Land Health Evaluation for the Mesquite Community Allotment – 4832

I. Introduction

The Mesquite Community Allotment land health evaluation was conducted in accordance with directions set forth in the Washington Office (WO) Instruction Memorandum (IM) No. 98-91 and Arizona State IM No. 99-012 for implementation of Standards for Rangeland Health and Guidelines for Grazing Administration (Standards and Guidelines). Additional guidance is provided in WO IM No. 2009-007.

The purpose of Standards and Guidelines is to ensure the health of public rangelands. 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, mining, fire, weather, and insects and disease. The standards are goals for the desired condition of the biological and physical components and characteristics of rangelands, such as adequate canopy and ground cover; guidelines are management approaches, methods, and practices that are intended to achieve a standard.

Background Information

Arizona's Standards for Rangeland Health and Guidelines for Grazing Administration were developed by the BLM State Standards and Guidelines 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 Guidelines in April 1997. The Decision Record, signed by the BLM State Director (April 1997) provides for full implementation of the Standards and Guidelines in all Arizona land use plans. See Appendix A for a copy of the Arizona Standards and Guidelines.

The permittee, interested publics, state agencies, and other federal agencies were encouraged to provide the BLM with allotment-specific resource data for consideration in development of this land health evaluation. This assessment was then conducted by an interdisciplinary assessment team (IAT) of resource specialists with expertise in soils, vegetation, and wildlife biology from:

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

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

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

The RRT, IAT, permittees and other interested parties were invited to attend an issue scoping meeting on January 22, 2008, and a field visit on February 3, 2009. At the conclusion of the field visit, the group that attended the allotment tour provided their opinions on the status of rangeland health in the Mesquite Community Allotment. In February and May 2010, BLM resource staff and staff from the U.S. Fish and Wildlife Service (USFWS) made field visits to allotments within desert tortoise habitat (including this allotment) to assess resource conditions and discuss desired vegetative communities that the BLM should manage for. The results of these discussions are incorporated into the desired plant community objectives developed for the allotment, and were used to make management recommendations, as well as in making recommendations on whether resource conditions were meeting the standards for rangeland health. These recommendations on whether the standards for rangeland health are being met are detailed on pages 74-78 of this evaluation report. In key areas where standards were partially being met, the group identified which resource uses needed to be addressed, and teams presented recommendations to improve resource conditions. BLM resource specialists have made field visits to the allotment numerous times since to observe resource conditions and conduct rangeland monitoring studies.

Technical recommendations from this land health evaluation will identify appropriate actions needed, which will inform the National Environmental Policy Act (NEPA) analysis, and provide the Field/Monument Managers the opportunity to consider all available information before making a final determination on achievement of standards. If the evaluation report documents that standards are not achieved in the assessment area, then the Field/Monument Managers will determine significant causal factors for non-achievement. Causal factors can include current grazing practices, historical livestock use, drought, off-highway vehicle (OHV) use, fire, recreation, etc. If existing grazing management practices or levels of grazing use on public land are significant factors, then an appropriate action will be developed and implemented in accordance with 43 CFR subpart 4180.2(c) and direction contained within WO IM No. 2009-007.

II. Allotment Profile

A. Description

The Mesquite Community Allotment is a large allotment that lies east of Mesquite, Nevada, and straddles the Virgin Mountains. The southern portion of the allotment (16,808 acres) is within Grand Canyon-Parashant National Monument (GCPNM), while the western edge (9,737 acres) is within Nevada. The allotment consists of two ecological zones: Mojave Desert and Mojave-Great Basin Transition. Vegetation types present are Great Basin Blackbrush, Mojave Blackbrush, Mojave Mixed Shrub, Chaparral, and Creosotebush/Bursage. Plant species range from Joshua trees, creosotebush, and burrobrush at the low elevations to pinyon pine, oak and

manzanita on the top of the Virgin Mountains. Approximately 17,405 acres (33%) of this allotment have been burned since 1993 – see map on page 90 of this evaluation report.

This allotment is categorized as an "improve" (I) allotment, which means that one or more of the following exists:

a) Present range condition is unsatisfactory;
b) The allotment has high to moderate resource production potential and is producing at low to moderate levels;
c) Serious resource-use conflicts/controversy exists;
d) Opportunities exist for positive economic return from public investments;
e) Present management appears unsatisfactory.

B. Acreage

The allotment contains:

- 48,073 acres of federal land
- 0 acres of state land
- 0 acres of private land

48,073 total acres

C. **Permitted Use**

1. Total grazing privileges

Active Grazing Use:	2,406 AUMs
Suspended Non-use:	153 AUMs
Total:	**2,559 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.)

2. Season(s) of use:

03/01-02/28

The Mesquite Community Allotment includes land both within and outside of desert tortoise habitat. Cattle only graze tortoise habitat during the tortoise inactive season (October 15 to March 15).

3. Kind and class of livestock

Cow/calf

4. Percent federal range[1]

100%

D. Key Species[2]

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 the allotment are:

Cool Season Grass

- Indian ricegrass — *Achnatherum hymenoides*

Warm Season Grasses

- Fendler threeawn — *Aristida purpurea*
- Big galleta — *Hilaria rigida*

Browse

- Burrobrush — *Ambrosia dumosa*
- Littleleaf ratney — *Krameria parvifolia*
- Cliffrose — *Purshia mexicana*
- Mormon tea — *Ephedra viridis*
- Rayless goldenhead — *Acamptopopappus sphaerocephalus*
- Desert globemallow — *Sphaeralcea ambigua*

The above listed key species are all important to wildlife and cattle for forage, cover, and watershed protection. These species are all native to the subject ecological sites, and add to the biodiversity of the region.

E. Grazing System

Desert tortoise habitat requirements dictate the grazing management in this allotment. The northern portion of the allotment (the Littlefield Slope Pasture) – in desert tortoise designated critical habitat – is grazed from October 15 to March 15 and then the cattle are moved into the non-tortoise habitat from March 16 to May 31, which is in the mountains and Tom and Cull Valley on the east side of the Virgin Mountains. The cattle are generally removed from the allotment from June 1 to October 14, although they occasionally remain in the higher parts of the allotment to graze part of the summer. For example, 100 head of livestock were left in the north pasture, in Tom and

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

[2] A complete list of species (common and scientific names) included in this assessment can be found in Section VIII.

Cull Valley, in 2009, as it had been rested for three years. In 2010, all cattle were taken out of the allotment by June 1. The permittee licenses his cattle for yearlong use in order to have this flexibility. Pastures on the Mesquite Community Allotment are rotated utilizing the permittee's other grazing areas located in Utah, moving from one pasture to another, based on which pasture is in the best range condition for the season at the time livestock exit one of the Mesquite Community Allotment pastures.

F. Biological Resources

1. Special Status Species

Threatened, Endangered, and Candidate Species

There are no listed or candidate plant species, or habitat for any listed plant species, within the Mesquite Community Allotment. The following threatened and endangered animal species may occur within the allotment, or may be affected by grazing within the allotment.

- California condor *(Gymnogyps californianus)* – endangered (experimental nonessential population)
- Mexican spotted owl (*Strix occidentalis lucida*) – threatened
- Mojave Desert tortoise (*Gopherus agassizii*) – threatened + critical habitat

See Section IV.B.7 of this assessment report for a detailed discussion of these species.

BLM Sensitive Species, Nevada State At-Risk Species, and Migratory Birds

Sensitive species are usually rare within at least a portion of their range. Many are protected under certain State and/or Federal laws. Species designated as sensitive by the BLM must be native species found on BLM administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either:

1. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or

2. The species depends on ecological refugia or specialized or unique habitats on BLM administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk."

All federally-designated candidate species, proposed species, and delisted species in the 5 years following delisting are included as BLM sensitive species. Nevada at-risk species are those species considered at highest risk of extirpation or extinction and

considered to be of long-term concern. Table 1 lists the sensitive species and at-risk species that may occur within this allotment.

Table 1. Sensitive Species and Nevada At-Risk Species Associated with the Mesquite Community Allotment

Species	Potential to Occur	BLM Sensitive Arizona/Nevada	Nevada At-Risk Species
Birds			
Bald eagle (*Haliaeetus leucocephalus*)	potential*	yes/yes	yes
Golden eagle (*Aquila chrysaetos*)	potential	yes/yes	no
American peregrine falcon (*Falco peregrinus*)	verified	yes/yes	yes
Ferruginous hawk (*Buteo regalis*)	potential	yes/yes	yes
Western burrowing owl (*Athene cunicularia hypugea*)	potential	yes/yes	no
Bendire's thrasher (*Toxostoma bendirei*)	potential	no/no	yes
Brewer's sparrow (*Spizella breweri)*	verified	no/no	yes
Loggerhead shrike (*Lanius ludovicianus*)	verified	no/yes	no
Pinyon jay (*Gymnorhinus cyanocephalus*)	potential	yes/yes	no
Mammals			
Allen's big-eared bat (*Idionycteris phyllotis*)	potential	yes/yes	yes
Big free-tailed bat (*Nyctinompos macrotis*)	potential	no/yes	yes
California leaf-nosed bat (*Macrotus californicus*)	verified	yes/yes	yes
Cave myotis (*Myotis velifer*)	potential	yes/yes	yes
Spotted bat (*Euderma maculatum*)	verified	yes/yes	yes
Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)	verified	yes/yes	yes
Greater western mastiff bat (*Eumops perotis californicus*)	potential	yes/yes	yes
California myotis (*Myotis californicus*)	potential	no/yes	no
Reptiles			
Banded gila monster (*Heloderma suspectum cinctum*)	potential	no/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 703-712), which prohibits the taking of any migratory birds, their parts, nests, or eggs unless specifically permitted by regulation. 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, provides for the protection of bald and golden eagles by prohibiting, except under certain specified conditions, the taking, possession and commerce (selling, purchasing, bartering, transporting, importing, or exporting) of such birds including their parts, nests, or eggs. "Take" includes "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb."

2. Other Wildlife Species

The Mesquite Community Allotment is in AGFD's Game Management Unit (GMU) 13B. Desert bighorn sheep (*Ovis canadensis nelson*) habitat is present throughout the Virgin Mountains portion of the allotment. Bighorn were believed to have been extirpated from the Arizona Strip around the turn of the 20th century. In a cooperative effort between the BLM and AGFD beginning in 1979, bighorn sheep were reintroduced into suitable habitat areas, including the Virgin River Gorge (northeast of this allotment). These reintroduction efforts and successful reproduction have resulted in a gradual increase in the population. Limited hunting occurs on an annual basis.

Mule deer (*Odocoileus hemionus*) habitat is considered yearlong in the majority of the allotment; the low elevation portion of the allotment (within the Mojave Desert ecological zone) is considered limited habitat for mule deer. Big game annual count data for GMU 13B can be found in Appendix E.

A variety of other wildlife species are present on this allotment. These species include small mammals (such as desert cottontail rabbits), birds (including raptors, songbirds, and quail), and reptiles. Predators include coyotes, bobcats, and mountain lions.

G. Recreation Resources

General Management: The Mesquite Community Allotment's recreational values derive from its geology, scenic viewsheds, and history. General recreation activities that occur in this allotment include sightseeing, ATV riding, hiking, horseback riding, camping, hunting, rock collecting, photography, bird watching and nature study.

Recreational Settings: The Arizona portion of the Mesquite Community Allotment within the Arizona Strip Field Office is primarily managed as part of the Arizona Strip Field Office Extensive Recreation Management Area (ERMA); the remainder of the Arizona Strip Field Office portion of the allotment is within the Virgin Ridge Special Recreation Management Area (SRMA), in the Virgin Mountains. In Nevada, the allotment is within the Southern Nevada ERMA. ERMAs receive only custodial management regarding visitor health and safety, user conflict and resource protection issues, with no activity level planning. In the ERMA, regulation of visitor use would occur only when monitoring indicates a trend towards unacceptable change to desired recreational settings brought about by such use.

The primary strategy for the Virgin Ridge SRMA is to target a demonstrated community recreation-tourism market demand from primarily local communities (dependent on public lands recreation and/or related tourism use, growth, and/or development), as well as some other regional visitors, for motorized/mechanized/non-mechanized exploring, world-class rock climbing, and guided touring in close-to-town natural settings. This demand is supported by the area's distinctive landscape, its close proximity to the rapidly growing communities of Mesquite, Bunkerville, Logandale, and Overton, Nevada and Beaver Dam, Scenic and Littlefield, Arizona. Local recreation-tourism visitors value these public lands as their own 'back-yard' recreation settings. Within the Virgin Ridge SRMA is the Virgin Ridge Recreation Management Zone (RMZ), managed for self-directed, rugged, adventure in a natural setting close to town with opportunities for scenic natural and historic appreciation. Activities in this RMZ could include hiking, scrambling, equestrian, hunting, OHV exploring, mountain bike riding. Also within the Virgin Ridge SRMA is the Lime Kiln RMZ, managed for world-class rock climbing in a natural setting close to town.

That portion of the allotment within GCPNM is within the Parashant SRMA and the Shivwitz Frontier 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. This demand is supported by the area's distinctive remote, rugged landscape; its proximity to the Grand Canyon; its vast size; and the largely open and undeveloped character of its recreation settings. Regional and local recreation-tourism visitors value this area for the distinctive kinds of dispersed recreation it produces.

The Shivwits Frontier RMZ is managed for sustainable access for scenic, natural, open-space appreciation, and exploration recreation adventure somewhat close to nearby communities.

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

Off Highway Vehicles (OHV): The OHV area designation for the portion of this allotment in Arizona is "limited to designated roads and trails." In Nevada, the OHV area designation is "limited to existing roads and trails and dry washes."

Wilderness Characteristics: There are 7,589 acres managed to maintain wilderness characteristics in the central portion of the allotment, on the crest of the Virgin Mountains in Arizona.

H. Special Designations

1. Designated Wilderness

There is no designated wilderness within this allotment.

2. Wild & Scenic Rivers

No eligible or suitable wild and scenic river segments occur within the allotment.

3. Areas of Critical Concern (ACECs)

The Virgin Slope Area of Critical Environmental Concern (ACEC) is located within the Arizona Strip Field Office portion of the allotment. This ACEC was designated to protect the threatened desert tortoise and comprises 15,960 acres in the Mesquite Community allotment.

In Nevada, 6,736 acres of the Mesquite Community allotment are within the Gold Butte, Part C (Virgin Mountain) ACEC, managed to protect important wildlife habitat and important botanical species. An additional 1,674 acres of this allotment are within the Gold Butte, Part A Desert Conservation Area, managed to protect desert tortoise.

4. National Monuments

The southern portion of the allotment is within GCPNM, designated by presidential proclamation in 2000. The purpose of this monument is to conserve, protect and preserve a vast array of outstanding "objects" (i.e., resources) for the benefit of current and future generations. These objects include a variety of scientific, biological, hydrological, and geological resources and a long and rich human history, which have been preserved by remoteness and limited travel corridors, with a sense of solitude, remoteness, and an unspoiled character (Presidential Proclamation No. 7265, 2000).

III. Management Objectives

A. Land Use Plan Objectives

Arizona Strip Field Office Resource Management Plan (RMP))(BLM 2008a)
and
Grand Canyon – Parashant National Monument RMP)(BLM 2008b)[3]

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 for the objectives are as follows:

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

Soil Stability

DFC-VM-03/**DFC-VM-04** (Vegetation – All Ecological Zones)
Vegetative communities will provide sufficient plant cover and litter accumulation to protect soils from wind and water erosion and enhance nutrient cycling and productivity, even during drought years.

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

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

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-04/**DFC-VM-05** (Vegetation – All Ecological Zones)
Ecological processes and functions will be protected, enhanced, and/or restored by allowing tools that are necessary and appropriate to mitigate adverse impacts of allowable uses and undesirable disturbances, and contribute to meeting the Standards for Rangeland Health **… and enhance Monument values**.

---

[3] Text in **BOLD** type are differences in the GCPNM objectives from those in the Arizona Strip Field Office RMP.

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

DFC-WF-11/**DFC-WF-12**
The natural biological diversity of fish, wildlife, and plant species will be maintained or, where necessary and feasible, restored throughout the Arizona Strip FO (**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-05/**DFC-VM-06** (Vegetation – All Ecological Zones)
Invasive plant species will be contained, controlled, or eliminated and native species restored to meet desired plant community (DPC) objectives.

DFC-VM-34/**DFC-VM-38** (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Management of Mohave-Great Basin Transition Ecological Zone plant communities will focus on removing invasive non-native plants, especially cheatgrass, Sahara mustard, and red brome, and preventing habitat degradation due to wildfire.

No Net Loss

DFC-VM-28 (Vegetation – Mojave Desert Ecological Zone)
There will be no net loss of acres of Mohave Desert plant communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

DFC-VM-33/**DFC-VM-37** (Vegetation – Mojave-Great Basin Transition Ecological Zone)
There will be no net loss in acres of Transition plant communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

Livestock Grazing

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

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

LG-1 (Las Vegas RMP 1998)
Provide for continued grazing of domestic livestock on public lands, consistent with law, regulation, established standards and guidelines and policy on areas open to livestock grazing (see Map 2-8).

Desired Plant Community

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

DFC-VM-02/**DFC-VM-03** (Vegetation – All Ecological Zones)
Native vegetative communities will be protected. A mosaic of native perennial and non-invasive annual vegetative communities will be present across the landscape with diversity of species, canopy, density, and age class reflecting its local ecological site potential and naturally occurring habitat conditions.

DFC-VM-26 (Vegetation – Mojave Desert Ecological Zone)
Endemic plant species and associated communities such as Creosotebush, 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 Creosotebush or Joshua trees, seeps, healthy streamside vegetation, and other interspersed grassland and shrub habitats.

DFC-VM-30/**DFC-VM-34** (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Endemic plant species and associated communities such as black brush, Joshua tree, Mojave yucca, and cacti will be present along with other shrubs, grasses, and wildflowers. These communities can include stands of young and old shrubs, sparse vegetation, scattered to larger expanses of black brush to various mixes of Black brush, Joshua trees, Pinyon-Juniper, Yucca, and shrub habitats.

DFC-VM-32/**DFC-VM-36** (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Priority plant species and associated communities such as black brush, Joshua tree, Mojave yucca, and cacti will be present along with other shrubs, grasses, and wildflowers. These communities can include stands of young and old shrubs, sparse vegetation, scattered to larger expanses of black brush to various mixes of black brush, Joshua trees, pinyon-juniper, yucca, and shrub habitats.

DFC-WF-16/**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-31/**DFC-VM-35** (Vegetation – Mojave-Great Basin Transition Ecological Zone)
Endemic animal species such as … 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.

Wildlife Forage Needs

DFC-WF-29/**DFC-WF-30**
Forage in desert bighorn sheep habitat areas will include at least 20% grasses, 20% forbs, and 20% palatable shrub species CBW, where consistent with site potential.

Fences

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

DFC-WF-19/**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-12/**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-27/**DFC-WF-28**
Desert bighorn habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

DFC-WF-34/**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-36/**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-44/**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-13/**DFC-WF-14**
Mule deer populations will be at or near maximum levels sustainable for the habitat.

DFC-WF-28/**DFC-WF-29**
Desert bighorn sheep populations will be at or near maximum levels sustainable for the habitat.

DFC-WF-35/**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-37/**DFC-WF-38**
Migratory birds that nest in the Arizona Strip FO/**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-17/**DFC-WF-18**
Water sources within mule deer habitat will be safely accessible to deer and other wildlife.

DFC-WF-18/**DFC-WF-19**
Water sources within mule deer habitat will be spaced no more than 3 miles apart.

DFC-WF-30/**DFC-WF-31**
Water sources within bighorn sheep habitat areas will be safely accessible to bighorn and other wildlife.

DFC-WF-31/**DFC-WF-32**
Water sources within bighorn sheep habitat will be spaced no more than 4 miles apart.

DFC-WF-42/**DFC-WF-43**
Water sources within game bird habitats will be safely accessible by all wildlife.

Special Status Species Habitat

DFC-VM-27 (Vegetation – Mojave Desert Ecological Zone)
Endemic animal species such as desert tortoise and chuckwalla will be present and thriving with more than adequate food, water, and cover resources.

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

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

DFC-TE-25/**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-27/**DFC-TE-23**
Potential roosting and nesting sites (for special status raptors) will be abundant.

Healthy Special Status Species Populations

DFC-TE-11
Desert tortoise populations within the ACECs and Desert Wildlife Management Area (DWMA) 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 ACECs and WHA will be healthy and stable. Declines (**Impacts to the population)** in the WHA will be minimized to the extent possible through mitigation.

DFC-TE-24/**DFC-TE-20**
Special status raptor populations will be healthy and self-sustaining throughout their range.

DFC-TE-29/**DFC-TE-25**
Rodent populations, as a prey base (for special status raptors), within the Arizona Strip FO will be abundant.

No Net Loss of Special Status Species Habitat

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

DFC-TE-10
There will be no net loss in the quality or quantity of desert tortoise habitat within the ACECs or WHA.

DFC-TE-26/**DFC-TE-22**
No net loss will occur in the quality and quantity of suitable habitat for special status raptors within the Arizona Strip FO/**Monument**.

Condors

DFC-TE-31/**DFC-TE-27**
The experimental non-essential population of California condor will be at or above 150 individuals, viable, and stable to increasing in number.

Wilderness Characteristics

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

Recreation and Visitor Services

DFC-RR-01
Recreation and visitor services will be managed to provide varying levels of both:
1. Structured recreation opportunities that offer a range of specific benefits, activities, and experiences within outdoor settings and/or,
2. Dispersed, unstructured recreation opportunities that focus only on visitor health and safety, user conflict, and resource protection issues (extensive recreation management areas (ERMAs).

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-04/**DFC-RR-05**
The excellent opportunities that exist to enjoy remote, rustic settings that provide moderate challenge and solitude in the specialized travel management areas (TMAs) will be maintained/enhanced.

DFC-RR-05/**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-06/**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.

