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

Mud and Cane -- #4850

I. Introduction

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

The purpose of Standards and Guides is to insure the health of public rangelands. These standards help the Bureau of Land Management (BLM), rangeland users, and interested members of the public achieve a common understanding of acceptable resource conditions, and work together to implement that vision (see appendices for a copy of the Standards and 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 appendices for a list of members on both teams). The RRT may provide informal advice to the BLM Field Manager regarding implementation of Standards and Guides, and "will have opportunities to raise any matter of concern with the resource advisory council and . . . to provide information and options to the council for their consideration" as provided for by regulations at 43 CFR 1784.6-2(a)(2)(iv)(A).

The BLM/RAC Implementation Strategy for Arizona states that the RRT's primary role is to assist BLM managers in assuring the Standards and Guides 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 January 29, 2002, and a field visit on October 16, 2002. In cases where standards were not being met, the group identified which resource uses needed to be addressed, and teams presented recommendations to improve resource conditions.

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: 4,716 AUMs
Suspended Non-use: 462 AUMs

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

B. Season(s) of use

3/1 to 2/28

C. Kind and class of livestock

399 Cows & Calves
2 Horses

D. Percent federal range[1]

98%

III. Allotment Profile

A. Description

The Mud & Cane grazing allotment is located in northwest Arizona, within the Grand Canyon-Parashant National Monument, approximately 40 miles south southwest of St. George, Utah. Mud Mountain, Pocum Cove and Hobble Canyon

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

are found within the allotment along with a good variety and diversity of vegetation, ranging from mountain chaparral and Pinyon-Juniper in the higher elevations to desert shrub and annual grasses in the lower elevations.

B. Acreage

The allotment contains:

- 81,910 acres of federal land
- 1,921 acres of state land
- 0 acres of private land

C. Objectives

1. Land Use Plan Objectives

Grand Canyon – Parashant National Monument Resource Management Plan (RMP) (2008)

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 are as follows:

RP= Riparian Ecological Zn	GM=Livestock Grazing	WM=Designated Wilderness
WS=Air, Water and Soils	TE=Special Status Species	VR=Visual Resources
VM=Vegetation	WC=Wilderness Characteristics	FM=Fire and Fuels Management
WF=Wildlife and Fisheries	RR=Recreation Resources	

Water

DFC-RP-06
All surface water will meet, or be improving towards, Arizona State water quality standards.

DFC-WS-03
Surface water availability at seeps and springs will be appropriate for the soil type, climate, and landform.

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

Watershed/Soil Stability

DFC-VM-04
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.

DFC-WS-08
Physical soil crusts will show an increase in organic cover including cryptobiotic colonies, moving them towards being organic crusts.

Ecological Processes

DFC-VM-05
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-RP-02
Riparian areas 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 Arizona Standards for Rangeland Health, NPS Vital Signs, and enhance Monument objects and values.

DFC-RP-03
Ecological functions and processes will be intact with vegetative species composition and cover appropriate to the site.

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
Invasive plant species will be contained, controlled, or eliminated and native species restored to meet desired plant community (DPC) objectives.

DFC-RP-11
Invasive plants and animals such as tamarisk, Russian olive, and brown-headed cowbird will be reduced or eliminated.

DFC-VM-38
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.

Fuel Loads

DFC-VM-07/DFC-FM-06
Each vegetation community is maintained within its natural range of variation in plant composition, structure, and function, and fuel loads are maintained below levels that are considered to be hazardous.

No Net Loss

DFC-VM-15
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
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.

DFC-VM-42
There will be no net loss of acres of Interior Chaparral 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.

DFC-GM-04
Monument values will be maintained, protected, and 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
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
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-16
Treatment objectives in sagebrush communities will focus on restoring natural disturbance processes, such as by using fire, increasing vegetative ground cover of native grasses and forbs, and removing invasive non-native plants.

DFC-VM-18
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
Sagebrush communities will include small, grassy openings to support long-billed curlews and burrowing owls.

DFC-VM-20
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
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
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
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
Fragmentation of sagebrush habitat will be less than 50% of the treatment area.

DFC-VM-25
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-27
Treatment objectives in the pinyon-juniper vegetation communities will focus on restoring the natural disturbance regime; increasing vegetative ground cover of native grasses, forbs, and shrubs; and removing non-native invasive species.

DFC-VM-28
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
Individual old growth trees will be present and will be protected during treatment implementation.

DFC-VM-34
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
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-VM-39
The Interior Chaparral Ecological Zone will consist of diverse populations of endemic vegetative species, particularly shrubs, and a mosaic of age class distributions of these species (see Map 2.3, Ecological Zone in the Grand Canyon-Parashant National Monument Resource Management Plan, 2008).

DFC-VM-40
Endemic plant species and associated communities such as manzanita, silk tassel, and live oak will be present, along with other shrubs, grasses, and forbs.

DFC-RP-01
Riparian areas, including Monument objects, will consist of a diversity of vertical and horizontal structures, vegetative age classes, and endemic species.

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

Riparian

DFC-RP-04
Where sites have the potential for over-story vegetation, the canopy cover of over-story and under-story vegetation will be at or approaching maximum density.

DFC-RP-05
All riparian areas will be in, or moving towards, proper functioning condition.

DFC-RP-07
Flowing water systems will provide contiguous water and associated riparian vegetative cover, where possible.

DFC-RP-08
Availability of surface water at seeps and springs will be appropriate for the soil type, climate, and landform and will support a diverse population of endemic plant and wildlife species.

DFC-RP-10
Riparian communities will provide habitat for common species such as rush, cottonwood, willow, and yellow-breasted chat, as well as rare species such as southwestern willow (SW) flycatcher, common black hawk, Lucy's warbler, and speckled dace where consistent with site potential.

DFC-WS-05
Flowing water systems will provide continuous flowing water and associated riparian vegetative cover, where possible.

DFC-TE-15
Essential habitats, important migration routes, required flows, and water quality will be protected and maintained in lentic and lotic systems in the Monument.

DFC-TE-24
Riparian areas will be in proper functioning condition and be of sufficient quantity and quality to provide adequate foraging areas for bald eagles, peregrine falcon, common black hawk, and other special status raptors.

DFC-TE-31
Riparian areas will be in proper functioning condition and be of sufficient quantity and quality to provide adequate foraging areas for SW flycatcher, Yuma clapper rail, yellow-billed cuckoo, and other special status birds.

DFC-TE-33
Riparian areas that can physically support SW flycatcher habitats due to floodplain width and gradient will attain the vegetation structure, plant species diversity, density, and canopy cover to be suitable habitat.

DFC-TE-34
Riparian vegetation will be sufficiently dense and structurally complex to minimize or eliminate the effects of SW flycatcher predators and preclude brown-headed cowbirds from finding SW flycatcher nests.

DFC-TE-35
Cottonwood gallery forests will be abundant and provide habitat for yellow-billed cuckoos.

DFC-TE-36
Potential roosting and nesting sites for riparian dependent special status birds will be abundant.

Wildlife Habitat

DFC-VM-35
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-VM-41
Endemic animal species such as black-chinned sparrow and mule deer 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.

DFC-TE-14
Habitat connectivity will be maintained, providing sufficiently frequent contact between tortoises to maintain genetic diversity.

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-TE-10
There will be no net loss in the quality or quantity of desert tortoise habitat within Wildlife Habitat Areas (WHAs).

DFC-TE-13
Desert tortoise habitat will provide sufficient forage and cover attributes to support thriving populations of the species.

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

DFC-RP-09
A sufficient quantity of water with safe access for wildlife will be available, where appropriate.

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.

DFC-TE-28
Peregrine falcon, ferruginous hawks, common black hawks, northern goshawks, and burrowing owls will be sufficiently abundant so that there will be no need to list these species.

No Net Loss of Threatened and Endangered Species Habitat

DFC-TE-04 & 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.

DFC-TE-29
No net loss will occur in the quality and quantity of suitable habitat for riparian-dependent special status bird species 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.

Healthy Desert Tortoise Populations

DFC-TE-11
Desert tortoise populations within the Desert Wildlife Management Areas (DWMAs) will be healthy and self-sustaining. Populations will be stable or increasing. Population declines will be halted.

DFC-TE-12
Desert tortoise populations outside of the wildlife habitat areas (WHAs) will be healthy and stable. Impacts to the population of the WHA will be minimized to the extent possible through mitigation.

Aquatic Habitat

DFC-TE-17
All biologically suitable perennial waters on public lands in the Monument will be occupied by thriving, self-sustaining populations of native, endemic amphibians and aquatic invertebrate species, as appropriate.

DFC-TE-18
New introduced (or re-introduced) populations of relict leopard frog will increase to the point of being viable and self-sustaining.

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

Black Rock Habitat Management Plan (HMP) Objectives:

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

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

MD2a1 Identify and manage for key forage and cover species in mule deer habitat, particular crucial summer range, based on DPC and establish key areas by 2000.

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

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

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

Allotment Management Plan

The main goal of the Mud & Cane Allotment Management Plan (AMP revised in 1989) ". . . is to improve vegetative cover and diversity on the Mud & Cane Allotment." Additional objectives of the AMP are to reduce soil erosion and water runoff by increasing effective ground cover, improving livestock forage, and improving wildlife habitat, especially the riparian habitat along Pocum Wash.

Five key areas for monitoring frequency, cover, and livestock utilization were established in 1982. An additional key area was added in Spring of 1987. If needed, additional monitoring areas could be established.

Specific Vegetation Objectives from allotment management plan:

The following species frequency and vegetative cover objectives were established for each individual key area in the AMP.

Key Area No. 1, located in the Ide Valley Pasture. The Ecological Site is Basalt Slopes 13"-17" precipitation zone (pz).

- Increase frequency of Purshia mexicana from 1 to 3%
- Increase frequency of Bouteloua gracilis from 1.5 to 5%
- Increase frequency of Elymus elymoides from 1 to 5%
- Increase Live Vegetation (Basal Cover) from 2% to 4%.

Key Area No. 2, located in the Black Canyon Pasture. The Ecological Site is Limy Upland 10"-13" pz.

- Increase frequency of Ephedra Nevadensis from 4 to 5%
- Increase frequency of Elymus elymoides from 0 to 5%
- Increase Live Vegetation (Basal Cover) from 3 to 5%.

Key Area No. 3, located in the Hobble Canyon Pasture. The Ecological Site is Basalt Slopes (Cal) 10-14" pz.

- Increase frequency of Ephedra Nevadensis from 0 to 5%
- Increase frequency of Purshia mexicana from 1 to 5%
- Increase Live Vegetation (Basal Cover) from 1 to 3%.

Key Area No. 4, located in the North Mud Mountain Pasture. The Ecological Site is Shallow Upland (Cal) 10-14" pz.

- Maintain frequency of Purshia mexicana at 5%
- Increase frequency of Ephedra Nevadensis from 1 to 5%
- Increase frequency of Elymus elymoides from 3 to 5%
- Increase frequency of Pleuraphis jamesii from 1 to 5%
- Increase Live Vegetation (Basal Cover) from 0 to 2%.

Key Area No. 5, located in the Mud Mountain South Pasture. The Ecological Site is Shallow Upland (Cal) 10-14" pz.

- Increase frequency of Ephedra Nevadensis from 0 to 5%
- Increase frequency of Achnatherum hymenoides from 0 to 5%
- Increase frequency of Sporobolus spp. from 0 to 5%
- Increase Live Vegetation (Basal Cover) from 0 to 2%.

Key Area No. 6, located in the Hobble Hills Pasture. The Ecological Site is Shallow Loamy 10-14" pz.

- Increase frequency of Pascopyrum smithii from 13 to 15%
- Increase frequency of Elymus elymoides from 2 to 5%
- Increase Live Vegetation (Basal Cover) from 2 to 4%.

Desired Plant Community (DPC) Objectives

The 2008 RMP and the previous 1992 RMP called for establishing DPC objectives to measure resource response to management activities, as does Standard 3 of the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration. The Arizona Standards for Rangeland Health and Guidelines for Grazing Administration state, "DPC objectives will be developed to assure that soil conditions and ecosystem function as 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, DPC objectives will be used as an indicator of ecosystem function and rangeland health."

The following DPC[2] objectives were developed during this evaluation process by the IAT, by consulting the Ecological Site Guides for key areas, as provided by Natural Resource Conservation Service, and site-specific information of the potential of the site to produce vegetation. These DPC objectives are described in terms of species composition by weight (CBW), and percent basal vegetative cover. Species composition data is collected using the Dry Weight Ranking method. Percent basal vegetative cover is monitored using the "Step-Point" method.

The IAT believe that these DPC objectives should be attainable under current management. DPC objectives when obtained will assure rangeland health, forage on a sustained yield basis, and habitat for wildlife species. The species listed below reflect plant species to be monitored to measure success of management actions.

Key Area No. 1, located in the Ide Valley Pasture.

- Maintain *Achnatherum hymenoides* composition by dry weight of 0 to 5%
- Maintain *Elymus elymoides* composition by dry weight of 0 to 5%
- Maintain *Purshia mexicana* composition by dry weight of 1 to 3%
- Maintain forb composition by dry weight of 1 to 10%
- Maintain Live Perennial Vegetation (Basal Cover) of 3% and 5%.

Rational: The ecological site, for this key area is a Basalt Slopes 13-17" precipitation zone (pz).–Achnatherum hymenoides, Elymus elymoides, and Purshia mexicana are key species recognized to be important as livestock and wildlife forage, watershed, and cover, and are components of the ecological site. The site guide allows for from 1 to 10% CBW for Achnatherum hymenoides, 0 to 10% for Elymus elymoides, and 0 to 25% for Purshia mexicana.

[2] DPC is one of the several plant community types that may occupy an ecological site, the one or combination that meets the minimum quality criteria for the soil, water, air, plant, and animal resources, and that meets the resource objectives established for that ecological site. The DPC must be consistent with the site's capability to produce the desired vegetation through management, land treatment, or combination of the two.

This pinyon-juniper site was chained in 1963 and seeded and has not been treated since. The species composition is gradually returning to native vegetation, and the current plant community is in late seral status. The IAT believes that the potential exists to achieve these DPC objectives under current management and normal precipitation years based on field observation and a review of data. The DPC objectives would also promote attainment of the RMP Desired Future Conditions (DFCs).

Key Area No. 2, located in the Black Canyon Pasture.

- Maintain PPGG (other perennial grasses) composition by dry weight of 1 to 5%
  Elymus elymoides, Aristida, and *Sporobolus spp.*
- Maintain *Achnatherum hymenoides* (*Achnatherum hymenoides)* composition by dry weight of 1 to 3%
- Maintain *Dasyochloa pulchella* composition by dry weight of 1 to 5%
- Maintain *Ephedra Nevadensis* composition by dry weight of 1 to 5% or above
- Maintain forb composition by dry weight of 1 to 10% or above
- Increase Live Perennial Vegetation (Basal Cover) to 3 to 5%.

Rational: The ecological site for this key area is a Limy Upland 10-13" pz. *Elymus elymoides, Achnatherum hymenoides, Sporobolus spp.,* and *Ephedra Nevadensis* are key species recognized to be important as livestock and wildlife forage, watershed, and cover, and are components of the ecological site. This site has burned at some point in the past and again during 2005.

The key species listed are the species recognized to be important for as livestock and wildlife forage and browse and are components of the ecological site. The site guide does not list *Elymus elymoides, Aristida,* or *Sporobolus spp.* but does allow 1-5% CBW for other perennial grasses (PPGG).

The IAT believes that the potential exists to achieve these DPC objectives under current management and normal precipitation years based on field observation and a review of data. The DPC objectives would also promote attainment of the RMP Desired Future Conditions (DFCs).

Key Area No. 3, located in the Hobble Canyon Pasture.

- Increase *Elymus elymoides* composition by dry weight to 1 to 3%
- Maintain *Ephedra Nevadensis* composition by dry weight of 2-7%
- Maintain *Purshia mexicana* composition by dry weight of 1-5%
- Maintain forb composition by dry weight of 1 to 10%
- Maintain Live Perennial Vegetation (Basal Cover) of 3 to 5%.

Rational: The ecological site for this key area is a Basalt Slopes (Cal) 10-14" pz. *Elymus elymoides, Ephedra Nevadensis*, and *Purshia mexicana* are key species recognized to be important as livestock and wildlife forage, watershed,

and cover, and are components of the ecological site. This site has burned at some point in the past, and is presently in high mid seral status.

This area is generally dominated by *Coleogyne ramosissima* or at least has the potential, particularly if fire is excluded. The site guide allows between 55 and 80% CBW for *Coleogyne ramosissima* and as high as 95% for shrubs, thus CBW for grass and grass like is minimal.

The key species listed are the species recognized to be important for forage and browse and are components of the ecological site. The site guide allows for from 0 to 3% CBW for *Elymus elymoides*, 3 to 7% for *Ephedra Nevadensis*, 0 to 5%, and 0 to 5% for *Purshia mexicana.*

The IAT believes that the potential exists to achieve these DPC objectives under current management and normal precipitation years based on field observation and a review of data. The DPC objectives would also promote attainment of the RMP Desired Future Conditions (DFCs).

Key Area No. 4, located in the North Mud Mountain Pasture.

- Maintain *Elymus elymoides* composition by dry weight of 1 to 3%
- Maintain *Sporobolus spp.* composition by dry weight of 1 to 2%
- Maintain *Pleuraphis jamesii* composition by dry weight of 5 to 15%
- Maintain *Purshia mexicana* composition by dry weight of 1 to 3%
- Maintain the forb composition by dry weight of 1 to 5%
- Maintain Live Perennial Vegetation (Basal Cover) of 3 to 5%.

