn because of its distance from water. Due to the isolated and remote location of the burn, no one has observed recovery specific to this burn on the allotment.

d. Maintain the vigor, percent composition, and overall health of cliffrose in the Gardner Breaks portion of the Gulch Point pasture

The Gardner Breaks are located on the southern end of the Hidden Hills Allotment. This area is considered to be high quality mule deer habitat particularly during the winter. The area has a high component of cliffrose, a staple browse species for mule deer wintering in the area. The area is also used by livestock during October and November as they are gathered to move to the winter range.

Utilization of cliffrose for the evaluation period has ranged from 14 to 38 percent. Overall average from 1998 to 2009 is 28 percent. These utilization levels are attributed to both livestock and wildlife since they occupy this area for a portion of the same time. There are no grazing management proposals or recommendations that would result in higher utilization levels of the Gardner Breaks area of this allotment. This will maintain the low to moderate utilization levels of cliffrose. In addition, there may be opportunities for "topping" the more decadent cliffrose plants to foster new growth in this area, which would stimulate new growth that provides nutritional browse for deer and other wildlife species.

V. Conclusions

A. Pertaining to Objectives

1. Land Use Plan Objectives

Grand Canyon – Parashant National Monument Resource Management Plan[c]

Soil Stability

DFC-VM-04 (Vegetation – All Ecological Zones)
Vegetative communities will provide sufficient plant cover and litter accumulation to protect soils from wind and water erosion and enhance nutrient cycling and productivity, even during drought years.

DFC-WS-06
The natural hydrologic functions of all watersheds will be intact.

DFC-WS-07
Soils will exhibit infiltration, permeability, and erosion rates appropriate for the soil type, climate, and landform.

These objectives are being met. Soil and vegetative condition and watershed function are at acceptable levels. This is especially evident in the Hidden Hills treatment area where ground cover, litter, and a diverse understory vegetation community provide stabilization for the watershed.

Ecological Processes

DFC-VM-05 (Vegetation – All Ecological Zones)
Ecological processes and functions will be protected, enhanced, and/or restored by allowing tools that are necessary and appropriate to mitigate adverse impacts of allowable uses and undesirable disturbances, and contribute to meeting the Standards for Rangeland Health and NPS Vital Signs and enhance Monument values.

DFC-WS-04
Ecological functions and processes will be intact at all seeps and springs.

DFC-WF-01
Ecological conditions will be within the range of natural variability and will be functional for dependant animal species.

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[c] Similar RMP objectives have been grouped together with one conclusion per grouping.

DFC-WF-12
The natural biological diversity of fish, wildlife, and plant species will be maintained or, where necessary and feasible, restored throughout the Monument. Habitats will be managed on an ecosystem basis, ensuring that all parts of the ecosystem and natural processes are functional.

These objectives are being met. Ecological processes, function, and condition as well as wildlife habitat needs were considered in developing the DPC objectives for this allotment. Site visits to the allotment determined that soils are within normal parameters and are meeting standards and are functioning properly. Plant communities include native shrubs, perennial grasses, and annual forbs, and are appropriate for the site.

Invasive Plants

DFC-VM-06 (Vegetation – All Ecological Zones)
Invasive plant species will be contained, controlled, or eliminated and native species restored to meet desired plant community (DPC) objectives.

DFC-VM-38 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Management of Mohave-Great Basin Transition Ecological Zone plant communities will focus on removing invasive non-native plants, especially cheatgrass, Sahara mustard, and red brome, and preventing habitat degradation due to wildfire.

These objectives are being met to the extent feasible. Noxious and invasive plant infestations specific to this allotment have been and continue to be inventoried, treated, and monitored. Known populations of Scotch thistle have been contained to their first inventoried locations. Invasive plants continue as a high priority issue and will be addressed upon detection. The presences of stable plant communities, which occur on this allotment, allow little to no growth of red brome and other invasive plants except in very wet years. There are new proposals to test ways to control invasive species.

No Net Loss

DFC-VM-15 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
There will be no net loss of total acres within sagebrush communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

DFC-VM-37 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
There will be no net loss in acres of Transition plant communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

These objectives are being met. The plant communities are healthy and are functioning properly in this allotment. In addition, effects to native plant communities are evaluated in all project-level NEPA analyses and mitigated to the extent feasible to ensure these communities are not removed from the landscape.

Livestock Grazing

DFC-GM-02
Livestock use and associated management practices will be conducted in a manner consistent with other resource needs and objectives to ensure that the health of rangeland resources is preserved or improved so that they are productive for all rangeland values. Where needed, public rangeland ecosystems will be improved to meet objectives.

This objective is being met. Livestock grazing (i.e., season of use, utilization levels, etc.) is managed to maintain or improve the ecological condition of the allotment and thus, protect monument values. DPC objectives have been developed to maintain and/or improve vegetation diversity and ecological condition. These actions will ensure rangeland resources and Monument values which include special status species, wildlife habitat, native vegetation, watershed function, and soil productivity are preserved or improved.

Desired Plant Community

DFC-GM-01
Healthy, sustainable rangeland ecosystems will be maintained or improved to meet Arizona's Standards for Rangeland Health and Vital Sign Standards on NPS-administered lands, and produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.

DFC-VM-03 (Vegetation – All Ecological Zones)
Native vegetative communities will be protected. A mosaic of native perennial and non-invasive annual vegetative communities will be present across the landscape with diversity of species, canopy, density, and age class reflecting its local ecological site potential and naturally occurring habitat conditions.

DFC-VM-14 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush (primarily Artemisia tridentata) communities will consist of a healthy, diverse mosaic of different height and age structures with a thriving community of native grasses and forbs. Mosaics may include stands of young and old sagebrush, openings (ranging from bare ground to short or sparse vegetation to high-density grasslands), wet meadows, seeps, healthy streamside (riparian) vegetation, and other interspersed shrub and woodland habitats.

VM-18 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Existing stands of sagebrush will have a balance between shrub and perennial grass cover, for open to moderate shrub canopy cover (5 to 25%), and multiple height classes. This mosaic will include young, sparse stands to support Vesper sparrows and lark sparrows, and older, dense stands to benefit Brewer's sparrows, sage sparrows, black-throated sparrows, gray flycatchers, and sage thrashers.

DFC-VM-19 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include small, grassy openings to support long-billed curlews and burrowing owls.

DFC-VM-20 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include large, continuous blocks (≥300 acres) of unfragmented sagebrush habitat, including mosaics of open to moderate shrub canopy cover (5 to 25%) and multiple age and height classes to benefit sage-dependent species.

DFC-VM-21 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include openings of short vegetation surrounded by sagebrush for ground foraging by sage thrashers, loggerhead shrikes, Brewer's sparrows, and sage sparrows.

DFC-VM-22 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include openings of short vegetation (2 to 8 in.) with wide visibility to provide breeding habitat for long-billed curlews, and burrowing owls.

DFC-VM-23 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Sagebrush communities will include native grass and forb cover in balance with open to moderate (5 to 25%) shrub canopy cover and within ecological site potential. Perennial grass components will be at or above 10%. Native forb composition will be at or above 5%.