DFC-RR-07
In Rural TMA, a wide variety of recreation opportunities associated with near-urban settings, such as walking, OHV play, equestrian, rock crawling, mountain biking, and viewing events, may be maintained/enhanced, provided they will be compatible with the protection of sensitive resource values.

RC-1 (Las Vegas RMP)
Ensure that a wide range of recreation opportunities are available for recreation users in concert with protecting the natural resources on public lands that attract users.

RC-10 (Las Vegas RMP)
Manage public lands not included within the Special Recreation Management Areas as the Southern Nevada Extensive Recreation Management Area, emphasizing dispersed and diverse recreation opportunities.

Areas of Critical Environmental Concern

DFC-AC-01
ACECs will provide protection for special status plant and animal species, scenic values, riparian values, and significant cultural resources.

AC-1 (Las Vegas RMP)
Establish areas of critical environmental concern specifically for management of desert tortoise within the Northeastern Mojave and Eastern Mojave recovery units identified in the *Tortoise Recovery Plan* (SS-31a) (see Table 2-2). Manage a sufficient quality and quantity of desert tortoise habitat, which in combination with tortoise habitat on other Federal, State and private land, will meet recovery plan criteria. Maintain functional corridors of habitat between areas of critical environmental concern to increase the chance of long-term persistence of desert tortoise populations within the recovery unit.

AC-2 (Las Vegas RMP)
Protect areas with significant cultural, natural, or geological values by establishing areas of critical environmental concern shown in Tables 2 through 6.

B. Specific Resource Condition Objectives

1. Land Health Standards

Standard 1 - Upland Sites

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

- Signs of accelerated erosion are minimal and are appropriate for the site as indicated by ground cover (litter, rock, vegetative cover, etc.) and signs of erosion.
- This objective applies to all ecological sites. A departure from the ecological site description or reference sheet of moderate or greater would not be achieving the standard. A departure of none to slight or slight to moderate is considered achieving the standard.
- Achievement of Standard 1 (appropriate erosion and vegetative cover levels) will ensure properly functioning watersheds and ecological processes in order to sustain healthy biotic populations and communities.

Standard 2 – Riparian/Wetlands

Springs occur on the allotment in or near the Virgin Mountains. These springs are Buck, Lead Mine, Lime Kiln, Narrow, Rattlesnake, Upper and Lower Heck Hole, and an additional unnamed spring in Arizona, as well as Lower Middle Canyon, Middle Canyon and Cabin Canyon in Nevada, none of which meet the criteria for priority riparian areas (as listed in the RMPs) due to small size and ephemeral flows. In addition, the Arizona S&Gs provide an exemption to Standard 2 (Riparian/Wetland Sites) for "water facilities constructed or placed at a location for the purpose of providing water for livestock … and which have not been determined through local planning efforts to provide for riparian or wetland habitat." The springs listed above are developed, either for livestock watering or, in the case of Cabin Canyon, as one of the water sources for the city of Mesquite, Nevada. Thus, these areas are not by definition wetland/riparian areas, so there are no wetlands/riparian areas in this allotment.

Standard 3 – Desired Resource Conditions

Productive and diverse upland and riparian-wetland communities of native species exist and are maintained. If Standard 3 is achieved, ecological sites contain productive and diverse communities of native species, resulting in proper ecosystem function. Under Standard 3, when Desired Plant Community (DPC) objectives for wildlife habitat are being achieved, the site is producing desirable forage, cover and soil protection. For wildlife this means "healthy" rangeland should provide the necessary food and cover to sustain the species.

All key areas will be measured against the ecological site DPC objectives. The objectives will be used to determine whether standards for land health are being achieved or not achieved, and if not achieved, is significant progress being made toward achievement.

2. Allotment Management Plan

Allotment Management Plan Specific Objectives[4]

Key Area #1 (within critical desert tortoise habitat)
Maintain desirable browse species at about 53% composition and increase perennial grass cover from 0 to 5% in 15 years.

(Key Area # 2 (within critical desert tortoise habitat)
Maintain key browse species at 21% but increase perennial grass from 0-5% of the species composition in 15 years.

Key Area #3
Maintain key species composition of 37% in 15 years.

Key Area #4
Increase key species composition from 1% to 20% in 15 years

Key Area #7
Increase key species composition from 18% to 30% in 15 years.

3. Desired Plant Community (DPC) Objectives

The Arizona Strip Field Office RMP and Grand Canyon-Parashant National Monument RMP direct the BLM to establish DPC objectives to measure resource response to management activities, as does Standard 3 of the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration. The Arizona Standards for Rangeland Health and Guidelines for Grazing Administration state, "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."

DPC objectives were developed during this evaluation process by an interdisciplinary team of resource specialists. The species composition objectives were developed by consulting the Ecological Site Guides, developed by the NRCS, and site specific

[4] Current frequency objectives found in the allotment management plan (AMP) will be analyzed in this assessment. DPC objectives developed for this assessment will also be analyzed in this document and will replace the AMP objectives in future assessments.

information of the potential of the site to produce vegetation. Site guides used are from the Soil Survey of Shivwits Area, Arizona (Part of Mohave County) USDA-NRCS, 2004. The DPC objectives implement RMP objectives and reflect vegetative composition and attributes important for desert tortoise habitat, as well as habitat requirements for other species. The objectives are set to be achieved within a time interval of 20 years from permit renewal. DPC objectives are expressed in figures of Composition by Weight (CBW). Composition data is collected using the Dry Weight Rank sampling method.

Key Area #1 (within desert tortoise habitat)

Ecological Site: Limy Upland (6 to 9 inch precipitation zone [p.z.])

- Maintain total ground cover between 20 and 40%.
- Maintain native browse (burrobrush, littleleaf ratany, goldeneye) at 45-60% CBW
- Maintain native shrubs (creosotebush, desert rue) at 10-20% CBW
- Maintain native forbs (desert globemallow, plantain, desert marigold) at 1-10% CBW.

Key Area #2 (burned in 2005) (within desert tortoise habitat)

Ecological Site: Limy Upland Deep 6-9"

- Maintain total ground cover between 25 and 45%.
- Increase perennial grass (big galleta, threeawn) at 2-8% CBW.
- Maintain native browse (burrobrush, littleleaf ratany, Mormon tea) at 5-15% CBW
- Maintain native shrubs (catclaw, creosotebush, burrobrush, desert almond) at 25-45% CBW.
- Maintain native forbs (desert globemallow, plantain, desert marigold) at 1-10% CBW.

Key Area #3 (burned in 2005)

Ecological Site: Limestone Slopes (13 to 17 inch p.z.)

- Maintain total ground cover between 25 and 45%.
- Maintain native perennial grasses (threeawn, Indian ricegrass) at 5-15% CBW.
- Maintain native browse (cliffrose) at 2-8% CBW.
- Increase native shrubs (Yerba santa, longspine horsebrush) at 2-10% CBW.
- Maintain native forbs (desert globemallow, desert marigold) at 1-10% CBW.

Key Area #4 (burned in 1948)

Ecological Site: Loamy Upland (13 to 17 inch p.z.)

- Maintain total ground cover between 20 and 40%.
- Maintain native perennial grasses* (threeawn) at 3-15% CBW.
- Maintain native browse (Mormon tea, littleleaf ratany) at 8-15% CBW.
- Maintain native shrubs (goldenbush, desert rue, Yerba santa) at 45-55% CBW.

Key Area #7 (burned in 2005)

Ecological Site: Shallow Upland Calcareous (9 to 13 inch p.z.)

- Maintain total ground cover between 20 and 40%.

- Maintain native perennial grasses *(threeawn, sideoats grama, big galleta) at 15-30% CBW.
- Maintain browse (cliffrose, Mormon tea) at 5-15% CBW.
- Maintain native shrubs (desert almond, desert rue, Apache plume, yucca) at 20-30% CBW.
- Maintain native forbs (desert globemallow) at 1-10% CBW.

Rationale for the above objectives: The desired plant community was designed by the interdisciplinary team from the ecological site guide shown for each key area. The species and compositions listed above are generally those shown in the ecological site guides. Other species desired in the plant community are also included, as they will ensure perennial forage for wildlife and livestock, as well as soil protection. The species not shown in the site guides are still native species and are appropriate for the ecological zone. Other species levels in the composition not shown in the guide are chosen as desired due to their presence in the transition stages of the early and mid seral stages. The current functional groups of plants also provide habitat for desert tortoises (key areas 1 and 2).

Summary:
As described above, the allotment is partially within designated critical habitat for the Mojave population of the desert tortoise – key areas 1 and 2 are in desert tortoise habitat (see map on page 91 of this report). The physical and biological habitat features (referred to as primary constituent elements) that are essential for the conservation of the species are:

1) Space for individual and population growth, and for normal behavior;
2) Food, water, or other nutritional or physiological requirements;
3) Cover or shelter;
4) Sites for breeding, reproduction, rearing of offspring; and
5) Habitats that are generally protected from disturbance or are representative of the historic geographical and ecological distributions of a species (USFWS 1994b).

Vegetation attributes for composition, structure, and cover are used to detail a site-specific plant community which will provide the primary constituent habitat elements for desert tortoise. The DPC objectives for this allotment (presented as functional groups) provide for known desert tortoise forage plants (native perennial grasses and forbs – Element #2 above), or those important to their needs for cover, shelter or denning (browse and other shrub species – Element #3 above) – see Table 2. The DPC objectives were established and based upon monitoring data collected at each key area and the associated species in the ecological site guides. The DPC objectives are also intended to provide forage and habitat components for other wildlife, forage for livestock, ground cover to protect the soils and watershed values, and ethno-botanicals for the Southern Paiute (Kaibab and Shivwits).

In setting the species composition levels of each functional group, it is recognized that all species vary in levels across a given site and over time. A range is therefore given for each species due to this natural variance, which is shown in the vegetation data in

Appendix C and Table 5.

Table 2. Important Forage and Shelter Plants for the Desert Tortoise

Grasses	
Sixweeks threeawn	*Aristida adscensionis*
Grama	*Bouteloua* sp.
Fluffgrass	*Erioneuron pulchellum*
Big galleta	*Hilaria rigida*
Bush muhly	*Muhlenbergia porteri*
Indian ricegrass	*Achnatherum hymenoides*
Sand dropseed	*Sporobolis cryptandrus*
Desert needlegrass	*Stipa speciosa*
Six-weeks fescue	*Vulpia octoflora*
Shrubs	
Burrobrush	*Ambrosia dumosa*
Blackbrush	*Coleogyne ramosissima*
Eastern Mojave buckwheat	*Eriogonum fasciculatum*
Mormon tea	*Ephedra* sp.
Spiny hopsage	*Grayia spinosa*
Littleleaf ratany	*Krameria parvifolia*
Creosotebush	*Larrea tridentata*
Forbs	
Trailing Windmills	*Allionia incarnata*
Two-seeded milkvetch	*Astragalus didymocarpus*
Woolly bottlebrush	*Camissonia boothii*
Desert pincushion	*Chaenactis fremontii*
Cryptantha	*Cryptantha* sp.
Rattlesnake weed	*Euphorbia albomarginata*
Sandmat	*Euphorbia micromera*
Deer vetch	*Lotus strigosus*
Desert dandelion	*Malacothrix glabrata*
Curvenut combseed	*Pectocarya recurvata*
Plantain	*Plantain* sp.
Desert globemallow	*Sphaeralcea ambigua*

Source: U. S Fish and Wildlife Service 2010a

According to monitoring data, most of the above plants occur in the allotments in the Arizona Strip and Southeast Nevada, including Mesquite Community, that are within desert tortoise critical habitat. Many of the perennial plants listed above are in the key areas. However, it should be noted that not all of the species occur at all of the key areas due to site variation (see the trend and ESI in Tables 4 and 6). The ecological site guides allow for annual plants, but do not list them by species due to their great variation in occurrence year to year. Annual plants are important food sources for the tortoise (Ernst and Lovich 2009; Oftedal et. al 2002). The annual forbs listed above occur in the key areas of this allotment, but last only two months in the spring and then

turn to dried plant litter. They fluctuate in abundance according to the winter and spring moisture. If monitoring is done while the annuals are present, they are recorded for reference.

C. Issues identified in scoping.

1. Issues relating to Rangeland Health

a. 15,273 acres burned in 2005 and those acres do not meet Standard #3

b. Desert tortoise occur on the Mojave Desert part of the allotment and populations are still declining

c. Wildlife access to water on Lime Kiln, Narrow, Middle Canyon, Buck and Upper/Lower Heck Hole springs and pipelines

d. Lack of big galleta grass along the boundary with the Cottonwood Allotment

e. Exotic and invasive species

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

a. Dumping along Lime Kiln Road.

A 2008 clean-up occurred with the public from Mesquite, Nevada volunteering by loading the garbage into dumpsters. However, some trash remains in isolated areas and new trash accumulates over time. Clean ups by BLM personnel have periodically occurred since 2008, and enforcement of dumping regulations also occurs.

IV. Management Evaluation

A. Purpose of Evaluation

The purpose of this land health evaluation is to determine if the existing soil, water, and vegetative resources are meeting/making progress toward meeting or are not meeting the Arizona Standards for Rangeland Health. These resources are managed according to the Arizona Strip RMP, Grand Canyon-Parashant National Monument RMP, Las Vegas Field Office RMP, the allotment management plan, and other activity plans, which identify terms and conditions for management of public lands within the Mesquite Community Allotment. If the current livestock grazing practices are determined to be causing non-attainment of Standards, then they will be modified to comply with the Guidelines for Grazing Administration. This assessment will also evaluate and update existing activity plan objectives to ensure multiple use objectives are tied to the indicators for rangeland health.

B. Summary of Studies Data

1. Livestock Actual Use

The licensed number is 201 head of cattle (2,406 AUMs). This number was run on a yearlong basis every year until 2006; since 2006, cattle are removed from the desert tortoise critical habitat portion of the allotment from March 16 to October 14 and brought back from October 15 to March 15 (to avoid grazing during the active tortoise season). The permittee willingly decreases AUMs in years with below average precipitation and lower vegetative production to ensure that the allotment condition, vegetative diversity, and trend continue to improve; however, the allotment capacity remains at 2,406 AUMs. Actual use for the Mesquite Community Allotment is displayed in Table 3.

Table 3. Actual Use Data

Year	AUMs Used	% of Permitted Use
2007	1,401	58%
2008	612	25%
2009	1,605	67%
2010	1,611	67%
2011	1,611	67%
2012	1,506	63%
2013	1,493	62%
2014	1,799	75%

* 2008 livestock numbers were reduced voluntarily by the permittee in response to 2007 precipitation being 55% of normal.

2. Precipitation

Precipitation data for this allotment is collected at the Cottonwood Wash Exclosure rain gauge. Precipitation over the past 10 years (2005 through 2014) has been average or above average for five years and below average for the other five years. See Appendix C for detailed historic precipitation data.

Precipitation and weather patterns affect the amount of vegetation produced on the allotment; fluctuating amounts and the seasonal distribution of precipitation results in varying amounts of forage from year to year. Normal grazing schedules and livestock management practices may have to be modified during periods of drought. WO IM No. 2002-120 and Arizona IM No. AZ-2002-025 outline guidance strategies when evaluating impacts to rangelands due to drought. The BLM works with livestock permittees to voluntarily reduce livestock numbers on public lands, or portions of or entire allotments may be temporarily closed. Livestock operators and the BLM jointly develop short and long-term strategies for modifying livestock use on public land to ensure the conservation and protection of soil and vegetation resources. For example, the BLM works

cooperatively with livestock permittees to match available forage with appropriate livestock numbers. Historically, most livestock operators impacted by drought conditions have voluntarily reduced their numbers without issuance of formal livestock closure notices (such as occurred in 2008, as demonstrated in Table 3 above). However, if the BLM determines immediate protection of the range resource is merited; closures or modifications to an allotment may be issued effective upon issuance under the authority of 43 CFR 4110.3-3.

3. Utilization

Utilization is defined as the proportion of current year's forage production that is consumed or removed by grazing 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.

This allotment has a 45% utilization objective in the pasture within desert tortoise habitat (key areas 1 and 2); the other pastures (key areas 3, 4 and 7) have a 50% utilization objective. Table 4 (below) shows the utilization data that has been compiled for this evaluation. If a cell is blank it means there was no reading for that year for that species. Zeros mean there was no use on the species in that year.

Table 4. Utilization Data –Mesquite Community Allotment

Key Area #1 (within desert tortoise habitat)																			
Species	**Year**																		
	81	**85**	**86**	**87**	**88**	**90**	**91**	**92**	**93**	**99**	**00**	**02**	**06**	**07**	**08**	**09**	**11**	**12**	**13**
Burrobrush	0	12	21	22	0	6	4	3	0	3	0	0	0	0	8	0	9	15	7
Mormon tea	0	0	0	0	0	22	0	3	12	17	0	0	0	0	0	0	0	0	0
Littleleaf ratany	17	34	22	10	3	15	3	3	0	15	0	1	0	0	0	0	11	16	6
Rayless goldenhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	20	3
Average	**17**	**25**	**21**	**20**	**3**	**11**	**3**	**3**	**6**	**9**	**0**	**1**	**0**	**0**	**8**	**8**	**10**	**16**	**5**

Key Area #2 (within desert tortoise habitat)																				
Species	**Year**																			
	81	**83**	**85**	**86**	**87**	**88**	**90**	**91**	**92**	**93**	**99**	**02**	**04**	**06**	**07**	**08**	**09**	**11**	**12**	**13**
Burrobrush	0	0	0	0	0	0	0	10	0	17	0	0	0	0	0	0	15	30	12	4
Big galleta	55	62	47	56	62	51	42	41	5	0	0	28	10	10	70	62	52	38	40	24
Mormon tea	40	33	57	68	40	41	45	31	3	28	24	66	9	3	8	60	26	36	29	21
Littleleaf ratany	0	0	0	0	0	0	42	10	3	0	0	0	0	0	0	0	0	0	0	0
Threeawn	0	0	0	0	0	0	27	9	3	0	0	0	0	0	52	0	0	0	0	0
Average	**41**	**47**	**53**	**62**	**48**	**44**	**40**	**19**	**4**	**25**	**13**	**58**	**9**	**4**	**18**	**61**	**29**	**34**	**32**	**14**

Key Area #3														
Species	**Year**													
	82	**83**	**84**	**86**	**87**	**88**	**89**	**91**	**01**	**04**	**06**	**07**	**09**	**10**
Cliffrose	25	39	33	24	10	5	28	0	0	0	33	25	0	0

Desert globemallow	0	68	40	38	70	0	0	0	85	0	17	38	0	0
Mormon tea	58	40	70	0	0	0	30	0	0	0	0	0	0	0
Muttongrass or squirreltail	52	44	71	50	66	15	35	0	36	0	0	0	0	0
Indian ricegrass	43	65	0	0	43	54	74	0	36	0	0	0	0	0
Threeawn	0	0	55	48	70	24	55	0	77	0	12	47	0	0
Average	**44**	**49**	**52**	**38**	**48**	**24**	**56**	**0**	**60**	**0**	**18**	**40**	**0**	**0**

Key Area #4									
Species	**Year**								
	82	**83**	**84**	**86**	**87**	**88**	**90**	**91**	**06**
Cliffrose	44	55	27	7	10	5	8	5	2
Mormon tea	35	34	0	8	10	0	17	0	5
Average	**43**	**48**	**27**	**7**	**10**	**5**	**10**	**5**	**2**

Key Area #7															
Species	**Year**														
	82	**83**	**84**	**85**	**86**	**87**	**88**	**91**	**01**	**04**	**06**	**07**	**08**	**09**	**11**
Cliffrose	30	37	38	38	37	14	18	13	43	37	2	0	0	0	7
Mormon tea	49	38	59	59	42	32	14	15	74	53	0	0	0	50	0
Indian ricegrass	54	63	50	50	60	0	0	0	0	0	5	0	0	0	0
Threeawn	0	72	0	15	0	0	10	12	0	0	0	0	0	62	12
Average	**35**	**38**	**44**	**44**	**38**	**20**	**15**	**13**	**54**	**43**	**3**	**0**	**0**	**43**	**10**

Average utilization at Key Area #1 (in desert tortoise habitat) has never exceeded the maximum allowable of 45%. However, since 1981, average utilization exceeded 45% six times at Key Area #2. The most recent time this occurred was in 2008, which was following a year of drought (annual precipitation was 55% of normal). However, increased allotment supervision has resulted in 45% utilization not being exceeded since 2008. Average utilization exceeded 50% of the annual growth of forage three times since 1982 at Key Area #3, no times at Key Area #4, and once at Key Area #7. It should be noted that none of these exceedances have occurred in recent years, and in most years utilization is light.

4. Trend

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

Trend monitoring was collected using the Pace-Frequency method, which measures the occurrence frequency of forage and non-forage vegetative species. Cover data, which determines the percent of bare ground, litter, rock and live basal vegetation, is also collected. Ground cover is determined by dividing the total number of hits for all categories except bare ground by the total number of hits (including bare ground) – see page 73 of TR 1734-4 (BLM 1996). Change in ground cover is an important aspect of

trend. It is also used to determine if favorable or unfavorable conditions exist for germination and establishment of new plants, and to estimate nutrient cycling. In addition, the occurrence frequency of all plant species is collected. The first readings established a baseline for comparison to all future readings. Overall trend is considered up when the sum percentages of key species, basal cover, and surface litter increase by 10+ percent from the first reading to the last shown reading. The trend is static or not apparent if it shows a change of 0 to 10% or 0 to -10% from the first to the last reading. Down trend is a reading with the sum of those attributes (key species, basal cover and surface litter) of more than -10% from the first reading.

The following table (Table 5) shows the key species frequency, which is the ratio between the number of sample units that contain key species and the total number of sample units, comparing the most recent data to the base year. Overall trend at each key area is the direction of change in frequency observed from the initial reading (base year) and the current reading, as depicted by the arrows, i.e., (↗) upward, (↘) downward, and (→) static or no apparent trend.