Rational: The ecological site for this key area is a Shallow Upland (Cal) 10-14" pz. *Elymus elymoides, Pleuraphis jamesii*, and *Ephedra Nevadensis* are key species recognized to be important as livestock and wildlife forage, watershed, and cover, and are components of the ecological site.

This site has possibly burned several times by wildfires. Parts of the area have more recently burned in 1996, 2002 and again in 2005. Because of wildfires, the area was set back to the very early stages in plant community succession. The site guide allows for from 1 to 3% CBW for *Elymus elymoides*, 5-10% for *Pleuraphis jamesii, Purshia mexicana* 1-3%, and 3 to 5% for *Ephedra Nevadensis*.

The IAT believes that the potential exists to achieve these DPC objectives under current management and normal precipitation years based on field observation and a review of data. The DPC objectives would also promote attainment of the RMP Desired Future Conditions (DFCs).

Key Area No. 5, located in the Mud Mountain South Pasture.

- Increase *Elymus elymoides* composition by dry weight to 1 to 3%
- Maintain *Sporobolus spp.* composition by dry weight of 1 to 2%
- Maintain *Achnatherum hymenoides* composition by dry weight of 1 and 5%
- Increase *Ephedra Nevadensis* composition by dry weight to 1 to 3%
- Maintain the forb composition by dry weight of 1 to 5%
- Maintain Live Perennial Vegetation (Basal Cover) of 2 to 5%.

Rational: The ecological site for this key area is a Shallow Upland (Cal) 10-14" pz. *Elymus elymoides, Sporobolus spp., Achnatherum hymenoides*, and *Ephedra Nevadensis* are key species recognized to be important as livestock and wildlife forage, watershed, and cover, and are components of the ecological site.

This site has burned several times by wildfires. Parts of the area recently burned in 1986 and again in 2005. As a result of wildfires the area was set back to the very early stages of plant community succession. The area is gradually returning to native vegetation and at this point, in the plant community succession is in early seral status.

The key species listed are the species recognized to be important for forage and browse and are components of the ecological site. The site guide allows from 1 to 3% CBW for *Elymus elymoides*, 1 to 2% for *Achnatherum hymenoides*, 1-2% for *Sporobolus spp.*, and 3 to 5% for *Ephedra Nevadensis.*

The IAT believes that the potential exists to achieve these DPC objectives under current management and normal precipitation years based on field observation and a review of data. The DPC objectives would also promote attainment of the RMP Desired Future Conditions (DFCs).

Key Area No. 6, located in the Hobble Hills Pasture.

- Maintain *Elymus elymoides* composition by dry weight of 1 to 5%
- Maintain *Pascopyrum smithii* composition by dry weight of 0 to 5%
- Maintain *Sporobolus spp.* composition by dry weight of 1 to 5%
- Maintain the forb composition by dry weight of 1 to 5%
- Increase Live Perennial Vegetation (Basal Cover) from 2 to 5%.

Rational: The Ecological Site, for this key area, is a Shallow Loamy 10-14" pz. *Elymus elymoides, Sporobolus spp.*, and *Pascopyrum smithii* are key species recognized to be important for forage, watershed, and cover, and are components of the ecological site.

This site has been burned by several wildfires from at least the 60's and has been reseeded in the past. Parts of the area have more recently burned in 1996, 1999, 2001 and 2005. As a result of wildfires the area was set back to the very early

stages of succession. The area is gradually returning to native vegetation and at this point, in the plant community succession is in low mid seral status.

The key species listed are the species recognized to be important as livestock and wildlife forage and browse and are components of the ecological site. The site guide allows for from 5 to 10% CBW for *Elymus elymoides,* 5-20% for *Pascopyrum smithii*, and 1-5% for *Sporobolus spp*.

The IAT believes that the potential exists to achieve these DPC objectives under current management and normal precipitation years based on field observation and a review of data. The DPC objectives would also promote attainment of the RMP Desired Future Conditions (DFCs).

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 allotments. 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 listed below by common name and scientific (Latin) name, and commonly used synonyms for the scientific name in parentheses:

Plant Category	Common Name	Scientific Name
Cool season Grasses		
	Indian ricegrass	*Achnatherum hymenoides* (*Oryzopsis hymenoides*)
	Bottlebrush squirreltail	*Elymus elymoides* *(Sitanion hystrix)*
	Western Wheatgrass	*Pascopyrum smithii* (*Agropyron Smithii*)
	Threeawn	*Aristida spp*
Warm Season Grasses	Galleta grass	*Pleuraphis jamesii* (*Hilaria jamesii)*
	Sand dropseed	*Sporobolus spp.*
	Low woollygrass	*Dasyochloa pulchella* (*Tridens pulchellus)*
Browse		
	Mormon tea	*Ephedra nevadensis*
	Cliffrose	*Purshia mexicana* *(Cowania mexicana)*

E. Grazing System

Implementation of the AMP began in 1992; however, implementation is not yet complete, as some infrastructure has not yet been installed. This allotment uses two separate grazing systems to facilitate management of the allotment and accommodate the two different herds of cattle that run there. (See Appendix F, which includes map of the pastures mentioned below.)

The first grazing system is the Desert Herd Grazing system. Grazing of 200 to 250 cattle, (3,000 AUMs) are managed using the Desert Herd Grazing system. The Desert Herd Grazing System is divided into three pastures: Black Canyon, North Mud Mountain, and South Mud Mountain. These three pastures are grazed in a two-year rotation as follows: North Mud Mountain from June 15 through November 15 each year. The first year the herd is moved from North Mud Mountain into Black Canyon the Middle of November and from Black Canyon to South Mud Mountain the Middle of January. About June 15, the cattle are moved back into the North Mud Mountain Pasture from South Mud Mountain Pasture. The Second Year cattle leave the North Mud Mountain Pasture in November and go back into the South Mud Mountain pasture where they stay until April 15 when they move into Black Canyon until June 15.

The North Mud Mountain pasture is not grazed until cool season grasses in the area are setting seed. This allows cool season grasses to retain vigor and increase in abundance. Warm season grasses and browse are grazed during their growing seasons and are monitored closely. Black Canyon and South Mud Mountain pastures are rested every other spring and each summer, allowing for growth and maintaining vigor of both cool and warm season grasses.

The second grazing system is the Browse Herd grazing system. A herd of 100 to 150 cattle (1,800 AUMs) grazes the north and east sides of the allotment. This portion of the allotment is divided into seven pastures (See Appendix F).

The three summer pastures, Sand Cove, Pocum Cove, and Ide Valley (See Appendix F) are rested each spring to promote cool season grasses. They can also be deferred as necessary during the summer growing season. Hobble Hills and Hobble Canyon are rested throughout the growing season every year. The Pocum Wash pasture (which includes Cane Springs) is grazed in the spring and fall every other year, an average of one and a half months every two years. The Road Canyon pasture is grazed early spring and late fall every other year (five months every two years).

Cattle leaving the summer pastures at the end of October return to the Road Canyon pasture for two months. They graze the Hobble pastures for the months of January, February, and March. They spend the months of April and May in the Pocum Wash. The second year the rotation is reversed. The third year repeats the

first year, except the November use is in Pocum Wash, and Road Canyon is used during March April, and May. The fourth year is the same as the second year.

The Grand Wash Pasture, is grazed from October through May on even years (2008, 2010, etc.), and from October through March 15 on odd years (2009, 2011, etc.) by approximately 40 head of replacement heifers. Heifers are either integrated into the main herds or placed in the Pocum Wash pasture until they can be moved in with the main herds.

F. Other uses

1. Special Status Species

Listed below are the threatened and endangered (T and E) animal species that may occur within the Mud and Cane allotment.

- The Mojave Desert Tortoise (*Gopherus agassizii*) (Threatened) [Desert Tortoise Critical Habitat, designated, 1994 (Critical Habitat on allotment map, page 1 of the Appendices)
- California Condor (*Gymnogyps californianus*) (Endangered)
- Mexican Spotted Owl (*Strix occidentalis lucida*) (Threatened)

Sensitive Species

Sensitive species are usually rare within at least a portion of their range. Many are protected under certain State and/or Federal laws. Species listed as sensitive by the BLM 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 US 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 listing of Wildlife of Special Concern in Arizona. Table #1 lists the sensitive animal species that may occur within this allotment.

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 limits the taking of any migratory birds, their parts, nests, or eggs. 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.

Table #1. Sensitive Species that are Known to Occur or have the Potential to Occur* in the Allotment

Species	Mud and Cane	BLM Sensitive	Arizona Wildlife Species of Concern
Bald eagle (*Haliaeetus leucocephalus*)	potential	no	endangered
Golden eagle (*Aquila chrysaetos*)	potential	no	no
American peregrine falcon (*Falco peregrinus*)	verified	yes	yes
Ferruginous hawk (*Buteo regalis*)	potential	yes	yes
Swainson's hawk (*Buteo swainsoni*)	potential	no	yes
Western burrowing owl (*Athene cunicularia hypugea*)	potential	yes	no
White-faced ibis (*Plegadis chihi*)	potential	yes	no
Spotted bat (*Euderma maculatum*)	verified	yes	yes
Western small-footed myotis (*Myotis ciliolabrum*)	verified	yes	no
Fringed myotis (*Myotis thysanodes*)	verified	yes	no
Big free-tailed bat (*Nyctinomops macrotis*)	verified	yes	yes
Townsend's big-eared bat (*Corynorhinus townsendii*)	verified	no	no
California leaf-nosed bat (*Macrotus californicus*)	verified	Yes	yes

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

2. Other Wildlife

The Mud and Cane allotment is in the AGFD's Game Management Unit (GMU) 13B. Desert bighorn sheep (*Ovis canadensis nelson*) may be present in the far southeast corner of the allotment. Mule deer (*Odocoileus hemionus*) may be present throughout the allotment. Merriam's turkey (*Meleagris gallopavo merriami)* and Rio Grande turkey (*Meleagris gallopavo Intermedia)* may occur in the extreme northern portion of the allotment.

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

3. Riparian

The Cane Springs area (T. 38 N., R. 14 W., Section 34) is probably the largest riparian area in the Monument and consists of several small, terraced wet meadows primarily vegetated with sedges, located on the eastern flank of Mud Mountain. The various springs and seeps are small; combined they cover approximately 3 to 4 acres. There is a very small and dilapidated exclosure fence (est. at 30 feet by 30 feet), at the main upper spring. Most of the riparian area is presently grazed by cattle. Also, reportedly the second largest turbinella oak in the world is found here.

Pocum wash is a dry wash containing some cottonwoods, willows, and mostly tamarisk. During wetter than normal periods a clay layer with gravel above allows certain areas to remain moist supporting scattered riparian grasses and sedges besides the cottonwoods and willows. The area is fenced into a separate pasture used the 1st year in April, 2nd year in November, and not at all the 3rd year.

4. Recreation

The Mud and Cane Allotment has high recreation values for its geology, scenic viewsheds, remoteness, and solitude. General recreation activities include; recreational OHV use on designated routes, driving for pleasure on designated routes, horseback riding, hiking backpacking, camping, hunting, photography, bird watching, and nature study.

This allotment contains areas in both the Paiute and the Grand Wash Cliffs wilderness areas, which have been designated closed to OHV use. OHV use in the remainder of the allotment is limited to designated roads and trails.

The allotment is within the Parashant Special Recreation Management Area (SRMA) and mostly within the Shivwitz Frontier Recreation Management Zone (RMZ). A very small portion of the allotment in the Grand Wash Cliffs Wilderness is within the Parashant Wildlands RMZ. The primary strategy for the Parashant SRMA is to target a undeveloped recreation-tourism demand from local community and regional/national visitors for trophy hunting opportunities, guided backcountry tours, hiking, viewing/appreciating wildland landscapes and cultural sites, canyoneering and motorized/mechanized/non-mechanized exploring. 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 support this demand. Regional and local 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 adventure somewhat close to nearby communities. In addition, the Parashant Wildlands RMZ is managed for extreme world class, deep wildlands exploration in remote and rugged Grand Canyon country.

The allotment contains areas designated Class I and II for Visual Resource Management; VRM Class I areas are within the Paiute and Grand Wash Cliffs Wilderness areas.

No suitable wild and scenic river segments are within this allotment.

5. Wilderness

Portions of the Paiute Wilderness and Grand Wash Cliffs Wilderness are within the Mud and Cane Allotment. These designated wilderness areas are wild and very remote. Many rugged canyons, scenic escarpments, miles of cliffs, and sandstone buttes mark this transition between the Colorado Plateau and Basin and Range province. There are also small areas managed to maintain wilderness characteristics in the allotment.

G. Issues brought out in scoping meeting.

1. Issues relating to Rangeland Health and Guidelines for Grazing Administration

a. Concern over the fact that feral pigs are present in the allotment at Mud, Sand, and Cane Springs.

b. The recurrence of wildfire and resultant expansion of cheatgrass (Fire cycle – Cheatgrass).

c. Increase in woody species such as pinyon and juniper, resulting in reduced forage availability.

d. The presents of Milkweed and Jimson weed, which could poison livestock.

e. Concern as to whether there is erosion in Pocum wash area. Is it natural and/or OHV related?

f. Concern as to what is the riparian condition associated with the springs?

g. Is the Desert Tortoise Critical Habitat being taken into account in this assessment?

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

a. Road maintenance

The need for road maintenance on some of the more remote roads would be passed on to the operations crew. Specific roads would be identified.

b. Maintenance of facilities – wildlife catchments

Concern was expressed at the scoping meeting, that wildlife catchments were not being maintained. The 2 catchments in question on this allotment have been repaired.

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 resource management plans, allotment management plans, and other activity plans which identify terms and conditions for management on public lands within the Mud and Cane Allotment. If the current livestock grazing practices are determined to be causing non-attainment of standards, 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. Evaluation of rangeland conditions is based on all available monitoring, inventory, and assessment data.

B. Summary of Studies Data

1. Livestock Actual Use

Permitted use on the Mud and Cane Allotment is 4,716 AUMs. During most years, actual use has been consistently at about 75% of the use allowed (4,716 AUMs). Since 2003, the use has varied between 25% and 100%. Table 2 shows the number of livestock AUMS used from 1988 to 2008.

Table 2
Actual use on the Mud and Cane Allotment.

Year	AUMs Used
1987	3,552
1988	3,552
1989	3,552
1990	3,552
1990	3,550
1991	3,540
1992	3,540
1992	3,540
1993	3,540
1994	3,540
1995	3,540
1996	3,540
1997	3,548
1998	3,540
1999	3,540
2000	3,528
2001	3,528
2002	3,528
2003	1,176
2004	4,716
2005	4,716
2006	2,881
2007	1,176
2008	2,352

2. Precipitation

Precipitation amounts vary due to extremes in elevations found in the allotment, and inherent climatic fluctuation. Yearly moisture accumulations range from a maximum of 19-inches on the higher elevations to a minimum average of 8-inches in the southern portion of the allotment. Most of the allotment falls in a 12-inch precipitation zone with most occurring either during the summer or winter months.

Precipitation amounts during the recent drought years were: 1). 2000 precipitation year was 62% of average (0% for fall, 85% winter, 26% spring, and 83% for summer). 2) 2001 precipitation was above average for fall and winter, but was below for spring (0%) and summer (78%). 3) 2002 precipitation was only 25% of average, with no effective precipitation received, (fall 12%, winter 27%, spring 10%, and summer 39%).

Southern end of allotment:

The temperature-precipitation for the southern end of the Mud and Cane grazing allotment show an average annual precipitation of 7 to 8.12 inches and an average annual air temperature of 61.6 to 68 degrees F. Comparing the daily minimum and maximum temperatures for that area shows a range of 210 to 282 frost-free days. These sites represent the hottest, driest climate in the allotment.

Central portion of the allotment:

Average annual precipitation for most of the central areas ranges from 11.25 to 14.1 inches, the average annual air temperature is 57 degrees F, and the estimated number of frost-free days is 140 to 160.

Extreme northern portion of the allotment:

Average annual precipitation for the extreme northern portion of the allotment ranges from 15 to 19 inches. Average annual air temperature is estimated to be 48 to 56 degrees F, and the annual number of frost-free days is estimated to be 120 to 165 days.

3. Utilization

Utilization is the proportion or degree of current year's forage production that is consumed or removed by animals (both livestock and wildlife). Estimates of utilization are made using the key species grazed class method, a procedure in which photo guides are used to estimate utilization. Utilization was read at the key areas. Utilization in excess of district standards (>50% except for desert tortoise habitat where it is >45%) was reduced by partial implementation of the AMP in 1992. Table 3 below shows the utilization data from 1982-2008 that has been compiled for this evaluation and illustrates the number of times utilization exceeded allowable use in the pre-AMP and post-AMP era. In the pre-AMP era utilization exceeded allowable 32 times and during the post-AMP era to present the allowable utilization level was exceeded 4 times. In desert tortoise habitat (Key area # 2) pre-AMP (prior to 1992) allowable utilization (>50%) was exceeded 10 times; the post-AMP era (1992 to present) allowable utilization (>45%) was not exceeded.

