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

Cottonwood
Number 4809

I. Introduction

The Cottonwood 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 October 27, 2004, and a field visit on September 14, 2005. 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: 1,867 AUMs
Suspended Non-use: 472 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

155 Cow & Calves
1 Horse

D. Percent federal range[1]

100%

III. Allotment Profile

A. Description

The Cottonwood grazing allotment is located in northwest Arizona, within the Grand Canyon-Parashant National Monument, approximately 40 miles south

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

southwest of St. George, Utah. The western edge of Mud Mountain and Cottonwood Canyon are found within the allotment a long with a good variety and diversity of vegetation, ranging from mountain Pinyon-Juniper in the higher elevations to desert shrub and annual grasses in the lower elevations.

B. Acreage

The allotment contains:

- 33,129 acres of federal land
- 0 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 Wilderne
WS=Air, Water and Soils	TE=Special Status Species	VR=Visual Resources
VM=Vegetation	WC=Wilderness Characteristics	FM=Fire and Fuels
WF=Wildlife and Fisheries	RR=Recreation Resources	Management

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

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-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-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.

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

Wildlife Habitat

DFC-VM-35
Endemic animal species such as desert tortoise, chuckwalla, and desert bighorn sheep will be present and thriving with more than adequate food, water, and cover resources.

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

Habitat Connectivity

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

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

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.

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.

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

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

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

Condors

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

Healthy Desert tortoise Populations

DFC-TE-11
Desert tortoise populations within the Desert Wildlife Management Areas (DWMA)s 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.

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 Area (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

Desired Plant Community (DPC) Objectives

The 2008 Resource Management Plan (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 states, "Desired plant community 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, desired plant community 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 include species composition by weight (CBW), and percent basal vegetative cover.

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 Brumley pasture

- Increase perennial grasses composition by dry weight to 1-5%
  (Includes needlegrass, sand dropseed, Indian ricegrass, and bush muhly),
- Maintain Mormon tea composition by dry weight of 1-5%
- Maintain Forb composition by dry weight of 5-10%
- Maintain vegetative basal cover to 3-8%

Rational: The ecological site for this key area is a Sandy Loam (Gravelly) 9-12" precipitation zone (pz). Needlegrass, bush muhly, and Mormon tea are key species recognized to be important as livestock and wildlife forage, watershed, and cover, and are components of the ecological site. Indian ricegrass and sand dropseed are also recognized to be important for forage, watershed, and cover; though they are not listed in the site guide, they are present on the key area and

[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.

would be included in the category listed in the site guide as other perennial grasses (PPGG).

The site guide allows 1-5% composition by dry weight for PPGG (which for this key area includes needlegrass, sand dropseed, Indian ricegrass, and bush muhly), and 1-5% for Mormon tea.

The site guide indicates that this is mostly a shrub dominated community (70-82% CBW). 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 Mud Mountain pasture

- Increase Indian ricegrass composition by dry weight to 1-3%
- Increase Bottlebrush squirreltail composition by dry weight to 1-3%
- Increase Sand dropseed composition by dry weight to 1-3%
- Maintain Forb composition by dry weight of 3-5%
- Maintain vegetative basal cover to 3-8%

Rational: The ecological site for this key area is a Shallow Upland (Cal) 9-13" pz. Indian ricegrass, bottlebrush squirreltail, and sand dropseed 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 1-2% composition by dry weight for Indian ricegrass, 1-3% for Bottlebrush squirreltail, and 1-3% for Sand dropseed.

The site guide indicates that this key area is mostly a shrub dominated community (70-81% CBW). The IAT believes that the potential exists to achieve these DPC objectives under current management and normal precipitation years based on site observation and review of data. The DPC objectives would also promote attainment of the RMP DFCs.

Key Area No. 5 located in the Lower Cottonwood pasture

- Increase big galleta composition by dry weight to 1-5%
- Increase Perennial grasses composition by dry weight to 1-5%
  (Includes Sand dropseed, fluffgrass and needle and thread grass)
- Maintain Mormon tea composition by dry weight of 1-5%
- Maintain Forb composition by dry weight of 5-10%
- Maintain vegetative basal cover to 3-8%

Rational: The ecological site for this key area is a Sandy Loam (Gravelly) 9-12" pz. Big galleta, Sand dropseed, and Mormon tea 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 1-5% composition by dry weight for Big galleta, 1-5% for PPGG (which includes Sand dropseed), and 1-5% for Mormon tea.

The site guide indicates that this is mostly a shrub dominated community (70-82% CBW).

The IAT believes that the potential exists to achieve these DPC objectives under current management and normal precipitation years based on site observation and review of data. The DPC objectives would also promote attainment of the RMP 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:

Common Name	Scientific Name
Grasses	
Indian ricegrass	*Achnatherum hymenoides* (*Oryzopsis hymenoides*)
Bottlebrush squirreltail	*Elymus elymoides* *(Sitanion hystrix)*
Needlegrass	*Achnatherum* Species *(Stipa Species)*
Big galleta	*Pleuraphis* rigida *Hilaria rigida*
Sand dropseed	*Sporobolus spp.*
Black grama	*Bouteloua eriopoda*
Bush muhly	Muhlenbergia porter
Browse	
Mormon tea	*Ephedra nevadensis*

E. Grazing System

An Allotment Management Plan (AMP) was developed in 1981 which describes a three pasture deferred rotation system. Two pastures Cedar Cove and Mud would be rotated between January and August deferring use of the Jacobs pasture until September through November. By rotating Cedar Cove and Mud pastures January through April and May through August, each would get a growing season rest every other year while the Jacobs pasture would be rested every year and used September through November. The Cottonwood pasture would only be used in December which is the dormant season for plant growth.

F. Other uses

1. Special Status Species

Listed below are the federally threatened and endangered animal species that may occur within the Cottonwood allotment.

- The Mojave Desert Tortoise (*Gopherus agassizii*) (Threatened) [Desert Tortoise Critical Habitat, designated, 1994]
- 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 their range; are under status review by the U.S. Fish and Wildlife Service; 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 has 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 the Cottonwood Allotment.

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

Table #1			
Species	**Cottonwood**	**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
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.

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

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

2. Other Wildlife Species

The Cottonwood allotment is in the Arizona Game and Fish Department's (AGFD) Game Management Unit (GMU) 13B. Desert bighorn sheep (*Ovis canadensis nelson*) may be present in the far southwestern edge of the allotment. Mule deer (*Odocoileus hemionus*) may be present throughout the allotment.

Nongame wildlife found on the allotment is typical of the area, including a variety of vertebrates including desert cottontail rabbits; a variety of avian species; and herpetofauna. Mammalian predators include coyotes, bobcats, and mountain lions. The non-native and invasive European pig (*Sus scrofa*) is known from this allotment.

3. Recreation

General Management: The allotment is within the Parashant Special Recreation Management Area (SRMA) and the Shivwitz Frontier Recreation Management Zone (RMZ). The primary strategy for the Parashant SRMA is to target a demonstrated undeveloped recreation-tourism market demand from local community and regional/national visitors for trophy hunting opportunities, guided backcountry tours, hiking, viewing and appreciating wildland landscapes and cultural sites, canyoneering and motorized/mechanized/non-mechanized exploring. 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 recreation-tourism visitors value this area for the distinctive kinds of dispersed recreation it produces. The Shivwits Frontier RMZ is managed for sustainable access for scenic, natural, open-space appreciation, and exploration recreation adventure somewhat close to nearby communities.

Camping, sightseeing, ATV and automobile touring on designated routes are activities enjoyed mainly during the spring and fall on this allotment because of the extreme heat in the Mojave Desert.

Off-Highway Vehicle Management (OHV): The OHV designation within this allotment is Limited to Designated Roads and Trails.

Trails: No historic or scenic trails are in this allotment.

Visual Resource Management (VRM): The VRM class designations in this allotment are Class I within the Paiute Wilderness and II outside it.

Wild and Scenic Rivers: No suitable wild and scenic river segments occur within this allotment.

4. Wilderness

A very small portion of the Paiute Wilderness is within the northern portion of the Cottonwood Allotment. This wilderness area is wild and very remote. Many rugged canyons, scenic escarpments, miles of cliffs, and sandstone buttes mark the transition between the Colorado Plateau and Basin and Range provinces.

There are also areas within the allotment that are managed to maintain wilderness characteristics.