Table 5. Mesquite Community Allotment Trend Data

Species	*Key Area #1 (unburned, within desert tortoise habitat)*					
	1984	**1988**	**1991**	**2001**	**2004**	**2010**
Buckhorn	6	3	10	7	9	7
Burrobrush*	22	11	19	20	54	32
Cholla	6	0	1	0	1	0
Creosotebush	8	4	12	15	32	9
Desert rue	1	0	0	2	1	0
Littleleaf ratany*	1	1	5	0	11	3
Rayless goldenhead*	5	4	4	2	7	14
Yucca	2	1	2	1	2	0
Annuals	0	0	0	0	189	67
Ground Cover						
basal vegetation	2	6	19	11	2	5
surface litter	11	14	7	19	34	35
Overall Trend for Key Area #1: (↗) Upward						

Species	*Key Area #2 (burned in 2005, within tortoise habitat)*					
	1985	**1988**	**1991**	**2001**	**2007**	**2012**
Beavertail	0	0	0	0	1	0
Big galleta*	1	1	1	0	1	0
Blackbrush	1	1	1	1	1	0
Desert trumpet	3	0	5	2	0	16
Brittlebush	3	3	4	2	0	3
Burrobrush*	2	1	1	1	0	T
Catclaw	0	0	8	5	9	15
Cheesebush	0	0	3	2	0	T
Cholla	1	0	0	1	1	T
Creosotebush	1	0	1	1	0	1
Desert globemallow	0	0	0	1	1	1
Desert rue	13	10	21	10	1	2

Fluffgrass	22	31	23	31	16	0
Goldenhead*	0	0	2	2	0	T
Littleleaf ratany	1	1	1	3	0	1
Marigold	7	0	7	3	2	15
Mormon tea*	4	4	5	4	2	1
Snakeweed	1	1	0	2	0	0
Threeawn	6	6	11	1	1	0
Annuals	0	0	104	7	10	103
Ground Cover						
basal vegetation	3	5	9	7	3	1
surface litter	18	66	16	58	8	45
Overall Trend for Key Area #2: (↗) Upward						

Species	***Key Area #3 (burned in 2005)***					
	1984	**1988**	**1991**	**2001**	**2007**	**2013**
Apache plume	2	1	2	3	5	0
Blackbrush	0	0	0	2	0	0
Cliffrose*	5	3	8	19	5	3
Desert almond	0	0	0	1	0	0
Desert globemallow*	16	13	12	30	40	69
Desert rue	0	1	0	0	1	0
Desertparsley	0	0	0	0	0	15
Indian ricegrass*	0	0	1	0	1	4
Littleleaf ratany	0	0	0	0	0	1
Longspine horsebrush	0	0	0	0	0	2
Maraposa lily	0	0	0	0	0	7
Marigold	1	0	0	0	0	0
Mormon tea*	0	0	0	0	0	1
Needlegrass	0	0	1	0	0	0
New Mexico thistle	0	0	0	0	0	1
Prickly pear	1	1	1	5	7	4
Redstem stork's bill	0	0	0	0	0	44
Snakeweed	44	48	70	9	1	28
Squirreltail	1	10	7	0	0	0
Threeawn*	5	2	5	3	6	38
Wolfberry	1	1	2	0	0	0
Yerba santa	24	9	12	0	2	0
Annuals	0	2	1	0	1	131
Ground Cover						
basal vegetation	2	2	19	6	1	4
surface litter	27	48	16	44	36	55
Overall Trend for Key Area #3: (↗) Upward						

Species	***Key Area #4 (not recently burned – burned in 1948)***					
	1984	**1988**	**1991**	**2001**	**2008**	**2013**
Banana yucca	0	0	0	0	0	4
Blackbrush	2	2	2	3	4	1
Buckwheat	0	0	4	3	5	1
Cholla	0	0	8	2	2	4
Cliffrose*	1	0	1	0	3	0
Desert rue	4	3	14	9	11	9

Goldenbush	2	0	0	0	4	20
Hedgehog cactus	0	0	0	0	0	1
Juniper	11	3	15	16	19	16
Littleleaf ratany	0	0	0	0		8
Maraposa lily	0	0	0	0	0	14
Milkvetch	0	0	0	0	0	1
Mormon tea*	2	0	0	0	1	2
Pricklypear	5	2	0	3	6	8
Scrub oak	1	0	1	2	2	3
Snakeweed	31	24	19	14	7	12
Threeawn	0	0	0	1	0	0
Yerba Santa	15	12	9	12	7	18
Annuals	0	0	0	0	0	18
Ground Cover						
basal vegetation	2	5	27	18	2	3
surface litter	19	17	14	16	46	41
Overall Trend for Key Area #4: (↗) Upward						

Species	***Key Area #7 (burned in 2005)***						
	1981	**1984**	**1988**	**1991**	**2001**	**2007**	**2012**
Apache plume	3	2	0	0	3	2	2
Big galleta	0	0	0	0	0	0	T
Blackbrush	2	5	1	4	6	1	T
Bottlebush squirreltail	0	0	3	0	0	0	T
Cholla	0	1	0	1	0	0	0
Cliffrose*	15	19	5	20	17	1	2
Desert almond	0	1	0	1	8	1	2
Desert globemallow	7	24	11	11	1	15	10
Desert rue	10	4	6	15	9	2	4
Guara	0	0	0	0	0	1	0
Marigold	2	6	6	8	2	2	0
Mormon tea*	2	4	3	3	1	2	1
Sideoats grama	0	0	0	0	0	1	T
Snakeweed	61	54	45	35	24	4	19
Threeawn*	30	13	3	2	2	6	9
Wolfberry	0	1	0	0	0	0	0
Yucca	0	5	3	8	0	5	4
Annuals	0	0	0	4	0	2	76
Ground Cover							
basal vegetation	6	9	5	22	16	2	2
surface litter	30	15	40	12	29	23	44
Overall Trend for Key Area #7: (→) Static							

* = key species

As shown in Table 5, the frequency for some key species has been variable since the key areas were established in the early to mid-1980s. Key areas 2 and 3 burned in 2005; the burn has had a strong effect on the succession of these plant communities. For example, desert globemallow, which responds well after fire, has dramatically increased at Key Area #3; threeawn has also sharply increased. Other species (such as cliffrose at key areas 3 and 7) have decreased post-burn.

Overall trend at a key area is determined by assessing the sum percentages of the following attributes: key species, live vegetation cover/basal cover, and ground cover (surface litter). Both basal cover and surface litter are important attributes when evaluating Standard #1. It is therefore possible to have one of the attributes, such as key species, remain static and have an overall trend of upward (or downward). Overall vegetative trend at key areas 1, 2, 3 and 4 is upward, while trend at Key Area 7 is static.

5. Lithology and Soils

a. Lithology

The Mesquite Community Allotment consists mainly of limestone, Navajo sandstone, gypsiferous mudstone, granite, and gneiss. Landforms are mountains, mesas, ridges, fan and stream terraces, fan terrace dunes, and cliffs that have slopes ranging from one to seventy percent. Soils are sandy, gravelly, or cobbly, shallow to very deep and well to excessively well drained.

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

04 Arizo gravelly sandy loam, 1 to 5 percent slopes, nonflooded, (coalescent fan piedmont), granite and gneiss; Limey Upland (Deep), 6" to 9" ppt

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

12 Blind family-Shelley complex, 5 to 15 percent slopes, moist, (fan piedmont), granite, gneiss; Sandy Loam (Gravelly), 9" to 12" ppt

13 Blind family-Shelley complex, 5 to 15 percent slopes, stony, (fan piedmont), granite, gneiss; Cobbly Limey Upland (Deep), 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, Navajo sandstone; Shallow Upland, 9" to 12"

42 Katzine-Rock outcrop-Yumtheska complex, 35 to 70 percent slopes, (mountain canyons and cliffs), Supai sandstone, Callville & Red Wall limestones; Limestone Slopes, 13" to 17"

43 Meadview-Cave complex, 2 to 30 percent slopes, stony, (fan terrace), limestone, volcanics; Meadview=Limey Upland (Deep), 6" to 9" ppt; Cave=Limey Upland, 6" to 9" ppt

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

57 Nipton-RO-Nickel family complex, 10 to 50 percent slopes, (mountains), gneiss schist, granite; Nipton=Granitic Hills, 9" to 12" ppt; Nickel family=Limey Upland, 9" to 12" ppt

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

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

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

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

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

81 Tsezhin very cobbly sandy loam, 5 to 15 percent slopes, (fan terraces), granite, gneiss, LS; Loamy Upland (Cobbly) Chaparral-PJ, 13" to 17" ppt

84 Virgin Peak-Rock outcrop complex, 10 to 70 percent slopes (mountain) granitics, gneiss; Granitic Hills (Stony), 13" to 17"

94 Yumtheska-Katzine-Rock outcrop complex, 5 to 50 percent slopes, moist (mountain) Supai sandstone, Callville & Redwall limestones; Limestone Slopes (Chaparral, PJ-Woodland), 13" to 17"

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

c. Soil Condition

Initial field work was done in conjunction with the RRT in 2009. Additional field observations, data and sample collection, and lab testing were done in the spring of 2012 and the results are shown in Table 6 (below).

Table 6. Soil Data for Mesquite Community Allotment

Soil Sample	Location	Texture	pH CaCO3	EC	Normal Bulk Density (Db) g/cc	Root restricting Db g/cc*	Sample Db g/cc	% Increase in Db	% Decrease in Porosity
MC-Db1 (3-7") Arizo, mu 04	T39N, R16W sec 32 SESE	gr- sandy loam	8.0 es	0.24	1.40	1.75	1.38	minus 1.4	increase 2.3
MC-Db2 (1-5") Arizo, mu 04	T38N, R16W sec 10 SENW	gr- sandy loam	7.8 es-ev	0.30	1.40	1.75	1.48	5.7	6.4
MC-Db3 (1-5") Arizo, mu 04	T39N, R16W sec 27 NESE	gr- sandy loam	7.9 es-ev	0.15	1.40	1.75	1.39	minus 0.7	increase 0.6
MC-Db4 (1-5") Meadview, mu 43	T38N, R16W sec 17 NWNW	gr- sandy loam	8.1 ev	0.19	1.40	1.75	1.40	0	0

MC-Db5 (1-5") Blind, mu 13	T38N, R16W sec 17 SWNE	Vcb-sandy loam +	7.2 eo	0.31	1.35	1.70	1.58	17.0	18.5
MC-Db6 (2-6") Strych, mu 73	T38N, R15W sec 31 SENW	gr-loam -	7.9 es-ev	0.27	1.25	1.70	1.38	10.4	9.1

* NRCS soil quality information sheet "Rangeland Soil Quality – Compaction", May 2001. Most root systems are greatly affected at these Db levels, especially young grasses. The initiation of root restriction for many plants may start below these Db levels.

Except for the recent gravelly alluvial fans and sandy floodplains, most of the soils on the allotment are shallow to deep gravelly sandy loams over caliche or bedrock. Due to the compression resistant gravelly sandy textures, the soils have zero to moderate compaction, and all are well below root restricting bulk density. Very little sheet or rill erosion is evident, likely due to low precipitation, high infiltration rates of the sandy soils, some litter, and surface gravels and cobbles of 25 to 80 percent. Crypotgamic cover is fair to good except where gravelly desert pavement dominates the surface. As in the first field assessment, no significant areas of impacts detrimental to soils were found.

6. 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 (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 NRCS. 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 NRCS Ecological Site Guides, and were used to set the DPC objectives.

Ecological status is the present state of the vegetation at an ecological site in relation to the potential natural community (PNC). A PNC is "the biotic community that would become established if all successional sequences were completed without interferences by humans under the present environmental conditions". It may include "acclimatized or naturalized nonnative species" (BLM 2005 and 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" (BLM 2001). The BLM uses "potential natural community" terminology rather than "historic climax plant community" because PNC recognizes past influences by man. It is an expression of the relative degree to which the kinds, proportions, and amount of plants in a plant community resemble that of the PNC for the site. It is a coefficient of community similarity, which gives an ecological rating of the plant community.

Ecological status expresses the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the potential natural plant community for the site. Ecological status changes slowly for most of the sites in this area and seral stages should not be confused with Desired Plant Communities. Ecological status is reported in the following four classes, or seral stages, which are the developmental stages of ecological succession (and corresponds to percent similar to the PNC):

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

Table 7 displays ecological site inventory data for the Mesquite Community Allotment. The site guide used for the information below is the Soil Survey of Shivwits Area, Arizona, Part of Mohave County, NRCS, 1994.

Table 7. Mesquite Community Allotment Ecological Site Inventory Data

Key Area # 1: Limy Upland Deep 6-9" Last monitoring data collected in 2010 *(not burned)*			
Key Area and Plant Species	**Current Composition %**	**Site Guide Composition %**	**Current Score[5]**
Burrobrush*	50	35-45	45
Cholla	14	1-3	3
Creosotebush	10	25-35	10
Desert rue	2	1-5	2
Goldenhead	15	3-8	8
Littleleaf ratany*	6	1-5	5
Wirelettuce	1	0-1	1
Score: 74 – Late Seral			

[5] "Current score" = lower of either Column 2 (current composition) or Column 3 (site guide composition).

Key Area #2: Limy Upland Deep 6-9" Last monitoring data collected in 2012 *(burned in 2005)*			
Key Area and Plant Species	**Current Composition**	**Site Guide Composition %**	**Current Score**
Big galleta*	0	1-5	0
Brittlebush*	6	1-5	5
Catclaw	26	1-5	5
Creosotebush	2	25-35	2
Desert almond	2	1-5	2
Desert globemallow	2	1-5	2
Desert marigold	27	1-5	5
Desert trumpet	25	0-2	2
Fluffgrass	0	0-2	0
Littleleaf ratany	4	1-5	4
Mormon tea*	4	1-3	3
Opuntia spp	1	1-4	1
Threeawn	0	0-2	0
Score: 31 – Mid Seral			

Key Area #3: Limestone/Sandstone Cliffs 13-17" Last monitoring data collected in 2013 *(burned in 2005)*			
Key Area and Plant Species	**Current Composition**	**Site Guide Composition %**	**Current Score**
Cliffrose*	1	2-5	1
Desert globemallow*	48	0-1	1
Indian ricegrass*	3	5-10	3
Longspine horsebrush	3	0-1	1
Mormon tea*	1	0-1	1
Opuntia species	4	1-3	3
Perennial forbs	1	3-6	1
Littleleaf ratany	1	0-1	1
Snakeweed	24	0-1	1
Threeawn*	15	0-1	1
Score: 14 – Early Seral			

Key Area #4: Sandy Loam Upland 13-17", Cobbly Surface Last monitoring data collected in 2013 *(burned in 1948)*			
Key Area and Plant Species	**Current Composition**	**Site Guide Composition %**	**Current Score**
Blackbrush	1	45-50	1
Cholla	3	0	0
Desert rue	8	0-1	1
Hedgehog cactus	1	0	0
Juniper	22	10-20	20
Littleleaf ratany	8	0	0

Mormon tea*	2	0-1	1
Narrowleaf goldenbush	22	5-10	10
Prickly pear	7	0-1	1
Scrub oak	1	10-15	1
Snakeweed	6	0-1	1
Yerba Santa	18	0-1	1
Yucca	3	0-1	1
Score: 38 – Mid Seral			

Key Area #7: Shallow Upland Calcareous 10-14" Last monitoring data collected in 2012 *(burned in 2005)*			
Key Area and Plant Species	**Current Composition**	**Site Guide Composition %**	**Current Score**
Apache plume	4	0-2	2
Big galleta	2	5-10	2
Cholla	1	1-2	1
Cliffrose*	6	1-3	3
Desert almond	4	1-3	3
Desert globemallow	13	1-3	3
Desert rue	8	0	0
Mormon tea*	4	3-5	4
Sideoats grama	2	1	1
Snakeweed	27	1-2	2
Threeawn*	23	1	1
Yucca	7	2-5	5
Score: 27 – Mid Seral			

* = key species

Discussion:

This allotment has had long term fire influence with fire playing a role in the ecological status on this allotment, especially on the east side of the Virgin Mountains (outside of tortoise habitat). There is oral history and historic photographs which show fires in the 1940s and on through the decades. The burned areas eventually all trend back to shrubs and trees, until reburned. To get the vegetation back to a blackbrush dominated range will take a century or more after a fire, with no reburns and depending on the fire intensity. Key Area #1 is the only key area on this allotment that is currently in late seral. Key Area #3 is in early seral as a result of the 2005 fire. This key area, as well as key areas #2 and #7 were in mid seral prior to the fire due to periodic burns. Another key area (#4) is slowly recovering from a fire that occurred in 1948; however, this key area is on the low precipitation end of the ecological site description (ESD), exhibits soil inclusions from multiple soil types (meaning the vegetation present varies somewhat from that predicted in the ESD), and fire has allowed blackbrush to be replaced by other shrub species, resulting in a mid seral rating.

Weather, next to fire, is the most powerful influence on vegetative trend. Wet weather promotes faster recovery of vegetation from fire and/or grazing. Drought in a desert ecosystem can markedly delay recovery and cause accelerated mortality of vulnerable species of vegetation communities.

Creosotebush and burrobrush are two major components of the Mojave Desert plant community. If one of the major species exhibits low occurrence, it lowers the score. That is the case at Key Area #2, which burned in 2005 – creosotebush is currently at 2% composition (the site guide suggests 25-35% composition for this species). Key areas 1 and 2 are in desert tortoise critical habitat. Key Area #1, which has not burned, is shrub dominated range and is in a late seral stage.

The mid elevation ranges are all originally blackbrush dominated areas and the high elevation ranges are originally pinyon/juniper and interior chaparral ranges. Key areas 3, 4 and 7 should be pinyon/juniper, manzanita and turbinella oak dominated ranges, but all three key areas have burned and (in the case of key areas 3 and 7) burned again in 2005 and now have early or mid seral vegetation such as desert globemallow, snakeweed, Indian ricegrass and big galleta growing on them.

In the early 1990s, an ecological site inventory was completed on the Mesquite Community Allotment (see Table 8). This data represents the ecological status and acres of each site. As depicted in these data, there can be a different ecological status within sites due to natural variability in such elements as soil texture and depth, aspect, and surface and subsurface chemistry.

Table 8. Mesquite Community Ecological Site Inventory Summary

Mesquite Community Allotment #4832			
Ecological Site Inventory Summary			
Ecological Site	**Acres**	**Percent of Allotment**	**Ecological Status**
Shallow Upland 6-9"	1,269	3%	Late Seral
Shallow Upland 6-9"	580	2%	PNC
Limy Upland Deep 6-9"	6,350	17%	PNC
Limy Upland Deep 6-9"	2,445	6%	Late Seral
Granitic Hills 7-10"	155	1%	Mid Seral
Granitic Hills 7-10"	1,423	4%	Late Seral
Granitic Hills 7-10"	2,387	6%	PNC
Sandy Wash 7-11"	816	2%	Mid Seral
Sandy Wash 7-11"	540	1%	Late Seral
Unclassified	22,108	58%	Unclassified
Total Acres Inventoried: 38,073			
Acres unclassified (acres with no ecological classification, i.e., transition zones, rock outcrops, inclusions, etc.): 22,108 (58%)			
Inventoried acres in PNC Ecological Status: 9,317 (24%)			
Inventoried acres in Late Seral Ecological Status: 5,677 (15%)			
Inventoried acres in Mid Seral Ecological Status: 971 (3%)			

Since this survey was completed, some circumstances and conditions have changed. For example, fires have burned or re-burned portions of the allotment in the Virgin Mountains and Hatchet and Tom & Cull Valleys. In addition, some sites in the unclassified category now have been classified; however a site description or guide remains incomplete.

7. Special Status Species

Threatened, Endangered, and Candidate Species

California condor: The California condor was listed as endangered in 1967. In the late 1970s, the species was reduced to a population of less than 25 birds. The decision was made to bring all of the wild condors into captivity to begin a captive breeding program, the last wild condor was secured in April of 1987. In 1996, California condors were re-introduced into Arizona in the Vermilion Cliffs under the ESA's 10(j) rule (non-essential experimental). Additional releases of 16 condors occurred in 1998 and 1999 from the Hurricane Cliffs, northeast of Diamond Butte. The reintroduction program continues annually as captive-reared birds are released along the Vermilion Cliffs. Each released condor is equipped with radio telemetry or GPS satellite transmitters and numbered wing tags to allow observers to track their movements. As of October 2014, there were 74 condors in the wild in northern Arizona (The Peregrine Fund 2015).

Condors range widely, easily covering over 100 miles in a day, and their current range includes the entire Arizona Strip, throughout the Grand Canyon, into adjacent Utah and Nevada, and south of the Grand Canyon in Arizona. Condors are most commonly observed near the release site on the Vermilion Cliffs, at Navajo Bridge near Marble Canyon, on the Kaibab Plateau, and the South Rim of the Grand Canyon, although they are also now roosting in Southern Utah near Zion National Park and along the Kolob Plateau. They may fly over and feed on carrion in this allotment, although it would be a rare event for condors to occur in the area of this allotment (USFWS 2011a). The Mesquite Community Allotment is within the non-essential experimental population area for the species.

Mexican spotted owl: The Mexican spotted owl was listed as threatened on April 15, 1993. The range of the Mexican spotted owl extends from the southern Rocky Mountains in Colorado and the Colorado Plateau in central and southern Utah, southward through Arizona and New Mexico and into northern Mexico. Although the Mexican spotted owl's entire range covers a broad area of the southwestern United States and Mexico, it does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, uneven-aged forests, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico. On the Colorado Plateau (which includes the majority of the Arizona Strip), spotted owls use narrow, steep-walled canyons where ledges and caves provide cover from high temperatures, as well as nest sites and foraging habitat. In essence, complex, rocky

terrain has been substituted for old-growth forest (Willey and Ward 2003). The Arizona Strip District is surrounded by areas where Mexican spotted owls have been detected, including Grand Canyon, Zion, and Canyonlands national parks, and Grand Staircase-Escalante National Monument.