DFC-VM-24 (Vegetation – Great Basin Ecological Zone – Sagebrush Communities)
Fragmentation of sagebrush habitat will be less than 50% of the treatment area.

DFC-VM-25 (Vegetation – Great Basin Ecological Zone – Pinyon-Juniper Communities)
Healthy, diverse woodland communities will consist of a mosaic of trees, shrubs, grasses, and forbs. Mosaic patches can include stands of young and old pinyon-juniper, openings, wet meadows, seeps, and other interspersed shrub habitats. The communities will be composed of a variety of different height structures and age classes, with a thriving understory community of native grasses, forbs, and shrubs.

DFC-VM-28 (Vegetation – Great Basin Ecological Zone – Pinyon-Juniper Communities)
Stands of pinyon-juniper will include a balance between tree, shrub, and perennial grass cover to support pinyon jay and mule deer. This mosaic will include stands of old growth pinyon-juniper to support juniper titmouse; large openings of grasses, forbs and shrubs to support mule deer and provide foraging habitat for raptors such as sharp-shinned hawk, northern goshawk, Coopers hawk, American kestrel, and red-tailed hawk; and areas of sparse to dense tree canopy cover to support pinyon jay.

DFC-VM-29 (Vegetation – Great Basin Ecological Zone – Pinyon-Juniper Communities)
Individual old growth trees will be present and will be protected during treatment implementation.

DFC-VM-34 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Endemic plant species and associated communities such as black brush, Joshua tree, Mojave yucca, and cacti will be present along with other shrubs, grasses, and wildflowers. These communities can include stands of young and old shrubs, sparse vegetation, scattered to larger expanses of black brush to various mixes of black brush, Joshua trees, pinyon-juniper, yucca, and shrub habitats.

DFC-VM-36 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Priority plant species and associated communities such as black brush, Joshua tree, Mojave yucca, and cacti will be present along with other shrubs, grasses, and wildflowers. These communities can include stands of young and old shrubs, sparse vegetation, scattered to larger expanses of black brush to various mixes of black brush, Joshua trees, pinyon-juniper, yucca, and shrub habitats.

DFC-WF-17
Mule deer habitat in pinyon-juniper woodland sites will include a healthy diverse mosaic of trees, shrubs, grasses, and forbs.

These objectives are being met. The Hidden Hills Allotment supports a diversity of wildlife (including avian species, reptiles, and large and small mammals) and their habitat, provides forage for livestock, provides recreational opportunities, and provides functional watersheds. The DPC objectives have been developed on the allotment to maintain and/or enhance these public values. Communities of healthy diverse habitat including vertical and horizontal structures, vegetative age classes, and endemic species are present throughout the allotment.

Wildlife Habitat

DFC-VM-35 (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Endemic animal species such as desert tortoise, chuckwalla, and desert bighorn sheep will be present and thriving with more than adequate food, water, and cover resources.

DFC-WF-02
Native wildlife communities will be protected. A complete range of diverse, healthy, and self-sustaining populations of native animal species will occupy all available suitable habitats.

These objectives are being met. Sustainability needs such as forage, cover, shelter, and nesting sites, for endemic wildlife species were taken into consideration when developing the DPC objectives for this allotment. Meeting these objectives will ensure that wildlife habitat needs will be provided across the allotment and ensure that healthy populations of native species are present.

Habitat Connectivity

DFC-WF-06
Habitat connectivity and wildlife movement between ecological zones will be maintained.

This objective is being met through continued wildlife population and habitat monitoring. Habitat connectivity and wildlife movement are taken into consideration for all project level planning, including travel management to minimize impacts from proposed activities.

Wildlife Forage Needs

DFC-WF-16
On BLM administered lands, forage in crucial winter mule deer habitat will include at least 30% palatable browse species CBW at all key areas, where consistent with site potential.

DFC-WF-30
On BLM administered lands, forage in desert bighorn sheep habitat areas will include at least 20% grasses, 20% forbs, and 20% palatable shrub species CBW, where consistent with site potential.

These objectives are partially being met. Sustainability needs such as appropriate forage composition for mule deer and desert bighorn sheep were taken into consideration when the DPC objectives for these allotments were developed. Key areas within crucial mule deer and bighorn sheep habitat have the following forage compositions.

Key Area	Grasses/Forbs	Browse
Key Area #7	12%	84%
Key Area #8	6%	66%

Key areas #7 and #8 within crucial mule deer winter habitat and far exceed the 30% palatable browse composition. Key area #8 is the closest key area to desert bighorn sheep habitat; as demonstrated above, grasses and forbs are less than the desired composition but shrubs far exceed the 20% palatable browse composition.

Fences

DFC-WF-05
Fences will be the minimum necessary for effective livestock control or other administrative purposes. Fences will be wildlife passable, consistent with the species found in the area.

DFC-WF-20
All fences in mule deer habitat will be deer passable.

These objectives are being met. No issues have been identified on this allotment regarding unsafe wildlife fences. Should wildlife safety issues be identified, fence modification will occur as funding allows.

Healthy Wildlife Populations

DFC-WF-03
Forage, water, cover, and space will be available to wildlife of sufficient quantity and quality to support productive and diverse wildlife populations.

DFC-WF-13
Mule deer habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-28
Desert bighorn habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-35
Desert cottontail habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-37
Migratory bird habitats will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-45
Carnivore habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

These objectives are all being met. Sustainability needs (such as forage, cover, and shelter) for wildlife including mule deer, migratory birds, and carnivores were taken into consideration when the DPC objectives for this allotment were developed. Wildlife waters are inspected by the BLM and AGFD and maintained/repaired as funding allows. A mule deer management plan has been jointly developed between the BLM and AGFD. This plan will outline objectives to better manage this species. Wildlife population and habitat monitoring would continue. Impacts to wildlife (including mule deer, bighorn sheep, migratory birds, and carnivores) and their sustainability needs are taken into consideration and analyzed during all project-level planning in order to minimize impacts from proposed activities.

Wildlife Population Numbers

DFC-WF-14
On BLM administered lands, mule deer populations will be at or near maximum levels sustainable for the habitat.

DFC-WF-29
On BLM administered lands, desert bighorn sheep populations will be at or near maximum levels sustainable for the habitat.

DFC-WF-36
Desert cottontail rabbits will be present in sufficient quantity to provide an adequate prey base for raptors, carnivores, and other predatory species, as well as ample recreational opportunities for hunting and wildlife viewing.

DFC-WF-38
Migratory birds that nest in the Monument will have resources of sufficient quantity and quality to provide for nesting sites and to fledge young successfully.

Progress toward meeting these objectives is occurring and is ongoing. Sustainability needs such as forage, cover, shelter, and nesting sites, for mule deer, bighorn sheep, and migratory birds have been taken into consideration when developing DPC objectives for this allotment. The plant communities are healthy and are functioning properly. Management proposed for this allotment would continue to achieve desired objectives, which will facilitate wildlife population numbers reaching maximum levels sustainable for the habitat.

In addition, a mule deer management plan, which outlines objectives to better manage this species, has been jointly developed by the BLM and AGFD. Annual mule deer population surveys will continue and the results will provide data to assist in management of this and other species.