G. Issues brought out in scoping meeting.

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

a. Water may not continue to be available to Hardy Pond and Desert Pond for small game and deer.

b. There is no water on the South end of Mud Mountain for livestock or wildlife.

c. Wildlife does not have safe access to Jacob Well and Desert Pond.

d. There may not be surface water at Cottonwood Spring.

e. Springs may be dewatered, specifically at Cottonwood Spring.

f. There may be a fence line contrast on the south end of the allotment in Cottonwood Wash, which might be indicative of excessive livestock utilization in tortoise habitat.

g. Exotic species exist inside the Monument. Bermuda grass, an exotic species, is becoming established at Cottonwood Spring, and Texas sandbur is established at Jacob Well.

h.

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 Cottonwood 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 are based on all available monitoring, inventory, and assessment data.

B. Summary of Studies Data

1. Livestock Actual Use

Permitted use on the Cottonwood Allotment is 1,867 AUMs. Average use has been about 84% of this amount. Table 2 shows the number of livestock AUMS used from 1988 to 2008.

Table 2
Actual use on the Cottonwood Allotment.

Year	AUMS
1988	1,860
1989	1,860
1990	373
1991	373
1992	1,564
1993	1,639
1994	1,614
1995	1,772
1996	1,777
1997	1,733
1998	1,813
1999	1,867
2000	1,862
2001	1,892
2002	1,750
2003	1,494
2004	1,480
2005	1,480
2006	1,420
2007	1,720
2008	1,580

2. Precipitation

The Cottonwood Wash Exclosure rain gauge is located in T. 37 N., R. 15 W., in the NW1/4 of SW1/4 sec. 17, which is northwest of Brumley Well at the exclosure in the middle of the Cottonwood Allotment. Average seasonal precipitation at this site is 1.84 inches for fall, 4.67 inches for the winter, 1.99 inches for the spring, and 3.50 inches for the summer. The average total annual is 11.99 inches. The percent of average precipitation from 1978 to 2007 is listed by year in Table #3.

Table #3

Cottonwood Wash Ex Precipitation Rain Gauge Number: 04

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Fall % Avg	62	211	27	87	53	215	130	105	177	65	215	33	23	72	64
Winter % Avg	330	110	19	43	59	123	21	139	45	94	67	89	56	72	118
Spring % Avg	147	201	55	151	121	144	28	38	186	91	155	32	109	96	260
Summer % Avg	76	64	87	83	161	119	208	61	95	91	118	101	111	132	41
Annual % Avg	184	127	46	79	98	139	93	94	103	88	119	74	76	93	111

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Fall % Avg	174	109	84	61	122	54	152		188	27	62	38	354	68	68
Winter % Avg	263	51	203	62	104	118	31	83	181	19	72	95	262	11	21
Spring % Avg	95	68	76	32	58	121	113	13	206	32	126	51	139	126	19
Summer % Avg	35	221	71	68	157	152	114	89	157	50	29	25	79	121	82
Annual % Avg	155	113	125	58	115	119	88	60	179	31	67	58	202	71	46

The Cottonwood Overlook rain gauge is located in T. 38 N., R. 15 W., in the NW1/4 of SW1/4 sec. 10, which is on the northern boundary of the Cottonwood Allotment. Average seasonal precipitation at this site is 2.29 inches for the fall, 6.00 inches for the winter, 2.71 inches for the spring, and 3.99 inches for the summer. The average total annual is 14.99 inches. The percent of average precipitation from 1978 to 2007 is listed by year in Table #4.

Table #4															
Cottonwood Overlook Precipitation Rain Gauge Number: 03 Page 1															
Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Fall % Avg	107	197	24	77	53	224	131	103	184	93	213	39	39	94	84
Winter % Avg	273	130	158	48	46	123	46	134	39	79	59	89	61	73	118
Spring % Avg	143	191	86	204	118	154	37	22	174	101	160	32	89	106	277
Summer % Avg	38	89	107	88	137	125	297	74	101	102	147	58	124	68	36
Annual % Avg	161	140	111	91	84	145	124	93	102	91	124	63	79	81	120
Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Fall % Avg	131	77	113	2	120	60	140	33	151	27	87	31	339	66	55
Winter % Avg	225	80	265	58	77	120	28	79	134	19	73	105	229	11	17
Spring % Avg	92	100	148	28	42	119	88	23	55	23	115	55	111	170	14
Summer % Avg	28	257	94	47	150	180	63	78	129	41	44	38	94	100	66
Annual % Avg	134	130	175	41	97	127	65	62	121	27	75	67	188	72	35

4. 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. Table 5 below shows the utilization data from 1982-2006 that has been compiled for this evaluation. More detailed information is listed in Appendix D.

Table #5

Brumley Pasture					Key Area Number 1					
	1983	1984	1985	1986	1987	1988	1990	1994	2002	2006
Indian ricegrass	16	57	45	31	16	49	11	18		11
Needlegrass							11	18		2
Sand dropseed	12	51	32	22	30		10		50	26
Black grama			42		30	31	10	10		
Big galleta			38	22	30	47	18	21		0
Bush muhly			39	31	30	31	10			2
Winterfat							14		38	
Fourwing saltbush							14			
Mormon tea	44	43	28	27	24	34	14	9		13

Mud Mtn Pasture			Key Area Number 2		
	1982	1983	1985	1986	1988
Indian ricegrass	44	16	24	40	
Bottlebrush squirreltail			24	10	20
Sand dropseed	27	12	10		18
Black grama	40				
Mormon tea	36	44	10		

5. 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 2006) on the Cottonwood Allotment is in Table 6 below. While readings on individual plant species have fluctuated over the years in 1999 a severe drought that influenced all vegetation, causing a die-off of many plants including sagebrush and pinyon pine throughout the Monument resulted in some static to downward trends of key species on the Cottonwood Allotment. To illustrate the effects of drought a comparison of **less palatable** plant data collected prior to drought with data collected at the end of the drought showed these plants decreasing; i.e., threeawn (Key Area (KA) 1 from 14% to 0%, KA 2 from 63% to 7%, KA 5 from 6% to 1%), Broom snakeweed (KA 1 from 13% to 2%, KA 2 from 33% to 6%, KA 5 from 16% to 2%), creosote bush (KA 1 from 9% to 3) etc.

To further show the effects of drought, data collected just prior to the start of drought was compared back to the base year, which showed no down trends on any key species prior to drought; but comparing data from the start of drought to the end of the drought period showed that 31% of the key species had a down trend. Table #6 list changes in trends on key species and a comparison of the most recent data to the base year again shows that there were no down trends on any key species.

Basal cover, which is part of ground cover, improved on 2 key areas and remained static on 1. Litter, another attribute of ground cover, showed improvement on 2 key areas and went down on one. Table 6 also shows a comparison of data from inside and outside of an exclosure located on the Cottonwood Allotment. Trends of plants inside the exclosure were very similar to the trend on plants outside the exclosure, which suggests precipitation is the main force to plant changes. (For specific information, see pace frequency analysis tables in Appendix E).

Fire has also been an influence on the Cottonwood Allotment on key area #1 (prior to 1982), key area #2 (prior to 1982, 1995, and 2005), and key area #5 (1985 and 2005).

Table #6											
Changes to basal cover, litter and key plant species by key area from base year											
Key Species or Cover Category	Years plots were read										Key Species Trend
Key Area #1	1981		1985		1988		2001		2005		
Litter	29		34		29		38		19		↓
Vegetation (basal cover)	2		2		2		0		13		↑
% Ground Cover**	42		43		43		40		44		→
Indian ricegrass			1		1				0*		→
Needlegrass			0		3						→
Sand dropseed			4				0				→
Black grama	0										→
Bush muhly			4		4		0				→
Mormon tea	9		14		12		9		5		→
Key Area #2	1982		1985		1988		2005				Trend
Litter	37		55		43		87				↑
Vegetation (basal cover)	7		2		4		4				→
% Ground Cover**	59		71		67		96				↑
Indian ricegrass			1								→
Bottlebrush squirreltail	3		13		12						→
Sand dropseed	2				1						→
Green Mormon tea			0		1						→
Key Area #5	1990	1992	1993	1996	1998	1999	2001	2003	2004	2006	Trend
Litter	3	77	83	25	22	58	91	48	74	69	↑
Vegetation (basal cover)	0	7	4	3	6	6	1	3	1	5	↑
% Ground Cover**	6	86	88	29	28	64	93	52	76	74	↑
Big galleta					1		0	0		0	→
Sand dropseed	7	14	14	5	5	38	11			8	→
Mormon tea		0		0		1	1	0	0	1	→

Comparison of trend inside and outside exclosure						
Cottonwood Exclosure	Inside Exclosure			Outside Exclosure		
	1982	2005	Trend	1982	2005	Trend
Litter	34	70	↑	23	47	↑
Vegetation (basal cover)	1	5	↑		1	→
% Ground Cover**	35	74	↑	23	48	↑
Big galleta	36	35	→	6	6	→
Sand dropseed	7		↓	9		↓
Black grama	1		→	8		↓
Bush muhly	1		→	2		→
Fourwing saltbush	4	1	→	1	1	→
Mormon tea	8	17	↑	14	14	→
Desert almond	-	-	→	1		→
Broom snakeweed	19	5	↓	31	11	↓
Rabbitbrush	1		→			→
Anderson Wolfberry	5	6	→	6	6	→
Haplopappus_Goldenhead	1		→	1		→
Yucca	1	2	→	2	2	→
Burrobrush	1		→			→
Opuntia			→	1		→
Juniper			→	1		→
other-shrub (SSSS)			→		1	→
Globemallow		2	→		5	↑
other annual forbs (AAFF)		4	↑		6	↑

*0 indicates that the plant was present in the study plots, but only as a trace.
**% Ground Cover includes litter, rock, live vegetation (Basal Cover)

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 7 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 F for specific ecological site information and data from the Cottonwood exclosure.)