Designated critical habitat was established for this species in 2001 and revised in 2004. No designated critical habitat occurs on this allotment. However, a tool for predicting suitable canyon habitats that may have higher potential for species occupancy and nesting birds than other nearby canyons is the Willey and Spotskey Mexican spotted owl habitat model (created in 1997 and revised in 2001). This model uses a geographic information system to identify key features of owl habitat and then map the extent of suitable habitat (Willey and Spotskey 2000). The model uses terrain parameters to determine depth and width of canyons (owls need cooler microsites for nesting and roosting) and other features (such as distance to water and north facing cliff sites). The model predicts the canyons most likely to support nesting owls; from this it can then be determined if any "higher quality" habitat (according to the model) exists. It is important to note that any model is only an analysis tool, and experience with the current owl model has shown it to be accurate in some cases, but not in others (such as delineating cliff faces outside of canyons as high potential owl habitat).

The Mesquite Community Allotment contains a small amount of habitat that is considered potential Mexican spotted owl habitat by the 1997 Spotskey-Willey habitat model. Eighteen separate habitat polygons totaling approximately 216 acres are scattered through the mountainous portion of the allotment on the Arizona side (the model is not available at this time for the Nevada side). Most of the sites identified as potential habitat are within the Lime Kiln Canyon area, with a few in the Virgin Mountains to the west. All of these sites were visually surveyed to assess their actual suitability for owls. Although technically considered to be within a canyon, much of the habitat falls on mountainsides and thus is extremely exposed; the other "canyon" wall is often far away and provides absolutely no shelter and no cool microsites. There are several locations where the canyon is somewhat narrower, and there are numerous fins and vertical fractures in north and northeast-facing cliffs providing some shade; however, most of these locations do not have any deep shady pockets for nesting or roosting sites. Vegetation within the modeled habitat consists mostly of scattered pinyon-juniper woodland, Joshua trees, and Great Basin scrub and lacks multistory vegetation. There is no riparian vegetation present to indicate a reliable fresh water source. The general assessment indicates that the majority of the potential habitat in the Mesquite Community Allotment is not suitable for Mexican spotted owls, mostly due to its overall exposure. This habitat has not been surveyed for spotted owls and no owls have been observed on the allotment or elsewhere within this portion of the Arizona Strip.

Mojave Desert tortoise: The Mojave population of the desert tortoise was listed under the ESA as threatened on April 2, 1990 (USFWS 1990). Critical habitat was designated on February 8, 1994 (USFWS 1994b). The recovery plan developed in 1994 (USFWS 1994a) divided the range of the desert tortoise into six recovery units and established 14 desert wildlife management areas (DWMAs) throughout the recovery units. Recovery

units for the desert tortoise are special units that are geographically identifiable and are essential to the recovery of the entire listed population. DWMAs are areas where recovery efforts are concentrated. Establishment of recovery units and DWMAs was intended, in part, to facilitate an ecosystem approach to land management and desert tortoise recovery, as stipulated by section 2(b) of the ESA. The recovery plan was revised in May 2011 and recovery units were adjusted in light of new information, with the goal of balancing both distinctiveness and variability to ensure that local adaptation and critical genetic diversity are maintained since the long-term persistence of extensive, unfragmented habitats is essential for the survival of the species. The revised recovery plan reduces the number of recovery units from six to five, and changes some boundaries, although the collective boundary of recovery units (when taken as a whole) has not changed and still encompasses the entire range of the species. The recovery units were revised based upon identification of geographic barriers that coincide with observed variation among tortoise populations (USFWS 2011b). No areas in Arizona are affected by the recovery unit boundary revisions.

Under the revised recovery plan, the focal areas for recovery within each recovery unit are "tortoise conservation areas." These tortoise conservation areas include desert tortoise habitat within critical habitat units, ACECs, DWMAs, national monuments, national wildlife refuges, National Park Service lands, the Red Cliffs Desert Reserve, and other areas managed for desert tortoises. Tortoise conservation areas capture the diversity of the Mojave population of the desert tortoise within each recovery unit and are considered the minimum baseline within which to focus recovery efforts (USFWS 2011b).

In Arizona, Virgin Slope Area of Critical Environmental Concern (ACEC) is located within the Arizona Strip Field Office portion of the allotment. This ACEC was designated to protect the endangered desert tortoise and comprises 15,960 acres in the Mesquite Community allotment.

In Nevada, 6,736 acres of the Mesquite Community allotment are within the Gold Butte, Part C (Virgin Mountain) ACEC, managed to protect important wildlife habitat and important botanical species. An additional 1,674 acres of this allotment are within the Gold Butte, Part A Desert Conservation Area, managed to protect desert tortoise.

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 generally considered to be active from approximately March 15 through October 15, although activity has been observed as early as February and as late as November (depending on climatic conditions). 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. Tortoises use multiple burrows within their home ranges to aid in escaping temperature extremes while out foraging. During

droughts, tortoises forage over larger areas, increasing the likelihood of injury or mortality through encounters with humans and predators.

Documented threats to the Mojave population of the desert tortoise were identified in the 1994 recovery plan, and continue to affect the species today. The revised recovery plan (USFWS 2011b) discusses these threats to the desert tortoise and its habitat in detail; a brief summary of these threats is included below. Threats identified in the revised recovery plan include:

- ***The present or threatened destruction, modification, or curtailment of desert tortoise habitat or its range.***

This threat includes permanent habitat loss across large areas, such as urbanization, proliferation of roads and highways, off-highway vehicle activity, landfills and other waste facilities, poor grazing management, and habitat invasion by non-native invasive species. Another threat that has come to the forefront is the increased frequency of wildfire due to the invasion of desert habitats by non-native plant species. The proliferation of non-native plant species has contributed to an increase in fire frequency in tortoise habitat by providing sufficient fuel to carry fires, especially in the inter-shrub spaces that are mostly devoid of native vegetation. Alien annual grasses alter the fuel structure and fire behavior in the Mojave Desert making it more susceptible to frequent fires. Stems of alien annual grasses (including *Bromus* species) remain rooted and upright into the summer fire season and can accumulate over successive years whereas those of most native forbs crumble soon after senescence[6] (Brooks and Esque 2002). Approximately 6,250 acres of desert tortoise critical habitat within this allotment has burned in the past 20 years (much of it in 2005). Changes in plant communities caused by non-native plants and recurrent fire can adversely affect the desert tortoise by altering habitat structure and species available as food plants. Off-highway vehicle activity, roads, livestock grazing, agricultural uses, and other activities contribute to the spread of non-native species (or the displacement of native species) and the direct loss and degradation of habitats. For example, unmanaged livestock grazing, especially where plants are not adapted to large herbivorous mammals or where the non-native species are less palatable than the natives, can preferentially remove native vegetation, leaving non-native plants to grow under reduced competition (USFWS 2011b).

The revised recovery plan identifies livestock grazing and related actions as a threat to the species. Among the threats described from livestock grazing are competition for forage plants between the two species, trampling of tortoise by cows and crushing of burrow and shelter sites, crushing of tortoise by ATVs or other vehicles associated with livestock operations and increased predation on tortoise resulting from attraction of predators to livestock water developments.

Livestock grazing can have direct and indirect impacts on desert tortoises and their habitats through trampling that result in direct mortality, either while above ground or in burrows, and degradation of vegetation and soils, including the spread of non-native

[6] The growth phase in a plant or plant part (as a leaf) from full maturity to death.

plants or the displacement of native plants. The magnitude of the threat on desert tortoise populations remains unclear, and the degree of impact depends on a number of factors including, but not limited to, resiliency of soil and vegetation types, type of livestock, stocking rates, season of use, and years of use with and without rest (USFWS 2011b). Cattle can potentially step on tortoises and injure or kill them should cattle be present during the tortoise active season (March 15-October 15). The likelihood of this is greater for hatchling or juvenile tortoises that are small and presumably difficult for cattle to see. However, no livestock use is authorized within the Mesquite Community Allotment in desert tortoise habitat from March 16 to October 14 to avoid grazing during the active tortoise season. There are no records of tortoise being injured or killed as a result of trampling by livestock on this allotment, although there are records from the Beaver Dam Slope in both Arizona and Utah (north of this allotment).

Similarly, cattle can step on and cause burrows to cave in, thereby disturbing essential thermal cover or even entrapping/injuring/killing a tortoise within. Tortoise burrows and cover sites are typically on the side slopes of washes or beneath shrub or other vegetation mounds; burrows may be as much as 30 feet long. Livestock typically attempt to avoid stepping directly on holes or openings in the ground, as evidenced by the large number of intact ground squirrel burrows present on this allotment. There is a greater likelihood that livestock would step on and collapse a portion of a burrow away from the opening.

It is possible that ATVs could cause burrows to cave in, with the same effects as described in the previous paragraph. However, the Arizona Strip Field Office RMP restricts motorized vehicles to designated roads, with the exception of ATV use by livestock operators for administrative purposes. In the Nevada portion of the allotment, motorized vehicles are limited to existing roads and trails and dry washes. The use of ATVs in cattle ranching operations is not common on the allotment. Most OHV use by ranchers in the allotment occurs on established travel routes; some also occurs along fencelines to facilitate effective management of livestock. Since tortoise burrows and cover sites typically occur on the side slopes of washes, beneath shrubs, or beneath other vegetation mounds, it is not likely that these sites would be traveled over by an ATV or other motorized vehicle. No crushing of tortoise burrows by ranchers are documented on this allotment. In addition, no livestock use is authorized in tortoise habitat during tortoise active season (March 15-October 15), reducing the possibility of direct encounters.

Oldemeyer (1994) suggests that the primary evidence that grazing adversely affects desert tortoises relates to an overlap in food habits of livestock and tortoises. Grazing can also reduce the cover of shrubs and annual forbs. Studies in the eastern Mojave Desert on foraging behavior and food preferences of range cattle and desert tortoises showed that a dietary overlap (spatial and temporal) exists and that this overlap is greatest in the spring when fresh annual plants preferred by both desert tortoises and livestock are at their peak biomass and densities. Competition for these food plants is expected to be greatest when annual plants start to dry in the spring, before cattle and tortoises switch to other forage plants (Avery and Neibergs 1997).

Hohman and Ohmart (1980) reported that forbs comprised the largest percentage of the diet of cattle and tortoises on the Beaver Dam Slope[7]. These annual plants comprised over 95% of the diet for tortoises and 57% for cattle. Overlap between the diets of tortoises and cattle in April of 1977, was 40%. During May, forbs accounted for 54% of the diet of tortoises but only 5% for cattle, which had shifted to using palatable shrubs. During April, succulent annual forbs and grasses were present in low to moderate amounts, indicating some competition for forage was likely occurring. Permitted livestock use in tortoise habitat on these allotments is from October 16 to March 14. This allows for the growth of desert vegetation during the spring and summer without any grazing use, resulting in ephemeral plant growth for forage for desert tortoise without competition from livestock, thus giving tortoises a better chance at obtaining important food sources. Most of the food plants in their diet contain high levels of potassium, which are toxic and low levels of protein (nitrogen). Unlike many other reptiles, desert tortoises lack functional salt glands that would normally assist in eliminating excess potassium. When water is available, tortoises excrete liquid urine, but they are able compensate during times of little to no available water by going for months without discharging from their bladder (Dantzler and Schmidt-Nielsen 1966). During this time they will store uric acid in their bladders. Tortoises use this uric acid to accumulate potassium and other electrolytes in their bladder until opportunities to drink again allow them to eliminate (Jørgensen 1998, Oftedal 2002, Oftedal et al. 2002).

A potassium excretion potential (PEP) index is a method of measuring the impact of varying diets on an animals' osmoregulation and protein assimilation (Oftedal 2002). Plants with a high PEP index indicate that there is more than enough water and protein in the food for a tortoise to excrete excess potassium, while those with a low PEP index implies that there are inadequate amounts of water and nitrogen in food for the tortoise to excrete excess potassium. Thus, plants with high PEP help the tortoises both rehydrate and ultimately produce uric acid that can assist in binding the excess potassium. The availability of high PEP plants in the spring is especially important to tortoises that may not get the opportunity to drink during the hot summer months. Additionally, access to and ingestion of high PEP plants may be essential to short and long term nitrogen balance, overall health in the face of infectious disease, and female reproductive output (Oftedal 2002). Henen (2002) evaluated whether body reserves help females produce eggs independent of rainfall and food availability, and found that female desert tortoises used large seasonal and annual changes in metabolism and body water, protein and energy reserves to survive and produce eggs. Although lipid reserves are important to female desert tortoises, nitrogen or crude protein appears to be the primary limiting resource for producing eggs. By reducing metabolic rates 90%, females conserved enough body reserves to produce eggs during extreme drought conditions, which is an effective "bet-hedging" reproductive pattern in an extreme and unpredictable environment such as occurs in the Mojave Desert.

[7] The Beaver Dam Slope is located north of the Mesquite Community Allotment, at the base of the Beaver Dam Mountains.

A shortage of high PEP plants may underlie the steep population crashes of desert tortoises throughout the Mojave Desert (Oftadal 2002). Desert tortoises are known to actively seek out plants with a PEP index that are both uncommon and highly patchy (Jennings 1993). Major tortoise foods with a high PEP index include, but are not limited to, evening primrose (*Camissonia claviformis*) and desert dandelion (*Malacothrix glabrata*). The most important foods seem to be desert annuals, plants with a life span of less than 30 days and are generally only available from April to June (Ernst and Lovich 2009).

- ***Overutilization for commercial, recreational, scientific, or educational purposes.***

This threat refers to the deliberate maiming or killing of tortoises (previously referred to as vandalism) and collection of desert tortoises by humans for food or as pets were cited as potential threats to the species. Data and anecdotal observations indicate that collection for personal or commercial purposes was significant in the past. While illegal collection of desert tortoises still occurs and collection could possibly impact local populations, there is no quantitative estimate of the magnitude of this threat (USFWS 2011b), and it is unknown whether this occurs on the Mesquite Community Allotment.

- ***Disease or predation.***

To date the available evidence indicates that upper respiratory tract disease (URTD), as caused by the bacteria *Mycoplasma agassizii* and *M. testudineum*, is probably the most important infectious disease affecting desert tortoises. Less is known about other diseases that have been identified in the desert tortoise (*e.g.*, herpes virus, cutaneous dyskeratosis, shell necrosis, bacterial and fungal infections, and urolithiasis or bladder stones).

In the 1970s, desert tortoises with signs of the disease were observed on the Beaver Dam Slope of Arizona/Utah, a site where many captive tortoises were being released. Surveys in 1989 and 1990 indicated that URTD was widespread on the Beaver Dam Slope (Jacobson 1992), which is north of the Mesquite Community Allotment (and on the opposite side of the Virgin River). Disease has been considered an important threat to the desert tortoise since its emergency listing in 1989. Changing ecological conditions as a result of natural events or human-caused activities may stress individual tortoises and result in a more severe clinical expression of URTD (Brown et al. 2002). However, what is currently known with certainty about disease in the desert tortoise relates entirely to individual tortoises and not populations; virtually nothing is known about the demographic consequences of disease (Tracy et al. 2004). Disease is a natural phenomenon in wild populations of animals and can contribute to population declines by increasing mortality and reducing reproduction. The disease probably occurs mostly in relatively dense desert tortoise populations, as mycoplasmal infections are dependent upon higher densities of the host (Tracy et al. 2004). The level of this threat on the Mesquite Community Allotment is unknown.

The role of environmental contaminants in directly inducing toxicosis-related diseases (i.e., liver diseases) and increasing susceptibility to infectious diseases has recently been suggested as a significant source of mortality. Illegal dumping of hazardous wastes may expose tortoises to increased levels and possible consumption of toxic substances and affect populations on a localized level where these activities are concentrated. It has been postulated that elemental toxicity may compromise the immune system of desert tortoises or otherwise detrimentally affect physiological function, rendering them more susceptible to disease, but further investigation is needed.

Desert tortoises, particularly hatchlings and juveniles, are preyed upon by several native species of mammals, reptiles, and birds. The common raven (*Corvus corax*) has been the most highly visible predator of small tortoises, while coyotes (*Canis latrans*) have been commonly implicated in deaths of adult tortoises. Common raven populations clearly have increased in the Mojave Desert over the past several decades; subregions vary in raven abundance, dispersion, and population growth rates. The West Mojave has the most ravens and is experiencing the largest increases while there is very little increase in the East Mojave (Boarman and Kristan 2006). There are a variety of anthropogenic (or human-caused) reasons for this increase in raven populations, due in large part to recent human subsidies of food, water, and nest sites (Knight et al. 1993, Boarman 1993, Boarman and Berry 1995). For example, ravens are able to use power structures as nesting substrates and consequently have increased in abundance in areas that have had power poles added (Kristan and Boarman 2007). While not all ravens may include tortoises as significant components of their diets, these birds are highly opportunistic in their feeding patterns and concentrate on easily available seasonal food sources, such as juvenile tortoises. The population-level effects of these or other predators are unknown (USFWS 2011b), and the level of this threat on the Mesquite Community Allotment is also unknown.

BLM Sensitive Species, Nevada State At-Risk Species, and Migratory Birds

The bald eagle was delisted from the ESA on August 9, 2007 (USFWS 2007). This species is not known to nest anywhere on the BLM's Arizona Strip District, although it may occur as a transient on these allotments. The bald eagle is a seasonal (winter) migrant that may roost in large cottonwood trees that occur along rivers and streams (none of which occur in this allotment). Bald eagles are both scavengers and predators. Golden eagles use their agility and speed combined with extremely powerful talons to snatch up prey including rabbits, marmots, ground squirrels, and large mammals such as fox, wild and domestic cats, and young deer. They will also eat carrion if prey is scarce, as well as reptiles. Birds, including large species up to the size of swans and cranes as well as ravens have all been recorded as prey. Golden eagles nest in high places including cliffs, trees, or human structures such as telephone poles. There are no known nests within this allotment.

The American peregrine falcon was virtually eradicated from eastern North America by pesticide poisoning in the mid-20th century. After significant recovery efforts, the peregrine falcon was delisted in 1999. Powerful and fast-flying, this falcon hunts medium-sized birds, dropping down on them from high above in swift, spectacular dives. The

peregrine falcon nests in a scrape, normally on cliff edges. Optimum habitat is considered to be steep cliffs overlooking woodlands, riparian habitats or other areas supporting abundant avian prey species. Cliff nests are generally located under an overhang, on ledges with vegetation, and south-facing sites are favored (Wikipedia 2015a). One historic peregrine falcon nest is known in the central portion of the allotment, in the Virgin Mountains at Lime Kiln Canyon. A pair of peregrine falcons occupied this site in April, 2012 but was not detected on subsequent monitoring visits. Monitoring at this site has shown that prairie falcons occupied this territory in 2011 and 2013 (the site was not monitored in 2014).

Ferruginous hawks are large hawks that inhabit the grasslands, deserts, and open areas of western North America – they are the largest American hawk and are often mistaken for eagles due to their size. Ferruginous means "rusty color" and refers to the bird's colored wings and legs. During the breeding season, the preference is for grasslands, sage, and other arid shrub country. Nesting occurs in the open areas or in trees including cottonwoods, willows and swamp oaks along waterways. They nest in trees if they are available, including riparian strips, but the presence of water does not appear to be critical. The ferruginous hawk primarily hunts small to medium-sized mammals but will also take birds, reptiles, and some insects. Mammals generally comprise 80 to 90 percent of the prey items or biomass in the diet with birds being the next most common mass component. The diet varies somewhat geographically, depending upon the distribution of prey species (Wikipedia 2015b). This species may occur on the Mesquite Community Allotment, but no specific sightings have been recorded.

Burrowing owls inhabit open areas, such as grasslands, pastures, coastal dunes, desert scrub, and the edges of agricultural fields, and wherever there is sufficient friable soil for a nesting burrow at elevations between 650 and 6,140 feet in Arizona. The presence of other nesting burrows (such as that of a badger, prairie dog, tortoise or other animal) seems to be a requirement for the species; a decline in the population of burrowing mammals may adversely affect owls through a lack of available burrows. Burrowing owls forage primarily at twilight but have been observed to hunt any time of the day or night. Insects are often taken during daylight and small mammals after dark. Observed causes of mortality include human disturbance through agricultural and construction activities and collisions with vehicles (the owls habitually sit and hunt on roads at night). Human activities that reduce quality of prey habitat and thus lower food supplies result in poorer reproductive success in females (Haug et al. 1993). This species is known to use habitat similar to that found on this allotment, although no specific sightings have been recorded.

Bendire's thrasher is a bird of the deserts of southwestern United States and northwestern Mexico. This bird constructs a cup-shaped nest from twigs, lining the interior with grass stems and rootlets. It is usually placed in a cactus or an otherwise thorny desert shrub or tree. The female lays three or four eggs, which are pale green to blue in color, and speckled with brown and purple. Bendire's thrasher, like the majority of thrashers, feed on small ground-dwelling insects. This bird may occur as a summer resident of the allotment (Wikipedia 2015c).

Brewer's sparrows have been described as dull, nondescript, or subtle. While undoubtedly inconspicuous, they are often the most abundant summer birds in their favored sagebrush habitat. Brewer's sparrows prefer dense stands of sagebrush that is broken up with grassy areas. Adults return persistently to the same breeding sites each year. Breeding takes place in mid-April through early August, and can occur in high densities. The nest is placed on or near the ground, and the male often helps with incubation. In the winter they favor low, dry vegetation, and Brewer's sparrows can often be found in large, noisy flocks (Audubon 2013). These birds forage primarily in shrubs or in low vegetation, but also on the ground. They mainly eat insects in summer with seeds becoming a more important part of the diet at other times of the year (Wikipedia 2013). Habitat destruction, alteration, and fragmentation impact populations of Brewer's sparrows; since the species requires habitat with a dense shrub component, manipulation of sagebrush can impact population numbers (Audubon 2013).