Wildlife Waters

DFC-WF-04
All waters will be safely accessible to wildlife.

DFC-WF-18
Water sources within mule deer habitat will be safely accessible to deer and other wildlife.

DFC-WF-19
On BLM administered lands, water sources within mule deer habitat will be spaced no more than 3 miles apart.

DFC-WF-31
Water sources within bighorn sheep habitat areas will be safely accessible to bighorn and other wildlife.

DFC-WF-32
On BLM administered lands, water sources within bighorn sheep habitat will be spaced no more than 4 miles apart.

DFC-WF-43
Water sources within game bird habitats will be safely accessible by all wildlife.

Progress toward meeting these objectives is occurring and is ongoing. Wildlife and livestock water catchments are inspected and repaired/maintained as funding allows; those found to be hazardous to wildlife are modified. Some of the catchments located within this allotment are now fenced with a pipe fence designed by AGFD to allow deer and wildlife free access but preclude livestock; the rest will be done as funding allows. Additionally, a mule deer management plan, which outlines objectives to better manage this species, has been jointly developed by the BLM and AGFD. This plan includes objectives to provide additional wildlife waters (to meet the water spacing requirement) and repair and maintain existing wildlife waters (to ensure reliable water sources).

Threatened and Endangered Species Habitat

DFC-TE-03
The Monument will provide a block of remote, contiguous habitat that will serve as refugia for populations of special status species.

DFC-TE-21
Habitat areas for special status raptors will provide sufficient forage and cover attributes to support thriving populations of the species.

DFC-TE-23
Potential roosting and nesting sites (for special status raptors) will be abundant.

These objectives are all being met. Quantity and quality of habitat for special status species are taken into consideration for all project-level planning, including applications for new trails, roads, or projects that bisect contiguous habitat and/or may affect the habitat needs for these species. Sustainability needs such as prey items, forage, cover, roosting and nesting sites, and quantity of suitable habitat for special status bird species have also been taken into consideration when developing the DPC objectives for this allotment, which will ensure habitat constituents for these species are provided.

Healthy Threatened and Endangered Populations

DFC-TE-20 Special status raptor populations will be healthy and self-sustaining throughout their range.

DFC-TE-25
Rodent populations, as a prey base (for special status raptors), within the Monument will be abundant.

The BLM is progressing towards meeting these objectives. Sustainability needs such as prey items, forage, cover, roosting and nesting sites, and quantity of suitable habitat for special status species have been taken into consideration when developing the DPC objectives for this allotment. The plant communities are healthy, and are functioning properly. Management proposed for this allotment would continue to achieve desired objectives, which will facilitate wildlife population numbers (including those of special status species) maintaining or reaching levels sustainable for the habitat.

No Net Loss of Threatened and Endangered Species Habitat

DFC-TE-04 and DFC-TE-08
There will be no net loss in the quality or quantity of special status species habitat throughout the Monument.

DFC-TE-16
No net loss will occur in the quality and quantity of suitable habitat for endemic amphibians and aquatic invertebrate species within the Monument.

DFC-TE-22
No net loss will occur in the quality and quantity of suitable habitat for special status raptors within the Monument.

These objectives are all being met. Quantity and quality of habitat for special status species are taken into consideration for all project-level planning, including applications for new trails, roads, or projects that bisect contiguous habitat and/or may affect the habitat needs for these species. Sustainability needs such as prey items, forage, cover, roosting and nesting sites, and quantity of suitable habitat for special status raptors and riparian-dependent special status bird species have also been taken into consideration when developing the DPC objectives for this allotment, which will help ensure no net loss of habitat.

Condors

DFC-TE-27
The experimental non-essential population of California condor will be at or above 150 individuals, viable, and stable to increasing in number.

Progress toward meeting this objective is ongoing. The BLM works cooperatively with the USFWS, AGFD, and the Peregrine Fund to continue the highly successful California condor reintroduction program on the Arizona Strip. The BLM provides financial and in-kind assistance to this program. Sustainability needs such as forage and cover for the California condor were taken into consideration when the DPC objectives for this allotment were developed.

Wilderness Characteristics

DFC-WC-02
Areas where wilderness characteristics will be maintained will be ecologically sustainable and resilient to natural and human-caused disturbances.

This objective is being met. Wilderness characteristics are considered during all project-level planning in order to ensure the characteristics of naturalness, solitude, and primitive recreation are maintained.

Recreation and Visitor Services

DFC-RR-01
Recreation and visitor services will be managed to provide varying levels of structured recreation opportunities that offer a range of specific benefits, activities, and experiences within outdoor settings.

DFC-RR-05
The excellent opportunities that exist to enjoy remote, rustic settings that provide moderate challenge and solitude in the Specialized TMAs will be maintained/enhanced.

DFC-RR-06
In Backways and Specialized TMAs, recreation opportunities associated with somewhat remote settings, such as exploring backcountry roads, vehicle camping, hunting, sightseeing, recreation aviation, and picnicking will be maintained/enhanced on existing roads, provided they will be compatible with the protection and enhancement of sensitive resource values, where appropriate.

DFC-RR-07
In the Primitive TMA, high quality recreation opportunities associated more with primitive recreation experience opportunities and non-motorized uses such as camping, sightseeing, hiking, horseback riding, and hunting, will be maintained/enhanced, provided they will be compatible with the protection and enhancement of sensitive resource values, where appropriate.

These recreation objectives are being met because a variety of recreation experiences are provided to local and regional community members within the rugged and remote SRMA and both RMZs in this allotment.

Designated Wilderness

DFC-WM-01
The first and dominant goal will be to provide for the long-term protection and preservation of the areas' wilderness character under a principle of non-degradation. The areas' natural condition, opportunities for solitude, opportunities for primitive and unconfined types of recreation, and any ecological, geological, or other features of scientific, educational, scenic, or historical value present will be managed so that they remain unimpaired.

DFC-WM-06
BLM wilderness areas and NPS proposed wilderness will be managed to be ecologically sustainable and resilient to natural and human-caused perturbations (See Vegetation Management and Fire Management decisions). The NPS and BLM will strive to preserve or restore the natural quiet and natural sounds associated with the physical and biological resources of designated wilderness.

The objectives for the management of the Grand Wash Cliffs Wilderness within this allotment are being met. Wilderness is considered during all project-level planning in order to protect and preserve the area's wilderness character.

Visual Resources

DFC-VR-01
Public lands will be managed in a manner which will protect the quality of the scenic (visual) values of these lands. (43 U.S. Code [USC] 1701, Section 102 (a) (8)).

DFC-VR-03
The region's scenic beauty, open space landscapes, and other high-quality visual resources will be maintained within the Monument.

The objectives for management of visual resources in the Hidden Hills Allotment are being met because visual resources are considered during all project-level planning in order to minimize impacts from proposed activities.

2. Specific Resource Objectives

Allotment Management Plan Objectives

Reduce the composition of sagebrush (Artemisia tridentata) from 60% to 0-20%, and increase the composition of perennial grasses and forbs from 21% to 60-85% in the identified sagebrush treatment areas in Hidden Lake Draw on the Hidden Hills allotment within 10 years of plan approval.