Table #7				
Plant Species	Site-Guide Allowable Percent Composition	Composition		Desired Percent Composition Objective
Key Area 1[a]		2001	2005	
other perennial grasses (Indian ricegrass, Needlegrass, Sand dropseed, & Bush muhly)	1-5%			1-5%
Mormon tea	1-5%	8%	10%	5-10%
Key Area 2[b]		1988	2005	
Indian ricegrass	1-2%			1-3%
Bottlebrush squirreltail	1-3%	2%		1-3%
Sand dropseed	1-2%			1-3%
Key Area 5[c]		1990	2006	
Big galleta	1-5%			1-5%
other perennial grasses (PPGG)	1-5%	8%	10%	1-5%
Mormon tea	1-5%		3%	1-5%

a. Area burned prior to 1982.
b. Area burned prior to 1982, again in 1995 and 2005.
c. Area burned (1995 and 2005).

6. Special Status Species

Desert Tortoise: The Mojave population of the desert tortoise was listed under the Federal ESA 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. Approximately 41 percent of the Cottonwood 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, approximately 41 percent of the Cottonwood allotment (13,569 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.

Large portions of the Gold Butte-Pakoon DWMA and CHU have burned in the last thirty years. Some areas have burned several times. Wildfires have significantly diminished the quality of desert tortoise habitat, destroy the natural Mojave vegetation and cause native vegetation to be replaced by less desirable non-native annual vegetation, such as cheatgrass. The invasion of cheatgrass leads to additional wildfires, further degrading the habitat and reducing its productivity.

Desert tortoise population surveys focusing on the status of the species within CHUs and DWMAs occurs annually. However, no surveys specific to this allotment have occurred. The desert tortoise is a wide ranging and sparsely dispersed species and status surveys limited to small areas generally yield little in terms of results. 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. During this time however, the study plot in the Gold Butte-Pakoon DWMA and CHU was surveyed only in 1991. Ten 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 the survey methodology to line-distance. This method is designed to monitor populations across the range of the species. Line-distance surveys began in spring 2001. In 2007, 37 transects from the Gold Butte-Pakoon DWMA and CHU were surveyed. Four live tortoises were recorded along with 10 carcasses. One live tortoise, not part of the surveys, was incidentally sited. The 2008 survey results from 40 line-distance transects within the Gold Butte-Pakoon DWMA and CHU, found no tortoises and 10 carcasses. One live tortoise, not as part of the surveys, was incidentally sited in this DWMA and CHU, 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 dropped 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 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 transmitter and numbered wing tags to allow observers to track their movements.

Condors range widely, easily covering over 100 miles in a day. 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 as the birds are especially vulnerable to lead poisoning.

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 Cottonwood allotment and canyons on the Monument are generally too open and hot to support Mexican spotted owls. An extremely small portion of this allotment, less than one percent, contains habitat designated as potential Mexican spotted owl habitat by the Spotskey-Willey habitat model.

Sensitive Species

Bald eagles and golden eagles may occur on this allotment. The bald eagle was delisted from the Federal ESA in June 2007. This species is not known to nest anywhere on the BLM's Arizona Strip District. The bald eagle is a seasonal (winter) migrant that forages in and around the Kaibab Plateau. Bald eagles are both scavengers and predators. Golden eagles feed mainly on small mammals like rabbits and ground squirrels, but may also take snakes, birds, and insects, even juvenile ungulates and carrion.

The American peregrine falcon was delisted from the Federal ESA in October 1999. There are monitoring requirements developed by the U.S. Fish and Wildlife Service to assess the status of the species regionally. Known nest sites are monitoring annually by BLM biologists on the Arizona Strip District. At least one known nest site is located within five miles of the allotment, yet suitable nesting habitat occurs here. No surveys occur to look for new nests on BLM lands. Falcons may fly over and forage on this allotment. Optimum peregrine falcon habitat is considered to be steep cliffs overlooking woodlands, riparian habitats or

other areas supporting abundant avian prey species. Peregrines return to breeding areas in Arizona from mid-February to mid-March. Egg laying occurs from mid-March through mid-May, and the young can fledge from May through August.

The ferruginous hawk is known from the BLM's Arizona Strip District, yet not from this allotment. However, suitable habitat exists. Suitable habitat also occurs on this allotment for Swainson's hawk, though no individuals have been sighted. Western burrowing owls are known from northern Arizona and suitable habitat occurs within this allotment, however, no specific data occurs regarding occupancy or use for foraging.

The spotted bat, western small-footed myotis, fringed myotis, big free-tailed bat, Townsend's big-eared bat, and California leaf-nosed bat are known from this allotment. All five species have been captured and recorded as part of a monitoring program. Although Townsend's big-eared bat is not listed as a species of concern by the BLM or AGFD, it is locally rare and closely monitored.

7. Wildlife Habitat

Habitat for mule deer on this allotment is categorized as yearlong throughout the allotment. Deer population data are not collected specifically for this allotment, but is collected for GMU 13B as a whole. Unit 13B is famous for producing large antlered "trophy" class mule deer bucks. Despite low deer densities throughout the GMU, good numbers of deer can typically be found in the higher elevations, generally over 4,000 feet. In the southern portion of the GMU, from approximately Hidden Canyon south, hunters can find deer in the Monument area of Mount Dellenbaugh and Snap point and all points in between. Other areas include Grassy Mountain, the Hidden Rim and Whitmore Point.

The mule deer population in GMU 13B, while remaining at a low density throughout the unit, appears to be showing signs of growth. See Appendix G for mule deer survey data from GMU 13B.

Suitable habitat for bighorn sheep abuts the southwestern edge of the allotment, and bighorn sheep may occasionally be found in this area.

8. Riparian/Fisheries Habitat – There is none in this allotment.

9. Wild Horse and Burro Habitat – There is none in this allotment.

10. Lithology and Soils

a. Lithology

The Cottonwood Allotment consists of slopes from one to forty percent. Soils are shallow and well drained. Landscapes are comprised of mesas, ridges, fan terraces, plateaus, duney fan terraces, cliffs and canyons.

b. Soils – Shivwits SSA 623

03 Arada family loamy fine sand, 1 to 10 percent slopes, (fan terrace dunes), sandstone; Coarse Sandy Loam (limey), 6" to 9" ppt

30 Gypill-Hobog complex, 6 to 35 percent slopes, (hills, ridges, mesas), gypsite, limestone; Gypill=Gypsum Hills, 6" to 9"; Hobog=Limey Upland, 6" to 9"

39 Hobog very gravelly sandy loam, 5 to 30 percent slopes, (plateau, mesa), limestone; Shallow Upland, 9" to 12"

44 Meadview very gravelly sandy loam, 2 to 18 percent slopes, (fan terraces) LS, Moenkopi; Limey Upland (Deep), 6" to 9"

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"

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

60 Pocum-Childers-Ubank complex, 1 to 10 percent slopes, (mesa), basalt; Shallow Upland (calcareous), 9" to 13" ppt

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

67 Ruesh very gravelly fine sandy loam, 3 to 20 percent slopes, (fan terrace), mixed sediment; Gypsum Fan, 6" to 9" 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"

78 Torriorthents-Calciorthids-RO complex, 10 to 40 percent slopes, (mesa scarps), Moenkopi and basalt; Torriorthents=Basalt Slopes, 6" to 9" ppt; Calciorthids=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

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

99 Yurm family very gravelly loam, 15 to 35 percent slopes, moist, (fan terraces), LS; Shallow Upland, 9" to 12" ppt

Field assessments found no large areas that failed to pass Standard 1, but there is some slight post-wildfire erosion in some spots.