Table #3																				
Pasture: Ide Valley; Key Area Number 1																				
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2008
Elymus elymoides	59	47	39	66	31	36	31	48	52	40	25	28	28	32	29	31	35	31	27	11
Purshia mexicana	36	38	7	42	37	30	37	44	49	42	40	28	31	33	28	31	25	28	18	14
Purshia tridentata			58	73	67	79	53	47	45	51	41	34	32	31	34	35	36	19	15	16
Pasture: Black Canyon; Key Area Number 2																				
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1995	1996	1997	1998	1999	2000	2008	
Elymus elymoides				65	25	22	22	45	51	52	40	39	41	45	32	33	27	30	30	
Sporobolus spp.						16											17	21	30	
Ephedra Nevadensis	52	57	47	59	42	41	44	47	51	49	41	38	45	45	39	36	20	24	42	
Pasture: Hobble; Key Area: Number 3																				
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2008	
Elymus elymoides				7	33	26	43	47	50	49	43	40	39	37	37	36	15	14	14	
Ephedra Nevadensis	79	74	50	51	42	44	40	46	48	43	54	36	44	41	28	29	16	19	21	
Purshia mexicana	44	40	26	41	41	35	53	70		25	40	39	34	35	35	29	32	16	17	
Pasture: Mud Mtn; Key Area: Number 4																				
	1983	1984	1985	1987	1988	1989	1990	1998	1999	2000	2005	2006	2007	2008						
Elymus elymoides	49	51	39	26	24	39	37	34	14	36	*	**	**	**						
Pleuraphis jamesii		58	66	45	27	43	23	22	18	15	*	**	**	**						
Ephedra Nevadensis			30	55	40	46	44	36	16	18	*	**	**	**						
Purshia mexicana	27	37	23	39	42	48	42	23	14	11	*	**	**	**						
Pasture: South Mud Mtn; Key Area: Number 5																				
	1982	1984	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1999	2005	2006	2007	2008		
Achnatherum hymenoides	50	59	27	23	32	38	29	1	7	6	33	39	16	23	*	**	**	**		
Elymus elymoides			13	19	30	40	36	1	13	21	35	39	22	31	*	**	**	**		
Sporobolus spp.	30	36	26	34	28	31	31	1	8	12	32	36	25	32	*	**	**	**		
Ephedra Nevadensis	50	51	11	41	37	50	40	3	18	16	39	57	42	30	*	**	**	**		
Pasture: Hobble Hills; Key Area: Number 6***																				
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1999	2005	2006	2007	2008						
Elymus elymoides	43	35	33	20	28	41	32	39	28	12	*	**	**	**						
Pascopyrum smithii	49	59	44	16	19	33	37	55	49	13	*	**	**	**						
Sporobolus spp.	50	53	41	32	23	24	25	51	37	16	*	**	**	**						

*Area was burned by wildfire the summer of 2005

**Area was not grazed due to 2005 wildfire to allow plant recovery.

***At key area number six, the first year studies were read was 1989, resulting in not a very good comparison between pre and post AMP

4. Trend of frequency and cover data

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 compared to detect change.

Trend data was collected using the Pace-Frequency method, which measures the occurrence frequency of forage and non-forage vegetative species. Trend monitoring is conducted at three key areas and at one exclosure on the allotment. Ground cover data, which is 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. To determine a trend or direction of change current frequency data may be compared to a base year's data by examining overlap of computed confidence intervals. Tables for 95% confidence intervals for the number of study plots read each year is used [see page 20 "Analysis, Interpretation, and Evaluation" TR 4400-7] to detect a change in direction or trend in a plant species when comparing current data with the first collected data or base year data. For example at a key area where 200 plots are read and the frequency of species for the current reading is at 10%, statistically to detect a change in plant frequency at the 95% confidence level, means that a difference in sampling variations would allow for any reading from 6-14% to be static trend; a reading of 15% would be upward trend and 5% would be a downward trend.

Monitoring data (1981 to 2008) from the Mud and Cane allotment indicates that drought and wildfire has impacts on trends. Drought from 1999 to 2004 has been an influence on all key areas. Wildfires have burned over some areas of the allotment 5 or 6 times since the 1960's.

Table 4 list changes in trends on key species comparing the recent data to the base year. To help illustrate the affects of drought and fire on plant species, a comparison of key species data from the base year of 1981 and 82 is made for the 1997 data (pre-drought), the 2002 and 2003 data (drought persisting) and 2007 and 2008 (post-fire). It is interesting to note the changes to Key Area 4 due to the wildfire where most key species trend was similar to the base year with the exception of a down trend for *Purshia mexicana* (a shrub susceptible to fire) and a significant trend upward for the grass *Pleuraphis jamesii (which is more fire resistant).*

The 2008 vegetative basal cover data, which is part of ground cover, showed improvement on three key areas and no change on the remaining 3. Ground cover (litter (persistent and non-persistent), rock and basal cover) showed improvement on all six key areas. Specific frequency and trend data is found in Appendix D.

Fire as mentioned has been an influence on key area #2 #3 #4 (1996, 2002, and key area #2 and #4 burned again in 2005), #5 (1986 & 2005), and #6 (1960's, 1996, 1999, and 2005). Drought (1999 to 2004) has been an influence on all key areas.

In summary after twenty one to twenty seven years, even with the occurrence of several wildfires since the 1960's, analysis of the data (Table #4) suggests that current management has not precluded achievement of static to improving trends on most key forage species. Climatic does however influence vegetative change.

Table #4

Shows changes to basal cover, litter, and key plant species by key area from base years (first year studies were read) to: pre-drought, drought, post drought years.

Key Area	Key Species or Cover Category	Years plots were read						
		1981	1997	1997 trend	2002	2002 Trend	2008	2008 Trend
1	Litter	81	48	↓	62	↓	43	↓
	Vegetation (basal cover)	2	6	↑	0	→	6	→
	Achnatherum hymenoides			→	1	→		→
	Elymus elymoides	1	5	↑	4	→		→
	Purshia mexicana	1	2	→	T	→	3	→
2		1982	1997	1997 trend	2002	2002 Trend	2008	2008 Trend
	Litter	25	52	↑	58	↑	62	↑
	Vegetation (basal cover)	3	4	→	5	→		→
	Elymus elymoides		7	↑	3	→		→
	Achnatherum hymenoides			→		→		→
	Sporobolus spp.			→		→	3	→
	Ephedra Nevadensis	4	12	↑	4	→	3	→
3		1982	1997	1997 trend	2002	2002 Trend	2008	2008 Trend
	Litter	17	49	↑	40	↑	53	↑
	Vegetation (basal cover)	T	5	↑	1	→	8	↑
	Elymus elymoides		3	→		→		→
	Ephedra Nevadensis		6	↑	1	→	4	↑
	Purshia mexicana	1	5	↑	2	→	4	→

4		1982	1990	1990 Trend	2002	Trend	2008	2008 Trend
	Litter	31	60	↑	Due to wildfire not read	Trend after wildfire would be presumed to be down	50	↑
	Vegetation (basal cover)		4	↑			5	↑
	Elymus elymoides	3	4	→			5	→
	Pleuraphis jamesii	1	2	→			20	↑
	Sporobolus spp.			→			2	→
	Ephedra Nevadensis	1	1	→				→
	Purshia mexicana	5	11	↑			1	↓
5		1982	1997	1997 Trend	2002	2002 Trend	2008	2008 Trend
	Litter	21	48	↑	66	↑	54	↑
	Vegetation (basal cover)	T	4	↑	5	↑	4	↑
	Achnatherum hymenoides	T	4	↑	5	↑	1	→
	Elymus elymoides			→	1	→		→
	Sporobolus spp.		8	↑	4	↑	23	↑
	Ephedra Nevadensis	T	2	→		→		→
6		1987	1997	1997 Trend	2003	2003 Trend	2007	2007 Trend
	Litter	43	38	→	51	↑	61	↑
	Vegetation (basal cover)	2	5	→	2	→	1	→
	Elymus elymoides	3	3	→	1	→	2	→
	Pascopyrum smithii	14		↓		↓		↓
	Sporobolus spp.		2	→		→	4	↑

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 the Ecological Site Guides.

Ecological (successional) status is the present state of the vegetation at an ecological site in relation to the potential natural community (PNC). PNC may include "acclimatized or naturalized nonnative species" (*Interpreting Indicators of Rangeland Health*, BLM, 2005 and *Ecological Site Inventory*, BLM, 2001). PNC 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.

Table 5 compares the most recent key species composition data with the base year at key areas in relation to allowable percent composition from the site-guide and the DPC objectives. (See Appendices E for specific ecological site information).

Table #5					
Plant Species	Site-Guide Allowable Percent Composition	Year and Species Composition			Desired Percent Composition Objective
Key Area #1			2002	2008	
Achnatherum hymenoides	0-10%		1%		0-5%
Elymus elymoides	0-10%		1%		0-5%
Purshia mexicana	1-25%		1%	2%	1-3%
Key Area #2			2002	2008	
(other perennial grass) PPGG	1-5%				1-5%
Elymus elymoides	Group PPGG		1%		
Aristida	Group PPGG		1%		
Sporobolus spp.	Group PPGG			5%	
Achnatherum hymenoides	1-3%			3%	1-3%
Dasyochloa pulchella	1-3%			5%	1-5%
Ephedra Nevadensis	1-5%		1%	13%	1-5%+

Key Area #3		1982	2002	2008	
Elymus elymoides	0-3%				1-3%
Ephedra Nevadensis	1-7%	2%	2%	3%	2-7%
Purshia mexicana	0-5%	3%		6%	1-5%
Key Area #4		N/A	N/A	2008	
Elymus elymoides	1-3%	N/a	N/a	3%	1-3%
Pleuraphis jamesii	5-10%	N/a	N/a	12%	5-15%
Sporobolus spp.	1-2%	N/a	N/a	2%	1-2%
Purshia mexicana	1-3%	N/a	N/a	1%	1-3%
Key Area #5		1982	2002	2008	
Achnatherum hymenoides	1-2%	1%	6%	1%	1-5%
Elymus elymoides	1-3%				1-3%
Sporobolus spp.	1-2%	11%		20%	1-2%
Ephedra Nevadensis	Group SSSS (1-3%)				1-3%
Key Area #6		2003	2007	2007	
Elymus elymoides	5-10%		1%		1-5%
Pascopyrum smithii	5-20%				0-5%
Sporobolus spp.	1-5%		3%		1-5%

*Wildfire burned through key areas during 2005.

6. Special Status Species

Desert Tortoise: The Mojave population of the desert tortoise was listed under the Federal Endangered Species Act as threatened on April 2, 1990. Critical habitat was designated under the ESA on February 8, 1994. The current Recovery Plan, developed in 1994, divided the range of the desert tortoise into six recovery units and established 14 Desert Wildlife Management Areas (DWMAs) throughout the Recovery Units. Establishment of Recovery Units and DWMAs was intended, in part, to facilitate an ecosystem approach to land management and desert tortoise recovery, as stipulated by section 2(b) of the ESA. The southern portion, of the Mud and Cane allotment lies within the Northeastern Mojave Recovery Unit and the Gold Butte-Pakoon DWMA. Designated critical habitat follows the DWMAs and are similarly named. Therefore, the southern portion of the Mud and Cane Allotment, approximately 20 percent (10,788 acres), is designated critical habitat and lies within the Gold Butte-Pakoon Critical Habitat Unit (CHU).

Desert tortoises are most active during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. In Arizona, tortoises are considered to be active from approximately March 15 through October 15. Desert tortoises spend the remainder of the year in burrows, escaping the extreme conditions of the desert.

Desert tortoise home range sizes vary with respect to location and year. Over its lifetime, each desert tortoise may require more than 1.5 square miles of habitat and make forays of more than seven miles at a time. During droughts, tortoises forage over larger areas, increasing the likelihood of injury or mortality through encounters with humans and predators.

There is no single or primary cause to the decline of this species. The situation is highly complex and varies from site to site and region to region. In most cases, there are many causes for declines. Threats identified in the 1994 Recovery Plan, and that formed the basis for listing the tortoise as a threatened species continue to affect the species. However, despite clear demonstration that these threats impact individual tortoises, there are few data available to evaluate or quantify the effects of threats on desert tortoise populations. While current research results can lead to predictions about how local tortoise abundance should be affected by the presence of threats, quantitative estimates of the magnitude of these threats, or of their relative importance, have not yet been developed. A revised draft Recovery Plan, intends to address this problem by creating a more cohesive, scientifically powerful recovery program to eventually recover the species and remove them from the threatened species list.

Within the Gold Butte-Pakoon DWMA and CHU , large portions have burned in the last thirty years, in some cases it has burned several times. Wildfires have significantly diminished the quality of desert tortoise habitat. Wildfires have destroyed the natural Mojave vegetation and caused that native vegetation to be replaced by less desirable non-native annual vegetation, such as cheatgrass. The invasion of cheatgrass also leads to additional wildfires, further degrading the habitat and reducing its productivity.

No surveys regarding desert tortoises specific to this allotment have occurred. However, surveys are focused to gain information for DWMAs and CHUs. Information on the distribution and abundance of desert tortoises in DWMAs and CHUs, began in the 1970s with the establishment of permanent plots. Some of these plots were surveyed through 2002, however, the study plot in the Gold Butte-Pakoon DWMA and CHU was surveyed only once, in 1991, and 10 live tortoises and shell remains from 11 individuals were recorded from 60 person days of searching. In 2000, the Desert Tortoise Management Oversight Group decided to change survey methodology to line-distance. This method is designed to monitor populations across the range of the species. Line-distance began in spring 2001. In 2007, 37 transects from the Gold Butte-Pakoon DWMA and CHU were surveyed and four live tortoises were recorded along with 10 carcasses. One live tortoise was incidentally sited, yet not part of the surveys. Results from the 2008 surveys from 40 line-distance transects from the Gold Butte-Pakoon DWMA and CHU, found no tortoises and 10 carcasses. One live tortoise was incidentally sited in this DWMA and CHU, yet not as part of the surveys, indicating that, at least some tortoises still remain in this CHU.

California Condor: The California Condor was listed as endangered in 1967. In the late 1970's, 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 Vermillion cliffs, under the ESA's 10J rule (non-essential experimental). Subsequent condor releases have occurred annually, with additional releases in 1998 and 1999 of 16 condors from the Hurricane Cliffs northeast of Diamond Butte.

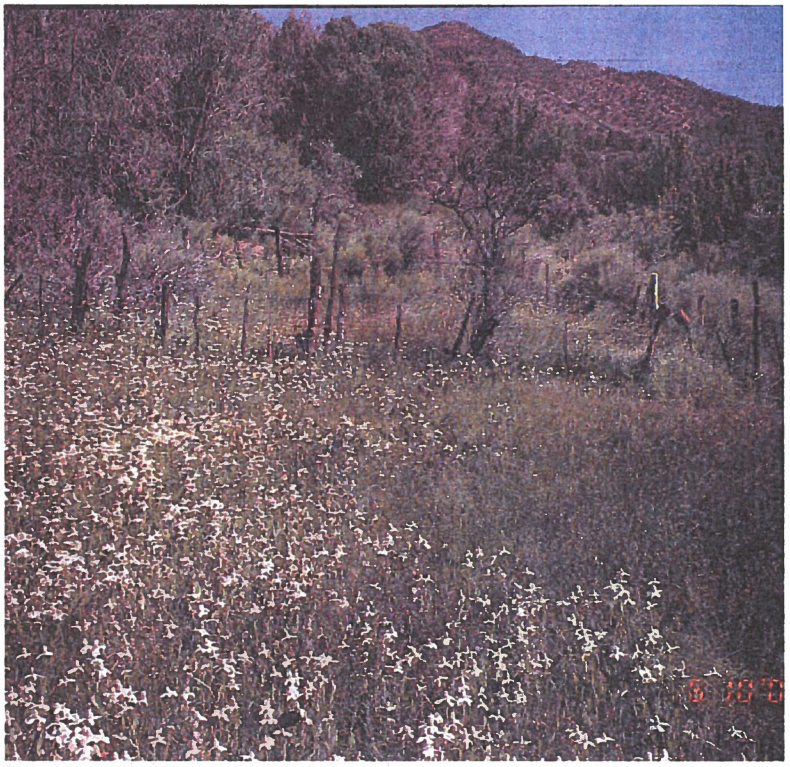
As of July 14, 2008, there are 63 condors in the wild in northern Arizona. The reintroduced population as a whole appears to be stable and is increasing. Two pairs of Arizona condors incubated eggs in 2004. Both eggs hatched and two chicks were visually confirmed. The reintroduction continues annually 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.

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 near 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 owls (*Strix occidentalis lucida*) are a federally threatened species. They are 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 within the Monument or on the Arizona Strip District, although a confirmed sighting of an owl occurred in 2007 just north of Colorado City and feathers collected in 2008 from Paria Canyon, were confirmed as being from a Mexican spotted owl.

The Mexican spotted owl requires steep, narrow canyons with microsites that remain cool during most of the day. They can also use mixed conifer stands. There is no mixed conifer within the Mud and Cane allotment and canyons on the Monument are generally too open and hot to support Mexican spotted owls. An extremely small portion of this allotment, one percent, contains habitat designated as potential Mexican spotted owl habitat by the Spotskey-Willey habitat model.

Some team members believed that Cane Springs provides a unique opportunity for wildlife and other values, and that the site has potential to be a major recreation destination spot within the Monument. Some additionally believed that the present use of the area by livestock limits that potential.



June 10, 2003

9. Wild Horse and Burro Habitat

This Allotment is not within a HMA and so is not classified as Wild Horse and Burro Habitat.