Partially met. A portion of this area (north end) received planned treatment using prescribed fire in 2004 as identified in the Parashant Interdisciplinary Management Plan. The south end of this specific project still needs to be implemented and entered into a 5 year fuels reduction plan or other integrated vegetation management plan.

Reduce the combined composition of pinyon-juniper and sagebrush from 83% to 2-35%, and increase perennial grasses, forbs, and browse composition from 21% to 32-90% in the identified treatment area of the Gulch Point pasture by 2002.

Not met. This area has not yet received the planned treatment as prescribed in the Parashant Interdisciplinary Management Plan. This specific project is being carried forward into the Shivwits Vegetation Management Plan, which is currently being developed.

Maintain the vegetation diversity of the Hidden Hills chaining area to produce future multiple-use benefits.

Met. Currently, vegetation diversity is producing benefits for all resource values.

Desired Plant Community Objectives

Key Area #1 – Overnight Pasture
Rangesite: Loamy Upland, Gravelly13-17" precipitation zone (p.z.)

- *Maintain perennial grass composition between 30-50% through 2030 by:*
  - *Maintaining squirreltail CBW at between 5-10%*
  - *Maintaining blue grama CBW at between 15-20%*
  - *Maintaining western wheatgrass CBW at between 2-8%*
- *Maintain shrubs CBW to between 25-45% by 2030.*
- *Maintain forb CBW at between 5-10% through 2030.*
- *Maintain tree CBW at between 1-5% through 2030.*
- *Maintain ground litter at between 15 and 30% through 2030.*
- *Maintain basal cover at between 5 and 10% through 2030.*

These objectives are met. The ecological condition is 66% similar to PNC. Present (2006) CBW for key species is as follows: squirreltail is 6%, blue grama is 26%, and western wheatgrass is 4%.

By functional group, CBW for shrubs is at 35%, CBW for perennial grasses is at 39%, CBW for trees is at 1% and CBW for forbs are at 25%. Basal cover is at 6%. This DPC objective is also consistent with and meets DFC-VM-25 and DFC-VM-28 of the GCPNM RMP.

Key Area #2 – Overnight Pasture
Rangesite: Clay Loam Upland, Gravelly13-17" p.z.

- *Maintain perennial grass composition between 20-30% through 2030 by:*
  - *Maintaining squirreltail CBW at between 1-5%*
  - *Maintaining blue grama CBW at between 15-25%*
  - *Maintaining muttongrass CBW at between 2-8%*
- *Maintain shrubs CBW to between 40-55% by 2030.*
- *Maintain forb CBW at between 1-10% through 2030.*
- *Maintain tree CBW at between 5-15% through 2030.*
- *Maintain ground litter at between 20 and 30% through 2030.*
- *Maintain basal cover at between 2 and 8% through 2030.*

These objectives are met. The ecological condition is 56% similar to PNC. Present (2006) CBW for key species is as follows: blue grama is 18%, muttongrass is 5%, and squirreltail is 1%.

By functional group, CBW for shrubs is at 51%, CBW for perennial grasses is at 27%, CBW for trees is at 19% and CBW for forbs are at 3%. Basal cover is at 2%. This DPC objective is also consistent with and meets DFC-VM-25 and DFC-VM-28 for pinyon-juniper communities.

Key Area #6 – Overnight Pasture
Rangesite: Shallow Loamy 10-14" p.z.

- *Maintain perennial grass composition between 40-65% through 2030 by:*
  - *Maintaining squirreltail CBW at between 5-10%*
  - *Maintaining blue grama CBW at between 45-55%*
  - *Maintaining sand dropseed CBW at between 1-5%*
- *Maintain shrubs CBW to between 15-35% by 2030.*
- *Maintain forb CBW at between 5-10% through 2030.*
- *Maintain tree CBW at between 2-10% through 2030.*
- *Maintain ground litter at between 15 and 30% through 2030.*
- *Maintain basal cover at between 5 and 10% through 2030.*

These objectives are met. The ecological condition is 42% similar to PNC. P resent (2006) CBW for key species is as follows: blue grama is 66% and squirreltail is 16%.

By functional group, CBW for shrubs is at 8%, CBW for perennial grasses is at 83%, CBW for trees is at 2% and CBW for forbs are at 9%. Basal cover is at 12%. This DPC objective meets DFC-VM-18 and DFC-VM-23 for sagebrush communities.

Key Area #7 – Gulch Point Pasture
Rangesite: Shallow Loamy/Breaks transition 10-14" p.z.

- *Maintain perennial grass composition between 5-15% through 2030 by:*
  - *Maintaining squirreltail CBW at between 1-5%*
  - *Maintaining muttongrass CBW at between 1-5%*
- *Maintain shrubs CBW to between 60-85% by 2030.*
- *Maintain EPNE, CBW at between 1-5% by 2030.*
- *Maintain COME, CBW at between 30-40% by 2030.*
- *Maintain forb CBW at between 5-10% through 2030.*
- *Maintain tree CBW at between 2-10% through 2030.*
- *Maintain ground litter at between 15 and 30% through 2030.*
- *Maintain basal cover at between 2 and 5% through 2030.*

These objectives are partially met. The ecological condition is 51% similar to PNC. Present (2006) CBW for key species is as follows: squirreltail is at a trace and muttongrass is also at a trace; cliffrose is 35%, and Mormon tea is 10%. Muttongrass has been as high 5% CBW, but squirreltail has never been more than a trace. This is an older age class shrub dominated site, and is important for wintering mule deer and other sagebrush-obligate species.

By functional group, CBW for shrubs is at 76%, CBW for perennial grasses is at a trace, CBW for trees is at 12% and CBW for forbs are at 12%. Basal cover is at 1%. This DPC objective is consistent with and partially meets DFC-VM-14 and DFC-VM-20 for sagebrush and sagebrush/pinyon-juniper transition communities.

Key Area #8 – Middle Bench Pasture
Rangesite: Shallow Sandy Loam, calcareous 10-14" p.z.

- *Maintain perennial grass composition between 2-10% through 2030 by:*

Maintaining squirreltail CBW at between 1-5%
Maintaining Indian ricegrass CBW at between 1-5%

- *Maintain shrubs CBW to between 60-85% by 2030.*
- *Maintain cliffrose CBW at between 10-20% by 2030.*
- *Maintain Mormon tea CBW at between 1-5% by 2030.*
- *Maintain forb CBW at between 5-10% through 2030.*
- *Maintain tree CBW at between 1-10% through 2030.*
- *Maintain ground litter at between 15 and 30% through 2030.*
- *Maintain basal cover at between 2 and 8% through 2030.*

These objectives are being met. The ecological condition is 34% similar to PNC. Present (2006) CBW for key species is as follows: squirreltail is at a 1%, Indian ricegrass is at 1%, cliffrose is 13%, and Mormon tea is 2%. This is a transition site where the upper limits of the Mohave meet the Great Basin Zone. This is a shrub dominated site which possesses high shrub diversity and height structure.

By functional group, CBW for shrubs is at 94%, CBW for perennial grasses is 2%, and forbs are at 4%. Basal cover is at 5%. This DPC objective is consistent with DFC-VM-34 and DFC-VM-36 for the Mohave-Great Basin Ecological Zone.