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

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

a. Water may not continue to be available to Hardy Pond and Desert Pond for small game and deer.

Water for these sources comes from outside the Cottonwood Allotment boundary, and use of the water is based on old agreements between grazing permittees. Their concern is that these agreements need to be renewed with the present grazing permittees to insure that the water remains available on the Cottonwood Allotment, assuring availability for wildlife.

b. There is no water on the South end of Mud Mountain for livestock or wildlife.

There is no available water at the southern end of the Cottonwood allotment for livestock or wildlife. Therefore, there is poor livestock distribution in that portion of the allotment, and wildlife are unable to use that area.

c. Wildlife does not have safe access to Jacob Well and Desert Pond.

Reservoirs as currently fenced do not allow safe access for all wildlife, due mostly to height of corral fences.

d. There may not be surface water at Cottonwood Spring.

An inventory of springs on the district during 2006 indicated that there was water at the spring source.

e. Springs may be dewatered, specifically at Cottonwood Spring.

An inventory of springs on the district during 2006 indicated that there was water at the spring source.

f. There may be a fence line contrast on the south end of the allotment in Cottonwood Wash, which might be indicative of excessive livestock utilization in tortoise habitat.

This site, visited by the IAT during the field trip to the Cottonwood Allotment, is a boundary fence between the Cottonwood Allotment and the Pakoon Springs Allotment. The Pakoon Springs Allotment had not been used for several years and the Cottonwood Allotment is used in a rotation every year. During this visit, the IAT team could not detect a fence line contrast.

g. Exotic species exist inside the Monument. Bermuda grass, an exotic species, is becoming established at Cottonwood Spring, and puncturevine is established at Jacob Well.

Bermuda grass (*Cynodon dactylon*) is not listed in Arizona as a noxious weed, but is considered an exotic species in the Monument. Puncturevine[3] (*Tribulus terrestris*) a Arizona prohibited and regulated noxious weed, is growing around the corrals and inlets to the reservoirs at Jacob Well.

[3] Other synonyms or common names used include Mexican sandbur, Texas sandbur, bullhead, caltrop, and goathead

V. Conclusions

A. Pertaining to Objectives

1. Land Use Plan Objectives

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

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

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.

These objectives are being met over most of the allotment, but are at risk due to vegetative changes caused by recurring fires. Due to wildfires (prior 1982, 1985, 2005, and 2006) 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 64% of the DPC objectives being met. Further ground cover improved at 4 key areas, but remained static at one, 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.).

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

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-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-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. Noxious plants are monitored and treated to the extent feasible. 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. There are proposals to test methods to control some invasive species such as red brome. The DPC objectives focus on enhancing the current species present, which helps native species compete with invasive species.

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.

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.

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-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.

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-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.

This objective is 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 the Mojave desert tortoise. Habitat connectivity for the desert tortoise and all wildlife species are taken into consideration for all project level planning, including travel management.

Fences

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

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

These objectives are being met. A fence inventory that encompasses the entire Arizona Strip District (including this allotment) is near completion. Results will identify where fence modification is needed. Additionally, a mule deer management plan is being jointly developed by the BLM and AGFD. This plan will outline objectives to better manage this species.

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 partially 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. The mule deer population within GMU 13B is stable yet not near maximum sustainable levels. 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 in order to minimize impacts from proposed activities.

Wildlife Population Numbers

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

DFC-WF-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.

The BLM is progressing towards meeting these objectives. Wildlife and livestock water catchments are inspected and repaired/maintained as funding allows. Water sources found to be hazardous to wildlife are being modified in cooperation with AGFD and the grazing permitee as funding allows. 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, including the desert tortoise, 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-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.

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

These objectives is only partially being met. 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.

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 are 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.

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 for maintaining wilderness characteristics 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 are available local community members and regional visitors within the SRMA and RMZ in this allotment.

Designated Wilderness

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

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

The Paiute 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

Desired Plant Community (DPC) Objectives

Key Area No. 1

- *Increase other perennial grasses (PPGG) composition by dry weight to 1-5%* (PPGG includes Indian ricegrass, Needlegrass, Sand dropseed, and Bush muhly)
  Not met. PPGG was not present in any study plots in 2001 or 2005.

- *Maintain Mormon tea composition by dry weight of 5-10%*
  Met. Mormon tea is at 10%.

- *Maintain Forb composition by dry weight of 3-5%*
  Met. Forbs were above 11%.

- *Maintain vegetative basal cover to 3-8%*
  Met. Basal cover is at 13%.

The perennial grass DPC objective was not met due to drought; however, these grasses were part of the community prior to the drought and it is believed that with normal precipitation they would comeback allowing their achievement.

Key Area No. 2

- *Increase Indian ricegrass composition by dry weight to 1-3%*
  Not met. Indian ricegrass is at 0%.

- *Increase Bottlebrush squirreltail composition by dry weight to 1-3%*
  Not met. Bottlebrush squirreltail is at 0%.

- *Increase Sand dropseed composition by dry weight to 1-3%*
  Not met. Sand dropseed is at 0%.

- *Maintain Forb composition by dry weight of 3-5%*
  Met. Forbs were at 37%

- *Maintain vegetative basal cover to 3-8%*
  Met. Basal cover is at 4%.

The grass DPC objectives were not met due to drought; however, these grasses were part of the community prior to the drought and it is believed that with normal precipitation they would comeback allowing their achievement.

Key Area No. 5

- *Increase Big galleta composition by dry weight to 1-5%*
  Not met. Big galleta is at 0%.

- *Increase Perennial grasses (PPGG) composition by dry weight to 1-5%*
  (PPGG also includes Sand dropseed), (see site guide)
  Met. PPGG is at 10%.

- *Maintain Mormon tea composition by dry weight of 1-5%*
  Met. Mormon tea is at 3%.

- *Maintain Forb composition by dry weight of 5-10%*
  Met. Forb Composition is at 54%.

- *Maintain vegetative basal cover to 3-8%*
  Met. Basal cover is at 5%.

The big galleta grass DPC objective was not met due to drought; however, this grass was part of the community prior to the drought and it is believed that with normal precipitation it would comeback allowing its achievement.

B. Response to Issues

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

a. Water may not continue to be available to Hardy Pond and Desert Pond for small game and deer.

BLM would assist in facilitating renewing agreement between permittees to assure that water would remain in the same areas and available to wildlife to use.

b. There is no water on the South end of Mud Mountain for livestock or wildlife.

Permittee, Game and Fish Department, and BLM would develop and process plans to provide water in the southern portion of the Cottonwood Allotment.

c. Wildlife does not have safe access to Jacob Well and Desert Pond.

Permittee, Game and Fish Department, and BLM would meet at these sites and work on fence modifications that would allow the permittee to still be able to handle livestock yet allow wildlife safe access.

d. There may not be surface water at Cottonwood Spring.

Water is available at the spring's source based on inventories conducted during 2006.



e. Springs may be dewatered, specifically at Cottonwood Spring.

See photo above and comments to previous section d. above which indicates that there is water at spring source. However, ultimately this is a legal issue concerning water rights that involves the State of Arizona and is beyond the scope of this document, and will have to be dealt with at a higher level.

f. There may be a fence line contrast on the south end of the allotment in Cottonwood Wash, which might be indicative of excessive livestock utilization in tortoise habitat.

The IAT team visited this location during the field trip on august 12, 2003, and determined that at that time there was no evidence of a fence line contrast. Utilization studies would be monitored more closely and studies should be completed at Key Areas #1 and #5 to monitor use in the lower portion of the allotment to insure that the 45% utilization in desert tortoise habitat is not exceeded.

g. Exotic species exist inside the Monument. Bermuda grass, an exotic species, is becoming established at Cottonwood Spring, and puncturevine is established at Jacob Well.

Bermuda grass is not listed in Arizona as a noxious or invasive plant, however, it is considered an exotic in the monument and as with any other plant that is considered a weed it should be controlled or removed. However, the Cottonwood Spring is inside the Paiute Wilderness, as such access is an issue as well as using some tools in an attempt to control exotic species, inside of the Monument.

The punctureVine at Jacob Well area has had some mechanical treatment done on it, but so far the efforts have not been effective. This area should be placed on the schedule to be monitored and receive annual treatment using integrated weed management and available tools to control noxious weeds consistent with vegetation management decisions for each Ecological Zone and as appropriate to the land use allocation in order to protect resources and Monument values.