10. Lithology and Soils

a. Lithology

The north part of the allotment consists of steep mountain slopes of basalt capped Moenkopi mudstones and gypsiferous shales. Navajo sandstone outcrops exist in areas near sand dunes. Kiabab limestone forms hills and canyons on the east side. The south part consists of basalt flows atop the mudstones of the Muddy Creek formation.

b. Soils

Soil Map Units , SSA 623,(SCS,1993)

01 Akinville-Mokaac association, 2 to 20 percent slopes, (fan terraces), gyp and limestone; Limey Upland (deep), 9" to 12" ppt

05 Arizo very gravelly sandy loam, 1 to 5 percent slopes, flooded, (floodplain, fan), granite and gneiss; Sandy Wash, 6" to 9" ppt

08 Barx fine sandy loam, 1 to 5 percent slopes, (fan terraces), mixed; Loamy Upland,9"to 13"

20 Dermala fam-Guy fam-Rock Outcrop complex, 10 to 40 percent slopes (mesa scarp) basalt; Basalt Slopes, 13" to 17"

21 Disterheff-Natank-Yumtheska complex, 2 to 15 percent slopes (hills) Virgin/lower red; Disterheff and Natank=Clay Loam Upland (Gravelly), 13" to 17"; Yumtheska=Limestone Slopes, 13' to 17"

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"

44 Meadview very gravelly sandy loam, 2 to 18 percent slopes, (fan terraces) LS, Moenkopi; Limey Upland (Deep), 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"

47 Mellenthin-Strych complex, 4 to 25 percent slopes, warm, (plateau, mesa) LS, mudstone; Mellenthin=Shallow Upland (calcareous), 9" to 13"; Strych=Loamy Upland (calcareous), 9" to 13"

50 Mellenthin-Tanbark complex, 5 to 50 percent slopes, warm (hill, mesa, LS, Moenkopi; Mellenthin=Shallow Upland (calcareous), 9" to 13"; Tanbark=Gypsum Hills (calcareous), 9" to 13"

51 Meriwhitica-Rock outcrop-Strych complex, 35 to 70 percent slopes, (cliffs, canyons) Callville & Redwall limestones; Meriwhitica=Breaks, 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"

53 Mespun complex, 2 to 10 percent slopes, (duney fan terrace), sandstone; Mespun=Sandy Upland, 9" to 13" ppt; Mespun,Loamy=Sandy Loam Upland, 9" to 13" ppt

59 Padilla silt loam, 1 to 5 percent slopes, (fan terrace), mixed sedimentary; Clay Loam Upland, 9" to 13" ppt

60 Pocum-Childers-Ubank complex, 1 to 10 percent slopes, (mesa), basalt; Shallow Upland (calcareous), 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

64 Riverwash-Torrifluvents complex, 1 to 3 percent slopes, (channel, floodplain), mixed; Torrifluvents=Sandy Wash, 9" to 12" ppt

65 Rizno-Bond_RO complex, 4 to 25 percent slopes, (plateau slopes), Navajo sandstone; Shallow Sandy Loam, 9" to 13" ppt

72 Springerville-Delenbaw complex, 3 to 25 percent slopes (mesa) basalt; Springerville and Delenbaw=Clay Loam Upland (gravelly) PJ-Woodland, 13" to 17"

73 Strych very gravelly loam, 2 to 10 percent slopes (fan) mixed; Loamy Upland, 9" to 13"

74 Tanbark fam-Strych fam-RO complex, 10 to 40 percent slopes (mesa) Moenkopi, basalt; Tanbark and Strych= Basalt Slopes (calcareous), 9" to 13"

76 Tassi-Risno complex, 5 to 35 percent slopes, (benches), limestone, sandstone; Tassi=Shallow Upland (calcareous), 9" to 13" ppt

77 Tonopah gravelly loamy fine sand, 1 to 10 percent slopes, (fan terraces), mixed alluvium; Limey Upland (Deep), 6" to 9" ppt

78 Torriorthents-Calciorthids-RO complex, 10 to 40 percent slopes, (mesa scarps), Littlefield formation mudstones and basalt talus; Torriorthents=Basalt Slopes, 6" to 9" ppt; Calciorthids=Limey Upland, 6" to 9" ppt

80 Tsezhin fam-Ashfork fam-RO complex, 10 to 70 percent slopes (mesa) basalt/Moenkopi; Tsezhin and Ashfork=Basalt Slopes, 13" to 17"

86 Winkel-RO complex, 2 to 35 percent slopes, (plateaus, mesas), LS alluvium over basalt; Limey Upland, 6" to 9" ppt

87 Winkel_RO complex, 2 to 35 percent slopes, moist, (summits, shoulders), basalt; Shallow Upland, 9" to 12" ppt

89 Winkel very gravelly loam, 2 to 25 percent slopes, moist, (plateaus, mesas), mixed alluvium; Shallow Upland, 9" to 12" 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"

97 Yurm family-Meadview association, 15 to 40 percent slopes, moist,(fan terraces, mesas), LS; Yurm family=Shallow Upland, 9" to 12" ppt; Meadview=Sandy Loam (Gravelly), 9" to 12" ppt

11. Cultural Resources

The following Class 3 cultural resource inventories have been completed on this allotment:
BLM-010-1970-37
BLM-010-1976-6, 17, 18, 49
BLM-010-1978-28, 29
BLM-010-1979-14
BLM-010-1980-54
BLM-010-1981-45, 46, 50, 56
BLM-010-1982-142, 143
BLM-010-1984-3, 20, 88
BLM-010-1985-100
BLM-010-1986-53
BLM-010-1990-19, 27, 60
BLM-010-1991, 46
BLM-010-1995, 32
BLM-010-1996-13, 15 37
BLM-010-1999-34, 53
BLM-010-2001-54

A collapsed rock cabin is present near the Cane Springs riparian area. A pre-historic village is present near Mud Springs. The scientific significance of this village is currently being lost, as the village is located on the edge of an eroding wash and many of the structures are collapsing into the wash.

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

1. Issues relating to Rangeland Health and Guidelines for Grazing Administration

a. Concern over the fact that feral pigs are present in the allotment at Mud, Sand, and Cane Springs.

The livestock grazing permittee has reported feral hogs or pigs at a couple of spring sites. There is no known information on how many pigs may be in this allotment, how they got there, how long they have been present, and if they are found there yearlong. The Arizona Game and Fish Department does not regulate the hunting of feral pigs and pigs have been harvested (unknown number) at

V. Conclusions

A. Pertaining to Objectives

1. Land Use Plan Objectives

Grand Canyon – Parashant National Monument Resource Management Plan[4]

Water

DFC-RP-06
All surface water will meet, or be improving towards, Arizona State water quality standards.

DFC-WS-03
Surface water availability at seeps and springs will be appropriate for the soil type, climate, and landform.

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

These objectives are being met. Cane Springs is the largest riparian area and it has water available at the surface at several locations. Pocum Wash is more of an intermittent type area and surface moisture is present in several spots from Mud Mountain upstream into Pocum Cove during spring runoff and in above average precipitation years. However, productive and diverse riparian-wetland plant communities of native plant species exist at both sites. (See sections III.F.3., IV.B.8, V.B.5 & 6., V.C. Standard 2. Riparian-Wetland sites). Flooding resulting from the 2007 wildfire might have temporally impacted some seeps and springs in upper Pocum Cove by scouring or sedimentation. A riparian inventory is needed to assess any damage.

Watershed/Soil Stability

DFC-VM-04
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.

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

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

DFC-WS-08
Physical soil crusts will show an increase in organic cover including cryptobiotic colonies, moving them towards being organic crusts.

These objectives are being met over most of the allotment, but are at risk due to vegetative changes caused by recurring fires.. However, due to extensive wildfires, (60's, 1986, 1996, 1999, 2001, 2002, 2005, and 2007) native vegetation has been replaced with non-native annual vegetation, such as cheatgrass. However, most of these areas are showing recovery based on studies at key areas with 85% of the DPC objectives being met. Further, ground cover improved at all 6 key areas indicating that litter and vegetation is present to protect the soils from wind and water erosion. (See sections IV.B.4.&5., V.B.5. and V.C.1.a.). The exception is where the 2007 fire burned off vegetation in the highlands of Pocum Cove. Fire rehabilitation money was unavailable to seed these areas to desirable grasses and native species are not moving in enough to protect the soils. Subsequent rains have caused severe sheet and gully erosion in some areas and flooding in Pocum Wash. Artemisia tridentata burned off the slump-block meadows below the cove rim, and cheatgrass and locust are moving into the sites. Sheet and rill erosion are occurring on some of these meadows due to a lack of vegetative cover, which was burned off by the 2007 wildfire.

Ecological Processes

DFC-VM-05
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-RP-02
Riparian areas 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 Arizona Standards for Rangeland Health, NPS Vital Signs, and enhance Monument objects and values.

DFC-RP-03
Ecological functions and processes will be intact with vegetative species composition and cover appropriate to the site.

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.

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 or are making significant progress toward functioning properly. Plant communities include native shrubs, perennial grasses, and annual forbs.

Invasive Plants

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

DFC-RP-11
Invasive plants and animals such as tamarisk, Russian olive, and brown-headed cowbird will be reduced or eliminated.

DFC-VM-38
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.

This objective is being met to the extent feasible. Noxious plants are monitored and treated as resources allow. To this date, no noxious weeds have been located on this allotment. In developing the DPC objectives, the focus will not be solely on removal of invasive species but rather on enhancing the current species that exist, which helps native species compete with invasive species. Cheatgrass is usually not a problem where native vegetation exists (except in pinyon-juniper areas), but becomes a problem when the native vegetation is burned due to wildfires. Invasive plants issues will continue to be addressed as technology and funding allows. In an allotment several miles to the southwest a research project is ongoing that is testing ways to control red brome.

Fuel Loads

DFC-VM-07/DFC-FM-06
Each vegetation community is maintained within its natural range of variation in plant composition, structure, and function, and fuel loads are maintained below levels that are considered to be hazardous.

This objective is being met. DPC objectives for the allotment have been set within the site potential as described in the ecological site guides provided by NRCS. There are no fuels reduction projects planned for this allotment. However, if the technology and funding become available, ways to reduce the amount of red brome and/or cheatgrass and reduce the fuel loads below levels that are considered hazardous may be addressed.

No Net Loss

DFC-VM-15
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
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.

DFC-VM-42
There will be no net loss of acres of Interior Chaparral 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.

This objective is being met. Effects to native plant communities are evaluated in all project-level NEPA analyses and mitigated to the extent feasible.

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.

DFC-GM-04.
Monument values will be maintained, protected, and improved.

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 protect monument values. DPC objectives have been developed to maintain and/or improve ecological condition. These actions will ensure rangeland resources including monument values (i.e. 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
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
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 (see Map 2.3).

DFC-VM-16
Treatment objectives in sagebrush communities will focus on restoring natural disturbance processes, such as by using fire, increasing vegetative ground cover of native grasses and forbs, and removing invasive non-native plants.

DFC-VM-18
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
Sagebrush communities will include small, grassy openings to support long-billed curlews and burrowing owls.

DFC-VM-20
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
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
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
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
Fragmentation of sagebrush habitat will be less than 50% of the treatment area.

DFC-VM-25
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-27
Treatment objectives in the pinyon-juniper vegetation communities will focus on restoring the natural disturbance regime; increasing vegetative ground cover of native grasses, forbs, and shrubs; and removing non-native invasive species.

DFC-VM-28
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
Individual old growth trees will be present and will be protected during treatment implementation.

DFC-VM-34
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
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-VM-39
The Interior Chaparral Ecological Zone will consist of diverse populations of endemic vegetative species, particularly shrubs, and a mosaic of age class distributions of these species (see Map 2.3, Ecological Zone in the Grand Canyon-Parashant National Monument Resource Management Plan, 2008).

DFC-VM-40
Endemic plant species and associated communities such as manzanita, silk tassel, and live oak will be present, along with other shrubs, grasses, and forbs.

DFC-RP-01
Riparian areas, including Monument objects, will consist of a diversity of vertical and horizontal structures, vegetative age classes, and endemic species.

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 allotment supports a diversity of wildlife (including avian species, reptiles, and large and small mammals), provides forage for livestock, provides recreation opportunities, and provides functional watersheds. The DPC objectives that have been developed for this allotment consider these public values. Communities of healthy diverse habitat including

vertical and horizontal structures, vegetative age classes, and endemic species are present throughout the allotment.

Riparian

DFC-RP-04
Where sites have the potential for over-story vegetation, the canopy cover of over-story and under-story vegetation will be at or approaching maximum density.

DFC-RP-05
All riparian areas will be in, or moving towards, proper functioning condition.

DFC-RP-07
Flowing water systems will provide contiguous water and associated riparian vegetative cover, where possible.

DFC-RP-08
Availability of surface water at seeps and springs will be appropriate for the soil type, climate, and landform and will support a diverse population of endemic plant and wildlife species.

DFC-RP-10
Riparian communities will provide habitat for common species such as rush, cottonwood, willow, and yellow-breasted chat, as well as rare species such as southwestern willow (SW) flycatcher, common black hawk, Lucy's warbler, and speckled dace where consistent with site potential.

DFC-WS-05
Flowing water systems will provide continuous flowing water and associated riparian vegetative cover, where possible.

DFC-TE-15
Essential habitats, important migration routes, required flows, and water quality will be protected and maintained in lentic and lotic systems in the Monument.

DFC-TE-24
Riparian areas will be in proper functioning condition and be of sufficient quantity and quality to provide adequate foraging areas for bald eagles, peregrine falcon, common black hawk, and other special status raptors.

DFC-TE-31
Riparian areas will be in proper functioning condition and be of sufficient quantity and quality to provide adequate foraging areas for SW flycatcher, Yuma clapper rail, yellow-billed cuckoo, and other special status birds.

DFC-TE-33
Riparian areas that can physically support SW flycatcher habitats due to floodplain width and gradient will attain the vegetation structure, plant species diversity, density, and canopy cover to be suitable habitat.

DFC-TE-34
Riparian vegetation will be sufficiently dense and structurally complex to minimize or eliminate the effects of SW flycatcher predators and preclude brown-headed cowbirds from finding SW flycatcher nests.

DFC-TE-35
Cottonwood gallery forests will be abundant and provide habitat for yellow-billed cuckoos.

DFC-TE-36
Potential roosting and nesting sites for riparian dependent special status birds will be abundant.

These objectives are being met, and the wildlife suited to the area is present. Cane Springs the largest has water available at the surface at several locations with associated riparian species. Pocum Wash is more of an ephemeral type area. However, productive and diverse riparian-wetland plant communities of native plant species exist at both sites and are being maintained and considered to be functioning. (See sections III.F.3., IV.B.8, V.B.5 & 6., V.C. Standard 2. Riparian-Wetland sites)

Wildlife Habitat

DFC-VM-35
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-VM-41
Endemic animal species such as black-chinned sparrow and mule deer 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 partially being met. Part of this allotment was affected by a 2005 wildfire. The BLM has taken steps to restore the habitat by fencing the burned areas and re-seeding. DPC objectives consider the needs of endemic

wildlife species and their habitat. Objectives for this allotment have been developed that incorporate wildlife needs.

Habitat Connectivity

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

DFC-TE-14
Habitat connectivity will be maintained, providing sufficiently frequent contact between tortoises to maintain genetic diversity.

These objectives are being met through continued wildlife population and habitat monitoring. The BLM is a cooperating agency with the on-going range wide population density monitoring that estimates the status of this species. Habitat connectivity for the desert tortoise and all wildlife species are taken into consideration for all project level planning, including travel management.

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-TE-10
There will be no net loss in the quality or quantity of desert tortoise habitat within Wildlife Habitat Areas (WHAs).

DFC-TE-13
Desert tortoise habitat will provide sufficient forage and cover attributes to support thriving populations of the species.

These objectives are partially being met. Most of the crucial winter habitat for mule deer in this allotment is at late seral to PNC and reflects the associated plant community. The U.S. Department of Agriculture's Rocky Mountain Research Station, in cooperation with the BLM, is conducting research to reduce the loss of native vegetation to catastrophic fire, and improve ecological functions and processes within the Grand Canyon – Parashant National Monument by systematically removing invasive plant species, especially the brome grasses that have impacted desert tortoise habitat. Treatment will begin after the research has identified the best methodology.

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.

Progress toward meeting these objectives is occurring and is ongoing. Water lots across the Arizona Strip District (including this allotment) will be prioritized for inspection and modification (to make them deer passable) as needed. Additionally, a mule deer management plan is being jointly developed by the BLM and AGFD. This plan will outline strategies to alleviate fence issues.

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-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 is being jointly developed between the BLM and AGFD. This plan will outline objectives to better manage this species. Wildlife population and habitat monitoring will continue. Impacts to wildlife (including mule deer, migratory birds, and carnivores) and their sustainability needs are taken into consideration and analyzed during all project-level planning.

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-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.

These objectives are being met. Sustainability needs such as forage, cover, shelter, and nesting sites, for both mule deer and migratory birds have been taken into consideration when developing DPC objectives for this allotment. A mule deer management plan, which will outline objectives to better manage this species, is being 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-43
Water sources within game bird habitats will be safely accessible by all wildlife.

DFC-RP-09
A sufficient quantity of water with safe access for wildlife will be available, where appropriate.

These objectives are all being met. Wildlife and livestock water catchments are inspected and repaired/maintained as funding allows; those found to be hazardous to wildlife are modified. A mule deer management plan, which will outline objectives to better manage this species, is being jointly developed by the BLM and AGFD.