Key Area #11 – Overnight Pasture
Rangesite: Clay Loam Upland, Gravelly13-17" p.z.

- *Maintain perennial grass composition between 60-80% through 2030 by:*
  Maintaining crested wheatgrass CBW at between 20-35%
  Maintaining intermediate wheatgrass CBW at between 30-40%
  Maintaining junegrass CBW at between 1-5%
  Maintaining squirreltail CBW at between 2-8%
  Maintaining sand dropseed CBW at between 1-5%
- *Maintain shrubs CBW to between 20-40% by 2030.*
- *Maintain forb CBW at between 1-10% through 2030.*
- *Maintain tree CBW at between 2-10% through 2030.*
- *Maintain ground litter at between 20 and 30% through 2030.*
- *Maintain basal cover at between 5 and 8% through 2030.*

These objectives are met. The ecological condition is 33% similar to PNC. Present (2006) CBW for key species is as follows: wheatgrass species are 67%, smooth brome is 3%, and junegrass is 4%.

By functional group, CBW for shrubs is at 17%, CBW for perennial grasses is at 80%, CBW for trees is a trace and CBW for forbs are 3%. Basal cover is at 8%. This DPC objective is consistent with and meets DFC-VM-28 for pinyon-juniper communities.

B. Pertaining to Issues

1. Issues relating to Rangeland Health

a. Invasive species and noxious weeds

All three areas have received chemical and hand treatment in the past. These areas, as with others, are monitored annually and treated if weeds are detected. The areas have not increased in size nor have weeds advanced beyond the areas of initial detection. The weeds will receive continued treatment efforts in order to strive for complete eradication. The BLM is actively participating in initiatives to find solutions for invasive species expansion in all ecological types which includes those present on Hidden Hills Allotment.

Invasives such as red brome occur on very wet years in a widespread manner. On normal and dry years, the occurrence of the two species is patchy and much of the desert has no invasives. See discussion on page 38 of this assessment.

b. *Long term maintenance of the chaining*

Maintaining the production and vegetation diversity in the Hidden Hills chaining treatment through timely maintenance is of concern to the RRT, BLM, AGFD, and the permittee. The current mix of diverse vegetation is desirable for all resource values and is reflected by the DPC objectives identified for the key areas. The Hidden Hills treatment is relatively young (1983), and presently needs little maintenance, however, vegetation diversity of similar, older age class treatments has decreased due to lack of timely maintenance.

c. Fire recovery on Grand Gulch Bench

A portion of the Tank Fire (2005) occurred on the extreme north and western edge of the Hidden Hills Allotment. Most of the fire was south of the allotment on the Lower Grand Wash Cliffs. The area burned was located in the Mohave-Great Basin transition zone and consists of scattered pinyon-juniper, sagebrush, and cliffrose.

d. Maintain the vigor, percent composition, and overall health of cliffrose in the Gardner Breaks portion of the Gulch Point pasture

Utilization of cliffrose for the evaluation period has ranged from 14 to 38 percent. Overall average from 1998 to 2009 is 28 percent. These utilization levels are attributed to both livestock and wildlife since they occupy this area for a portion of the same time. There are no grazing management proposals

or recommendations that would result in higher utilization levels of the Gardner Breaks area of this allotment. This will maintain the low to moderate utilization levels of cliffrose. In addition, there may be opportunities for "topping" the more decadent cliffrose plants to foster new growth in this area, which would stimulate new growth that provides nutritional browse for deer and other wildlife species.

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

A. Select areas of the pinyon and juniper woodland need to be thinned to allow herbaceous understory of grasses and brush species to repopulate and protect the soils from future erosion. Seeding of desirable species should be done where deemed feasible and necessary.

B. Include cryptobiotic colony composition data gathering in key vegetation transects and photo plots or set up new monitoring sites for them.

C. Include previously indentified treatment areas of Hidden Hills Allotment into future vegetation management plans. This includes future maintenance of existing treatment areas to maintain current species diversity of the vegetation.

C. Explore the possibility to establish joint wildlife/livestock water in the Gardner Breaks area.

D. Explore opportunities for "topping" the more decadent cliffrose plants in the Gardner Breaks area to foster new growth in this area, which would stimulate new growth that provides nutritional browse for deer and other wildlife species.

E. Renew the 10-year grazing permit with current terms and conditions. However, pending any season of use modifications of the Pakoon Allotment resulting from tortoise consultation, a season of use change may be necessary for Hidden Hills Allotment.

AUTHORIZED OFFICER CONCURRENCE:

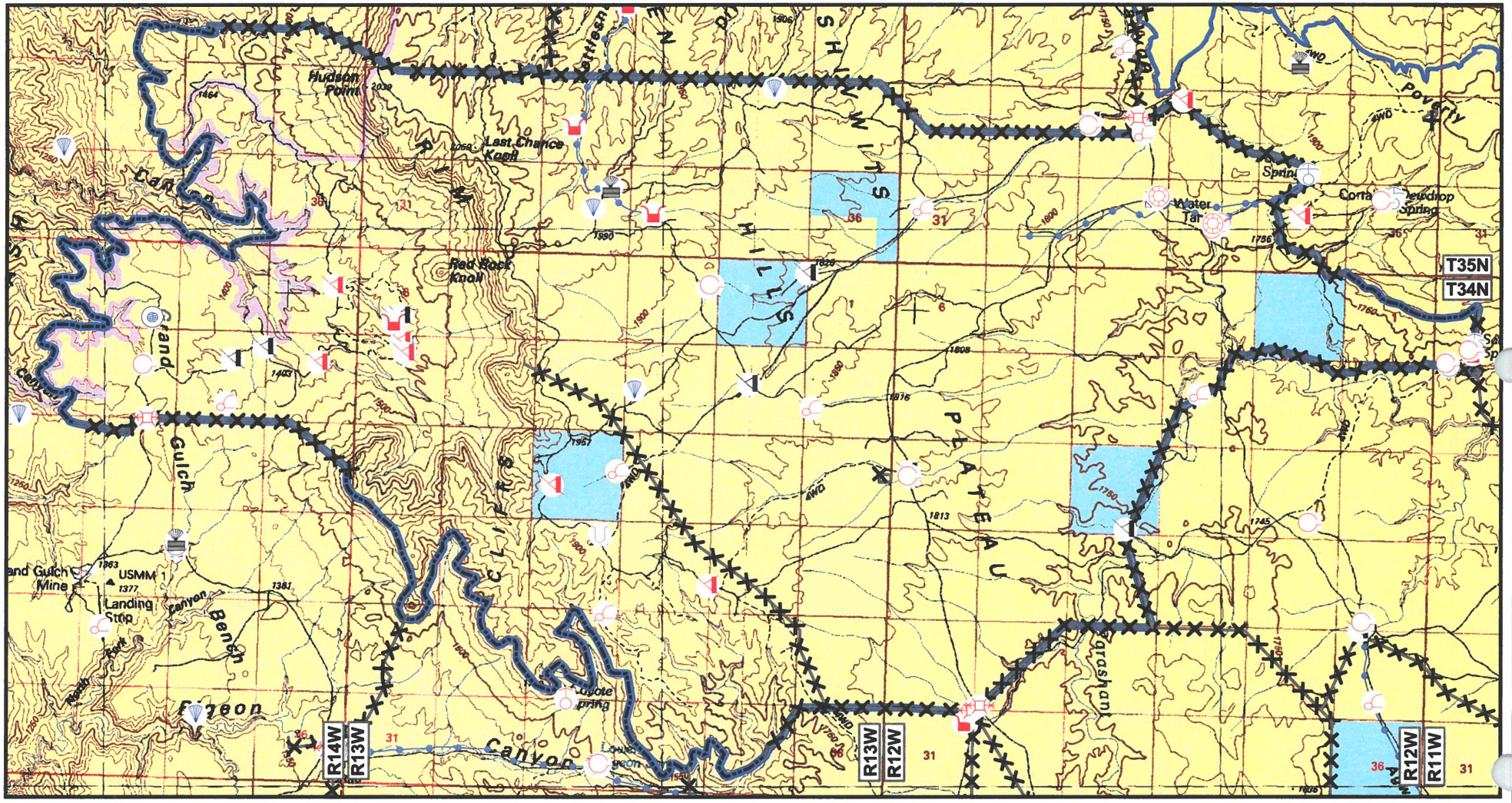
__✓__ I concur with the conclusions and recommendations as written.