Loggerhead shrikes are relatively common birds in open fields and scrubby habitats with scattered trees. They can be found year-round in the southern half of the United States from the Carolinas and Virginia through Florida and west to California and Baja. While they are usually solitary or can be found in pairs during the nesting season, they are easy to spot as they perch on the tops of trees, bushes, posts and wires while hunting with their superb eyesight. Because their talons are too weak to hold prey while they feed, they impale their prey on barbed wire or cactus spines and wait several days for it to soften. This behavior may also be a way of marking territory or caching food for later use, and has earned them the nickname "Butcher Bird." These are monogamous birds and pairs will raise 2-3 broods of 4-8 eggs each during each nesting season (About.com 2013).

The pinyon jay occurs in western North America from central Oregon to northern Baja California and east as far as western Oklahoma, although it wanders further afield outside of the breeding season. It is a permanent resident of pinyon-juniper woodlands and low-elevation ponderosa pine forests in the southwestern United States. This species is highly social, often forming very large flocks of 250 or more birds. Pinyon jays begin breeding in January or early February, nesting occurs from late February to April, and young pinyon jays fledge approximately 3 weeks following hatching. When the pinyon crop fails, pinyon jays forego late-winter breeding and instead breed in August when crops of pinyon seeds are ripe. The seed of the pinyon pine is the staple food for this bird, but they supplement their diet with fruits, berries, and insects. Pinyon jays influence seed dispersal, establishment, and genetic structure of pinyon pine populations – pinyon seeds are heavy and wingless and not suited for wind dissemination, so their dispersal requires animals such as pinyon jays (Wikipedia 2015d).

A total of eight bat species may occur on the Mesquite Community Allotment that are considered sensitive in Arizona or Nevada. Surveys for bats specific to this allotment have not been conducted.

Allen's big-eared bat is one of the most poorly known bat species in North America. It was not discovered in the United States until 1955. This species is often found near boulder piles, cliffs, rocky outcroppings, or lava flows. Preferred habitats for the species

include rocky and riparian areas in woodland and scrubland regions. This bat is also known to roost in abandoned mine shafts (Pima County 2015). Little is known about the breeding activity of the species, but females have been found with single young during the late spring and early summer (UDWR 2005). Colonies are most often found in rocky places near riparian habitat or woodlands. These bats feed on moths, soldier beetles, dung beetles, leaf beetles, roaches, and flying ants, either catching them in flight or gleaning them from foliage. Their enormous ears combined with unique lappets easily distinguish them from all other species (Bat Conservation International 2015).

The big free-tailed bat is found in south, north, and Central America. It has a wingspan of 17 inches and an average length of 5.5 inches. This bat frequents rocky or canyon country where it roosts in crevices. This migratory species is a swift, powerful flier. Little is known of mortality and longevity. Breeding probably occurs in mid-winter while the species is in warmer latitudes. A single young is born in mid-June to early July. Females form small nursery colonies, and the young do not leave the nursery until they are almost full grown. Moths seem to be the mainstay of their diet, although little data has been collected. When foraging, the big free-tailed bat usually emits a loud piercing chatter (Cabeza Prieta 2012). This bat emerges late in the evening and forages at high altitudes (Wikipedia 2015e).

The California leaf-nosed bat is the only bat in North America, north of Mexico, with large ears and leaf-like projections on the nose. It has very large ears and an erect triangular flap on nose. This bat does not migrate or hibernate. Because its wings are short and broad it is not suited for long distance flight needed for migration. Preferred habitats are caves, mines, and rock shelters, mostly in desert scrub. Roost sites are usually located near foraging areas. It eats various insects such as crickets, some beetles, grasshoppers, katydids, June beetles, diving beetles; and sphinx and other types of moths. It will capture prey either in flight or off of foliage or the ground. It is the only bat in North America known to catch caterpillars and is among the very few insect-eating bats that supplements its diet with cactus fruit (Arizona-Sonora Desert Museum 2015a).

The cave myotis bat is found throughout the southwestern United States from central Oklahoma and Texas to New Mexico, Arizona and extreme southeast California. It also extends its range into Mexico and Central America. As indicated by its name, the cave myotis prefers a cave habitat but will choose other roost area if a suitable cave is not available. These alternate areas can include mines, rock crevices, abandoned buildings, barns and under bridges. The cave myotis is an insectivore – it feeds upon a wide variety of insects depending upon which are available on any given night. Mating occurs in late fall, but as with many other bat species the female will store the sperm until early spring. They give birth to a single pup in June or July. During the summer this bat can be found roosting in caves in groups of 2,000-5,000 individuals. Some of these will stay and hibernate over winter, but most appear to be migratory over short distances (Arizona-Sonora Desert Museum 2013).

Spotted bats have been found from low desert in southwestern Arizona to high desert and riparian habitats in northwestern Arizona and Utah to conifer forests in northern

Arizona and other western states. They are found in desert scrub, riparian, pinyon-juniper, and montane coniferous forests at elevations up to 8,670 feet. They roost in small cracks found in cliffs and stony outcrops. They forage on large flying insects, primarily moths (AGFD 2003).

The Townsend's big-eared bat is a medium-sized bat with very long ears – when the ears are laid back they extend to the middle of its body. This bat uses a variety of habitats, almost always near caves or other roosting areas. It can be found in pine forests and arid desert scrub habitats. When roosting it does not tuck itself into cracks and crevices, like many bat species do, but prefers large open areas. It specializes in eating moths and other insects such as beetles, flies and wasps (Arizona-Sonora Desert Museum 2015b).

The greater western mastiff bat *(Eumops perotis)* is the largest bat in the United States. It can be easily identified by its very large ears which extend out over its nose. The subspecies *Eumops perotis californicus* is a species of concern as identified by the USFWS. The range of this subspecies is principally southwest desert regions of the United States, where it is most commonly found in rugged rocky canyons and cliffs, where crevices provide favored daytime retreats. Some roost sites are occupied throughout the year, but the four seasons are usually spent in different roosts. The greater mastiff is capable of fast and prolonged flight; the wings are long and slender and the flight membranes are tough and leathery. This bat lives in high, dry places, and usually cannot get airborne from the ground, but will scramble to a post or a tree to gain height for launching (Arizona-Sonora Desert Museum 2015c).

The California myotis is the smallest species of *Myotis* in America. The California myotis is found throughout Arizona, but it is less common in the higher mountains. Its elevation range is from sea level to 6,000 feet. The species range includes western North America from Alaska to Mexico. In western Arizona, the California myotis occupies desert ranges or flatlands; in eastern and northern Arizona, it is found in desert shrub-oak woodlands to ponderosa pine zones. The California myotis roosts in crevices, cracks in canyon walls, and sometimes in caves and mine shafts. This species may roost during the day in any convenient shelter, and they do not regularly return to the same place. Females give birth to 1 young, probably in June. The sexes are separate for most of year. The California myotis has a slow, very erratic flight pattern with abrupt changes of direction, laterally and vertically, usually feeding within about 5-10 feet off the ground. It is active in the first 2 hours after sunset and is often found near water (AGFD 2003). It is an insect eater that seeks out large concentrations of insects, often over water.

The Gila monster is one of only two species of venomous lizards (its cousin, the Mexican beaded lizard, is the other. The range of the Gila monster is primarily in Arizona and Mexico, the extreme southeastern corner of California, the southern tip of Nevada, and the southwestern corners of Utah and New Mexico. Gila monsters are desert dwellers, living near washes and arroyos and in semiarid rocky regions of desert scrub or grasslands. Gila monsters also seem to prefer rocky foothills and avoid open flats and agricultural areas. They can live in elevations up to 5,000 feet. Gila monsters

most often prey on small birds and mammals, eggs, lizards, frogs, insects, and carrion. In late April to early June, courtship and male-to-male combat take place. Females lay two to 12 leathery eggs that overwinter below ground and hatch ten months later in the spring. Hatchlings are about six inches long and are miniature replicas of their parents. With very few natural predators, they may spend up to 98 percent of their lives in or at the mouth of a burrow. They may live up to about 20 years. They are threatened by habitat destruction (Smithsonian Institution 2013). This species may occur in the allotment but has not been verified.

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

8. Wildlife Habitat

Approximately the northern ¼ of the allotment is within the Mojave Desert ecological zone. The southern ¾ is considered to be Mojave Desert/Great Basin Transition. Big game species that occur in the allotment include mule deer and desert bighorn sheep. Approximately the southern 2/3 of the allotment on the Arizona side is considered yearlong mule deer habitat. The northern 1/3 is considered limited habitat for this species. The southern portion on the Nevada side is considered crucial summer deer habitat.

Mule deer populations are monitored annually by the AGFD. While there is no estimate of mule deer numbers available specifically for this allotment, population trends should parallel data collected for Game Management Unit 13B (see Appendix F). The mule deer population in the unit exists at low densities, in some areas less than one per square mile. The population, while not at levels attained in the 1970s, has shown signs of growth in recent years. Over the past five years, fawn production has varied from 57 to 93 fawns per 100 does, as documented by AGFD survey counts, and the buck to doe ratio appears strong. Despite wide fluctuations, AGFD considers the mule deer population in Unit 13B to be stable. Black Rock Mountain and southern portions of Grand Canyon-Parashant National Monument (south and east of this allotment) contain the highest densities of mule deer in Unit 13B. However, mule deer are found year-round in most of the unit.

Mule deer populations on the Arizona Strip have fluctuated greatly. In the 1960s and 1970s there were many more mule deer on the western portion of the Arizona Strip than today. The mule deer populations appeared to crash by the early 1980s and have exhibited slow population growth and recovery. A variety of causes for this decline have been suggested including long-term drought, predation, competition from livestock, successional changes in the habitat, and disease. There has been little or no evidence of a serious disease problem within the Mesquite Community Allotment. However, Unit 13B has a long history of predator management. Coyotes and mountain lions are the primary predators of mule deer in 13B. Active livestock grazing operations occur within Unit 13B. Limited water resources, forage availability, and ability to navigate fences have all been identified as possible limiting factors to mule deer populations in 13B. The BLM and AGFD work cooperatively together to resolve these issues. While urban encroachment is not an issue in 13B, the populations of St. George,

Utah, Mesquite, Nevada, and Las Vegas, Nevada have provided a source of increased recreational visitor use to the area. The popularity of antler collection and OHV recreation has increased in Unit 13B (AGFD and BLM 2010).

Desert bighorn sheep habitat has been identified from habitat analysis that evaluates a combination of slope, topography, aspect, vegetation, proximity to escape cover, and water availability (Bighorn Sheep Core Team 2006). To escape predators, bighorn sheep prefer rough, rocky terrain with slopes greater than 20%, as is found throughout the Virgin Mountains portion of the Mesquite Community Allotment. Bighorn sheep may be found throughout the Virgin Mountains, including within this allotment; the mountainous portion of the allotment in the Arizona Strip Field Office is within the Virgin Mountains Wildlife Habitat Area (WHA), allocated for desert bighorn sheep. Vegetation in this WHA is primarily Mojave Desert shrub community; dominant species include creosotebush and Joshua trees at lower elevations, and blackbrush merging into pinyon-juniper woodlands at higher elevations. Reliable permanent waters in this allotment include a number of small developed perennial springs and pipelines, as well as a number of livestock ponds. Bighorn sheep also likely obtain some of the moisture they need from succulent vegetation. During the hot summer months, the sheep stay in shaded areas near water as much as possible and are seldom found more than three miles from dependable water sources. When rain or snowfall occurs, bighorn sheep expand their use of suitable habitat and range out from permanent waters. They also commonly drink from ephemeral pools of water found in rock pockets.

Key habitat use areas for bighorn sheep include concentration areas at reliable waters in the Virgin Mountains. More than 80% of the suitable habitat within the Virgin Mountains WHA is unoccupied, though the reasons for this are not fully understood (Bighorn Sheep Core Team 2006). However, the population in this WHA is considered stable enough that hunts were initiated in 1989, and AGFD has conducted several captures to transplant animals to other areas within the state – the most recent of these captures occurred in 2007. The Las Vegas Field Office on the Nevada side considers this crucial sheep habitat.

Habitat for a variety of other wildlife species is present on this allotment. These species include small game (such as rabbits and quail), raptors, reptiles, small birds, and small mammals. Coyotes are common.

9. Riparian/Fisheries Habitat

As described previously in this report, the allotment has numerous small springs in or near the Virgin Mountains, all of which are developed either for livestock watering or, in the case of Cabin Canyon, is one of the water sources for the city of Mesquite, Nevada. None of these spring sites meet the criteria for priority riparian areas due to their small size and ephemeral flows, as listed in the RMPs. In addition, the Arizona S&Gs provide an exemption to Standard 2 (Riparian/Wetland Sites) for "water facilities constructed or placed at a location for the purpose of providing water for livestock … and which have not been determined through local planning efforts to provide for

riparian or wetland habitat." Thus, these areas are not by definition wetland/riparian areas, so there are no wetland/riparian areas in this allotment.

10. Wild Horse and Burro Habitat

There are no wild horses, burros or habitat management areas, in this allotment.

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

1. Issues relating to Rangeland Health

a. 15,273 acres burned in 2005 and those acres do not meet Standard #3.

This burn area is on the east side of the Virgin Mountains (outside desert tortoise habitat). The area is north and east of Lime Kiln Canyon Road, on the north side of the road, and extends to the north boundary of the allotment in Tom and Cull Valley. There is also a burn area at the mouth of Lime Kiln Canyon that extends to Buck Spring. These burns have set some of the plant communities back to a lower seral stage, and some of the DPC objectives are not currently met.

b. Desert tortoise occurs on the Mojave Desert part of the allotment and populations are still declining.

The recovery program for the Mojave population of the desert tortoise requires range-wide, long-term monitoring to determine whether recovery goals are met. Monitoring of this species has been occurring for many years. Before the tortoise was listed, populations were monitored either using strip transects (where indications of tortoise presence – live or dead tortoises, scats, burrows, or tracks – were converted to estimates of abundance based on transects conducted in areas of better-known tortoise density) or by using capture-recapture population estimates on a limited number of (usually) 1 square mile study plots. Although data have continued to be collected on transects and study plots in recent years, both methods suffer statistical deficiencies and logistical constraints that render them unsuited for monitoring trends in abundance applicable either range-wide or to individual recovery units (USFWS 2012b).

In 1999 the Desert Tortoise Management Oversight Group endorsed the use of line distance sampling for estimating range-wide desert tortoise density, and this methodology began to be used in 2001 (Buckland et al., 2001). Distance sampling methods use measurements taken from the center of the transect lines to tortoises to model detection as a function of distance from the path walked by sampling personnel. Density estimates from any brief window of time would be expected to detect only catastrophic declines or remarkable population increases. Therefore, the first five years of this monitoring (2001-2005) were not to document trends, but to gather information on baseline densities and year-to-year recovery unit to recovery unit variability. In 2001, five live and nine dead tortoises were observed

within the Gold Butte-Pakoon DWMA – two of the live animals and none of the carcasses were within the Mesquite Community Allotment. In 2002, no live tortoises were encountered while two carcasses were observed within the DWMA; neither of the carcasses was within this allotment. In 2003, ten live tortoises were encountered in the DWMA (none within Mesquite Community Allotment), while 24 carcasses were observed (one of these within this allotment). In 2004, five live tortoises were encountered (one of these within the Mesquite Community Allotment) and ten carcasses were observed (one within Mesquite Community Allotment). In 2005, three live tortoises were encountered in the DWMA (none of these within Mesquite Community Allotment) and six carcasses were observed (none within Mesquite Community Allotment) (USFWS 2006). Monitoring efforts since 2001 (since line-distance sampling began) have generated the data shown in Table 8 to facilitate density estimates (USFWS 2009; USFWS 2012a; USFWS 2012b; USFWS 2013).

Table 8. Gold Butte-Pakoon Desert Tortoise Monitoring Results

Year	Area Monitored	Sampling Dates	# of live tortoises observed*	Density (per km^2)	
				Gold Butte-Pakoon	NE Recovery Unit
2001	1,603 km^2	May 10 – June 22	5/2	1.2	2.4
2002	Data not provided	April 24 – April 25	0/0	---	None calculated
2003	162 km^2	April 30 – June 17	10/0	1.8	3.7
2004	1,923 km^2	April 21 – May 19	5/1	0.7	1.2
2005	1,977 km^2	April 12 – June 7	3/0	0.2	1.8
2006	Not monitored				
2007	1,977 km^2	April 17 – May 29	4/0	1.2	1.7
2008	1,977 km^2	April 13 – May 16	0/0	---	None calculated
2009	1,977 km^2	April 27 – May 30	8/1	2.2	3.4
2010	1,977 km^2	April 7 – April 22	22/1	1.7	3.2
2011	1,977 km^2	April 6 – April 19	18/1	1.6	3.4
2012	1,977 km^2	April 6 – April 20	21/0	2.3	3.4

* First number represents total number across the entire Gold Butte-Pakoon Critical Habitat Unit; second number represents number associated with the Mesquite Community Allotment.

Results from the line distance sampling effort listed tortoise populations in the area as low. Density estimates from the monitoring are lower than estimates from earlier studies (Luckenbach 1982, Berry 1984). Precise comparisons cannot be made because the historical monitoring efforts were conducted using different techniques at different scales and with different goals. At this time, the data collected is only statistically valid at the recovery unit level. While annual estimates may be imprecise (due to a variety of factors such as vegetation that

differentially obscures vision with distance, or different detection protocols used by individual crews), over a period of years, any underlying trend in the number of tortoises should be obvious (USFWS 2010b).

c. Wildlife access to water on Lime Kiln, Narrow, Middle Canyon, Buck and Upper/Lower Heck Hole springs and pipelines.

All of these springs are unfenced and available for unrestricted access for mule deer, bighorn sheep, mountain lions, and other wildlife species. Lime Kiln Spring and trough are next to the main Lime Kiln Canyon road and may be avoided by wildlife when vehicles are present. However, traffic on this road is relatively light and wildlife should have ample opportunity to access the area, especially in the early morning and evening hours.

d. Lack of big galleta grass along the boundary with the Cottonwood Allotment

Big galleta is coming back slowly, but it is still low at 2% where the site guide composition suggests 5-10%. This may be due to the burn in 2005 (which burned very hot in some locations), although it should sprout from rhizomes; drought since the fire may also be the reason for the low composition of this species.

e. Exotic and invasive species

Exotic and invasive species are abundant on wet years and have very little occurrence during normal and dry years. The presence of stable plant communities allows little to no growth of invasive plants during these times. Invasive grasses (i.e., bromes) are particularly prevalent in burn areas. Over time, shrubs would be the main species to overcome exotics in the old burns. In the old burns, native shrubs dominate after 20 years.

Feral pigs reportedly escaped from captivity in the Mesquite, Nevada to Littlefield, Arizona area along the Virgin River corridor at some point in the past. Sightings and takes have been reported over the years in or near the Mesquite Allotment. Hunters are allowed to take feral pigs in Arizona to reduce or eliminate the population, but hunting them is difficult due to the rough and remote nature of the area and lack of access.

V. Conclusions

A. Pertaining to Objectives

1. Land Use Plan Objectives[8]

Arizona Strip Field Office RMP
and
Grand Canyon – Parashant National Monument RMP

Soil Stability

*DFC-VM-03/**DFC-VM-04** (Vegetation – All Ecological Zones)*
Vegetative communities will provide sufficient plant cover and litter accumulation to protect soils from wind and water erosion and enhance nutrient cycling and productivity, even during drought years.

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

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

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

All of these objectives are being met. A Standard #1 documentation worksheet was completed at Key Areas #1, #7 and at a fenceline contrast area with the Cottonwood Allotment (see Appendix E). The documentation worksheet evaluates seven indicators (surface litter, bare ground, rock, flow patterns, gullies, rills, and plant pedestaling) that determine the functional condition of upland sites as it relates to infiltration, permeability, and erosion rates. All seven indicators were rated at "None to Slight" at all key areas with rills rated as "Slight to Moderate" only in #7. The "None to Slight" determination means there was no or only a slight departure of those indicators from normal or the natural range of variation. The determination for all key areas is that they were functioning properly and meeting Standard #1. Soil, cryptobiotic soil crusts, and vegetative condition and watershed function are at acceptable levels and are appropriate for the site. The soils are resistant to compaction and have not been adversely altered by grazing or other activities overall. Due to very gravelly or rocky surface ground cover on the bajadas and mountain slopes, cryptogams are a minor component of the surface. Accelerated erosion is minimal and is not readily observed. To reconfirm this, recent field trips were conducted by an experienced soil scientist, and additional soil condition data was collected and samples analyzed (see pages 30-32 of this evaluation report). As

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

in the first field assessment, no significant areas of impacts detrimental to soils or vegetation were found.

Ecological Processes

*DFC-VM-04/**DFC-VM-05** (Vegetation – All Ecological Zones)*
*Ecological processes and functions will be protected, enhanced, and/or restored by allowing tools that are necessary and appropriate to mitigate adverse impacts of allowable uses and undesirable disturbances, and contribute to meeting the Standards for Rangeland Health **... and enhance Monument values**.*

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

*DFC-WF-11/**DFC-WF-12***
*The natural biological diversity of fish, wildlife, and plant species will be maintained or, where necessary and feasible, restored throughout the Arizona Strip FO **(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. The ecological site data reveal where burns have occurred and the plant communities have been set back to early or mid seral stages, although biological diversity is maintained (see Tables 5 and 7). While fire plays a natural role in this ecosystem, invasive species such as cheatgrass and red brome often take advantage of the vegetative niche created by fire and crowd out native annuals and perennials, resulting in increased fire propensity, increased fire intensity, and decreased fire interval. As shown in Table 7, the unburned areas are generally in mid to late seral stages.

The uplands that have either not burned or not burned recently are in mid to late seral ecological stages (see ESI and frequency trend data for key areas 1 and 4). The burned areas are all in early to mid seral (see data for key areas 2, 3 and 7). This allotment has wide vegetative diversity where burns have not occurred recently, as well as in old burn areas (see data for Key Area 4); new burns have less diversity. The fires from 2005 all have the potential to attain what the old burns have attained, which is a wide diversity within 20-30 years. It should be noted that the blackbrush composition remains very low in areas that have previously burned. To get the vegetation back to a blackbrush dominated range will take a century or more after a fire, with no reburns and depending on the previous fire intensity.