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 raptors and riparian-dependent special status bird species have also been taken into consideration when developing the DPC objectives for this allotment.

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.

DFC-TE-28
Peregrine falcon, ferruginous hawks, common black hawks, northern goshawks, and burrowing owls will be sufficiently abundant so that there will be no need to list these species.

These objectives are 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, including peregrine falcon, ferruginous hawks, and burrowing owls have also been taken into consideration when developing the DPC objectives for this allotment. Common black hawks and northern goshawks are not known from this allotment.

No Net Loss of Threatened and Endangered Species Habitat

DFC-TE-04& 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.

DFC-TE-29
No net loss will occur in the quality and quantity of suitable habitat for riparian-dependent special status bird species 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.

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.

This objective is being met. The BLM works cooperatively with the U.S. Fish and Wildlife Service, 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.

Healthy Desert Tortoise Populations

DFC-TE-11
Desert tortoise populations within the DWMAs will be healthy and self-sustaining. Populations will be stable or increasing. Population declines will be halted.

DFC-TE-12
Desert tortoise populations outside of the wildlife habitat areas (WHAs) will be healthy and stable. Impacts to the population of the WHA will be minimized to the extent possible through mitigation.

These objectives is only partially being met because the Mojave population of the desert tortoise continues to decline range wide. The BLM currently avoids, minimizes, and mitigates any impacts to the Mojave population of the desert tortoise and designated critical habitat through terms and conditions and conservation measures pursuant to section 7 of the ESA. Additionally, the BLM is a cooperating agency in the on-going range wide population density monitoring that estimates the status of this species as well as in the implementation of the current Recovery Plan (1994), as a signatory, and the draft revised Recovery Plan (2008). The population density monitoring indicates that the Mojave population of the desert tortoise continues to decline. While current research can predict how the tortoise populations should be affected by threats, the revised draft Recovery Plan outlines how to quantify the magnitude of these threats and, once understood, implement recovery actions to avoid, minimize, and mitigate the quantified threats to the population in order to recover the species and remove them from the Federal threatened list under the ESA.

Aquatic Habitat

DFC-TE-17
All biologically suitable perennial waters on public lands in the Monument will be occupied by thriving, self-sustaining populations of native, endemic amphibians and aquatic invertebrate species, as appropriate.

DFC-TE-18
New introduced (or re-introduced) populations of relict leopard frog will increase to the point of being viable and self-sustaining.

These objectives are being met. Native and endemic amphibians and aquatic invertebrate species are taken into consideration during all project-level planning for these species.
A candidate conservation agreement is in place for the relict leopard frog. The BLM is working cooperatively with the FWS, AGFD, Utah Division of Wildlife Resources, Nevada Department of Wildlife and the National Park Service to re-introduce the relict leopard frog throughout its historic range and prevent the listing under the ESA.

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 taken into consideration for all project-level planning.

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 objectives are being met because a wide variety of recreation experiences available to local community members within the SRMA 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.

Wilderness management objectives are being met. Wilderness resources are taken into consideration for all project-level planning.

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 this allotment are being met. Visual resources are taken into consideration for all project-level planning.

2. Specific Resource Objectives from Activity Plans

Black Rock Habitat Management Plan (HMP)

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

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

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

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

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

These objectives are being met. Factors suppressing mule deer population recovery have been identified and include limited summer range, lack of precipitation, high predation, and unrealistic estimates of the carrying capacity of the area for deer. While fawn survival has approached or exceeded 50 fawns per 100 does in unit 13B, typical fawn to doe ratios are closer to 35. This unit is considered to a low productivity area for mule deer, primarily due to dry conditions and encroachment by pinyon and juniper communities. It is doubtful that the area could ever support 2,200 mule deer without long term intensive and costly manipulation of the habitat.

MD2a1 *Identify and manage for key forage and cover species in mule deer habitat, particularly crucial summer range, based on DPC and establish key areas by 2000.*

This objective is being met. With all monitoring data at or above DPC objectives for mule deer, and with mule deer populations slowly increasing, habitat condition (rangeland health) does not appear to be a limiting factor for mule deer at this time.

Allotment Management Objectives

"The main goal of the AMP was to improve vegetative cover and diversity on the Mud & Cane Allotment. This includes decreased soil erosion and water runoff by increasing watershed cover, improving livestock forage, wildlife habitat conditions and the riparian zone along Pocum Wash."

These goals are being attained based on specific data from the key areas.

Specific Vegetation Objectives from allotment management plan:

Key Area No. 1, located in the Ide Valley Pasture.
The Ecological Site is Basalt Slopes 13"-17" pz.

- *Increase Purshia mexicana from 1% to 3% frequency.*
  Met, based on the 2008 studies data. *Purshia mexicana* frequency is at 3% and the Key area seems to be stable. Composition studies substantiate this.

- *Increase Bouteloua gracilis from 1.5% to 5% frequency.*
  Not met, frequency is at 0% based on the 2008 studies data. *Bouteloua gracilis* is present in the plant community, but at a very low frequencies, which the ecological site guide substantiates. *Bouteloua gracilis* was present in studies data through 1997; however, since 1998 at the Mustang rain gauge #21, summer precipitation has been below average 8 out of 9 years, and that one year was just barely above average. Lower summer precipitation for that extended period has had an impact on the warm season grass component.

- *Increase Elymus elymoides from 1% to 5% frequency.*
  Not met, *Elymus elymoides* is at 0%. *Elymus elymoides* is very responsive to precipitation; therefore, with the annual average precipitation since 2005 below 71%, at the Mustang precipitation gauge, it is not surprising to have it show up as 0% in the data. Similar precipitation results were noted for the Mud Mountain and the Olaf Knoll rain gauges.

- *Increase Live Vegetation (Basal Cover) from 2% to 4%.*
  Met, basal cover is at 6%.

Summary for key area #1: This site was a pinyon-juniper site chained in 1963 that is gradually returning to native vegetation. It appears that half of the objectives are being met. Other indicators suggest that the plant community is in balance with climatic fluctuations and current use is not inhibiting objective attainment. (See pace frequency trend analysis Table #4 [section IV., B., 4.], and ecological status Table #5 [section IV., B., 5.].

Ground cover did increase from 20% to 60%. An improvement in the Ecological Status section also is noted from 60 to 67%.

Forage and non-forage plants frequency fluctuated overtime indicating the precipitation is a major influence. The allowable utilization limit was exceeded 7 times during the 80's, but only one time during the 90's. However, since implementation started (1992), utilization levels have not been exceeded.

Soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 2, located in the Black Canyon Pasture.
The Ecological Site is Limy Upland 10"-13" pz.

- *Increase Ephedra Nevadensis from 4% to 5% frequency.*
  Not met. In 2002, *Ephedra Nevadensis* frequency was at 4%, however in the summer of 2005 the key area was burnt over by a wildfire, which reduced the *Ephedra Nevadensis* frequency to 3% in 2008.

  Note: the ecological site guide does not mention this plant specifically for this site, thus it is not considered a major component of this community. Any occurrence of this plant would most likely be very low.

- *Increase Elymus elymoides from 0% to 5% frequency.*
  Not met, *Elymus elymoides* is at 0%. *Elymus elymoides* is very responsive to precipitation; therefore, with the annual average precipitation since 2005 below 71%, at the Mustang precipitation gauge, it is not surprising to have it show up as 0% in the data. Similar precipitation results were noted for the Mud Mountain and the Olaf Knoll rain gauges.

  Note: The ecological site guide does not mention this plant specifically for this site, thus it is not considered a major component of this community. Any occurrence of this plant would most likely be minimal.

- *Increase Live Vegetation (Basal Cover) from 3% to 5%.*
  Not Met. Objective was met in 2002, basal cover was at 5%, however, a wildfire burnt over this key area in 2005 reducing the vegetative component.

Summary for key area #2: Again, it appears that most objectives were not being met; however, both key species are not listed in the ecological site guide, as such, are not considered major components of this plant community. Yet it was believed during the development of the AMP (1989) that they had the potential to be part of this plant community, therefore they were selected as key species. In addition, it has been determined that detecting such a small change in frequency is not possible, because the study plot size is inadequate for the variables being measured[5].

[5] Measuring changes in frequency from 4% to 5% for the Mormon Tea, or from 3% to 5% for the Basal Cover, at the 95% confidence interval means that there real frequency could actually be anywhere between 2-9%. So to detect a change the frequency would have to be above 10%.

This Key Area was burnt over during the summer of 2005. Plants that did not come back or were slow to comeback after the fire were plants like *Gutierrezia sarothrae, Coleogyne ramosissima, Cylindropuntia, Acamptopappus*, and *Thamnosma montana*, though not to diminish their importance in the plant community none are considered forage plants and some are considered invaders. Other plants remained static or increased from the base year of 1982 through the 2005 wildfire, such as *Ephedra Nevadensis, Prunus fasciculata, Sporobolus spp., Dasyochloa pulchella*, and *Achnatherum hymenoides*, all are considered desirable forage plants. Other indicators suggest that the plant community is in balance with climatic fluctuations and current use is not inhibiting objective attainment. (See pace frequency trend analysis Table #4 [section IV., B., 4.], and ecological status Table #5 [section IV., B., 5.].

From the base year of 1982, percent ground cover increased from 34-85% due to the increase in litter.

The allowable utilization limit was exceeded 3 times during the 80's, and 3 times during the 90's, however since implementation started (1992) utilization levels have not been exceeded. The area received two growing season rests from livestock grazing since the 2005 wildfires.

Soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the increased cover of litter etc., there is adequate ground cover to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal. Further, the annual/perennial forage vegetation is improving since the wildfire.

Key Area No. 3, located in the Hobble Canyon Pasture.
The Ecological Site is Basalt Slopes (Cal) 10-14" pz.

- *Increase Ephedra Nevadensis from 0% to 5% frequency.*
  Objective not met; however, frequency is at 4%, which is a change from the 1% recorded in 2002. However, at the 95% confidence interval its real frequency could actually be anywhere between 1-7%.

- *Increase Purshia mexicana from 1% to 5% frequency.*
  Objective not met; however, frequency is at 4%, which is a change from the 2% recorded in 2002. However, at the 95% confidence interval its real frequency could actually be anywhere between 1-7%.

- *Increase Live Vegetation (Basal Cover) from 1% to 3%.*
  Met, basal cover is at 8%.

Summary for key area #3: There was also a wildfire on this site sometime in the recent past. Again, see previous summary statements concerning variables being measured. Other indicators suggest that the plant community is in balance with

climatic fluctuations and current use is not inhibiting objective attainment. (See pace frequency trend analysis Table #4 [section IV., B., 4.], and ecological status Table #5 [section IV., B., 5.].

From the base year of 1982, percent ground cover has improved from 45% to 82%. A similar improvement in the Ecological Status section is noted, where the similarity index changed from 49% in 1988 to 60% in 2002 and to 98% (PNC) in 2008, with the changes mostly attributed to the increase in composition by weight of *Coleogyne ramosissima*. *Coleogyne ramosissima* is the main component of the plant community, which according to the ecological site guide could make up to 80% of the composition by weight of the community.

The forage and non-forage plants have responded similarly overtime indicating the precipitation is a major influence. The allowable utilization limit was exceeded 4 times during the 80's, and 1 time during the 90's, however since implementation started (1992) utilization levels were exceeded only one time (1993), and has not been exceeded since.

Soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 4, located in the North Mud Mountain Pasture.
The Ecological Site is Shallow Upland (Cal) 10-14" pz. Data collected in 1990 was used for this analysis, as the area burned in 1995, and again in 2002.

- *Maintain Purshia mexicana at 5% frequency.*
  Not Met. This objective was exceeded by 1990, but since then there has been three wildfires (1996, 2002, & 2005), which remove *Purshia mexicana* from the community.

- *Increase Ephedra Nevadensis from 1% to 5% frequency.*
  Not Met. See note above concerning wildfires.

- *Increase Elymus elymoides from 3% to 5% frequency.*
  Met, *Elymus elymoides* is at 5% frequency.

- *Increase Pleuraphis jamesii from 1% to 5% frequency.*
  Met, *Pleuraphis jamesii* is at 20% frequency.

- *Increase Live Vegetation (Basal Cover) from 0% to 2%.*
  Met, basal cover is at 5%.

Summary for key area #4: This site has possibly burned several times by wildfires. The area more recently burned in 1996, 2002 and 2005. Because of wildfires, the area continues to be set back to the very early stages of plant community succession slowing down objective attainment. As a result, only 3 out of 5 objectives were being met. However, even with the wildfires it is interesting to note that forage plants particularly grasses showed a slight improvement while non-forage plants showed a decrease. (See pace frequency trend analysis Table #4 [section IV., B., 4.], and ecological status Table #5 [section IV., B., 5.].

From the base year of 1982, ground cover changed from 37-67%.

The forage and non-forage plants responded similarly overtime up until the wildfires occurred indicating the precipitation is a major influence. The allowable utilization limit was exceeded 3 times during the 80's, and 0 times during the 90's, however since implementation started (1992) utilization levels have not been exceeded. This portion of the pasture has not been utilized by livestock since 2005.

Soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 5, located in the Mud Mountain South Pasture.
The Ecological Site is Shallow Upland (Cal) 10-14" pz.

- *Increase Ephedra Nevadensis from 0% to 5% frequency.*
  Not met. This area has had many wildfires with the latest being 2005.

- *Increase Achnatherum hymenoides from 0% to 5% frequency.*
  Not met, frequency is at 1%.

- *Increase Sporobolus spp. from 0% to 5% frequency.*
  Met, *Sporobolus spp.* is at 23%

- *Increase Live Vegetation (Basal Cover) from 0% to 2%.*
  Met, basal cover is at 4%.

Summary for key area #5: This site has burned several times by wildfires. Parts of the area burned in 1986 and again in 2005. Because of wildfires, the area was set back to the very early stages of plant succession. However, the area is gradually returning to native vegetation and the trend has improved at a steadily since 1982. At this point, the plant community succession is at early seral status. Again, see statement above concerning variables being measured. However, even with the wildfires it is interesting to note that forage plants particularly grasses showed a slight improvement while non-forage plants showed a decrease. Other

indicators suggest that the plant community is in balance with climatic fluctuations and current use is not inhibiting objective attainment. (See pace frequency trend analysis Table #4 [section IV., B., 4.], and ecological status Table #5 [section IV., B., 5.].

From the base year of 1982, percent ground cover changed from 28-70%. A similar improvement in the Ecological Status section is noted, where the similarity index changed from 16 to 20%.

The forage and non-forage plants have responded similarly overtime up until the 2005 wildfire indicating the precipitation is a major influence. The allowable utilization limit was exceeded 2 times during the 80's, and 1 time during the 90's, however since implementation started (1992) utilization levels were exceeded only one time (1996), and has not been exceeded since. This pasture has not been utilized by livestock since 2005.

Soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 6, located in the Hobble Hills Pasture.
The Ecological Site is Shallow Loamy 10-14" pz.

- *Increase Pascopyrum smithii from 13% to 15% frequency.*
  This objective has not been met, frequency is at 0

- *Increase Elymus elymoides from 2% to 5% frequency.*
  Objective not met, frequency is at 2%

- *Increase Live Vegetation (Basal Cover) from 2% to 4%.*
  Not met basal cover is at 1%.

Summary for key area #6:

Key area # 6 was read during 2003, after an additional year of drought, as opposed to the other key areas that were read in 2002. Summary of study data indicate that the key area was greatly affected by drought and recent fires, as a result, the trend for this key area is downward (compare 2003 study data with other years).

As mentioned this site has been burned by several wildfires, starting at least in the 60's and was reseeded in the past. Parts of the area burned again in 1996, 1999, 2001, and 2005. Because of wildfires, the area was set back to the very early stages of succession resulting in lack of objective attainment, however, between 2003 and 2008 the seral stage has improved from Early to Mid. The area is

gradually returning to native vegetation. Other indicators suggest that the plant community is in balance with climatic fluctuations and current use is not inhibiting objective attainment. (See pace frequency trend analysis Table #4 [section IV., B., 4.], and ecological status Table #5 [section IV., B., 5.].

From the base year of 1982, percent ground cover changed from 61-83% from the increase in litter.

The forage and non-forage plants have fluctuated similarly overtime indicating the precipitation is a major influence. The allowable utilization limit was exceeded 1 time during the 80's, and 3 times during the 90's, however since implementation started (1992) allowable utilization levels were exceeded only one time (1996), and has not been exceeded since. This pasture has not been utilized by livestock since 2005.

Soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Summary all key areas: Since objectives were written in 1989 a greater understanding of ecological process and a better understanding of the site potential has been made. As a result, it was determined that many original objectives were unobtainable, and measuring attainment of some objectives was not possible due to the study plot size being inadequate for the variables being measured.

Even though the data pertaining to the AMP objectives is somewhat inconclusive, frequency of 16 key forage species remained static, three improved, and only one decreased. Considering the frequency of fire and including the 2005 wildfire, trend of the key forage species remaining static is noteworthy.

Precipitation or climatic influences maybe the overriding factors influencing vegetation changes at the present grazing level. According to Hendrickson et al. "Rangeland ecosystems are event-driven, and water events are typically considered most important." Cook et al[6] (2005) stated that plant cover was closely related to weather cycles, and that basal area of perennial grasses decreased by as much as 65 percent during dry years. Herbel et al[7] (1996) indicated that droughts can change species composition, vegetation cover, and

[6] Cook, C. Wayne, and Sims, Phillip L., Drought And Its Relationship To Dynamics Of Primary Productivity And Production Of Grazing Animals, http://www.fao.org/wairdocs/ilri/x5543b/x5543b0l.htm or http://www.cnr.colostate.edu/frws/research/cook/CookDrought/drought.htm. 2005.