_____ I do not concur.

_____ I concur, with the following modifications:

Thomas R. Edgerton
Monument Manager
Grand Canyon-Parashant National Monument

11/4/10
Date



- 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

Hidden Hills Allotment

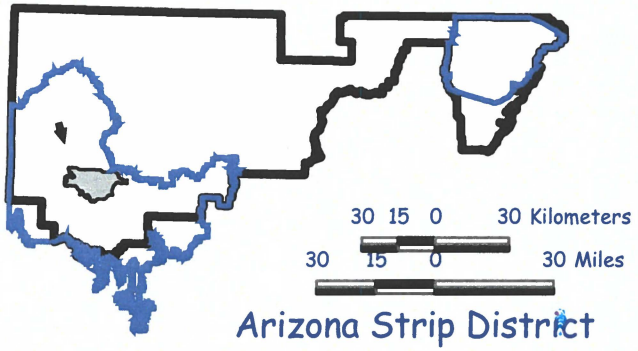
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Bureau of Land Management
Arizona Strip District



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 24, 2009

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."

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

TEAM MEMBERSHIP

Interdisciplinary Assessment Team

Linda Price	Project Coordinator (BLM)
Michael Herder	Former Wildlife Biologist (BLM)
Tom Folks	Wilderness/Recreation Specialist (BLM) – retired
Diana Hawks	Recreation, Wilderness, Cultural Resources Specialist (BLM)
Whit Bunting	Vegetation/Grazing Administration (BLM)
Robert Smith	Soil Scientist/Watershed Management (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,
Grazing
Rancher, St. George, UT

Bill Howes
Off Road Vehicle Use
Wizards Motorcycle Club

Kent McComb,
Grazing
Retired, St. George, UT

Non-Commodity Interests

Scott Hansen,
Environmental Conservation
Retired, St. George, UT

Spence Esplin,
Historical
Retired, St. George, UT

Phil Squire,
Dispersed Recreation/Wildlife
Retired, St. George, UT

Local Area Interests

Frank Malan,
Public-at-Large
Retired, St. George, UT

Roger McPeek
Public-at-Large
Retired, St. George, UT

Dennis Becenti
Native American Interests
Hopi and Navajo Tribes, AZ

Alternates

Maggie Sacher,
Commercial Recreation/Tourism
Owner: Lee's Ferry Lodge,
Marble Canyon, AZ

Paul Weaver
Non-Commodity
St. George, UT

Appendix C:
Precipitation Data

Alcorn	Seasonal Precipitation Amounts (Inches)					Percent of Normal				
	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.76	10	2.4	2.65	16.81	107%	261%	113%	57%	137%
1979	3.85	5.1	2.77	3.86	15.58	235%	133%	130%	83%	127%
1980	0.35	5.9	2.62	5.45	14.32	21%	154%	123%	118%	117%
1981	0.92	1.72	3.85	7.05	13.54	56%	45%	181%	152%	111%
1982	1.12	3.98	1.92	8.8	15.82	68%	104%	90%	190%	129%
1983	3.06	3.84	2.46	6.87	16.23	187%	100%	115%	148%	133%
1986	2.61	1.1	3.11	6.07	12.89	159%	29%	146%	131%	105%
1987	1.38	2.38	2.76	4.1	10.62	84%	62%	130%	89%	87%
1988	4.05	2.13	3.78	2.55	12.51	247%	56%	177%	55%	102%
1989	0.64	2.68	1.13	2.1	6.55	39%	70%	53%	45%	54%
1990	0.29	1.86	2	6.42	10.57	18%	49%	94%	139%	86%
1991	0.48	4	1.34	5.33	11.15	29%	104%	63%	115%	91%
1992	0.91	4.75	6.3	3.09	15.05	56%	124%	296%	67%	123%
1993	2.1	9.78	3.38	1.74	17	128%	255%	159%	38%	139%
1994	1.81	2.94	2.5	3.25	10.5	111%	77%	117%	70%	86%
1995	1.96	6.19	5.35	3	16.5	120%	162%	251%	65%	135%
1996	0.12	3.88	0.87	2.63	7.5	7%	101%	41%	57%	61%
1997	2.13	3.38	2.24	7.13	14.88	130%	88%	105%	154%	122%
1998	1.63	4.32	1.3	10	17.25	100%	113%	61%	216%	141%
1999	2.47	1.28	0.75	7.45	11.95	151%	33%	35%	161%	98%
2000	0	2.75	0.25	3.25	6.25	0%	72%	12%	70%	51%
2001	2.83	3.92	0.88	5.12	12.75	173%	102%	41%	111%	104%
2002	0.37	1.38	0	2.75	4.5	23%	36%	0%	59%	37%
2003	1.5	3	1.28	3.72	9.5	92%	78%	60%	80%	78%
2004	0.81	2.56	1.49	4.39	9.25	49%	67%	70%	95%	76%
2005	7.38	8	2.37	2.63	20.38	451%	209%	111%	57%	167%
2006	1	1.13	2.37	7.63	12.13	61%	30%	111%	165%	99%
2007	1	0.75	0.87	5.81	8.43	61%	20%	41%	126%	69%
2008	0.18	5.32	0.72	5.53	11.75	11%	139%	34%	119%	96%
2009	1.81	3.94	1.25	1.5	8.5	111%	103%	59%	32%	70%
2010	0.24	4.76	1.75	1.63	8.38	15%	124%	82%	35%	69%
Annual Average	1.64	3.83	2.13	4.63	12.23					