Livestock use in tortoise habitat occurs only in the fall and winter months, before the growing season of most desert plants. This maintains the ecological processes and functions at necessary levels. Fall and winter grazing results in minimal disturbance to vegetation within desert tortoise habitat – plants are dormant, which generally results in less damage to vegetation. The exception to this can be grazing on shrubs. The important factor when considering effects on shrubs is the amount of usage of current

year's growth; although the shrub is dormant, it is important to watch browsing of stems – buds are especially important to protect from grazing because they will be the source of new stems and leaves for continued growth after grazing. However, it should be noted that many of the shrub species present in tortoise habitat (such as creosote) are not particularly palatable to cattle, so utilization is minimal – this helps retain the habitat elements that are essential for the conservation of the species. While drought (and possibly past high utilization by livestock) have affected the frequency of some vegetative species, the ESI and trend data show that the plant communities are intact as a whole in areas that have not burned (the majority of the allotment), and the natural biodiversity of plants is at good levels.

Invasive Plants

*DFC-VM-05/**DFC-VM-06** (Vegetation – All Ecological Zones)*
Invasive plant species will be contained, controlled, or eliminated and native species restored to meet desired plant community (DPC) objectives.

DFC-VM-34/***DFC-VM-38*** *(Vegetation – Mojave-Great Basin Transition Ecological Zone)*
Management of Mohave-Great Basin Transition Ecological Zone plant communities will focus on removing invasive non-native plants, especially cheatgrass, Sahara mustard, and red brome, and preventing habitat degradation due to wildfire.

These objectives are being met to the extent possible. Invasive species, such as red brome and Sahara mustard, occur over a broad area during wet years, even in stable plant communities, and in those years these objectives are not met. In 2005 (an extremely wet year), a large amount of red brome and Sahara mustard occurred on the lower slopes of the Virgin Mountains. However, on normal to dry years (see precipitation data in Appendix D) such as 2006, 2007, 2008, 2009, and 2010, little to no red brome or Sahara mustard grew.

Sites that have a good shrub and tree component (the higher elevation areas of the Mojave-Great Basin Transition Zone) generally do not have annual brome encroachments on average or below average precipitation years. The presence of stable plant communities (such as occur at Key Area #7) allow little to no growth of these invasive plants during these times. However, the early seral stage plant communities can have annual brome invasions; shrubs, allowed to increase to a late seral stage will, on average moisture years, prevent or reduce annual brome invasions.

No Net Loss

DFC-VM-28 (Vegetation – Mojave Desert Ecological Zone)
There will be no net loss of acres of Mohave Desert plant communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

DFC-VM-33/***DFC-VM-37*** *(Vegetation – Mojave-Great Basin Transition Ecological Zone)*
There will be no net loss in acres of Transition plant communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

These objectives are being met. There has been no net loss of any plant community; wildfires have set the seral stage back to an earlier stage, but have not resulted in a long-term or permanent removal of the plant communities from the landscape – resprouting is occurring and, without reburning, will progress toward later seral stages. As noted in the Ecological Site Inventory discussion on page 35, to get the vegetation back to a blackbrush dominated range will take a century after a fire, with no reburns. In some cases, the blackbrush communities never return to a preborn state. Key area is slowly recovering from a fire that occurred in 1948; however, this key area is on the low precipitation end of the ecological site description (ESD), exhibits soil inclusions from multiple soil types (meaning the vegetation present varies somewhat from that predicted in the ESD), and fire has allowed blackbrush to be replaced by other shrub species, resulting in a mid seral rating.

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.

LG-1. (Las Vegas RMP)
Provide for continued grazing of domestic livestock on public lands, consistent with law, regulation, established standards and guidelines and policy on areas open to livestock grazing (see Map 2-8).

Livestock grazing (i.e., season of use, utilization levels, etc.) is managed to maintain or improve the ecological condition of the allotment. This allotment receives general use from October 15 to May 30 and is rested from June 1 to October 15. One of the three pastures on the east side of the Virgin Mountains may, in some years of abundant feed, be used until August and then livestock are removed. Use is monitored to ensure that allowable utilization levels are not exceeded. Livestock use in desert tortoise habitat only occurs during tortoise inactive season (October 15 to March 15), and is rested longer in some years. This grazing system allows for the growth of desert vegetation (in tortoise habitat) during the spring and summer without any grazing use, resulting in ephemeral plant growth for forage for desert tortoise and other wildlife species without

competition from livestock. This system also allows vegetation to regrow, thus giving wildlife species a better chance at obtaining important food sources.

Desired Plant Community

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

*DFC-VM-02/**DFC-VM-03** (Vegetation – All Ecological Zones)*
Native vegetative communities will be protected. A mosaic of native perennial and non-invasive annual vegetative communities will be present across the landscape with diversity of species, canopy, density, and age class reflecting its local ecological site potential and naturally occurring habitat conditions.

DFC-VM-26 (Vegetation – Mojave Desert Ecological Zone)
Endemic plant species and associated communities such as Creosotebush, 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 Creosotebush or Joshua trees, seeps, healthy streamside vegetation, and other interspersed grassland and shrub habitats.

*DFC-VM-30/**DFC-VM-34** (Vegetation – Mojave-Great Basin Transition Ecological Zone)*
Endemic plant species and associated communities such as black brush, Joshua tree, Mojave yucca, and cacti will be present along with other shrubs, grasses, and wildflowers. These communities can include stands of young and old shrubs, sparse vegetation, scattered to larger expanses of black brush to various mixes of black brush, Joshua trees, pinyon-juniper, yucca, and shrub habitats.

*DFC-VM-32/**DFC-VM-36** (Vegetation – Mojave-Great Basin Transition Ecological Zone)*
Priority plant species and associated communities such as black brush, Joshua tree, Mojave yucca, and cacti will be present along with other shrubs, grasses, and wildflowers. These communities can include stands of young and old shrubs, sparse vegetation, scattered to larger expanses of black brush to various mixes of black brush, Joshua trees, pinyon-juniper, yucca, and shrub habitats.

*DFC-WF-16/**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 partially met. Plant communities present in the allotment include native shrubs (such as burrobrush, creosotebush, desert rue, rayless goldenhead, littleleaf ratany, brittlebush, catclaw, desert almond, Mormon tea, cliffrose, longspine

horsebrush, blackbrush, Yerba santa, yucca, and cholla). Primary perennial grasses on the Mesquite Community Allotment include threeawn, Indian ricegrass, and sideoats grama. These communities occur in a mosaic pattern in burned and unburned areas. Ground cover meets or exceeds the DPC objectives at all sites and most of the functional groups meet the DPC objectives. Areas that have not burned consist of a healthy mix of native shrubs, perennial grasses and forbs. The sites that have a "not met" conclusion (Key Area #2 for native perennial grasses and Key Area #3 for native browse) are due to the early and mid seral state that the key areas are in from the recent fires. Many of the plant species are recovering from being burned off. The blackbrush zones in the Mesquite Community Allotment suffered losses from a fire in 1948 from which it has not fully recovered. As this shrub is a resprouter, its recovery is a long (multi-decadal) process. However, the shrub and browse objectives at Key Area #4 are being met to the extent possible due to the presence of other native species.

The allotment provides habitat for a diversity of wildlife (including avian species, reptiles, and large and small mammals), provides forage for livestock, provides recreational opportunities, and provides functional watersheds. The DPC objectives have been developed on the allotment to maintain and/or enhance these public values, including providing the primary constituent habitat elements for desert tortoise. Site visits to the allotment determined that soils are within normal parameters and functioning properly.

Wildlife Habitat

*DFC-VM-31/**DFC-VM-35** (Vegetation – Mojave-Great Basin Transition Ecological Zone)*
Endemic animal species such as ... 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.

Progress is being made toward meeting these objectives. The majority (85%) of the allotment consists of Mojave-Great Basin Transition Ecological Zone; the remainder (15%) of the allotment is Mojave Desert Ecological Zone. None of the Mojave Desert zone has burned within the last 20 years. However, much (44%) of the Mojave-Great Basin Transition zone has burned in the last 20 years, most of which occurred in 2005. Frequency for some vegetative species is down in the key areas that have burned; however, other native species (catclaw, desert marigold, desert trumpet, desert globemallow and threeawn) have shown an upward trend in these key areas. Fires are known to have occurred periodically in this allotment for decades. Following fire, the vegetative seral stage is set back and can take many years to recover.

Although there remain problems with non-native vegetation (growth of red brome and downy brome in wet years), the allotment is in good shape overall (i.e., trend and

ecological condition) and contains nutritious, high PEP plants. In addition, vegetative diversity is high. DPC objectives for this allotment have been developed to incorporate wildlife needs (such as forage, cover, shelter, and nesting sites of endemic wildlife species including the desert tortoise), thus ensuring healthy populations of native species. As stated above, the allotment contains two ecological zones (Mojave Desert and Mojave-Great Basin Transition); plant communities present include native shrubs and perennial grasses, which provide habitat for a variety of native wildlife communities. These communities occur in a mosaic pattern of burned and unburned areas. Ground cover meets or exceeds the DPC objectives, and most of the functional groups meet the DPC objectives. The sites that have a "not met" conclusion (Key Area #1 for native forbs, key areas 2 and 4 for native perennial grasses and Key Area #3 for browse) are due to the early and mid seral state that the key areas are in from the recent (2005), near recent or historical fire regimes. Many of the plant species are recovering from being burned off. The blackbrush zones in the Mesquite Community Allotment have suffered some losses from fire, although other native shrub species are present to provide shelter and cover for wildlife.

Summer crucial mule deer habitat (located on the Nevada portion of the allotment), as well as portions of bighorn sheep habitat, have burned in recent years. Within the burned areas, shrub compositions have been affected over at least the short term, so only key areas 2 and 7 met the palatable shrub objective (see "Wildlife Forage Needs" section on pages 61-62). Nevertheless, these burns provide an herbaceous forage resource that can benefit mule deer, bighorn sheep, and other wildlife species, especially for lactating females.

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.

Approximately 33% of the allotment has burned since 1993, primarily in the upper elevations of the allotment (in the blackbrush and sagebrush zones). These areas may require several decades to fully recover. Although these sites are at a lower vegetation seral stage, they provide a mosaic of vegetative structure and age classes, and therefore serve as valuable foraging areas for wildlife.

Lack of adequate vegetative cover can be a barrier to tortoise movement. However, the majority (approximately 64%) of the desert tortoise critical habitat in this allotment remains unburned. In unburned areas, there appears to be sufficient forage and cover for desert tortoise and other wildlife species to provide sufficient habitat connectivity. For example, Key Area #1 (within desert tortoise critical habitat) is currently at or near

desired plant community levels (late seral stage) – it contains native shrubs (such as creosotebush and burrobrush) that provide cover for tortoises and other wildlife species.

Habitat connectivity and wildlife movement are also taken into consideration for all project level planning, including travel management, to reduce or mitigate impacts from proposed activities so that movements of tortoises and other species will not be adversely affected.

Wildlife Forage Needs

*DFC-WF-29/**DFC-WF-30***
Forage in desert bighorn sheep habitat areas will include at least 20% grasses, 20% forbs, and 20% palatable shrub species CBW, where consistent with site potential.

Three of the key areas (2, 3, and 4) are within bighorn sheep habitat. There are approximately 29,000 acres of bighorn sheep habitat in the Mesquite Community Allotment; almost half (approximately 49%) has burned in recent years, setting the vegetative seral stage back. Key areas within bighorn sheep habitat have the following current forage compositions – site potential for each key area as predicted by NRCS's ecological site guides is shown in parentheses:

Key Area	Grass	Forbs	Palatable Shrubs
#2	0% (2-8%)	54% (1-10%)	8% (5-15%)
#3	18% (5-15%)	48% (1-10%)	1% (2-8%)
#4	0% (3-15%)	0% (0%)	10% (8-15%)

Summary
#2: Grasses not met; forbs met; palatable shrubs not met.
#3: Grasses not met; forbs met; palatable shrubs not met.
#4: Grasses not met; forbs not met; palatable shrubs not met.

Key Areas #2 and #3 burned in 2005 and have been set back to an earlier successional stage with a grass/forb dominated vegetation type. Key Area #4 has not burned since 1948 and has recovered to a shrub dominated vegetation type. Ecological site descriptions indicate that 20% grasses, forbs and palatable shrubs are probably not attainable for these specific key areas.

The shrub composition at Key Area #3 has been affected over the short term due to the recent burn. The site guide for Key Area #3 indicates that cliffrose composition is currently low. However, the composition of longspine horsebrush is higher than expected (from the site guide), resulting in a current palatable shrub composition that is within site potential. Forb composition at Key Areas 2 and 3 exceeds site guide criterion, adding to herbaceous forage available in the short term. These burns provide an herbaceous forage resource that can benefit bighorn sheep, especially for lactating females. Although Key Area #4 has not burned since 1948, blackbrush composition remains low; however desert rue, narrowleaf goldenbush and Yerba santa may have supplanted it. The grass and forb components for this key area were not recorded in the

latest trend data recording in 2013. However, it should be noted that the composition of forbs is highly variable and is influenced by spring and summer precipitation, so some years will have adequate forbs and other years will not. These specific areas may not currently meet the RMP objectives, but when incorporated into the entire habitat, it becomes a part of the natural range of variability and as such is progressing toward meeting objectives. In addition, as noted above, the ecological site descriptions for these key areas indicate that 20% palatable shrub composition is not within the potential of these sites.

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-19/**DFC-WF-20***
All fences in mule deer habitat will be deer passable.

These objectives are being met. There are no known issues regarding unsafe wildlife fences on this allotment. Should any wildlife safety issues be identified, fence modification will occur as funding allows.

Healthy Wildlife Populations

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

*DFC-WF-12/**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-27/**DFC-WF-28***
Desert bighorn habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.

*DFC-WF-34/**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-36/**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-44/**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 being met to the extent possible. As discussed above (in the "Wildlife Forage Needs" section on pages 61-62), the RMP forage objective for grasses and palatable shrubs within bighorn sheep habitat was not met at any of the key areas (the forb objective was met at key areas 2 and 3). It should be noted, however, that the bighorn sheep population in the Virgin Mountains WHA is considered stable enough that hunts were initiated in 1989, and AGFD has conducted several captures to transplant animals to other areas within the state – the most recent of these captures occurred in 2007.

Sustainability needs (such as forage, cover, and shelter) for wildlife including migratory birds, mule deer, bighorn sheep, and carnivores were taken into consideration when the DPC objectives for this allotment were developed (see "Desired Plant Community" conclusions above). Wildlife waters are inspected by the BLM and AGFD and maintained/repaired as funding allows. Wildlife population and habitat monitoring will continue. Impacts to wildlife and their sustainability needs are taken into consideration and analyzed during all project-level planning in order to minimize impacts from proposed activities. In addition, the BLM will continue to work cooperatively with AGFD and Nevada Department of Wildlife to identify and resolve issues that may be affecting mule deer and bighorn sheep populations in Unit 13B and in Nevada.

Wildlife Population Numbers

*DFC-WF-13/**DFC-WF-14***
Mule deer populations will be at or near maximum levels sustainable for the habitat.

*DFC-WF-28 **DFC-WF-29***
Desert bighorn sheep populations will be at or near maximum levels sustainable for the habitat.

*DFC-WF-35/**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-37 **DFC-WF-38***
*Migratory birds that nest in the Arizona Strip FO/**Monument** will have resources of sufficient quantity and quality to provide for nesting sites and to fledge young successfully.*

Progress towards meeting these objectives is ongoing. Unit 13B, which includes the Mesquite Community Allotment, is considered a low productivity area for mule deer, although their populations in the unit are generally stable. As stated previously in this land health evaluation report, approximately the southern 2/3 of the allotment on the

Arizona side is considered yearlong mule deer habitat while the northern 1/3 is considered limited habitat for this species; the southern portion on the Nevada side is considered crucial summer deer habitat. Factors suppressing mule deer population recovery have been identified and include limited summer range and periodic drought. The BLM will continue to work cooperatively with AGFD to resolve these issues (where possible).

The bighorn sheep count in 13B was lower in 2008 than previous years (likely due to the removal of over 20 sheep in 2007 for translocation to other areas). The sheep population in this unit was surveyed again in 2013 by AGFD; the total estimated population for 13B North (the Virgin Mountains population) had increased 72% since the 2008 survey (see Appendix F).

The IAT examined the indicators of Standard 1 (soil conditions and ground cover) and determined that there was "None to Slight" departure from normal (See Appendix E). In addition, habitat attributes (including shrubs and native perennial grasses) which provide forage, cover, shelter, and nesting sites for a variety of wildlife species have been taken into consideration when developing DPC objectives for these allotments and incorporated into these objectives. These objectives provide for sufficient plant cover and litter accumulation to protect soils from wind and water erosion, encouraging nutrient cycling and productivity. Management of the allotment would continue progression toward achieving desired objectives, which will facilitate wildlife population numbers reaching maximum levels sustainable for the habitat.

Wildlife Waters

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

*DFC-WF-17/**DFC-WF-18***
Water sources within mule deer habitat will be safely accessible to deer and other wildlife.

*DFC-WF-18/**DFC-WF-19***
***On BLM administered lands,** water sources within mule deer habitat will be spaced no more than 3 miles apart.*

*DFC-WF-30/**DFC-WF-31***
Water sources within bighorn sheep habitat areas will be safely accessible to bighorn and other wildlife.

*DFC-WF-31/**DFC-WF-32***
Water sources within bighorn sheep habitat will be spaced no more than 4 miles apart.

*DFC-WF-42/**DFC-WF-43***
Water sources within game bird habitats will be safely accessible by all wildlife.

Progress toward meeting these objectives is ongoing. Wildlife and livestock water catchments are inspected and repaired/maintained as funding allows; those found to be hazardous to wildlife are modified. The catchments located within this allotment are now fenced (or planned to be fenced, as funding allows) with a pipe fence designed by AGFD to allow wildlife free access but preclude livestock. Additionally, mule deer and bighorn sheep management plans, which outline objectives to better manage these species, have been jointly developed by the BLM and AGFD. These plans include objectives to provide additional wildlife waters where necessary to meet the water spacing requirement for mule deer and bighorn sheep and repair and maintain existing wildlife waters (to ensure reliable water sources).

Special Status Species Habitat

DFC-VM-27 (Vegetation – Mojave Desert Ecological Zone)
Endemic animal species such as desert tortoise and chuckwalla will be present and thriving with more than adequate food, water, and cover resources.

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

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

*DFC-TE-25/**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-27/**DFC-TE-23***
Potential roosting and nesting sites (for special status raptors) will be abundant.

These objectives are being met to the extent possible. As described in this assessment report, the primary constituent elements of habitat that are essential for the conservation of the desert tortoise include important forage plants (that provide nutritional needs) and shelter plants. This allotment provides many of these important forage and shelter plants, including creosotebush, burrobrush, littleleaf ratany, and annual forbs. The majority of the Mojave Desert portion of the allotment has not had the devastating wildfires that have occurred just north in Utah, or on other parts of the Arizona Strip in the Mojave Desert and Mojave-Great Basin Ecological Zones. Consequently, much of the Mojave Desert Ecological Zone within this allotment contains mature and healthy vegetation. In unburned areas, there appears to be sufficient forage and cover for desert tortoise and other wildlife species to provide sufficient habitat connectivity. For example, Key Area #1 (within desert tortoise critical habitat – see map on page 91 of this evaluation report) is currently at or near desired plant community levels (late seral stage) – it contains native shrubs and browse (such as creosotebush and burrobrush) that provide forage and cover for tortoises and other wildlife species.

Of the 17,000 acres of the Mesquite Community Allotment that have burned since 1980, 6,250 acres (36%) of these are within desert tortoise habitat. This has reduced areas of roosting and nesting habitat for raptors in these areas and modified desert tortoise habitat. These burned areas have sufficient desert tortoise forage; however the hiding cover (shrub) has been reduced to 44% composition in the area of the allotment represented by Key Area #2. Key Area 2 is the only key area affected by fire in desert tortoise habitat on this allotment.

Sustainability needs such as prey items, forage, cover, roosting and nesting sites, and quantity of suitable habitat for desert tortoise, special status raptors and riparian-dependent special status bird species have also been taken into consideration when developing the DPC objectives for this allotment. These habitat elements, including the primary constituent habitat elements for desert tortoise, were incorporated into the DPC objectives. In addition, livestock use in critical desert tortoise habitat only occurs during tortoise inactive season (October 15 to March 15), and is reduced on some years, ie 2007-2013, livestock actual use was 67% or less. This grazing system allows for the growth of desert vegetation (in tortoise habitat) during the spring and summer without any grazing use, resulting in ephemeral plant growth for forage for desert tortoise and other wildlife species without competition from livestock. All of these factors will ensure that BLM's management actions contribute toward providing habitat constituents for listed species.

Healthy Special Status Species Populations

DFC-TE-11
Desert tortoise populations within the ACECs and Desert Wildlife Management Area (DWMA) 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 ACECs and WHA will be healthy and stable. Declines (**Impacts to the population**) in the WHA will be minimized to the extent possible through mitigation.*

*DFC-TE-24/**DFC-TE-20***
Special status raptor populations will be healthy and self-sustaining throughout their range.

*DFC-TE-29/**DFC-TE-25***
Rodent populations, as a prey base (for special status raptors), within the Arizona Strip FO will be abundant.

The BLM is progressing towards meeting these objectives. As described on pages 51-53 of this report, long-term monitoring of the Mojave population of the desert tortoise has been occurring for many years in order to determine population trends. While it is likely too soon to make a definitive determination on population trends, recent monitoring data appears to show that the population of desert tortoise in the Northeastern Mojave

Recovery Unit (of which these allotments are a part) may have stabilized (see Table 8). The BLM will continue to work with the USFWS to implement best management practices that will assist in the recovery of the desert tortoise.