[6] Herbel, Charlton H. and Gibbens, Robert P., Post-Drought Vegetation Dynamics on Arid Rangelands of Southern New Mexico. Department of Animal and Range Sciences, New Mexico State University, Agricultural Experiment Station. Bulletin 776, June 1996.

herbage production, and can drastically reduce range condition regardless of past grazing history.

Soils at all key areas exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

The original AMP vegetation frequency objectives just reviewed have been replaced by the Desired Plant Community Objectives of species composition. These DPC objectives will be incorporated into the existing AMP for current and future management evaluations through 2025.

New AMP Desired Plant Community Objectives

Key Area No. 1, located in the Ide Valley Pasture.

- Maintain *Achnatherum hymenoides* composition by dry weight of 0 to 5%.
  Met. Currently it is at 0%

- Maintain *Elymus elymoides* composition by dry weight of 0 to 5%.
  Met. Currently it is at 0%.

- Maintain *Purshia mexicana* composition by dry weight of 1 to 3%.
  Met. Currently it is at 2%.

- Maintain the forb composition by dry weight of 1 to 10%.
  Met. Currently it is at 15%.

- Maintain Live Perennial Vegetation (Basal Cover) of 3% to 5%.
  Met. Currently it is at 6%.

Key Area No. 2, located in the Black Canyon Pasture.

- Maintain PPGG (other perennial grasses) composition by dry weight of 1 to 5% *Elymus elymoides, Aristida*, and *Sporobolus spp.*
  Met. Currently it is at 5%.

- Maintain *Achnatherum hymenoides* composition by dry weight of 1 to 3%.
  Met. Currently it is at 3%.

- Maintain *Dasyochloa pulchella* composition by dry weight of 1 to 5%.
  Met. Currently it is at 5%.

- Maintain *Ephedra Nevadensis* composition by dry weight of 1 to 5% or above
  Met. Currently, it is at 13%.

- Maintain forb composition by dry weight of 1 to 10% or above
  Met. Currently it is at 55%.

- Increase Live Perennial Vegetation (Basal Cover) to 3 to 5%.
  Not met. Currently, it is at 0%.

The DPC objective for basal cover was not met due to the recent wildfires that reduced the density of plants in the key area. As the area recovers and plant density increases then this objective is believed to be attainable.

Key Area No. 3, located in the Hobble Canyon Pasture.

- Increase *Elymus elymoides* composition by dry weight to 1 to 3%.
  Not met. Currently, it is at 0%.

- Maintain *Ephedra Nevadensis* composition by dry weight of 2 to 7%
  Met. Currently it is at 3%.

- Maintain *Purshia mexicana* composition by dry weight of 1 to 5%.
  Met. Currently it is at 6%.

- Maintain the forb composition by dry weight of 1 to 10%.
  Met. Currently it is at 4%.

- Increase Live Perennial Vegetation (Basal Cover) from 3 to 5%.
  Met. Currently it is at 8%.

The DPC objective for *Elymus elymoides* was not met due to the below average annual precipitation since 2005. With adequate seasonal precipitation this plant species should respond. However, blackbrush has increase in dominance since it was reduce by past wildfires. Blackbrush CBW changed from 41% CBW in 1988 to 75% in 2008. This changed is also reflected in the seral stage change from mid seral in 1988 to PNC in 2008. As a result fewer grasses would be maintained in the plant community based on the ecological site guide for the area.

Key Area No. 4, located in the North Mud Mountain Pasture.

- Maintain *Elymus elymoides* composition by dry weight of 1 to 3%.
  Met. Currently it is at 3%.

- Maintain *Sporobolus spp.* composition by dry weight of 1 to 2%.
  Met. Currently it is at 2%.

- Maintain *Pleuraphis jamesii* composition by dry weight of 5 to 15%.
  Met. Currently it is at 12%.

- Maintain *Purshia mexicana* composition by dry weight of 1 to 3%.
  Met. Currently it is at 1%.

- Maintain the forb composition by dry weight of 1 to 5%.
  Met. Currently it is at 57%.

- Maintain Live Perennial Vegetation (Basal Cover) of 3 to 5%.
  Met. Currently it is at 5%.

Key Area No. 5, located in the Mud Mountain South Pasture.

- Increasing *Elymus elymoides* composition by dry weight to 1 to 3%.
  Not met. Currently it is at 0%.

- Increasing *Sporobolus spp.* composition by dry weight to 1 to 2%.
  Met. Currently it is at 20%.

- Maintaining *Achnatherum hymenoides* composition by dry weight to 1 to 5%.
  Met. Currently it is at 1%.

- Increase *Ephedra Nevadensis* composition by dry weight to 1 to 3%.
  Not met. Currently it is at 0%.

- Maintain the forb composition by dry weight of 1 to 5%.
  Met. Currently it is at 59%.

- Increase Live Perennial Vegetation (Basal Cover) from 2 to 5%.
  Met. Currently it is at 4%.

The DPC objective for *Elymus elymoides* and *Ephedra Nevadensis* was not met due to the below average annual precipitation since 2005 and wildfires of 2005.

Key Area No. 6, located in the Hobble Hills Pasture.

- Maintain *Elymus elymoides* composition by dry weight of 1 to 5%.
  Not met. Currently it is at 0%.

- Maintain *Pascopyrum smithii* composition by dry weight of 0 to 5%.
  Met. Currently it is at 0%.

- Maintain *Sporobolus spp.* composition by dry weight of 1 to 5%.
  Met. Currently it is at 3%.

- Maintain the forb composition by dry weight of 1 to 5%.
  Met. Currently it is at 59%.

- Increase Live Perennial Vegetation (Basal Cover) from 2 to 5%.
  Not Met. Currently it is at 1%.

The DPC objective for basal cover was not met due to the recent wildfires that reduced the density of plants in the key area. As the area recovers and plant

density increase then this objective is believed to be attainable.

B. Response to Issues

1. Issues relating to Rangeland Health and Guidelines for Grazing Administration

a. Concern over the fact that feral pigs are present in the allotment at Mud, Sand, and Cane Springs.

In the 1993 Feral pig conference Synatzske noted that "Significant impacts have been documented on vegetation, vertebrate and invertebrate fauna, soil properties, and water quality thru . . . feral hog food habits, rooting/wallowing activities and behavioral patterns.

On the Mud and Cane allotment, feral pigs could be very damaging to native plants and animals. Feral pigs are competing for food with native wildlife such as deer, squirrels, and wild turkeys, they could prey on ground nesting birds and eggs, and they are recognized as a disease reservoir for brucellosis, pseudorabies, trichniosis, and both external and internal parasites. On the Mud and Cane allotment, feral pigs are rooting and destroying the underground structures of perennial plants. They could pose a health and safety concern for domestic animals and humans. As such, every effort should be made to find ways to remove feral pigs from this allotment and other allotments where they are found.

b. The recurrence of wildfire and resultant expansion of cheatgrass (Fire cycle - Cheatgrass).

Wetter winters and springs encourage annual grasses to flourish on this allotment. Fire has a negative effect on the native vegetation of this ecozone and results in a landscape more dominated by these aggressive annual species due to their competitiveness and phenological characteristics. Restoring the native Mojave vegetation may be impossible. To protect native Mojave vegetation wildfires need to be aggressively fought to minimize spread and reduce size of areas being burned. Livestock grazing is not the causal factor in any increase of the brome species, since the brome species have existed or become naturalized throughout the system for years. Brome species increase based on available moisture, its ability to out compete native annuals, and the reduced competition from native vegetation due to removal by fire.

c. Increase in woody species such as pinyon and juniper, resulting in reduced forage availability.

Encourage vegetative treatment projects in pinyon-juniper habitat to benefit livestock and mule deer forage using prescriptions developed in activity plans. Leave debris piles unburned for small mammals where practical. Leave as many snags as possible for raptor perches, cavity nesting birds, and bats.

d. The presents of Milkweed and Jimson weed, which could poison livestock.

Because these plant species are native to the area and are not listed on any lists as noxious there would not be any emphasis to eradicate them.

e. Concern as to whether there is erosion in Pocum wash area. Is it natural and/or OHV related?

The IAT and the RRT met at the Pocum Wash and, after lengthy discussion and looking at relevant data concerning the fact that most summers and dryer years there is no surface moisture evident, concluded the riparian area was in proper functioning condition. There was no evidence of erosion caused by OHVs. Except for some recent sheet and gully erosion due to major flooding from the highlands of Pocum Cove that burnt during 2007, Pocum Wash area has become more productive with a diverse riparian-wetland plant community of native plant species that are being maintained since pasture fences were installed. Therefore, the current management practices are maintaining and promoting sufficient vegetation to maintain wetland functions appropriate to climate and landform.

f. Concern as to what is the riparian condition associated with the springs?

Current management practices maintain and promote sufficient species composition and vegetative cover to maintain wetland functions appropriate to climate and landform. Cane Springs could provide recreational opportunities and could become a bird watching hotspot, and a site for public education.

g. Is the Desert Tortoise Critical Habitat being taken into account in this assessment?

The effects of all BLM authorized activities, including livestock grazing in the allotment, were analyzed in consultation with the USFWS and a Biological Opinion (B.O.) was issued on January 28, 1998. In the B.O., the FWS determined that the described livestock grazing for the Mud and Cane Allotment would not jeopardize the continued existence of the desert tortoise (Mojave population), nor would it adversely modify the designated critical habitat.

C. **SUMMARY** (Meeting Arizona Standards for Rangeland Health)

1. Standard 1. Upland Sites.

As discussed on pages 31 and 32 ground cover was measured at all 6 key areas. Ground cover improved at all 6 locations As such, soils are exhibiting infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover to prevent accelerated erosion key areas, and signs of accelerated erosion were minimal. The vegetative cover (basal) at the study sites are similar to or lower than what is suggested in the ecological site guides.

All key areas suffered from the drought as evidenced by analyses and supporting documentation referenced herein. This is evidenced where the trend from the base year to 2002 is also compared to data from the base year to data prior to 2005 (i.e., 1995 & 2003, depending on key area). Key Areas 2, 4, 5, & 6 were impacted by the 2005 fires, but all key areas are showing improving trend and the current ground cover data is similar to data from the base years. As such, all key areas are considered to be functioning properly and/or progressing towards meeting Standard 1.

2. Standard 2. Riparian-Wetland sites

Riparian Studies at Cane Springs indicate that the area is functioning properly. The Pocum Wash riparian area has made notable changes since a pasture fence was installed. At both sites, existing water facilities are located away from the riparian areas and are used in a way that does not conflict with riparian-wetland functions or ecological processes. Further, productive, and diverse riparian-wetland plant communities of native plant species exist at both sites. As such, the IAT determined based on supporting documentation and on site observation that riparian species were present, and re-sprouting was occurring, which is moving the community in the desired direction, and progressing towards meeting standard #2.

3. Standard 3. Desired Resource Conditions.

Twenty-seven of the 33 DPC objectives are being met as evidenced by analyses and supporting documentation referenced herein. The data shows that drought played a major role in vegetation changes, particularly between 1999 and 2004. In addition, the wildfires of 2005 removed existing vegetation and established a new vegetative baseline from which to begin monitoring the vegetative community recovery.

Six of the DPC objectives are not being met; however, five of those objectives were at key areas that burned during the 2005 wildfires. *Elymus elymoides* comprises three of these DPC objectives that were not meeting, however, it is believed that this species would respond to adequate precipitation coming during the right season; as such, attainment of these three DPC objectives is contingent on moisture availability.

Two other DPC objectives not meeting pertain to increasing basal cover and the remaining DPC objective is to increase *Ephedra nevadensis*. Achieving these three DPC objectives is contingent on moisture as well. Plant frequency varies in relation to precipitation and there are signs of plant recruitment which will have a major influence on basal cover (for more information on changes to plant frequency see Appendix D Pace Frequency Trend Analysis, Key Areas 2 and 6). It is believed that as the key areas recover from drought, additional plants would be added back to the community improving the chance of attaining the basal cover objectives. This is illustrated by grasses showing up in the studies data that were not recorded before. At Key Area #2 *Achnatherum hymenoides*, *Sporobolus spp.*, and *Dasyochloa pulchella* showed up in the 2008 data for the first time. Based on the 2008 data trend is up for *Pleuraphis jamesii* and *Aristida* at key area #4 which suggest more plants per unit area. At key area #5 the 2008 trend data shows *Sporobolus spp* and Dasyochloa pulchella trend is up, again suggesting greater numbers of plants per unit area. Similarly at key area #6 the 2008 trend is up for *Sporobolus spp.* and *Aristida,* again suggesting more plants per unit area. More plants per unit area should result in a greater chance of DPC objectives being met for basal cover.

Additional monitoring transects were established in 2007 and re-read again in 2008 on those areas that were burned during the 2005 wildfires. These plots show total perennial plant cover change from 11.34% to 10.05% (not significant) for the NW Plot; 9.64% to 19.63% for the Center Plot; and 5.09% to 10.79/% for the SE Plot. Analysis of the data collected is showing plant recruitment and recovery to vegetative cover after the 2005 wildfires.

As such, it is believed that the objectives not meeting standards can be achieved by 2025 under current management. In addition, relative to the criteria for meeting standards and indicators of rangeland health and based on plant species response to precipitation which is supported by documentation referenced herein, it is believed that key areas are progressing towards meeting standard #3. This determination is supported by the IAT based on supporting documentation and on site observation that native species are present and re-sprouting is occurring which is moving the community in the desired direction. Further, those areas burned recently are fenced, and are receiving rest from livestock grazing until plants are able to recover.

In conclusion, the amount and timing of precipitation has affected the frequency of plant species and other vegetation attributes. Monitoring data indicates that it was drought and wildfires rather than livestock grazing that were the causal factors influencing vegetation attributes. As such it is believed that current livestock grazing would not be a limiting factor in key areas achieving DPC objectives.

In the pre-AMP era (prior to 1992), utilization exceeded allowable 32 times, and during the post-AMP era to present (1992 to present), the allowable utilization levels were exceeded 4 times. In desert tortoise habitat (Key area # 2) pre-AMP allowable utilization (>50%) was exceeded 10 times; the post-AMP era allowable utilization (>45%) was not exceeded. As shown, post-AMP era utilization has been kept below allowable most of the time. By keeping the utilization levels below allowable, it is believed that native plants would be able to recover after events such as drought which appears to be what is happing on this allotment. After the 2005 wildfires, the permittee reduced the number of livestock by about 50%, and rested most pastures that had burned through the 2009 growing season which again is allowing native plants time to recover.

Nineteen of the 21 years of actual use data shows that the permittee used less than 75% of the use allowed (pages 27-28). Four of those years, the permittee used less than 61% of the Active Preference. Only during two years was 100% of active preference used. This reduction in use was a voluntary action on the permittee's part reflecting a desire to maintain and improve the vegetative resource.

As such, the IAT determined, based on supporting documentation and on site observation, that desired resource conditions are being met and further re-sprouting is occurring, which is moving the community in the desired direction and thus progressing towards meeting Standards 1, 2, and 3.

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 Mud and Cane allotment:

- ☐ 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. Renew the ten-year grazing permit on Mud and Cane allotment with current terms and conditions.

A. Establish and conduct species composition, vegetative cover, and utilization studies in the Cane Springs riparian area to ensure maintenance of a healthy riparian area by monitoring and adjusting management practices.

B. Ensure water continues to be available for wildlife, even if livestock are not present.

C. Continue full suppression of all fires in the Mohave Desert Ecological Zone and Mojave-Great Basin Transition Ecological Zone, to avoid a net loss in acres of Mohave and Transition plant communities.

D. Do a resource damage assessment of the springs, riparian areas, and the soils in upper Pocum Cove where the 2007 fire caused flooding and erosion.

E. Carry forward into the AMP the new key area DPC objectives established in this evaluation.

F. In areas that burn, allow a minimum of 2 years rest (growing season deferment) to allow recovery of the vegetation. Based on the "Tank Fire Emergency Stabilization Plan" "Generally success will be determined as having 40% or greater perennial plant frequency and/or a 15% or greater total perennial plant

cover, although these percentages may be modified based on the specific ecological site."