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

1. Standard 1. Upland Sites.

As listed in Table 6 (pages 24 and 25), ground cover was measured at all 3 key areas and inside and outside the exclosure (2 auxiliary study areas). At the key areas and exclosure ground cover improved at 4 locations, and remained static on 1. All the study areas have burned at least once since the 1980's. Some key areas have burned more than three times, with the latest wildfires occurring during 2005 and 2006. Areas that were burned during the 2005 and 2006 wildfires have been fenced to keep livestock out until plants recover.

On most key areas, plants, litter, and rock are present in pattern, kind, and amount sufficient to prevent accelerated erosion. The vegetative cover (basal) at the key areas were similar to or lower than what is suggested in the ecological site guides with 2 key areas improving and 1 static. The exclosure vegetative cover (basal) was similar with inside improving and outside static. Studies showed the trend of ground cover as static at one key area and improving on the other two key areas, as well as, inside and outside of the exclosure; and were considered to be functioning properly or trending towards attainment of Standard 1.

2. Standard 2. Riparian-Wetland sites

There are no riparian areas in the Cottonwood Allotment.

3. Standard 3. Desired Resource Conditions.

DPC objectives for some plant species were not met during this assessment process because their composition was down due to the effects of the drought. Monitoring data indicates that 64% of the DPC objectives are currently being met. All of those objectives not meeting pertain to grasses. Section IV.B.5. (Pages 23-25) describes various comparisons of trend, from the base year to start of drought, from start of drought to the end of drought, and from base year to current year to illustrate the effects of drought and the role drought has played in vegetation changes particularly between 1998 and 2005. Another major effect to DPC attainment is past wildfires which set back key areas to an early seral plant community that could take 50 plus years to recover.

Nine DPC objectives are being met as evidenced by analyses and supporting documentation referenced herein. Five DPC objectives are not being met. Four of the 5 DPC objectives were at 2 key areas that burned during the 2005 wildfires. The 5 DPC objectives not meeting are all grasses that would respond to adequate precipitation coming during the right season; as such, attainment of these DPC objectives are contingent on moisture. There are signs of recruitment under current management as noted during field evaluation. It is believed that these objectives can be achieved in the allotted timeframe provided there are no more wildfires and adequate moisture during the right season.

Due to the potential of the grass DPC objectives to be met based on how grasses, like bottlebrush squirreltail response to precipitation, and based on the supporting documentation referenced herein relative to the criteria for meeting standards and indicators of rangeland health, 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 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 rather than livestock grazing that was the causal factor influencing vegetation attributes along with wildfires. As such it is believed that current livestock grazing would not be a limiting factor in key areas achieving DPC objectives.

Ten of the 21 years (pages 20-21) of actual use data shows that the permittee used less than 88% of Active Preference. Six of those years, the permittee used less than 80% of the Active Preference. Only one year was 100% of active preference used. Between 1982 and 2002, utilization levels were only above the 45% allowable three times (1984, 1988, and 2002) on key species at Key Area number 1, and have not exceeded the 50% allowable use at Key Area number 2.

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 Standard 1 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 Cottonwood 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 Cottonwood allotment with current terms and conditions.

B. Continue with current grazing practices established in the AMP. Continue to improve the reliability of waters and add new waters to facilitate livestock distribution when necessary in all pastures to insure the grazing system can function as designed, so that timing of use and duration of use would have the greatest potential to improve vegetation conditions.

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

D. Texas sandbur is considered an Arizona Noxious Weed and as such should be made part of active weeds treatment program on the Arizona Strip. The Bermuda grass at Cottonwood Spring is not on the Arizona noxious weed list, but is considered an exotic species in the Monument and should be eliminated.

E. All fences around water sources in this allotment need to be checked and if needs be modified to ensure safe and reliable access for wildlife.

F. In areas that burn, allow a minimum of 2 years rest (growing season deferment) to allow recovery of the vegetation. Based on the "Cottonwood '06 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:

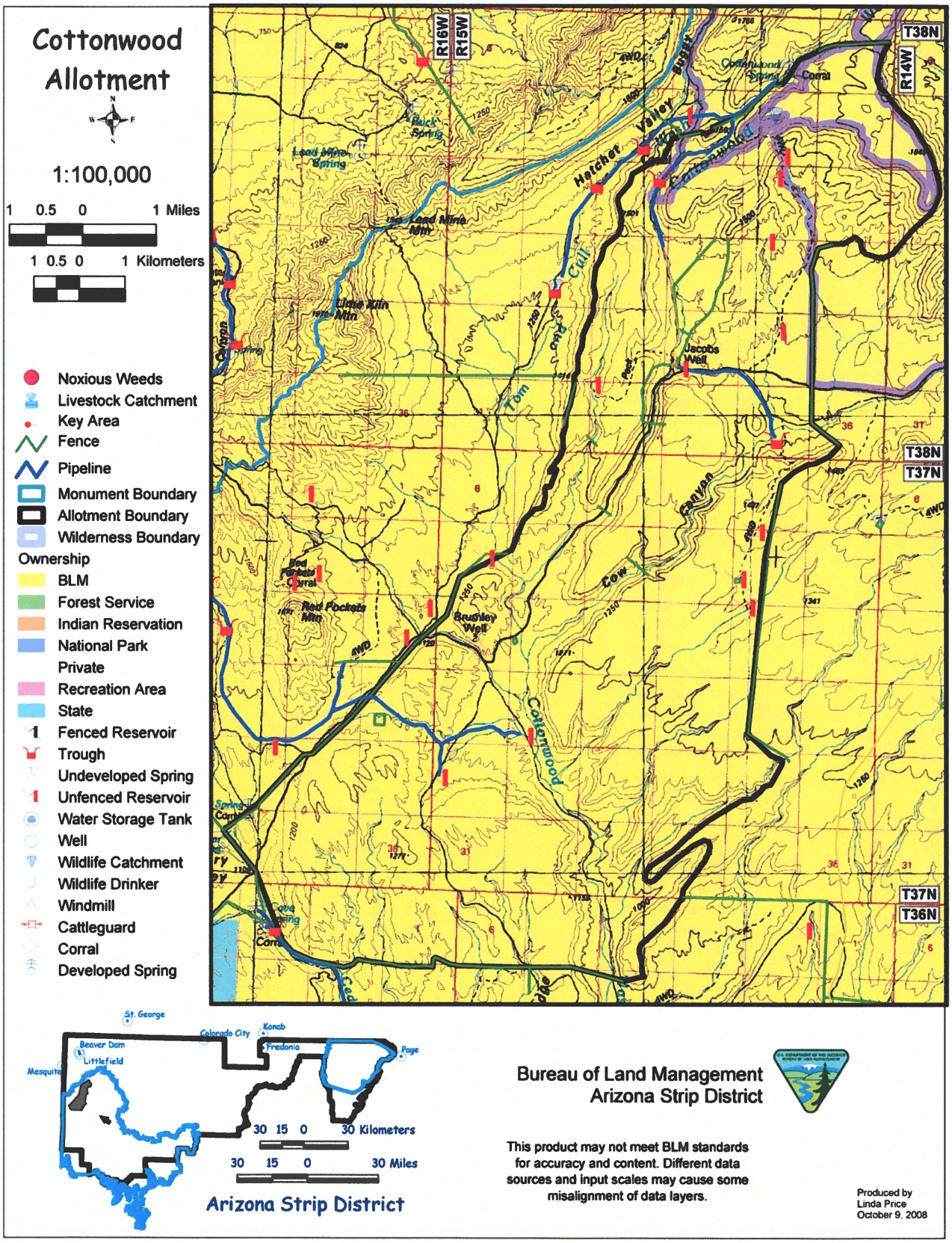
__✓__ I concur with the conclusions and recommendations as written.