Sustainability needs such as prey items, forage, cover, roosting and nesting sites, and quantity of suitable habitat for special status species have been taken into consideration when developing the DPC objectives for this allotment. The plant communities in unburned areas are healthy, are in late seral stage, and are functioning properly. In unburned areas, there appears to be sufficient forage and cover for special status species, including desert tortoise. The plant communities in the Mojave Desert ecological zone provide a mixture of Creosotebush, Burrobrush, native perennial grasses, and annual forbs, all of which are essential to the survival of the desert tortoise.

Burned areas of the allotment, including approximately 6,250 acres of critical tortoise habitat, could require decades to return to late seral stage. Management proposed for the allotment, including limiting grazing in tortoise habitat to October 15-March 14 (which is outside the active growing season for most vegetative species), would continue to achieve or move toward achieving desired objectives, as well as maintain habitat features for desert tortoises (and other special status species) in this allotment. This management will facilitate wildlife population numbers (including those of special status species) maintaining or reaching levels sustainable for the habitat to the extent possible.

No Net Loss of Special Status Species Habitat

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

DFC-TE-10
There will be no net loss in the quality or quantity of desert tortoise habitat within the ACECs or WHA.

*DFC-TE-26/**DFC-TE-22***
*No net loss will occur in the quality and quantity of suitable habitat for special status raptors within the Arizona Strip FO/**Monument**.*

These objectives are being met to the extent possible. The plant communities in unburned areas are healthy, are in late seral stage, and are functioning properly. However, recent fires have diminished the quality of some habitat in the Mesquite Community Allotment, mostly in the Mojave Desert-Great Basin Transition ecological zone. In addition, approximately 6,250 acres have burned in recent years in desert tortoise critical habitat. This habitat could require decades to return to late seral stage. Management proposed for the allotment, including limiting grazing in tortoise habitat to October 15-March 14, eliminates competition for forage and protects perennial shrubs in these areas by not authorizing grazing during the vegetative growing season for most species. The impact of grazing on plant growth depends greatly on when the grazing

occurs during the growing season and at what stage of the plant's life cycle. Plants are generally less damaged by grazing early in the season when time, soil moisture, and nutrients needed for regrowth are abundant. Plants are most likely to be damaged by grazing when the plant is beginning to produce flowers and seeds. At this time, the plant has high energy demands to produce seeds, complete growth for the season, and store energy to get through the dormant season (University of Idaho and Idaho Rangeland Resource Commission 2011).

When considering effects of grazing on shrub species, one must look at the amount of usage of current year's growth – these include the leaves and young stems that are important for photosynthesis. The current year's growth of shrubs is the most digestible part of the plant and is the portion generally removed by browsing animals. The buds are especially important to protect from grazing because they will be the source of new stems and leaves for continued growth after grazing. In winter, shrubs survive by using energy compounds (i.e., starches and sugars) stored in the stems. Thus, though the shrub is dormant, it is important to watch browsing of these stems. An indicator of "overgrazing" of shrubs is moderate or heavy hedging (i.e., growth of lateral stems just below a grazed point) and a lack of new or juvenile plants (University of Idaho 2011). As shown in Table 4 of this evaluation report, recent utilization on palatable shrubs has been well below the 45% maximum in tortoise habitat (except for Mormon tea in 2008) and below the 50% maximum elsewhere (except for Mormon tea at Key Area #7 in 2004 and 2009). It should be noted that creosotebush, which is an important cover plant in the Mojave Desert portion of the allotment is not particularly palatable to livestock and is therefore not generally browsed by livestock. Thus, fall/winter grazing in tortoise habitat would continue to achieve or move toward achieving desired objectives, as well as maintain habitat features for desert tortoises (and other special status species) in this allotment.

Condors

*DFC-TE-31/**DFC-TE-27***
The experimental non-essential population of California condor will be at or above 150 individuals, viable, and stable to increasing in number.

Progress toward meeting this objective is occurring. The BLM works cooperatively with the USFWS, AGFD, and the Peregrine Fund to continue the California condor reintroduction program on the Arizona Strip. The BLM provides financial and in-kind assistance to this program. In addition, conservation measures developed specifically for the California condor are incorporated into all projects that have the potential to affect the species.

Wilderness Characteristics

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

This objective is being met. Wilderness characteristics are taken into consideration for all project-level planning so that these characteristics are maintained. In addition, no projects are proposed at this time that would alter the wilderness character of these areas.

Recreation and Visitor Services

DFC-RR-01

Recreation and visitor services will be managed to provide varying levels of both:

1. Structured recreation opportunities that offer a range of specific benefits, activities, and experiences within outdoor settings and/or,

2. Dispersed, unstructured recreation opportunities that focus only on visitor health and safety, user conflict, and resource protection issues (extensive recreation management areas (ERMAs).

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-04/**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-05/**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-06/**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.

DFC-RR-07

In Rural TMA, a wide variety of recreation opportunities associated with near-urban settings, such as walking, OHV play, equestrian, rock crawling, mountain biking, and viewing events, may be maintained/enhanced, provided they will be compatible with the protection of sensitive resource values.

RC-1 (Las Vegas RMP)

Ensure that a wide range of recreation opportunities are available for recreation users in concert with protecting the natural resources on public lands that attract users.

RC-10 (Las Vegas RMP)
Manage public lands not included within the Special Recreation Management Areas as the Southern Nevada Extensive Recreation Management Area, emphasizing dispersed and diverse recreation opportunities.

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

Areas of Critical Environmental Concern

DFC-AC-01
ACECs will provide protection for special status plant and animal species, scenic values, riparian values, and significant cultural resources.

AC-1 (Las Vegas RMP)
Establish areas of critical environmental concern specifically for management of desert tortoise within the Northeastern Mojave and Eastern Mojave recovery units identified in the Tortoise Recovery Plan (SS-31a) (see Table 2-2). Manage a sufficient quality and quantity of desert tortoise habitat, which in combination with tortoise habitat on other Federal, State and private land, will meet recovery plan criteria. Maintain functional corridors of habitat between areas of critical environmental concern to increase the chance of long-term persistence of desert tortoise populations within the recovery unit.

AC-2 (Las Vegas RMP)
Protect areas with significant cultural, natural, or geological values by establishing areas of critical environmental concern shown in Tables 2 through 6.

Objective AC-1 is being met to the extent possible. The Mesquite Community Allotment is managed by the Arizona Strip Field Office; therefore livestock grazing on those portions of the allotment that extend into Nevada Las Vegas Field Office are subject to the Arizona Strip RMP. Livestock grazing on those lands only occurs during periods of tortoise inactivity (fall/winter), exactly as those that are in the Arizona Strip portion of this allotment. The other two objectives are being met. Protection of the desert tortoise within the Virgin Slope ACEC and Gold Butte, Part A is being provided by site-specific management. Protection of wildlife habitat and botanical resources in the Gold Butte, Part C ACEC is being provided by site-specific management and mitigation. These actions include the following:

- The ACECs are closed to live vegetation harvest, except salvage in areas where surface disturbance has been authorized.
- Livestock grazing in the Virgin Slope ACEC will only occur during the tortoise inactive season (October 15 to March 15).

---

2. Specific Resource Objectives

Land Health Standards

Standard 1 (Upland Sites):

This allotment was classified in the RMP as category I, which suggests the watershed units currently are in satisfactory erosion condition and are not especially susceptible to wind and water erosion following disturbance. The soils found at lower elevations have low productivity and are moderately to strongly calcareous due to the slight leaching of salts.

Ground cover was measured at each key area and exhibited fluctuations between readings, which is not uncommon. These variations are strongly tied to surface litter, which are a reflection of weather and growth of annuals and forbs. A Standard #1 documentation worksheet was completed at several key areas (see Appendix E). The documentation worksheet evaluates seven indicators (surface litter, bare ground, rock, flow patterns, gullies, rills, and plant pedestalling) that determine the functional condition of upland sites as it relates to infiltration, permeability, and erosion rates. All seven indicators were rated at "None to Slight" at all of these key areas. The "None to Slight" determination means there was no or only a slight departure of those indicators from normal or the natural range of variation.

Based on this analysis, the IAT had consensus that all key areas are meeting Standard #1.

Table 9. Ground Cover Data for Mesquite Community Allotment

Key Area #1	Bare Ground	Litter	Rock	Live Vegetation
1984	71	11	16	2
1988	80	14	0	6
1991	56	7	18	19
2001	65	19	5	11
2004	39	34	25	2
2010	27	35	33	5

Key Area #2	Bare Ground	Litter	Rock	Live Vegetation
1985	59	18	20	3
1988	18	66	11	5
1991	46	16	29	9
2001	29	58	6	7
2007	88	8	1	3
2012	20	45	34	1

Key Area #3	Bare Ground	Litter	Rock	Live Vegetation
1984	34	27	38	2
1988	30	48	20	2
1991	40	16	25	19
2001	41	44	9	6

2007	49	36	14	1
2013	15	55	26	4

Key Area #4	Bare Ground	Litter	Rock	Live Vegetation
1984	66	19	13	2
1988	78	17	0	5
1991	40	14	19	27
2001	57	16	9	18
2008	40	46	12	2
2013	33	41	23	3

Key Area #7	Bare Ground	Litter	Rock	Live Vegetation
1981	49	30	15	6
1984	57	15	19	9
1988	49	40	6	5
1991	56	12	10	22
2001	45	29	10	16
2007	69	23	6	2
2012	31	44	23	2

Standard 2 (Riparian-Wetland Sites):

There are no riparian/wetland areas within the Mesquite Community Allotment.

Standard 3 (Desired Resource Conditions):

The IAT evaluated trend data, current composition, and conducted an assessment at key areas 1, 2, 3, 4 and 7 relative to criteria for meeting standards, and indicators of rangeland health. As shown in Table 4, trend at key areas 1, 2, 3 and 4 is up, while trend at Key Area 7 is static. This static trend at Key Area 7 is due to the fires in 2005. Table 10 exhibits the DPC objectives and whether or not they are currently being met at each key area.

As shown in Table 10, Key Area #1 (which is within desert tortoise habitat) is meeting DPC objectives, with the exception of native forbs. However, it should be noted that the composition of forbs is highly variable and is greatly influenced by spring and late summer precipitation. Thus, forb composition fluctuates greatly and will be met some years and not met during other years. Removing livestock from this portion of the allotment by March 15 (which is prior to the growth of forbs in most years) minimizes the effects of grazing on the presence of this important forage resource for desert tortoises. Key Area #2 (also in desert tortoise habitat) and Key Area #4 did not meet the perennial grass objective. Key Area #3 did not meet the browse objective. Key Area #7 met all DPC objectives. This data resulted in a recommendation that the areas (with the exception of Key Area #7, which is meeting Standard #3), were partially meeting Standard #3. It was determined by the IAT that livestock grazing is not the causal factor in only partially meeting DPC objectives and that current livestock

grazing would not be a factor in the areas not achieving DPC objectives. This determination was based on ESI, utilization, trend and precipitation data, as well as a field visit on February 3, 2009. (It is important to note that the data collected subsequent to 2009 also supports this assessment by the IAT.)

The potential for these sites to produce browse species and perennial grasses at levels to reach desired objectives is attainable over time. Key Areas 2, 3 and 7 were burned in 2005 and are progressing, but still lack the perennial grass (Key Area 2) and native browse (Key Area 3) component. It should be noted that removing livestock from the Mojave Desert portion of the allotment (key areas 1 and 2) between March 15 and October 15 results in little grazing by cattle on plants that are within their active growing stages. Plants are generally less damaged by grazing early or late in the season when time, soil moisture, and nutrients needed for regrowth are abundant. Plants are most likely to be damaged by grazing when the plant is beginning to produce flowers and seeds. The grazing season in the desert tortoise habitat portion of the allotment is outside this phenological time period. The low forb composition at some key areas was not of great concern due to the natural variation that occurs from timing and amounts of precipitation (i.e., during normal or wet years, sufficient forbs would be present).

Allotment Management Plan Objectives

Key Area #1 (within critical desert tortoise habitat)
Maintain desirable browse species at about 53% composition and increase perennial grass cover from 0 to 5% in 15 years.

- Browse objective met (current composition is 71%)
- Perennial grass objective not met (current composition is 0%)

(Key Area # 2 (within critical desert tortoise habitat)
Maintain key browse species at 21% but increase perennial grass from 0-5% of the species composition in 15 years.

- Browse objective not met (current composition is 8%)
- Perennial grass objective not met (current composition is 0%)

Key Area #3
Maintain key species composition of 37% in 15 years.

- Objective met (composition of key species is currently 67%)

Key Area #4
Increase key species composition from 1% to 20% in 15 years

- Objective not met (composition of key species is currently 10%)

Key Area #7
Increase key species composition from 18% to 30% in 15 years.

- Objective met (composition of key species is currently 48%)

Summary: Due to the arid nature of the allotment and fire frequency, rapid change should not be expected under any kind of management (including complete rest). Fire has played a key role in reducing native browse in many areas of the Mesquite Community Allotment. At the time the AMP objectives were written, ESDs were not available for these key areas. Often the data was reviewed and professional judgment was utilized to come up with AMP objectives. The above objectives therefore appear to have been very optimistic, and some do not appear to be accurate (i.e., not within the potential of the site). For example, the ESD for some ecological sites listed grass species as dominant when in fact the site is shrub dominated. As technology and site descriptions have become more refined, the descriptions for the key areas (such as #1 and #7) have changed.

Desired Plant Community (DPC) Objectives

Table 10 presents each DPC objective and whether or not it is currently being met.

Key Area #1 (within desert tortoise habitat)
Ecological Site: Limy Upland (6 to 9 inch precipitation zone [p.z.])

- *Maintain total ground cover between 20 and 40%.*
- *Maintain native browse (burrobrush, littleleaf ratany, goldeneye) at 45-60% CBW*
- *Maintain native shrubs (creosotebush, desert rue) at 10-20% CBW*
- *Maintain native forbs (desert globemallow, plantain, desert marigold) at 1-10% CBW.*

Conclusion:

Based on vegetative composition in Table 10, this key area meets DPC objectives for ground cover, native browse and native shrubs. Native forbs were not met, possibly due to 2010 being a low precipitation year (since the composition of forbs is highly variable and is greatly influenced by spring and summer precipitation).

Key Area #2 (burned in 2005) (within desert tortoise habitat)
Ecological Site: Limy Upland Deep 6-9"

- *Maintain total ground cover between 25 and 45%.*
- *Increase perennial grass (big galleta, threeawn) at 2-8% CBW.*
- *Maintain native browse (burrobrush, littleleaf ratany, Mormon tea) at 5-15% CBW*
- *Maintain native shrubs (catclaw, creosotebush, burrobrush, desert almond) at 25-45% CBW.*
- *Maintain native forbs (desert globemallow, plantain, desert marigold) at 1-10% CBW.*

Conclusion:

Based on vegetative composition in Table 10, this key area meets DPC objectives for ground cover, native browse, native shrubs and native forbs. Native perennial grasses were not met and it is a very minor vegetative component (Table 4), possibly due to previous fire activity and intensity.

Key Area #3 (burned in 2005)
Ecological Site: Limestone Slopes (13 to 17 inch p.z.)

- *Maintain total ground cover between 25 and 45%.*
- *Maintain native perennial grasses (threeawn, Indian ricegrass) at 5-15% CBW.*
- *Maintain native browse (cliffrose) at 2-8% CBW.*
- *Increase native shrubs (Yerba santa, longspine horsebrush) at 2-10% CBW.*
- *Maintain native forbs (desert globemallow, desert marigold) at 1-10% CBW.*

Conclusion:

Based on vegetative composition in Table 10, this key area meets DPC objectives for ground cover, native perennial grass, native shrubs and native forbs. The native browse objective was not met, possibly due to previous fire activity and intensity.

Key Area #4 (burned in 1948)
Ecological Site: Loamy Upland (13 to 17 inch p.z.)

- *Maintain total ground cover between 20 and 40%.*
- *Maintain native perennial grasses (threeawn) at 3-15% CBW.*
- *Maintain native browse (Mormon tea, littleleaf ratany) at 8-15% CBW.*
- *Maintain native shrubs (goldenbush, desert rue, Yerba santa) at 45-55% CBW.*

Conclusion:

Based on vegetative composition in Table 10, this key area meets DPC objectives for ground cover, native browse and native shrubs. Native perennial grasses were not met; however, this key area appears to be predominantly shrub dominated.

Key Area #7 (burned in 2005)
Ecological Site: Shallow Upland Calcareous (9 to 13 inch p.z.)

- *Maintain total ground cover between 20 and 40%.*
- *Maintain native perennial grasses (threeawn, sideoats grama, big galleta) at 15-30% CBW.*
- *Maintain browse (cliffrose, Mormon tea) at 5-15% CBW.*
- *Maintain native shrubs (desert almond, desert rue, Apache plume, yucca) at 20-30% CBW.*
- *Maintain native forbs (desert globemallow) at 1-10% CBW.*

Conclusion:

Based on vegetative composition in Table 10, this key area meets DPC objectives for all categories (ground cover, native perennial grass, native browse, native shrubs and native forbs).

Table 10. Desired Plant Community Objectives Determination

Key Area #1 (desert tortoise habitat) Ecological Site: Limy Upland Deep 6 to 9"			
Plant Species	**Current Composition**	**Desired Plant Composition**	**Objective Met or Not**
Ground Cover	73	20-40%	Met
Native Browse	71	45-60%	Met
Burrobrush	50		
Goldeneye	15		
Littleleaf ratany	6		
Native Shrubs	12	10-20%	Met
Creosotebush	10		
Desert rue	2		
Native Forbs	0	1-10%	Not Met
Desert marigold	0		
Desert globemallow	0		
Plantain	0		

Key Area #2 – burned in 2005 (desert tortoise habitat) Ecological Site: Limy Upland Deep 6 to 9"			
Plant Species	**Current Composition**	**Desired Plant Composition**	**Objective Met or Not**
Ground Cover	80	25-45%	Met
Native Perennial Grass	0	2-8%	Not Met
Big galleta	0		
Threeawn	0		
Native Browse	8	5-15%	Met
Littleleaf ratany	4		
Mormon tea	4		
Native Shrubs	36	25-45%	Met
Catclaw	26		
Creosotebush	2		
Brittlebush	6		
Desert almond	2		
Native Forbs	29	1-10%	Met
Desert marigold	27		
Desert globemallow	2		

Key Area #3 – burned in 2005 Ecological Site: Limestone/Sandstone Cliffs 13 to 17"			
Plant Species	**Current Composition**	**Desired Plant Composition**	**Objective Met or Not**
Ground Cover	85	25-45%	Met
Native Perennial Grass	18	5-15%	Met
Indian ricegrass	3		
Threeawn	15		

Native Browse	1	2-8%	Not Met
Cliffrose	1		
Native Shrubs	3	2-10%	Met
Longspine horsebrush	3		
Yerba Santa	0		
Native Forbs	48	1-10%	Met
Desert marigold	0		
Desert globemallow	48		

Key Area #4 **Ecological Site: Sandy Loamy Upland 13 to 17", Cobbly Surface**			
Plant Species	**Current Composition**	**Desired Plant Composition**	**Objective Met or Not**
Ground Cover	67	20-40%	Met
Native Perennial Grass	0	3-15%	Not Met
Threeawn	0		
Native Browse	10	8-15%	Met
Littleleaf ratany	8		
Mormon tea	2		
Native Shrubs	48	45-55%	Met
Desert rue	8		
Goldenbush	22		
Yerba santa	18		

Key Area #7 – burned in 2005 **Ecological Site: Shallow Upland Calcareous 10 to 14"**			
Plant Species	**Current Composition**	**Desired Plant Composition**	**Objective Met or Not**
Ground Cover	69	20-40%	Met
Native Perennial Grass	27	15-30%	Met
Big galleta	2		
Sideoats grama	2		
Threeawn	23		
Native Browse	10	5-15%	Met
Cliffrose	6		
Mormon tea	4		
Native Shrubs	23	20-30%	Met
Apache plume	4		
Desert almond	4		
Desert rue	8		
Yucca	7		
Native Forbs	13	1-10%	Met
Desert globemallow	13		

Conclusion: Some species in the sites above have a "not met" conclusion due to the early and mid seral state that the key areas are in. These areas have had recent fires, so some of the species are slowly recovering from being burned, but will not be at PNC levels for various time intervals. However, these objectives (the lower end of the objective) should be attainable within 20 years under current livestock management practices provided the areas are not burned again.

B. Pertaining to Issues

1. Issues relating to Rangeland Health

a. 15,273 acres burned in 2005, and those acres do not meet Standard #3

There are three key areas within this recent burn area (2, 3, and 7). Key Area #2 is within desert tortoise habitat, while key areas 3 and 7 are not. In the fire areas, these plant communities are recovering but have a higher composition of annuals. As shown in Table 10 (above), the perennial grass objective for Key Area #2 is not met and the browse objective for Key Area #3 is not met, but all other categories for these three key areas meet their desired plant community objectives. Removal of all or most cattle from the allotment every year from May 30 to October 15 (and all cattle from desert tortoise critical habitat from March 15 to October 15) provides rest during the summer monsoon season for plant growth. Cattle are also moved from pasture to pasture in the spring to allow other pastures to rest during their growing seasons, along with summer rest. This allows plants to grow (to replenish root reserves and increase vigor) and set seed, which would maintain or improve the ecological condition of the allotment (including the burned areas). The IAT recommended that two of the three key areas that burned in 2005 (#2 and #3) partially meet Standard 3, while Key Area #7 meets Standard 3.

b. Desert tortoise occur on the Mojave Desert part of the allotment and populations are still declining

As described on pages 51-53 of this report, long-term monitoring of the Mojave population of the desert tortoise has been occurring for many years. Monitoring methodology changed in 2001 when line distance sampling began to be used. The first five years of monitoring (2001-2005) were not to document trends, but to gather information on baseline densities. Sample size was also increased to get statistically sound data. While it is too soon to make a definitive determination on population trends, recent monitoring data may indicate that the population of desert tortoise in the Northeastern Mojave Recovery Unit (of which the Mesquite Community Allotment is a part) may have stabilized (see Table 8).