Poverty	Seasonal Precipitation Amounts (Inches)					Percent of Normal				
	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.85	10	3.68	1.76	17.29	81%	179%	133%	38%	113%
1979	4.76	8	2.57	4.78	20.11	207%	143%	93%	103%	131%
1980	2.02	6.44	2.57	5.17	16.2	88%	115%	93%	111%	106%
1981	1.45	2.37	4.72	6.18	14.72	63%	42%	170%	133%	96%
1982	1.35	5.4	5.25	8.6	20.6	59%	97%	189%	185%	135%
1983	4.78	5.5	4.2	4.81	19.29	208%	98%	151%	103%	126%
1984	3.13	4.76	0.8	6.6	15.29	136%	85%	29%	142%	100%
1985	2.14	8.37	1.72	3.75	15.98	93%	150%	62%	81%	104%
1986	4.5	2.06	3.5	4.77	14.83	196%	37%	126%	103%	97%
1987	1.85	5.66	3	3.42	13.93	81%	101%	108%	74%	91%
1988	4.33	2.66	3.5	4.45	14.94	189%	48%	126%	96%	98%
1989	0.97	5.68	1.79	2.37	10.81	42%	102%	64%	51%	71%
1990	0.5	3.59	2.63	6.56	13.28	22%	64%	95%	141%	87%
1991	1.5	5.25	1.5	4.3	12.55	65%	94%	54%	92%	82%
1992	1.18	4.9	5.64	4.94	16.66	51%	88%	203%	106%	109%
1993	3.8	11.45	3.21	5.25	23.71	165%	205%	116%	113%	155%
1994	2.88	4.4	2.47	2	11.75	125%	79%	89%	43%	77%
1995	2.56	10.88	5.31	3.75	22.5	111%	195%	191%	81%	147%
1996	0.05	5.95	1	3.5	10.5	2%	106%	36%	75%	69%
1997	2.75	5.25	1.5	8.88	18.38	120%	94%	54%	191%	120%
1998	1.63	7.74	2.38	6.5	18.25	71%	138%	86%	140%	119%
1999	2.85	1.9	3.25	6.75	14.75	124%	34%	117%	145%	96%
2000	0.25	3.5	0.63	10.5	14.88	11%	63%	23%	226%	97%
2001	3.62	5.12	4.63	1.25	14.62	158%	92%	167%	27%	95%
2002	0.62	2	0.76	2.12	5.5	27%	36%	27%	46%	36%
2003	2.44	4.25	3.56	4.56	14.81	106%	76%	128%	98%	97%
2004	1	4	1.25	4.56	10.81	44%	72%	45%	98%	71%
2005	9.25	11.22	3.79	2.13	26.39	403%	201%	137%	46%	172%
2006	1.63	1.05	5.07	3.37	11.12	71%	19%	183%	72%	73%
2007	1.19	2.62	0.87	7.32	12	52%	47%	31%	157%	78%
2008	0.25	9.82	1.05	4.25	15.37	11%	176%	38%	91%	100%
2009	2.37	5.88	1.25	2.56	12.06	103%	105%	45%	55%	79%
2010	0.34	6.87	2.54	1.75	11.5	15%	123%	92%	38%	75%
Annual Average	2.30	5.59	2.78	4.65	15.31					

Appendix D:

Wildlife Data

Arizona Game Management Unit 13B Mule Deer Population Counts				
Year	**Number of Animals Surveyed**	**Bucks/100 Does**	**Fawns/100 Does**	**Population Estimate**
1985	108	30	50	1000-1500
1986	41	29	18	1000-1500
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	<1000
1993	117	126	52	800-1000
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	84	29	46	No Estimate
2004	102	34	57	No Estimate
2005	128	65	72	No Estimate
2006	143	68	64	No Estimate
2007	152	79	41	No Estimate
2008	158	45	63	No Estimate

Bighorn Sheep

13BNorth

	Ram Age Class							Yearling							
	I	II	III	IV	Ad Ram										
Year	(2)	(3-5)	(6-8)	(9+)	Total	Ewes	Lambs	M	F	Uncl	Total	Grps.	M:100F:L:Yrl.		Pop Est
2002	6	8	6	2	22	47	5	0	4	0	78	22	47: 11: 9		
2003	Insufficient data														
2004	Insufficient data														
2005	4	12	18	1	35	58	19	3	6	0	121	32	60: 33: 16		172
2006	5	13	11	3	32	90	18	3	10	0	153	32	36: 20: 14		174
2007	6	14	15	1	36	93	17	6	8	0	160	36	39: 18: 15		192
2008	3	12	16	3	34	44	8				86	31	77: 18: 0		Not Calculated Yet

13BSouth

	Ram Age Class							Yearling						
	I	II	III	IV	Ad Ram									Pop Est
Year	(2)	(3-5)	(6-8)	(9+)	Total	Ewes	Lambs	M	F	Uncl	Total	Grps.	M:100F:L:Yrl	
2003	3	2	2		7	18	10	0	1	1	37	10	39: 56: 6	78
2005	1	6	1		8	38	11	2	1	0	60	10	21: 29: 8	74
2008	2	3	8		13	22	68	0	1		42	15	77: 27: 5	Not Calculated Yet59

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."

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

TEAM MEMBERSHIP

Interdisciplinary Assessment Team

Linda Price	Project Coordinator (BLM)
Michael Herder	Former Wildlife Biologist (BLM)
Tom Folks	Wilderness/Recreation Specialist (BLM) – retired
Diana Hawks	Recreation, Wilderness, Cultural Resources Specialist (BLM)
Whit Bunting	Vegetation/Grazing Administration (BLM)
Robert Smith	Soil Scientist/Watershed Management (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,
Grazing
Rancher, St. George, UT

Bill Howes
Off Road Vehicle Use
Wizards Motorcycle Club

Kent McComb,
Grazing
Retired, St. George, UT

Non-Commodity Interests

Scott Hansen,
Environmental Conservation
Retired, St. George, UT

Spence Esplin,
Historical
Retired, St. George, UT

Phil Squire,
Dispersed Recreation/Wildlife
Retired, St. George, UT

Local Area Interests

Frank Malan,
Public-at-Large
Retired, St. George, UT

Roger McPeek
Public-at-Large
Retired, St. George, UT

Dennis Becenti
Native American Interests
Hopi and Navajo Tribes, AZ

Alternates

Maggie Sacher,
Commercial Recreation/Tourism
Owner: Lee's Ferry Lodge,
Marble Canyon, AZ

Paul Weaver
Non-Commodity
St. George, UT

Appendix C:

Precipitation Data

Alcorn	Seasonal Precipitation Amounts (Inches)					Percent of Normal				
	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.76	10	2.4	2.65	16.81	107%	261%	113%	57%	137%
1979	3.85	5.1	2.77	3.86	15.58	235%	133%	130%	83%	127%
1980	0.35	5.9	2.62	5.45	14.32	21%	154%	123%	118%	117%
1981	0.92	1.72	3.85	7.05	13.54	56%	45%	181%	152%	111%
1982	1.12	3.98	1.92	8.8	15.82	68%	104%	90%	190%	129%
1983	3.06	3.84	2.46	6.87	16.23	187%	100%	115%	148%	133%
1986	2.61	1.1	3.11	6.07	12.89	159%	29%	146%	131%	105%
1987	1.38	2.38	2.76	4.1	10.62	84%	62%	130%	89%	87%
1988	4.05	2.13	3.78	2.55	12.51	247%	56%	177%	55%	102%
1989	0.64	2.68	1.13	2.1	6.55	39%	70%	53%	45%	54%
1990	0.29	1.86	2	6.42	10.57	18%	49%	94%	139%	86%
1991	0.48	4	1.34	5.33	11.15	29%	104%	63%	115%	91%
1992	0.91	4.75	6.3	3.09	15.05	56%	124%	296%	67%	123%
1993	2.1	9.78	3.38	1.74	17	128%	255%	159%	38%	139%
1994	1.81	2.94	2.5	3.25	10.5	111%	77%	117%	70%	86%
1995	1.96	6.19	5.35	3	16.5	120%	162%	251%	65%	135%
1996	0.12	3.88	0.87	2.63	7.5	7%	101%	41%	57%	61%
1997	2.13	3.38	2.24	7.13	14.88	130%	88%	105%	154%	122%
1998	1.63	4.32	1.3	10	17.25	100%	113%	61%	216%	141%
1999	2.47	1.28	0.75	7.45	11.95	151%	33%	35%	161%	98%
2000	0	2.75	0.25	3.25	6.25	0%	72%	12%	70%	51%
2001	2.83	3.92	0.88	5.12	12.75	173%	102%	41%	111%	104%
2002	0.37	1.38	0	2.75	4.5	23%	36%	0%	59%	37%
2003	1.5	3	1.28	3.72	9.5	92%	78%	60%	80%	78%
2004	0.81	2.56	1.49	4.39	9.25	49%	67%	70%	95%	76%
2005	7.38	8	2.37	2.63	20.38	451%	209%	111%	57%	167%
2006	1	1.13	2.37	7.63	12.13	61%	30%	111%	165%	99%
2007	1	0.75	0.87	5.81	8.43	61%	20%	41%	126%	69%
2008	0.18	5.32	0.72	5.53	11.75	11%	139%	34%	119%	96%
2009	1.81	3.94	1.25	1.5	8.5	111%	103%	59%	32%	70%
2010	0.24	4.76	1.75	1.63	8.38	15%	124%	82%	35%	69%
Annual Average	1.64	3.83	2.13	4.63	12.23					

Poverty	Seasonal Precipitation Amounts (Inches)					Percent of Normal				
	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.85	10	3.68	1.76	17.29	81%	179%	133%	38%	113%
1979	4.76	8	2.57	4.78	20.11	207%	143%	93%	103%	131%
1980	2.02	6.44	2.57	5.17	16.2	88%	115%	93%	111%	106%
1981	1.45	2.37	4.72	6.18	14.72	63%	42%	170%	133%	96%
1982	1.35	5.4	5.25	8.6	20.6	59%	97%	189%	185%	135%
1983	4.78	5.5	4.2	4.81	19.29	208%	98%	151%	103%	126%
1984	3.13	4.76	0.8	6.6	15.29	136%	85%	29%	142%	100%
1985	2.14	8.37	1.72	3.75	15.98	93%	150%	62%	81%	104%
1986	4.5	2.06	3.5	4.77	14.83	196%	37%	126%	103%	97%
1987	1.85	5.66	3	3.42	13.93	81%	101%	108%	74%	91%
1988	4.33	2.66	3.5	4.45	14.94	189%	48%	126%	96%	98%
1989	0.97	5.68	1.79	2.37	10.81	42%	102%	64%	51%	71%
1990	0.5	3.59	2.63	6.56	13.28	22%	64%	95%	141%	87%
1991	1.5	5.25	1.5	4.3	12.55	65%	94%	54%	92%	82%
1992	1.18	4.9	5.64	4.94	16.66	51%	88%	203%	106%	109%
1993	3.8	11.45	3.21	5.25	23.71	165%	205%	116%	113%	155%
1994	2.88	4.4	2.47	2	11.75	125%	79%	89%	43%	77%
1995	2.56	10.88	5.31	3.75	22.5	111%	195%	191%	81%	147%
1996	0.05	5.95	1	3.5	10.5	2%	106%	36%	75%	69%
1997	2.75	5.25	1.5	8.88	18.38	120%	94%	54%	191%	120%
1998	1.63	7.74	2.38	6.5	18.25	71%	138%	86%	140%	119%
1999	2.85	1.9	3.25	6.75	14.75	124%	34%	117%	145%	96%
2000	0.25	3.5	0.63	10.5	14.88	11%	63%	23%	226%	97%
2001	3.62	5.12	4.63	1.25	14.62	158%	92%	167%	27%	95%
2002	0.62	2	0.76	2.12	5.5	27%	36%	27%	46%	36%
2003	2.44	4.25	3.56	4.56	14.81	106%	76%	128%	98%	97%
2004	1	4	1.25	4.56	10.81	44%	72%	45%	98%	71%
2005	9.25	11.22	3.79	2.13	26.39	403%	201%	137%	46%	172%
2006	1.63	1.05	5.07	3.37	11.12	71%	19%	183%	72%	73%
2007	1.19	2.62	0.87	7.32	12	52%	47%	31%	157%	78%
2008	0.25	9.82	1.05	4.25	15.37	11%	176%	38%	91%	100%
2009	2.37	5.88	1.25	2.56	12.06	103%	105%	45%	55%	79%
2010	0.34	6.87	2.54	1.75	11.5	15%	123%	92%	38%	75%
Annual Average	2.30	5.59	2.78	4.65	15.31					

Appendix D:
Wildlife Data

Arizona Game Management Unit 13B Mule Deer Population Counts				
Year	**Number of Animals Surveyed**	**Bucks/100 Does**	**Fawns/100 Does**	**Population Estimate**
1985	108	30	50	1000-1500
1986	41	29	18	1000-1500
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	<1000
1993	117	126	52	800-1000
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	84	29	46	No Estimate
2004	102	34	57	No Estimate
2005	128	65	72	No Estimate
2006	143	68	64	No Estimate
2007	152	79	41	No Estimate
2008	158	45	63	No Estimate

Bighorn Sheep

13BNorth

	Ram Age Class							Yearling							
Year	I (2)	II (3-5)	III (6-8)	IV (9+)	Ad Ram Total	Ewes	Lambs	M	F	Uncl	Total	Grps.	M:100F:L:Yrl.		Pop Est
2002	6	8	6	2	22	47	5	0	4	0	78	22	47: 11: 9		
2003	Insufficient data														
2004	Insufficient data														
2005	4	12	18	1	35	58	19	3	6	0	121	32	60: 33: 16		**172**
2006	5	13	11	3	32	90	18	3	10	0	153	32	36: 20: 14		**174**
2007	6	14	15	1	36	93	17	6	8	0	160	36	39: 18: 15		**192**
2008	3	12	16	3	34	44	8				86	31	77: 18: 0		**Not Calculated Yet**

13BSouth

	Ram Age Class							Yearling							
Year	I (2)	II (3-5)	III (6-8)	IV (9+)	Ad Ram Total	Ewes	Lambs	M	F	Uncl	Total	Grps.	M:100F:L:Yrl		Pop Est
2003	3	2	2		7	18	10	0	1	1	37	10	39: 56: 6		78
2005	1	6	1		8	38	11	2	1	0	60	10	21: 29: 8		74
2008	2	**3**	8		13	22	68	0	1		42	15	77: 27: 5		**Not Calculated Yet59**