_____ I do not concur.

_____ I concur, with the following modifications:

Thomas R. Edgerton
Manager
Grand Canyon-Parashant National Monument

1/4/10
Date


Cottonwood Allotment
1:100,000
1 0.5 0 1 Miles
1 0.5 0 1 Kilometers
Noxious Weeds
Livestock Catchment
Key Area
Fence
Pipeline
Monument Boundary
Allotment Boundary
Wilderness Boundary
Ownership
BLM
Forest Service
Indian Reservation
National Park
Private
Recreation Area
State
Fenced Reservoir
Trough
Undeveloped Spring
Unfenced Reservoir
Water Storage Tank
Well
Wildlife Catchment
Wildlife Drinker
Windmill
Cattleguard
Corral
Developed Spring
R16W
R15W
R14W
T38N
T37N
T36N
Hatchet Valley
Cottonwood Spring Corral
Buck Spring
Lead Mine Spring
Lead Mine Mtn
Lake Kiln Mtn
Jacobs Well
Red Pockets Corral
Red Pockets Mtn
Bentley Well
Cottonwood
Canyon
Cow
Tom
Crail
St. George
Colorado City
Kanab
Fredonia
Page
Beaver Dam
Littlefield
Mesquite
30 15 0 30 Kilometers
30 15 0 30 Miles
Arizona Strip District
Bureau of Land Management
Arizona Strip District
This product may not meet BLM standards for accuracy and content. Different data sources and input scales may cause some misalignment of data layers.
Produced by
Linda Price
October 9, 2008

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

Commodity Interests

Bill Gubler,
Grazing
Rancher, St. George, UT

Bill Howes
Off Road Vehicle Use
Wizards Motorcycle Club

Kent McComb,
Grazing
Retired, St. George, UT

Non-Commodity Interests

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

Spence Esplin,
Historical
Retired, St. George, UT

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

Local Area Interests

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

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

Dennis Becenti
Native American Interests
Hopi and Navajo Tribes, AZ

Alternates

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

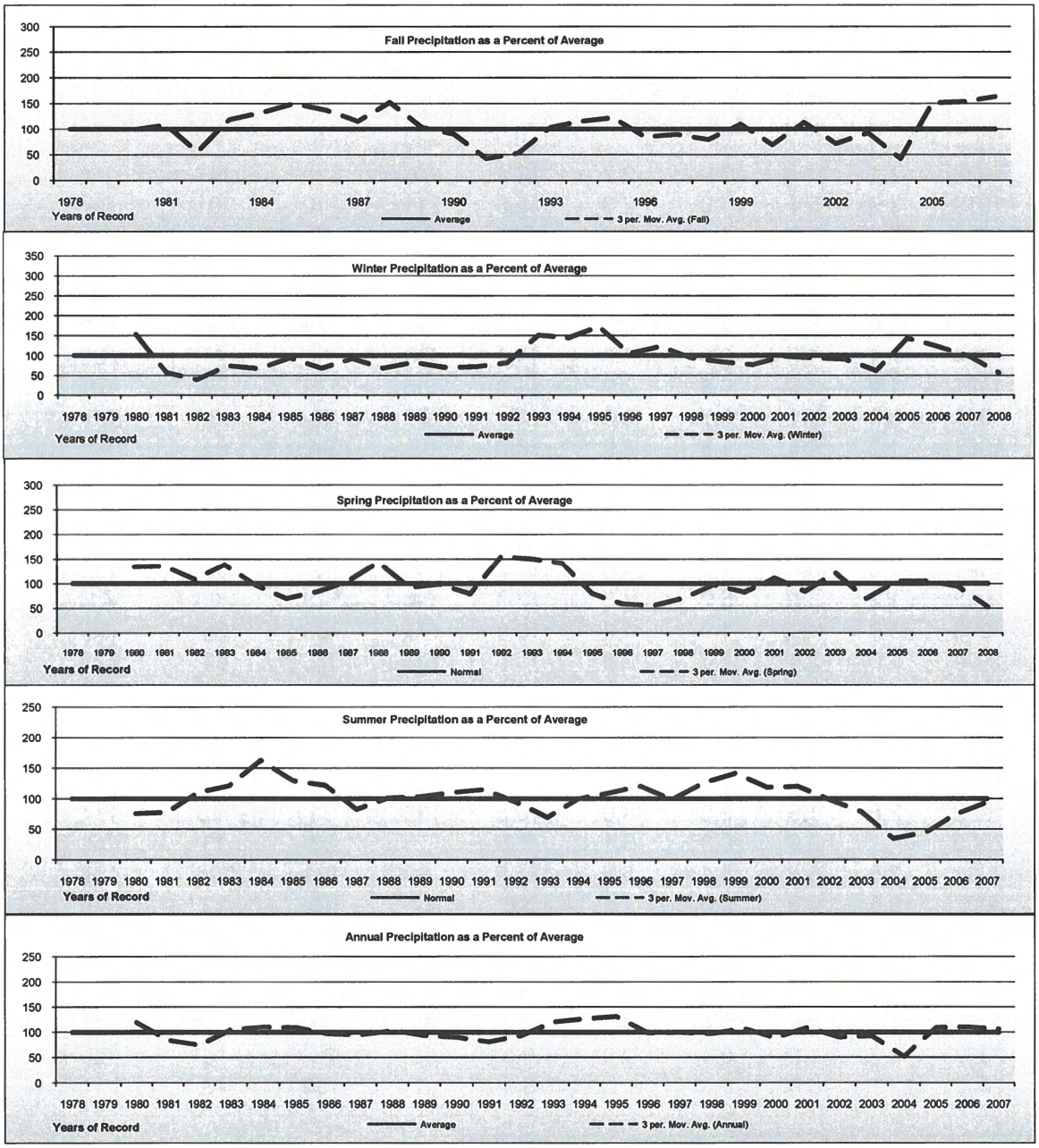
Paul Weaver
Non-Commodity
St. George, UT

Appendix C:
PRECIPITATION DATA

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%

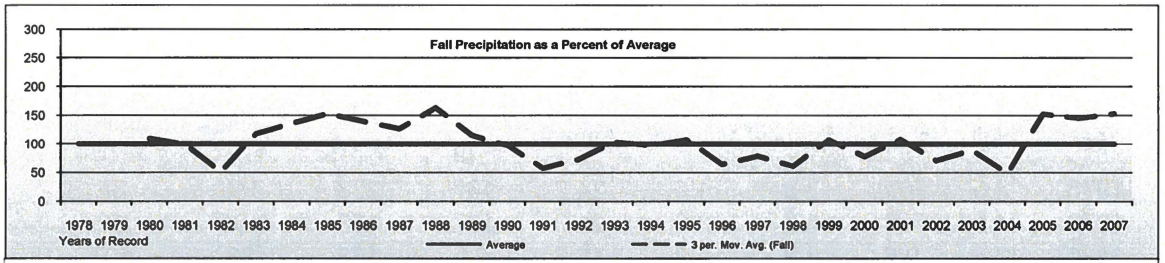
Cottonwood Wash Ex Precipitation rain gauge number 04

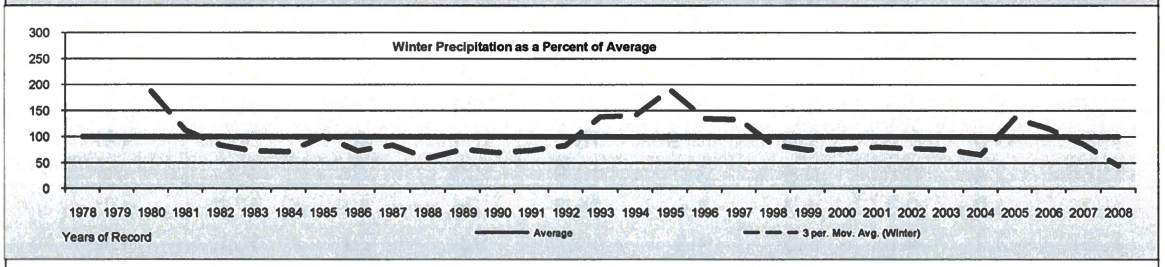


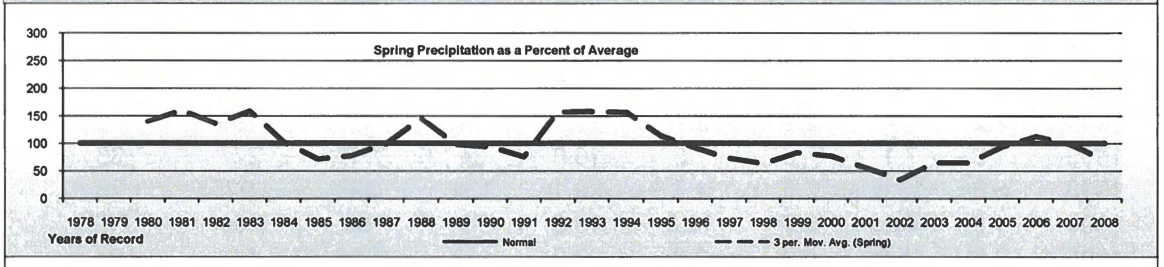
		Cottonwood Overlook		PRECIPITATION RAIN GAUGE NUMBER:						03
Annual Average	2.29	6.00	2.71	3.99	14.99					
Year	Fall	Winter	Spring	Summer	Annual	Fall % Avg	Winter % Avg	Spring % Avg	Summer % Avg	Annual % Avg
1978	2.5	16.4	3.9	1.5	24.2	107	273	143	38	161
1979	4.5	7.8	5.2	3.6	21.0	197	130	191	89	140
1980	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