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
Manager
Grand Canyon-Parashant National Monument

10/5/09
Date

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

Team Membership

Interdisciplinary Assessment Team

Linda Price	Project Coordinator (BLM)
Karen Jensen	Wildlife Biologist, Team Lead (BLM)
Larry Gearhart	Wilderness/Recreation Specialist (BLM)
Diana Hawks	Recreation, Wilderness, Cultural Resources Team Lead (BLM)
Phil Seegmiller	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

<u>Commodity Interests</u>

Bill Gubler,
Grazing
Rancher, St. George, UT

Bill Howes
Off Road Vehicle Use
Wizards Motorcycle Club

Kent McComb,
Grazing
Retired, St. George, UT

<u>Non-Commodity Interests</u>

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

Spence Esplin,
Historical
Retired, St. George, UT

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

<u>Local Area Interests</u>

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

<u>Alternates</u>

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

Paul Weaver
Non-Commodity
St. George, UT

Appendix C:
PRECIPITATION DATA

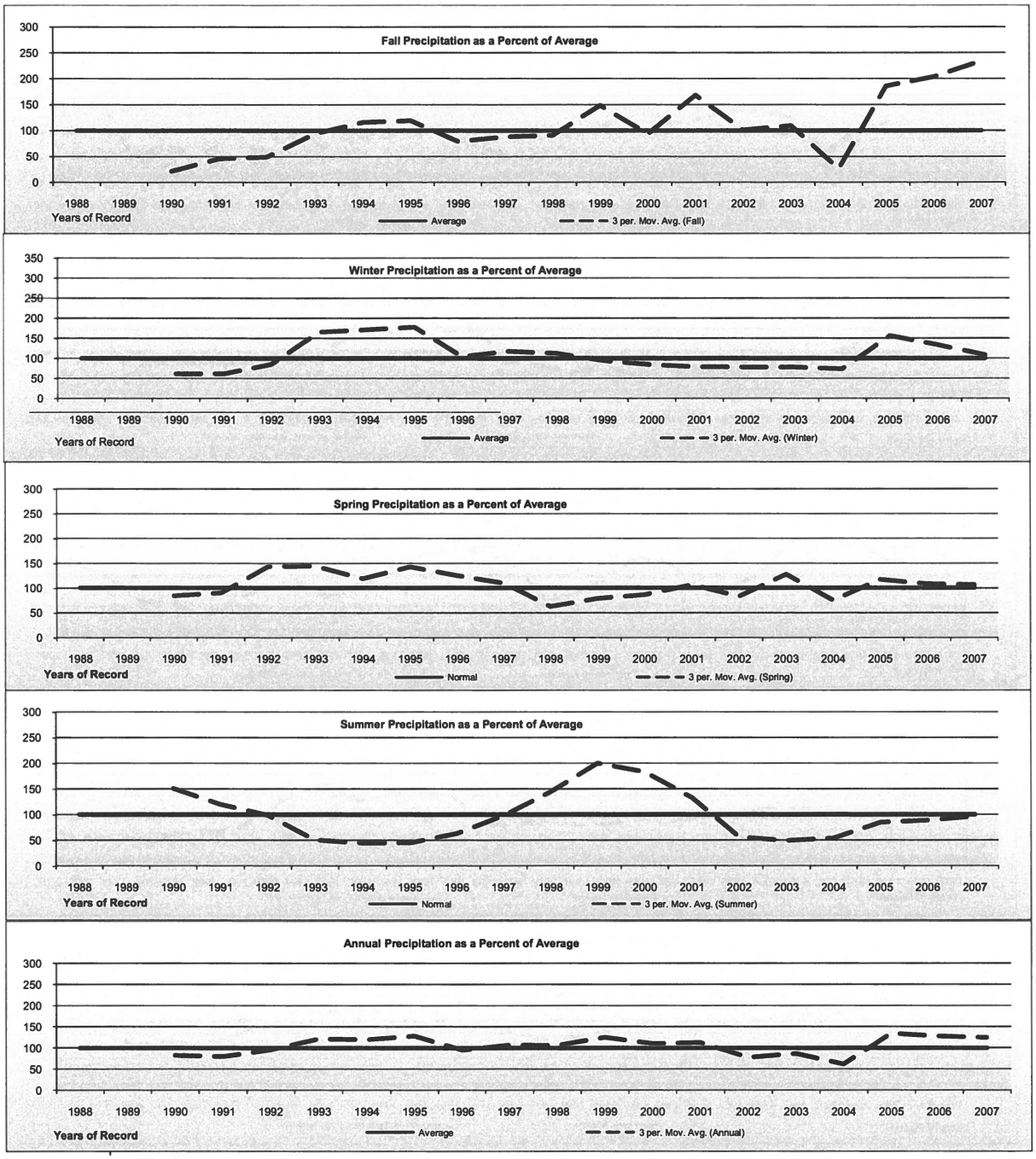
Cottonwood Wash Ex					PRECIPITATION RAIN GAUGE NUMBER:					04
Annual Average	1.84	4.67	1.99	3.50	11.99					
Year	Fall	Winter	Spring	Summer	Annual	Fall % Avg	Winter % Avg	Spring % Avg	Summer % Avg	Annual % Avg
1978	1.1	15.4	2.9	2.7	22.1	62	330	147	76	184
1979	3.9	5.1	4.0	2.3	15.3	211	110	201	64	127
1980	0.5	0.9	1.1	3.0	5.5	27	19	55	87	46
1981	1.6	2.0	3.0	2.9	9.5	87	43	151	83	79
1982	1.0	2.8	2.4	5.6	11.8	53	59	121	161	98
1983	4.0	5.8	2.9	4.2	16.7	215	123	144	119	139
1984	2.4	1.0	0.6	7.3	11.2	130	21	28	208	93
1985	1.9	6.5	0.8	2.2	11.3	105	139	38	61	94
1986	3.3	2.1	3.7	3.3	12.4	177	45	186	95	103
1987	1.2	4.4	1.8	3.2	10.6	65	94	91	91	88
1988	3.9	3.1	3.1	4.1	14.3	215	67	155	118	119
1989	0.6	4.1	0.6	3.5	8.9	33	89	32	101	74
1990	0.4	2.6	2.2	3.9	9.1	23	56	109	111	76
1991	1.3	3.4	1.9	4.6	11.2	72	72	96	132	93
1992	1.2	5.5	5.2	1.5	13.3	64	118	260	41	111
1993	3.2	12.3	1.9	1.2	18.6	174	263	95	35	155
1994	2.0	2.4	1.4	7.8	13.5	109	51	68	221	113
1995	1.5	9.5	1.5	2.5	15.0	84	203	76	71	125
1996	1.1	2.9	0.6	2.4	7.0	61	62	32	68	58
1997	2.3	4.9	1.2	5.5	13.8	122	104	58	157	115
1998	1.0	5.5	2.4	5.3	14.3	54	118	121	152	119
1999	2.8	1.5	2.3	4.0	10.5	152	31	113	114	88
2000		3.9	0.3	3.1	7.2		83	13	89	60
2001	3.5	8.5	4.1	5.5	21.5	188	181	206	157	179
2002	0.5	0.9	0.6	1.7	3.8	27	19	32	50	31
2003	1.1	3.4	2.5	1.0	8.0	62	72	126	29	67
2004	0.7	4.4	1.0	0.9	7.0	38	95	51	25	58
2005	6.5	12.3	2.8	2.8	24.3	354	262	139	79	202
2006	1.3	0.5	2.5	4.3	8.5	68	11	126	121	71
2007	1.3	1.0	0.4	2.9	5.5	68	21	19	82	46
2008		6.5	0.3		6.8		139	13		56

Cottonwood Wash Ex		Rain Gauge #	04
Percent of Average by Season.			
Fall	Winter	Spring	Summer
15%	39%	17%	29%

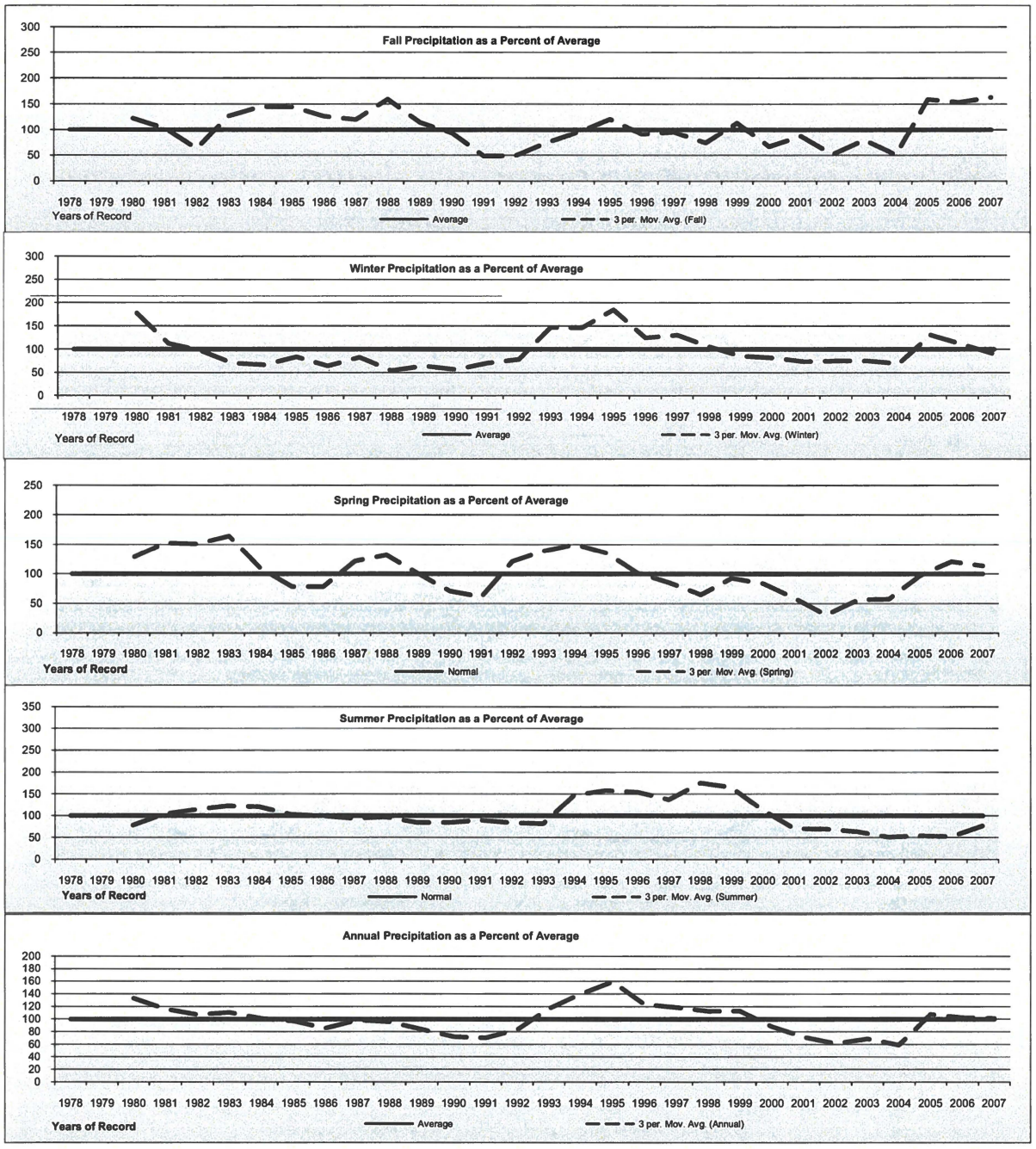
Cottonwood Overlook				PRECIPITATION RAIN GAUGE NUMBER:						03
Annual Average	2.29	6.00	2.71	3.99	14.99					
Year	Fall	Winter	Spring	Summer	Annual	Fall % Avg	Winter % Avg	Spring % Avg	Summer % Avg	Annual % Avg
1978	2.5	16.4	3.9	1.5	24.2	107	273	143	38	161
1979	4.5	7.8	5.2	3.6	21.0	197	130	191	89	140
1980	0.6	9.5	2.3	4.3	16.6	24	158	86	107	111
1981	1.8	2.9	5.5	3.5	13.7	77	48	204	88	91
1982	1.2	2.8	3.2	5.5	12.6	53	46	118	137	84
1983	5.1	7.4	4.2	5.0	21.7	224	123	154	125	145
1984	3.0	2.8	1.0	11.9	18.6	131	46	37	297	124
1985	2.4	8.0	0.6	3.0	13.9	103	134	22	74	93
1986	4.2	2.3	4.7	4.0	15.3	184	39	174	101	102
1987	2.1	4.8	2.8	4.1	13.7	93	79	101	102	91
1988	4.9	3.6	4.3	5.9	18.6	213	59	160	147	124
1989	0.9	5.4	0.9	2.3	9.4	39	89	32	58	63
1990	0.9	3.7	2.4	4.9	11.9	39	61	89	124	79
1991	2.2	4.4	2.9	2.7	12.1	94	73	106	68	81
1992	1.9	7.1	7.5	1.5	18.0	84	118	277	36	120
1993	3.0	13.5	2.5	1.1	20.1	131	225	92	28	134
1994	1.8	4.8	2.7	10.3	19.5	77	80	100	257	130
1995	2.6	15.9	4.0	3.8	26.3	113	265	148	94	175
1996	0.1	3.5	0.8	1.9	6.1	2	58	28	47	41
1997	2.8	4.6	1.2	6.0	14.5	120	77	42	150	97
1998	1.4	7.2	3.2	7.2	19.0	60	120	119	180	127
1999	3.2	1.7	2.4	2.5	9.8	140	28	88	63	65
2000	0.8	4.8	0.6	3.1	9.3	33	79	23	78	62
2001	3.5	8.1	1.5	5.1	18.1	151	134	55	129	121
2002	0.6	1.1	0.6	1.6	4.0	27	19	23	41	27
2003	2.0	4.4	3.1	1.8	11.2	87	73	115	44	75
2004	0.7	6.3	1.5	1.5	10.0	31	105	55	38	67
2005	7.8	13.8	3.0	3.8	28.3	339	229	111	94	188
2006	1.5	0.6	4.6	4.0	10.8	66	11	170	100	72
2007	1.3	1.0	0.4	2.6	5.3	55	17	14	66	35
2008	0.1	6.4	0.6		7.1	6	106	23		48

Cottonwood Overlook	Rain Gauge #	03	
Percent of Average by Season.			
Fall	Winter	Spring	Summer
15%	40%	18%	27%

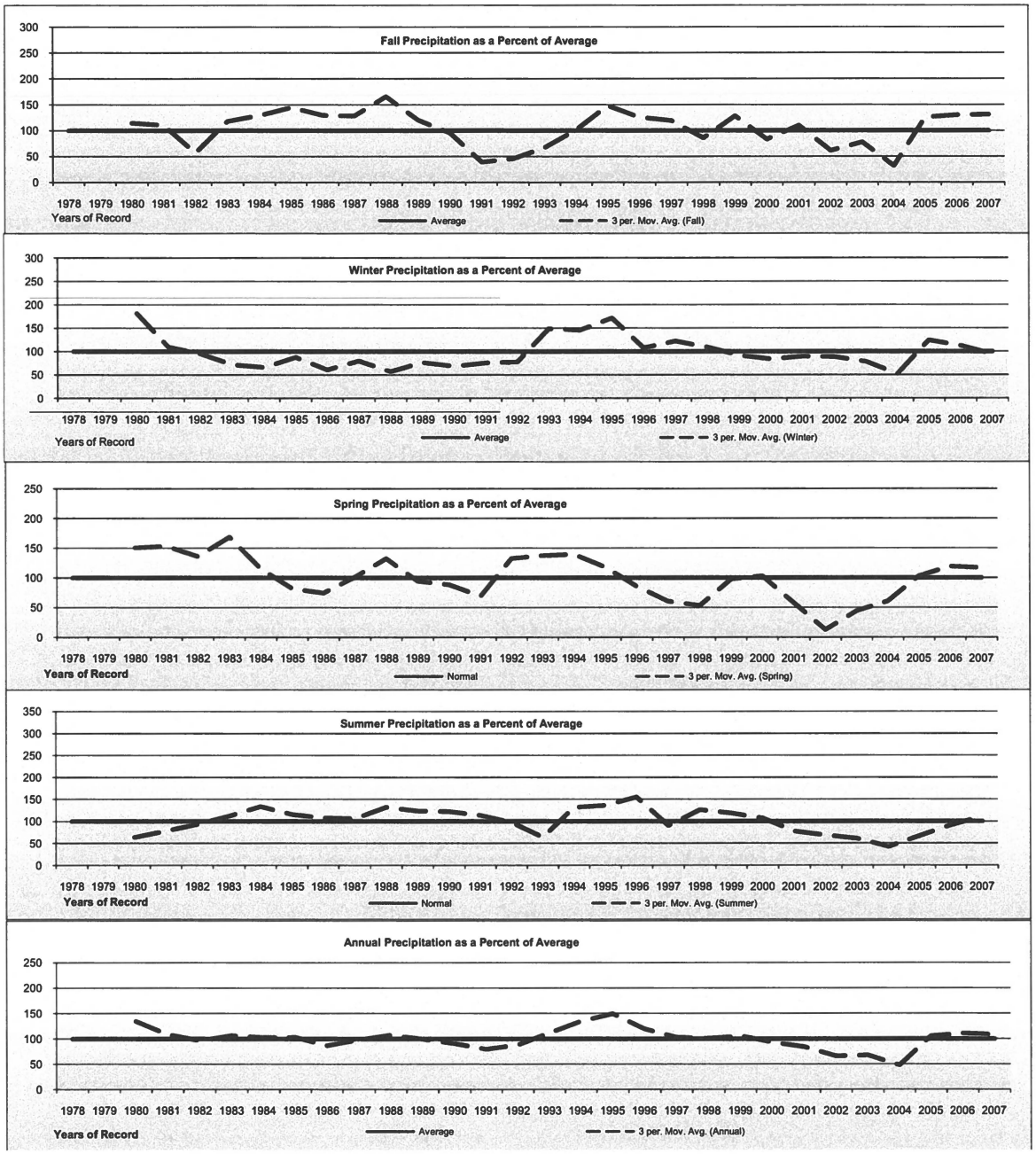
Olaf Knolls Precipitation rain gauge number 08



Mustang Precipitation rain gauge number 21



Mud Mountain Precipitation rain gauge number 06



Appendix D:

Pace Frequency Data

PACE FREQUENCY TREND ANALYSIS								
ALLOTMENT:	MUD & CANE							
PASTURE:	IDE VALLEY							
KEY AREA:	1							
COVER CATEGORIES	years plots were read							
	1982	1985	1988	1992	1997	2002	2008	Trend
Bare Ground	81	53	55	51	48	62	41	↑
Litter	17	39	33	41	40	35	43	↑
Rock	2	5	7	3	6	2	11	→
Vegetation (basal cover)	2	2	4	5	6	0	6	→
% Ground Cover	20	47	45	49	52	38	60	↑
FREQUENCY OF GRASSES								
Achnatherum hymenoides						1		→
Elymus elymoides	1	3	3	4	5	4		→
Seeded						0		
Bouteloua gracilis	2	1	1	2	3			→
Aristida	2	0	3	3	6			
Dasyochloa pulchella						0		
FREQUENCY OF FORBS								
(other annual forb) AAFF			4	4	3	4	2	
(other annual grass) AAGG						1		
Eriogonum							5	
Penstemon	32	28	16	14	12	1	5	
(other perennial forbs) PPFF						4	1	
Euphorbia							4	
FREQUENCY OF SHRUBS								
Purshia mexicana	1	0	1	2	2	0	3	→
Ceanothus greggii	3	0	2	3	2	6	3	
Gutierrezia sarothrae	41	45	37	37	35	28	4	
Chrysothamnus viscidiflorus							27	
Chrysothamnus	3	5	6	4	3	3		
Artemisia tridentata	2	6	4	5	5	21	37	
Eriogonum	17	24	38	40	34	44	10	
Haplopappus-Acamptopappus	2	6	5	8	7			
Juniperus osteosperma	2	1	2	2	1	4	5	
Pinus monophylla		0	0			1	1	
(other shrubs) SSSS							12	

PACE FREQUENCY TREND ANALYSIS								
ALLOTMENT:	MUD & CANE							
PASTURE:	BLACK CANYON							
KEY AREA:	2							
COVER CATEGORIES	years plots were read							
	1982	1986	1989	1992	1997	2002	2008	Trend
Bare Ground	67	37	41	36	36	36	15	↑
Litter	25	48	50	55	52	58	62	↑
Rock	6	14	7	6	9	2	23	↑
Vegetation (basal cover)	3	2	2	4	4	5		→
% Ground Cover	34	63	59	64	65	64	85	↑
FREQUENCY OF GRASSES								
Achnatherum hymenoides							2	→
Elymus elymoides		5	6	7	7	3		→
Sporobolus spp.							3	→
Aristida	1	2	2	6	7	2		
Dasyochloa pulchella							3	
FREQUENCY OF FORBS								
(other annual forb) AAFF					3	42	3	
(other annual grass) AAGG						95		
Eriogonum				2	3		25	
(other perennial forbs) PPFF		1					23	
Euphorbia							68	
Erodium cicutarium						66		
FREQUENCY OF SHRUBS								
Ephedra Nevadensis	4	6	8	10	12	4	3	→
Prunus fasciculata						1	3	
Gutierrezia sarothrae	7	21	20	20	19	33	2	
Coleogyne ramosissima	6	5	5	7	7	6		
Opuntia	3	8	9	15	14	7	1	
Lycium andersonii	4	2	2	3	4		1	
Haplopappus-Acamptopappus	7	8	9	10	8	4		
Juniperus osteosperma	1		0	1				
Rhus trilobata		1	1	1	1		1	
Thamnosma montana	24	26	30	36	30	51	1	
(other shrubs) SSSS		1	1	2	3			

PACE FREQUENCY TREND ANALYSIS								
ALLOTMENT:	MUD & CANE							
PASTURE:	HOBBLE CANYON							
KEY AREA:	3							
COVER CATEGORIES	years plots were read							
	1982	1985	1988	1992	1997	2002	2008	Trend
Bare Ground	55	54	55	42	40	58	18	↑
Litter	17	35	27	50	49	40	53	↑
Rock	27	8	14	4	7	0	22	→
Vegetation (basal cover)	0	3	3	4	5	1	8	↑
% Ground Cover	45	46	45	58	60	42	82	↑
FREQUENCY OF GRASSES								
Elymus elymoides		1	1	1	3			→
FREQUENCY OF FORBS								
Sphaeralcea				1	2			
(other annual forb) AAFF			10	0		56	9	
(other annual grass) AAGG						28	2	
Eriogonum							1	
Penstemon		0	1	1	1			
Euphorbia							1	
Erodium cicutarium						3		
FREQUENCY OF SHRUBS								
Ephedra Nevadensis		3	6	5	6	1	4	↑
Purshia mexicana	1	1	4	3	5	2	4	→
Gutierrezia sarothrae	35	60	71	64	67	31	6	
Chrysothamnus viscidiflorus							1	
Chrysothamnus		0	3	1	1		1	
Coleogyne ramosissima	39	25	34	26	30	49	70	
Opuntia						0		
Lycium andersonii							1	
Lycium	0	1	1	0	1		1	
Juniperus osteosperma	4	2	2	1	1	4	8	

PACE FREQUENCY TREND ANALYSIS					
ALLOTMENT:	MUD & CANE				
PASTURE:	MUD MT				
KEY AREA:	4				
COVER CATEGORIES	years plots were read				
	1982	1987	1990	2008	Trend
Bare Ground	64	55	60	33	↑
Litter	31	34	31	50	↑
Rock	6	7	6	11	↑
Vegetation (basal cover)		4	4	5	↑
% Ground Cover	37	45	40	67	↑
FREQUENCY OF GRASSES					
Elymus elymoides	3	19	4	5	→
Pleuraphis jamesii	1	5	2	20	↑
Sporobolus spp.				2	→
Aristida	4	7	4	12	
FREQUENCY OF FORBS					
Sphaeralcea	27	45	25	24	
(other annual forb) AAFF	2		1	5	
(other annual grass) AAGG				6	
Eriogonum				20	
(other perennial forbs) PPFF				0	
Euphorbia				58	
Erodium cicutarium			66		
FREQUENCY OF SHRUBS					
Ephedra Nevadensis	1	0	1		→
Purshia mexicana	5	9	11	1	→
Encelia				0	
Gutierrezia sarothrae	8	30	35	15	
Coleogyne ramosissima	1		1		
Artemisia tridentata	1		1		
Opuntia	6	14	10	3	
Yucca				0	
Juniperus osteosperma	9	4	4		

PACE FREQUENCY TREND ANALYSIS							
ALLOTMENT:	MUD & CANE						
PASTURE:	SOUTH MUD MT						
KEY AREA:	5						
COVER CATEGORIES	years plots were read						
	1982	1988	1992	1997	2002	2008	Trend
Bare Ground	72	50	35	40	26	30	↑
Litter	21	40	51	48	66	54	↑
Rock	6	9	11	9	4	12	↑
Vegetation (basal cover)	0	2	3	4	5	4	↑
% Ground Cover	28	50	65	60	74	70	↑
FREQUENCY OF GRASSES							
Achnatherum hymenoides	0	4	3	4	5	1	→
Elymus elymoides					1		→
Sporobolus spp.		7	8	8	4	23	↑
Aristida	38	47	39	43	20	0	
Dasyochloa pulchella	1	6	5	8	7	14	
FREQUENCY OF FORBS							
Salsola kali			5				
Sphaeralcea	34	31	25	22		36	
(other annual forb) AAFF	8	2	3	3			
(other annual grass) AAGG			2	4		11	
Eriogonum			2			16	
Euphorbia						2	
Aster		5	9	10			
FREQUENCY OF SHRUBS							
Ephedra Nevadensis	0	2	2	2			→
Encelia	2	2	4	6	6	5	
Prunus fasciculata					1		
Gutierrezia sarothrae	13	6	6	8	35	5	
Artemisia tridentata	0		1	2			
Opuntia		2	1	3			
Lycium andersonii	0						
Lycium		1	1	2			
Yucca	1	2	2			1	
Yucca brevifolia				2	2		
(other shrubs) SSSS		2	2	2			

PACE FREQUENCY TREND ANALYSIS						
ALLOTMENT:	MUD & CANE					
PASTURE:	HOBBLE HILLS					
KEY AREA:	6					
COVER CATEGORIES	years plots were read					
	1987	1989	1997	2003	2007	Trend
Bare Ground	40	42	43	24	17	↓
Litter	43	31	38	51	61	↑
Rock	16	22	14	23	20	→
Vegetation (basal cover)	2	4	5	2	1	→
% Ground Cover	61	58	57	76	83	↑
FREQUENCY OF GRASSES						
Elymus elymoides	3	2	3	1	2	→
Crested Wheatgrass	2	5	4			
Pascopyrum smithii	14					↓
Seeded		7	8		0	
Poa	4	1	2	2	3	
Sporobolus spp.		1	2		4	↑
Aristida		9	8	2	15	
Dasyochloa pulchella					0	
FREQUENCY OF FORBS						
Sphaeralcea	14	13	12	15	32	
(other annual forb) AAFF	4			36	40	
(other annual grass) AAGG				25	40	
(other perennial forbs) PPFF					17	
Euphorbia					13	
Aster			1			
Erodium cicutarium				19		
FREQUENCY OF SHRUBS						
Purshia mexicana				0		→
Prunus fasciculata				1	0	
Gutierrezia sarothrae	15	20	16	12	8	
Artemisia tridentata	2	2	3	3	1	
Opuntia	6	4	3	3	9	
Lycium	1	1	1			
Juniperus osteosperma	1	1	1			
(other shrubs) SSSS					0	

Appendix E:

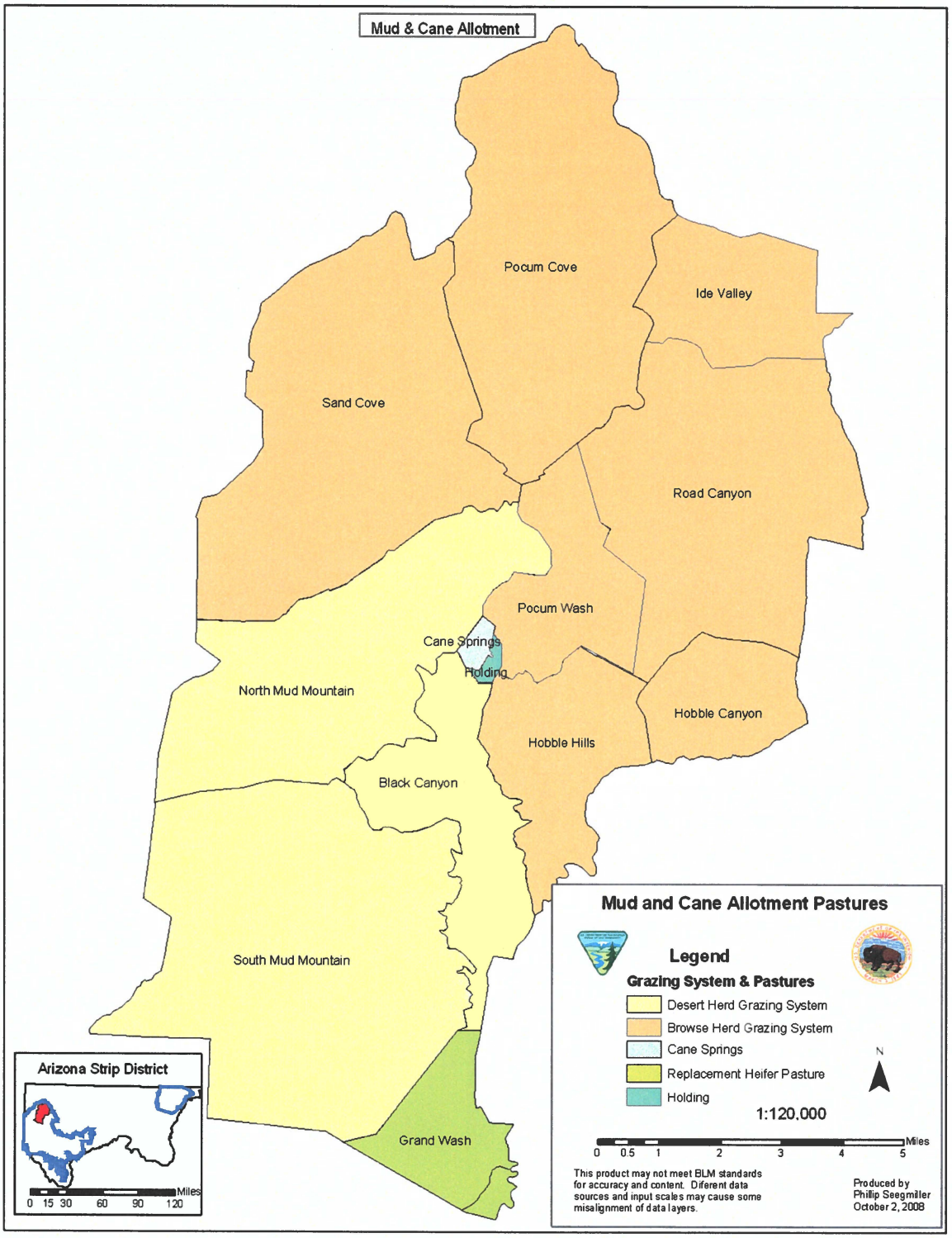
Ecological Site Data

Key Area #5	Allotment: Mud & Cane				
	Pasture: South Mud Mtn				
	Range Site: Shallow Upland (Cal) 10-14" pz				
Plant Species	Site-Guide Allowable Percent Composition	1988	2002	2008	Desired Percent Composition Objective
Grasses	15-25%	42%	17%	31%	
Achnatherum hymenoides	1-2%	1%	6%	1%	1-5%
Elymus elymoides	1-3%				1-3%
Sporobolus spp.	1-2%	11%		20%	1-2%
Aristida	Group PPGG	26%	11%		
Dasyochloa pulchella	Group PPGG	3%	1%	10%	
(other perennial grass) PPGG	1-2%				
Pleuraphis jamesii	5-10%				1-3%
Forbs	3-5%	56%	65%	59%	1-5%
Salsola kali	Group AAFF				
Sphaeralcea	1-3%	12%	2%	41%	
(other annual forb) AAFF	1-3%		24%		
(other annual grass) AAGG	2-5%	43%	38%		
Eriogonum	Group PPFF			8%	
Aster	Group PPFF	1%			
(other perennial forbs) PPFF	1-2%				
Baileya multiradiata				1%	
Bouteloua barbata				8%	
Euphorbia				1%	
Shrubs/Trees	70-80%/0-1%	2%	18%	10%	
Ephedra Nevadensis	Group SSSS				1-3%
Encelia	Group SSSS			4%	
Prunus fasciculata	Group SSSS		2%		
Gutierrezia sarothrae	1-2%		14%	3%	
Artemisia tridentata	0-3%				
Opuntia	1-2%				
Lycium	Group SSSS				
Yucca	2-5%	2%	2%	2%	
Yucca brevifolia	Group SSSS				
Cylindropuntia	Group Opuntia				
(other shrubs) SSSS	1-3%				
	Similarity	16%	20%	20%	
	Status	Early	Early	Early	

Key Area: #6	Allotment: Mud & Cane			
	Pasture: Hobble Hills			
	Range Site: Shallow Loamy 10-14 pz			
Plant Species	Site-Guide Allowable Percent Composition	2003	2007	Desired Percent Composition Objective
Grasses	60-75%		23%	
Elymus elymoides	5-10%		1%	1-5%
Agropyron cristatum	-			
Pascopyrum smithii	5-20%			0-5%
Seeded	-		1%	
Poa	5-10%		2%	
Aristida	1-5%		16%	
Pleuraphis jamesii	5-15%			
Achnatherum hymenoides	5-10%			
Sporobolus spp.	1-5%		3%	1-5%
Dasyochloa pulchella				
Forbs	1-5%	88%	59%	1-5%
Sphaeralcea	1-5%	6%	35%	
(other annual forb) AAFF	1-5%	71%	14%	
(other annual grass) AAGG	-	10%	10%	
Aster	1-5%			
Shrubs	10-40%	12%	18%	
Purshia mexicana	Group SSSS			
Prunus fasciculata	Group SSSS		1%	
Gutierrezia sarothrae	5-10%	6%	8%	
Artemisia tridentata	5-30%	2%	4%	
Opuntia	1-5%	4%	5%	
Lycium	Group SSSS			
Juniperus osteosperma	5-10%			
Ephedra Nevadensis	1-5%			
	Similarity	22%	38%	
	Status	Early	Mid	

Appendix F:

Allotment Map of Pastures


Mud & Cane Allotment
Pocum Cove
Ide Valley
Sand Cove
Road Canyon
Pocum Wash
Cane Springs
Holding
North Mud Mountain
Hobble Canyon
Hobble Hills
Black Canyon
South Mud Mountain
Grand Wash
Arizona Strip District
0 15 30 60 90 120
Miles
Mud and Cane Allotment Pastures
Legend
Grazing System & Pastures
Desert Herd Grazing System
Browse Herd Grazing System
Cane Springs
Replacement Heifer Pasture
Holding
1:120,000
N
0 0.5 1 2 3 4 5
Miles
This product may not meet BLM standards for accuracy and content. Diferent data sources and input scales may cause some misalignment of data layers.
Produced by
Philip Seegmiller
October 2, 2008

Appendix G:
Wildlife Data

Arizona Game & Fish 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