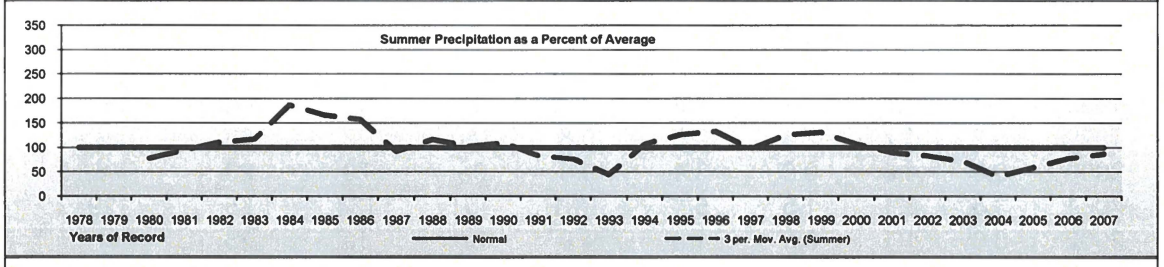
Cottonwood Overlook		Rain Gauge #	03
Percent of Average by Season.			
Fall	Winter	Spring	Summer
15%	40%	18%	27%

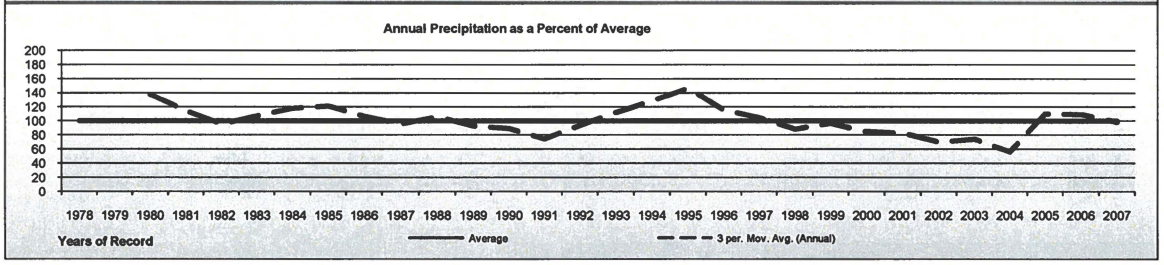
Cottonwood Overlook Precipitation rain gauge number 03











Appendix D:
Utilization Data

UTILIZATION STUDY SUMMARY										
Allotment = Cottonwood Pasture = Brumley Key Area Number =1										
Utilization expressed as a percent use for each species as of the particular year read.										
Cool Season Grasses	1983	1984	1985	1986	1987	1988	1990	1994	2002	2006
Indian ricegrass	16	57	45	31	16	49	11	18		11
Needlegrass							11	18		2
Cool season grasses (CSGG)									50	4
Average	16	57	45	31	16	49	11	18	50	6
WARM SEASON GRASSES										
Sand dropseed	12	51	32	22	30		10		50	26
Black grama			42		30	31	10	10		
Big galleta			38	22	30	47	18	21		0
Blue grama										5
Bush muhly			39	31	30	31	10			2
Average	12	51	36	23	30	37	12	20	50	13
BROWSE										
Winterfat							14			
Fourwing saltbush							14			
Mormon tea	44	43	28	27	24	34	14	9	38	13
Average	44	43	28	27	24	34	14	9	38	13
Avg All Species	27	50	35	26	27	37	12	17	44	10

UTILIZATION STUDY SUMMARY						
Allotment = Cottonwood Pasture = Mud Mtn Key Area Number =2						
Utilization expressed as a percent use for each species as of the particular year read.						
Cool Season Grasses	1982	1983	1985	1986	1988	AVG
Indian ricegrass	44	16	24	40		24
Bottlebrush squirreltail			24	10	20	19
Average	44	16	24	14	20	21
WARM SEASON GRASSES						
Sand dropseed	27	12	10		18	16
Black grama	40					40
Average	30	12	10		18	16
BROWSE						
Mormon tea	36	44	10			39
Average	36	44	10			39
Avg All Species	36	27	23	14	19	24

Appendix E:
Vegetation Trend Data

PACE FREQUENCY TREND ANALYSIS						
ALLOTMENT:	Cottonwood					
PASTURE:	Brumley					
8/30/2005	Key Area 1					
COVER CATEGORIES	years plots were read					
	1981	1985	1988	2001	2005	Trend
Bare Ground	58	57	57	60	56	→
Litter	29	34	29	38	19	↓
Rock	11	7	13	2	12	→
Vegetation (basal cover)	2	2	2	0	13	↑
% Ground Cover	42	43	43	40	44	→
FREQUENCY OF GRASSES						
Indian ricegrass		1	1		0	→
Needlegrass		0	3			→
Sand dropseed		4		0		→
Black grama	0					→
Bush muhly		4	4	0		
Threeawn	9	10	14	3		
Fluffgrass	2	21	6	7		
FREQUENCY OF FORBS						
Globemallow	6	9	4	1		
Other annual forbs (AAFF)			2	1	63	
Other annual forbs (AAGG)					62	
Buckwheat	2			2		
other perennial forbs (PPFF)	2	3	1	5	1	
Phacelia					2	
FREQUENCY OF SHRUBS						
Mormon tea	9	14	12	9	5	→
Catclaw				0	0	
Brittlebush	4			2	0	
Broom snakeweed		0	12	13	2	
Rabbitbrush	4					
Blackbrush	5	9	16	13	12	
Opuntia	1	2	2		3	
Haplopappus_Goldenhead	2			4	4	
Yucca		8	13	8	18	
Burrobrush	1					
Joshua Tree	7		1	2		
Creosote bush	1	9	9	6	3	
Turpentinebroom	4	2	5	3	3	
Other-Shrub (SSSS)	0	0		4		

PACE FREQUENCY TREND ANALYSIS					
ALLOTMENT:	Cottonwood				
PASTURE:	Mud Mtn				
8/4/2005	Key Area 2				
COVER CATEGORIES	years plots were read				
	1982	1985	1988	2005	Trend
Bare Ground	41	29	34	4	↓
Litter	37	55	43	87	↑
Rock	15	14	20	4	↓
Vegetation (basal cover)	7	2	4	4	→
% Ground Cover	59	71	67	96	↑
FREQUENCY OF GRASSES					
Indian ricegrass		1			→
Bottlebrush squirreltail	3	13	12		→
Sand dropseed	2		1		→
Threeawn	53	34	63	7	
Fluffgrass			1		
FREQUENCY OF FORBS					
Globemallow	26	28	39	9	
other annual forbs (AAFF)				25	
other annual grasses (AAGG)				86	
other perennial forbs (PPFF)	0		1	8	
FREQUENCY OF SHRUBS					
Brittlebush				1	
Broom snakeweed	23	39	33	6	
Rabbitbrush			1		
Opuntia	4	3	3	4	
Anderson Wolfberry	1	1	1	1	
Yucca	8	13	10	7	
Green Mormon tea		0	1		
Turpentinebroom		1	1	2	
Other-Shrub (SSSS)			1	1	

PACE FREQUENCY TREND ANALYSIS											
ALLOTMENT:	Cottonwood (west)										
PASTURE:	Cottonwood										
9/29/2006	Key Area 5										
COVER CATEGORIES	years plots were read										
	1990	1992	1993	1996	1998	1999	2001	2003	2004	2006	Trend
Bare Ground	94	14	12	71	72	36	7	48	24	26	↓
Litter	3	77	83	25	22	58	91	48	74	69	↑
Rock	2	1	0	1	1		0	1	1		→
Vegetation (basal cover)	0	7	4	3	6	6	1	3	1	5	↑
% Ground Cover	6	86	88	29	28	64	93	52	76	74	↑
FREQUENCY OF GRASSES											
Big galleta					1		0	0		0	→
Sand dropseed	7	14	14	5	5	38	11			8	→
Threeawn	2		6								
Threeawn		1		6	1	4	3			0	
Fluffgrass	23	12	9		1	4	1				
FREQUENCY OF FORBS											
Locoweed							87				
Russian thistle				0							
Globemallow	1	2	1	0	3	5	0				
other annual forbs (AAFF)		8		1	61	4	1	0		18	
other annual grasses (AAGG)	2	74	87	4			75			20	
Buckwheat	24	50	4	13	24	1	9				
other perennial l forbs (PPFF)		1	1	2	2	1	3			18	
Spurge			0								
Filaree	35	4	0	52		103					
FREQUENCY OF SHRUBS											
Mormon tea		0		0		1	1	0	0	1	→
Brittlebush	1					2	0	1	0	0	
Broom snakeweed	0	5	4	5	8	16	2	2	6	9	
Rabbitbrush				1			2	1	0		
Opuntia			1								
Anderson Wolfberry							3			2	
Wolfberry		1	0	1	2	3			2		
Haplopappus_Goldenhead						1					
Yucca		0		0	1		0		0		
Desert holly	0										
Burrobrush				1							
Creasote bush	0		0	0		1					
Whitestem paperflower					1	1	0	2	0	2	
Turpentinebroom		0	0		1			1	1	1	
other-shrub (SSSS)		0		0		3	1	1			

PACE FREQUENCY TREND ANALYSIS							
Allotment:	Cottonwood				Pasture:	Exclosure	
8/25/2005			Key Area	Exclosure			
COVER CATEGORIES	Listed in Eco-Site Guide	Inside			Outside		
		1982	2005	Trend	1982	2005	Trend
Bare Ground		65	26	↑	77	52	↑
Litter		34	70	↑	23	47	↑
Basal Cover		1	5	↑		1	→
% Ground Cover		35	74	↑	23	48	↑
BROWSE							
Atca2		4	1	→	1	1	→
Epne		8	17	↑	14	14	→
Prfa		-	-	→	1		→
Totals		11	18	↑	17	16	→
Warm Season							
Hiri		36	35	→	6	6	→
Spcr		7		↓	9		↓
Boer		1		→	8		↓
Mupo2		1		→	2		→
Totals		45	35	↓	26	6	↓
OTHER SHRUBS							
Gusa2		19	5	↓	31	11	↓
Chvi8		1		→			→
Lyan		5	6	→	6	6	→
Happ_Acamp		1		→	1		→
Yucca		1	2	→	2	2	→
Hysa		1		→			→
Opunt				→	1		→
Juos				→	1		→
SSSS				→		1	→
Totals		27	13	↓	43	20	↓
OTHER GRASSES							
Trpu		1		→	6		↓
Totals		1		→	6		↓
FORBS							
Sphae			2	→		5	↑
AAFF			4	↑		6	↑
Totals			6	↑		11	↑

Appendix F:
Composition Data

Key Area # 1	Allotment: Cottonwood			
9/16/2008	Pasture: Brumley			
	Range Site: Sandy Loam (Grav) 9-12" pz			
Plant Species	Site-Guide Allowable Percent Composition	First Reading Percent Composition Base Year	Second Reading Percent Composition	Desired Percent Composition Objective
Grasses	20-25%	8%		
Indian ricegrass	PPGG			
Needlegrass	1-5%			
Sand dropseed	PPGG			
Black grama	PPGG			
Bush muhly	1-5%			
Threeawn	1-2%			
Fluffgrass	PPGG	8%		
Other perennial grasses (PPGG)	1-5%			1-5%
Forbs	5-10%	1%	11%	5-10%
Globemallow	2-5%			
Other annual forbs (AAFF)	1-2%	1%	11%	
Other annual grasses (AAGG)				
Buckwheat				
Other perennial l forbs (PPFF)	1-3%			
Phacelia				
Red Brome	1-5%			
Shrubs	70-82%	91%	89%	
Mormon tea	1-5%	8%	10%	5-10%
Catclaw	Not listed		3%	
Brittlebush	Not listed			
Broom snakeweed	Not listed	15%	17%	
Rabbitbrush	Not listed			
Blackbrush	30-40%	28%	32%	
Opuntia	0-1%			
Haplopappus_Goldenhead	0-3%	5%	4%	
Yucca	2-5%	13%	8%	
Burrobrush	0-3%			
Joshua Tree	0-1%	7%		
Creosote bush	5-10%	9%	7%	
Turpentinebroom	Not listed	2%	7%	
Other-Shrub (SSSS)	1-5%	5%		
	Similarity Status	57% Late	59% Late	

Key Area # 2	Allotment: Cottonwood				
9/29/2006	Pasture: Mud Mtn.				
	Range Site: Shallow Upland (Cal) 9-13" pz				
Plant Species	Site-Guide Allowable Percent Composition	1988	2001	2005	Desired Percent Composition Objective
Grasses	15-25%	42%	81%	7%	
Indian ricegrass	1-2%				1-3%
Bottlebrush squirreltail	1-3%	2%			1-3%
Sand dropseed	1-2%				1-3%
Threeawn	Group PPGG	40%	81%	7%	
Fluffgrass	Group PPGG				
Other perennial grasses (PPGG)	1-2%				
Forbs	3-5%	21%	2%	37%	3-5%
Globemallow	1-3%	21%		23%	
Other annual forbs (AAFF)	1-3%				
Other annual grasses (AAGG)	2-5%				
Other perennial l forbs (PPFF)	1-2%		2%	14%	
Shrubs/Trees	70-80/0-1%	37%	17%	56%	
Brittlebush	-				
Broom snakeweed	1-2%	21%	6%	15%	
Rabbitbrush	1-2%				
Opuntia	1-2%	3%	3%	5%	
Anderson Wolfberry	Group SSSS	3%	3%	5%	
Yucca	2-5%	10%	6%	26%	
Green Mormon tea	3-5%				
Turpentinebroom	-			4%	
Other-Shrub (SSSS)	1-3%				
	Similarity Status	19% Early	16% Early	19% Early	

Key Area # 5		Allotment: Cottonwood							
9/29/2006		Pasture: Cottonwood							
		Range Site: Sandy Loam (Gravelly) 9-12" pz							
Plant Species	Site-Guide Allowable Percent Composition	Percent Composition for the Year Read							DPC
		1990	1992	1993	1994	2003	2004	2006	
Grasses	20-25%	38%	11%	13%	11%	1%		10%	
Big galleta	1-5%				2%	1%			1-5%
Sand dropseed	Group PPGG	8%	8%	5%	1%			10%	
Threeawn	1-2%		1%	4%	5%				
Fluffgrass	Group PPGG	29%	2%	5%	3%				
Other perennial grasses (PPGG)	1-5%								1-5%
Forbs	5-10%	58%	81%	82%	90%	1%		54%	5-10%
Locoweed	Group PPFF								
Russian thistle	Group AAFF								
Globemallow	2-5%		2%	1%	1%				
Other annual forbs (AAFF)	1-5%		12%			1%		1%	
Other annual grasses (AAGG)	1-5%		30%	76%	86%				
Buckwheat	Group AAFF	58%	31%	2%	3%				
Other perennial l forbs (PPFF)	1-3%			2%	1%			7%	
Spurge	Group AAFF			1%					
Filaree			7%						
Shrubs/Trees	70-80/0-2%	4%	8%	5%	30%	21%	25%	19%	
Mormon tea	1-5%		1%		1%	1%	1%	3%	1-5%
Brittlebush	-	4%			1%	2%	1%	1%	
Broom snakeweed	-		7%	3%	19%	4%	10%	12%	
Rabbitbrush	-					2%	1%		
Opuntia	0-1%				2%	3%	1%		
Wolfberry	1-5%				3%	5%	4%		
Haplopappus_Goldenhead	-								
Yucca	2-5%			1%	2%		3%		
Desert holly	-								
Burrobrush	-								
Creosote bush	5-10%			1%		1%			
Whitestem paperflower	-				2%		1%	1%	
Turpentinebroom	-					2%	3%		
Other-shrub (SSSS)	1-5%								
	Similarity Status	12% Early	24% Early	20% Early	29% Mid	15% Early	14% Early	22% Early	

Key Area: Exclosure		Allotment: Cottonwood	
9/13/2005		Pasture:	
		Range Site: Limy Upland 6-9" pz	
Plant Species	Site-Guide Allowable Percent Composition	Inside Exclosure Percent Composition 2005	Outside Exclosure Percent Composition 2005
Grasses	1-5%	67%	12%
Hiri	Group PPGG	67%	12%
Spcr	-		
Boer	-		
Mupo2	-		
Trpu	1-1%		
PPGG	1-1%		
Forbs	3-5%	17%	8%
Sphae	1-3%		
AAFF	1-2%	17%	8%
Shrubs	85-95%	16%	80%
Atca2	Group SSSS		4%
Epne	1-5%		25%
Prfa	-		
Gusa2	Group SSSS	4%	24%
Opunt	2-6%		
Chvi8	-		
Lyan	-	4%	12%
Happ_Acamp	-		
Yucca	Group SSSS	9%	
Juos	-		
Cyan	Group Opunt		4%
Hysa	Group SSSS		
SSSS	5-10%		
	Similarity	9%	22%
	Status	Early	Early

Appendix G:
Wildlife Data

Cv cxAGFD MULE DEER DATA FOR GMU 13B

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