As discussed on pages 38-44 of this evaluation report, a variety of factors (including habitat degradation due to the proliferation of non-native plant species, an increase in fire frequency caused by non-native plants providing

sufficient fuel to carry fires, disease, predation by ravens, livestock grazing, and off-road vehicle use) are considered threats to the Mojave population of the desert tortoise. Most of the Mojave Desert portion of the Mesquite Community allotment has not burned, resulting in the Mojave Desert plant communities within this allotment primarily being at or near desired plant community levels, functioning properly, and containing necessary habitat constituents for the desert tortoise. However, much of the Mojave-Great Basin Transition zone has burned, most of which occurred in 2005.

Permitted livestock use in desert tortoise habitat within this allotment is from October 15 to March 15. The fall/winter grazing in tortoise habitat allows for the growth of forbs and other desert vegetation during the spring and summer without any grazing use, resulting in ephemeral plant growth for forage for desert tortoises without competition from livestock, thus giving tortoises a better chance at obtaining important food sources. Since the season of use in tortoise habitat is during the inactive season for desert tortoises, livestock grazing should not result in direct mortality to tortoises unless a tortoise is injured or killed due to its burrow being stepped on and collapsed. The BLM will continue to work with the USFWS to monitor this species and implement best management practices that will assist in the recovery of the Mojave population of the desert tortoise.

c. Wildlife access water on Lime Kiln, Narrow, Middle Canyon, Buck and Upper/Lower Heck Hole pipelines and springs, as well as a number of additional springs including: Lead Mine, and Cabin Canyon.

There is water in open reservoirs along the pipelines and at springs, providing water for wildlife. However, water is shut off to some tanks to facilitate moving livestock to other areas of the allotment.

d. Lack of big galleta grass along the boundary with Cottonwood Allotment

Big galleta is coming back slowly, but it is still low at 2% (where the site guide composition suggests 5-10%). This may be due to the hot burn in 2005, although it should sprout from rhizomes; drought since the fire may also be the reason for the low composition of this species.

e. Exotic and invasive species

Exotic and invasive species are abundant on wet years and have very little occurrence during normal and dry years. The presence of stable plant communities allows little to no growth of invasive plants during these times. The rest from grazing during the summer and early fall months will benefit native species over time and reduce the exotics. The shrubs would be the main species to overcome exotics in the old burns. In the old burns native shrubs dominate after 20 years.

Feral pigs reportedly escaped from captivity in the Mesquite, Nevada to Littlefield, Arizona area along the Virgin River corridor at some point in the past. Sightings and takes have been reported over the years in or near the Mesquite Allotment. Hunters are allowed to take feral pigs in Arizona to reduce or eliminate the population, but hunting them is difficult due to the rough and remote nature of the area and lack of access.

VI. Technical Recommendations

A. Continue implementing current management practices by conducting consistent utilization monitoring at the key areas and ensuring compliance with livestock removal from tortoise habitat from March 15 until October 15. Range improvements will be maintained and utilized as a rotation tool to enhance condition of vegetation communities and facilitate livestock management and control.

B. Key areas 2, 3 and 7 were burned in 2005 and Key Area 4 was burned in 1948. Continue to monitor vegetative trend on a regular basis (every 5 years) to maintain static to upward trends on desirable vegetative species in all key areas.

C. Utilization will be monitored by the BLM to assure that utilization levels do not exceed 50% (45% in desert tortoise critical habitat) of the annual growth of forage species at key areas. Proper forage utilization in pastures will be enhanced by the use of salt/supplement placement.

D. Continue to work with the USFWS to monitor the desert tortoise and implement best management practices that will assist in the recovery of this species.

AUTHORIZED OFFICER CONCURRENCE:

✓ We concur with the recommendations as written.

_____ We do not concur.

_____ We concur, with the following modifications:

Lorraine M. Christian
Field Manager
Arizona Strip Field Office

May 15, 2015
Date

Mark Wenn
Acting Monument Manager
Grand Canyon-Parashant National Monument

May 12, 2015
Date

VII. References Cited

About.com. 2013. Birding/Wild Birds Guide – Loggerhead Shrike. Accessed at: http://birding.about.com/od/birdprofiles/p/loggerheadshrike.htm. Accessed January 10. 2013.

Arizona Game and Fish Department (AGFD). 2003. *Arizona Bat Conservation Strategic Plan*, Technical Report 213. Arizona Bat Resource Group. Edited by K. E. Hinman, Bat Project Coordinator; T. K. Snow, Region 5 Nongame Specialist. Nongame Branch, Wildlife Management Division Region 5, Field Operations Division. Phoenix, Arizona.

Arizona Game and Fish Department and U.S. Department of the Interior, Bureau of Land Management (AGFD and BLM). 2010. *Arizona Strip Interdisciplinary Mule Deer Management Plan 2010-2014*. Written by: Thompson, L., R. Price, T. McCall, C. Hadley, T. Denniston, W. Bunting.

Arizona-Sonora Desert Museum. 2013. Animal Fact Sheet: Cave Myotis Bat. Available at: http://www.desertmuseum.org/kids/bats/cave_myotis.php. Accessed January 10. 2013.

Arizona-Sonora Desert Museum. 2015a. Animal Fact Sheet: California Leaf-Nosed Bat. Available at: http://www.desertmuseum.org/kids/bats/california_leaf_nosed_bat.php. Accessed February 27, 2015.

Arizona-Sonora Desert Museum. 2015b. Animal Fact Sheet: Townsend's Big-Eared Bat. Available at: http://www.desertmuseum.org/kids/bats/townsends.php. Accessed February 27, 2015.

Arizona-Sonora Desert Museum. 2015c. Animal Fact Sheet: Greater Western Mastiff Bat. Available at: http://www.desertmuseum.org/kids/bats/greater_mastiff_bat.php. Accessed February 27, 2015.

Audubon. 2013. Brewer's Sparrow. Accessed at: http://audubon2.org/watchlist/viewSpecies.jsp?id=46. Accessed January 10. 2013.

Avery, H.W., and A.G. Neibergs. 1997. Effects of cattle grazing on the desert tortoise, *Gopherus agassizii*: Nutritional and behavioral interactions. Pages 13-20 *in* J. Van Abbema (ed.), Proceedings of the International Conference on Conservation, Restoration, and Management of Tortoises and Turtles. New York Turtle and Tortoise Society, New York.

Bat Conservation International. 2015. Species Profiles – Allen's big-eared bat. Accessed at: http://www.batcon.org/index.php/all-about-bats/species-profiles.html?task=detail&species=2215&country=43&state=all&family=all&limitstart=0. Accessed February 27, 2015.

Berry, K.H. 1984. A description and comparison of field methods used in studying and censusing desert tortoises. Appendix 2. Pp 1-33 *in* K.H. Berry (ed.), The status of the

desert tortoise (*Gopherus agassizii*) in the United States. Report to the U.S. Fish and Wildlife Service from the Desert Tortoise Council. Order No. 11310-0083-81.

Bighorn Sheep Core Team. 2006. *Arizona Strip Desert Bighorn Sheep Management Plan, as Amended.* Prepared for the Bureau of Land Management, U.S. Forest Service and Arizona Game and Fish Department, 18 pp.

Boarman, W.I. 1993. When a native predator becomes a pest: a case study. For: conservation and resource management (S K. Majumdar, *et al.*, eds.), pages 186-201. Pennsylvania. Academy of Science, Easton, PA.

Boarman, W. I. and K. H. Berry. 1995. Common ravens in the southwestern United States, 1968-92. Pages 73-75 in E. T. LaRoe, G. F. Farris, C. E. Puckett, P. D. Doran, and M. J. Mac, editors. Our living resources: A report to the nation on the distribution, abundance, and health of U.S. plants, animals, and ecosystems. National Biological Service. Washington, D.C.

Boarman, W.I. and W.B. Kristan. 2006. Trends in common raven populations in the Mojave and Sonora deserts: 1968-2004. Draft report to U. S. Fish and Wildlife Service, Ventura CA 93003.

Brooks, M.L., and T.C. Esque. 2002. Alien plants and fire in desert tortoise *(Gopherus agassizii)* habitat of the Mojave and Colorado deserts. Chelonian Conservation and Biology 4:330-340.

Brown, D.R. , I. M. Schumaeher, G.S. McLaughlin, L.D. Wendland, M.B. Brown, P.A. Klein, and E.R. Jacobson. 2002. Application of diagnostic tests for mycoplasmal infections of the desert and gopher tortoises, with management recommendations. Chelonian Conservation and Biology 4:497-507.

Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D.L. and Thomas, L. 2001. *Introduction to Distance Sampling*. Oxford University Press, Oxford. 432 pp.

Cabeza Prieta Natural History Association. 2012. Sonoran Desert Mammals – Big Free-tailed Bat. Accessed at: http://cabezaprieta.org/mammal_page.php?id=1755. Accessed March 2, 2012.

Dantzler, W.H. and B. Schmidt-Nielsen. 1966. Excretion in fresh water turtle (*Pseudemys scripta*) and desert tortoise (*Gopherus agassizii*). American Journal of Physiology, 201:198-210.

Ernst, C.H. and J.E. Lovich. 2009. *Turtles of the United States*. Johns Hopkins University Press. Baltimore, Maryland.

Haug, E.A., B.A. Milsap, and M.S. Martell. 1993. Burrowing owl (*Speotyto cunicularia*). In *The Birds of North America*, edited by A. Poole and F. Gill. No. 61. Philadelphia: The Birds of North America.

Henen, B.T. 2002. Reproductive Effort and Reproductive Nutrition of Female Desert Tortoises: Essential Field Methods. Integrative and Comparative Biology, 42:43-50. Oxford University Press.

Hohman, J. P.; Ohmart, R. D. 1980. Ecology of the desert tortoise on the Beaver Dam Slopes, Arizona. Contract YA-510-PH7-54. Report for the U.S. Department of the Interior, Bureau of Land Management, Arizona Strip District Office, St. George, Utah. 46 p. + appendix.

Jacobson, E. 1992. The Desert Tortoise and Upper Respiratory Tract Disease. A Special Report prepared for the Desert Tortoise Preserve Committee, Inc. and the Bureau of Land Management. University of Florida, Gainesville.

Jennings, W.B. 1993. Foraging ecology of the desert tortoise (*Gopherus agassizii*) in the western Mojave Desert. M.S. thesis, University of Texas, Arlington.

Jørgensen, C.B. 1998. Role of urinary and cloacal bladders in chelonian water economy: historical and comparative perspectives. Biol. Rev. 73:347–366.

Knight, R.L, H.A.L. Knight, and R. J. Camp. 1993. Raven populations and land-use patterns in the Mojave Desert, California. Wildlife Society Bulletin

Kristan, W.B. III and W.I. Boarman. 2007. Effects of anthropogenic developments on common raven nesting biology in the west Mojave Desert. Ecological Applications 17:1703-1713.

Luckenbach, R.A. 1982. Ecology and management of the desert tortoise (*Gopherus agassizii*) in California. Pp 1-37 *in* R.B. Bury (ed.), North American Tortoises: Conservation and Ecology.

Oftedal, O.T. 2002. Nutritional ecology of the desert tortoise in the Mohave and Sonoran deserts. Pp. 194-241 in Van Devender, T.R. (ed) The Sonoran Desert Tortoise Natural History, Biology, and Conservation. University of Arizona Press, Tucson.

Oftedal, O.T., S. Hillard, and D.J. Morafka. 2002. Selective spring foraging by juvenile desert tortoises (*Gopherus agassizii*) in the Mojave Desert: Evidence of an adaptive nutritional strategy. Chel. Conservation & Biology 4(2): 341-352.

Oldemeyer, J.L. 1994. Livestock Grazing and the desert tortoise in the Mohave Desert. Pages 95-103 in R.B. Bury and D.J. Germano (eds.), Biology of North American Tortoises. National Biological Survey, Fish and Wildlife Research 13, Washington, D.C.

The Peregrine Fund. California Condor Current Population Data Table, March 15, 2015. Accessed at: http://peregrinefund.org/index.php?action=search-results&sid=13253.

Pima County. 2015. Vulnerable Species Fact Sheets – Allen's big-eared bat. Accessed at: http://www.pima.gov/cmo/sdcp/species/fsheets/vuln/abeb.html. Accessed February 27, 2015.

Smithsonian Institution. 2013. Fact Sheet – Banded Gila Monster. Accessed at: http://nationalzoo.si.edu/Animals/ReptilesAmphibians/Facts/FactSheets/Gilamonster.cfm Accessed January 14, 2012.

Tracy, C.R., R. Averill-Murray, W.I. Boarman, D. Delahanty, J. I-leaton, E. McCoy, D. Morafka, K. Nussear, B. Hagerty, and P. Medica. 2004. Desert tortoise recovery plan assessment report. Unpublished report. 254 pages.

U.S. Department of the Interior, Bureau of Land Management (BLM). 1995. Biological evaluation; livestock grazing program on the Arizona Strip District, desert tortoise habitat. Bureau of Land Management, Arizona Strip District, Shivwits Resource Area, St. George, Utah.

U.S. Department of the Interior, Bureau of Land Management (BLM). 1996. *Sampling Vegetation Attributes*, Technical Reference 1734-4. Written by: Coulloudon, B., K. Eselman, J. Gianola, N. Habich, L. Hughes, C. Johnson, M. Pellant, P. Podborny, A. Rasmussen, B. Robles, P. Shaver, J. Spehar, and J. Willoughby. Denver, CO. BLM/RS/ST-96/002+1730. pp. 112.

U.S. Department of the Interior, Bureau of Land Management (BLM). 2001. *Ecological Site Inventory*, Technical Reference 1734-7. Written by: Habich, E.F. Denver, CO. BLM/ST/ST-01/003+1734. pp. 112.

U.S. Department of the Interior, Bureau of Land Management (BLM). 2005. *Interpreting Indicators of Rangeland Health, Version 4*, Technical Reference 1734-6. Written by: Pellant, M., P. Shaver, D. A. Pyke, and J. E. Herrick. Denver, CO. BLM/ST/ST-01/003+1734. pp. 112.

U.S. Department of the Interior, Bureau of Land Management (BLM). 2008a. *Arizona Strip Field Office Resource Management Plan.* Bureau of Land Management, St. George, Utah.

U.S. Department of the Interior, Bureau of Land Management (BLM). 2008b. *Grand Canyon-Parashant National Monument Resource Management Plan.* Bureau of Land Management, St. George, Utah.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1990. Determination of Threatened Status for the Mojave Population of the Desert Tortoise. *Federal Register* 55:12178-12191.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1994a. Desert tortoise (Mojave population) recovery plan. Portland, Oregon. 73 pages plus appendices.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1994b. Determination of Critical Habitat for the Mojave Population of the Desert Tortoise. *Federal Register* 59:5820-5866.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2006. *Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2001-2005 Summary Report*. Prepared by Desert Tortoise Monitoring Committee, Desert Tortoise Recovery Office. Reno, Nevada.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2007. Final Rule Removing the Bald Eagle in the Lower 48 States From the List of Endangered and Threatened Wildlife. *Federal Register* 72:37346-37372.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2009. *Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2007 Annual Report*. Prepared by Linda Allison, Desert Tortoise Monitoring Coordinator, Desert Tortoise Recovery Office. Reno, Nevada.

U.S. Fish and Wildlife Service (USFWS). 2010. Email from Brian Wooldridge, Arizona Ecological Services, Flagstaff, Arizona Office.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2011a. Email from Brenda Smith, Arizona Ecological Services, Flagstaff, Arizona Office.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2011b. Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*). Region 8, Pacific Southwest Region, Sacramento, California. 227 pages.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2012a. *Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2008 and 2009 Annual Report*. Prepared by Linda Allison, Desert Tortoise Monitoring Coordinator, Desert Tortoise Recovery Office. Reno, Nevada.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2012b. *Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2010 Annual Report*. Prepared by Linda Allison, Desert Tortoise Monitoring Coordinator, Desert Tortoise Recovery Office. Reno, Nevada.

U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 2013. *Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2011 Annual Report*. Prepared by Linda Allison, Desert Tortoise Monitoring Coordinator, Desert Tortoise Recovery Office. Reno, Nevada.

University of Idaho and Idaho Rangeland Resource Commission. 2011. *Rangelands – An Introduction to Wild Open Spaces*. Moscow, Idaho. 12 pages.

Utah Division of Wildlife Resources (UDWR). 2005. Biotics Database, NatureServe and the network of Natural Heritage Programs and Conservation Data Centers. Accessed at: http://dwrcdc.nr.utah.gov/rsgis2/search/Display.asp?FlNm=idiophyl. Accessed May 14, 2015.

Wikipedia, The Free Encyclopedia. 2015a. American Peregrine Falcon. Available at: http://en.wikipedia.org/wiki/Peregrine_Falcon. Accessed February 27, 2015.

Wikipedia, The Free Encyclopedia. 2015b. Ferruginous Hawk. Available at: http://en.wikipedia.org/wiki/Ferruginous_Hawk. Accessed February 27, 2015.

Wikipedia, The Free Encyclopedia. 2015c. Bendire's Thrasher. Available at: http://en.wikipedia.org/wiki/Bendire's_Thrasher. Accessed February 27, 2015.

Wikipedia, The Free Encyclopedia. 2015d. Pinyon Jay. Available at: http://en.wikipedia.org/wiki/Pinyon_Jay. Accessed February 27, 2015.

Wikipedia, The Free Encyclopedia. 2015e. Big Free-tailed Bat. Available at: http://en.wikipedia.org/wiki/Big_Free-tailed_Bat. Accessed February 27, 2015.

Wikipedia, The Free Encyclopedia. 2013b. Brewer's Sparrow. Available at: http://en.wikipedia.org/wiki/Brewer's_Sparrow. Accessed January 10, 2013.

Willey, D. W., and D. Spotskey. 2000. Field test of a habitat model for Mexican spotted owl breeding habitat. Final Report; Arizona Heritage Program, Phoenix, AZ.

Willey, D. W., and R.V. Ward. 2003. Mexican Spotted Owl Distribution and Habitat within Grand Canyon National Park. *Natural Resource Management*, 328-334.

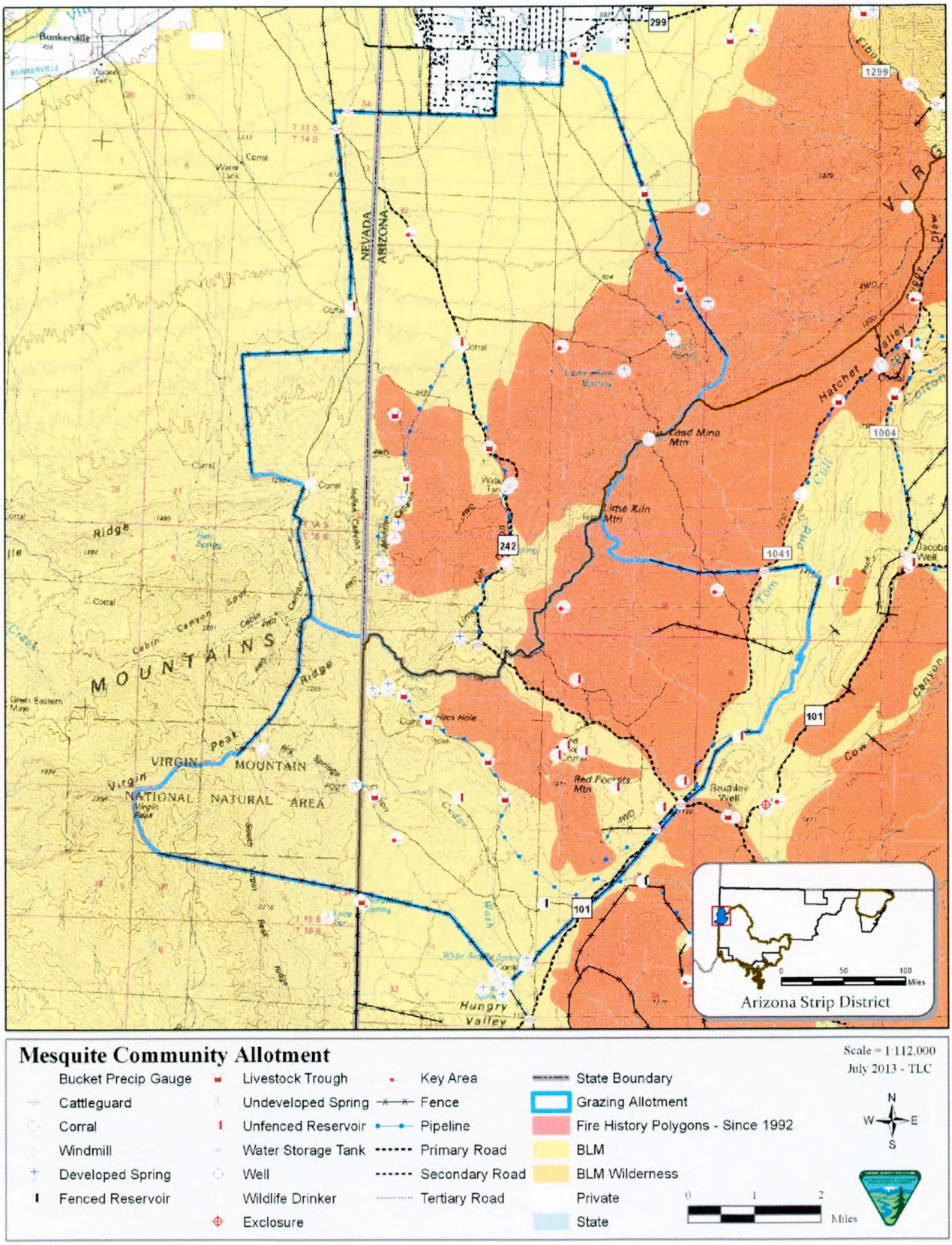
VIII. Plant Species List

Below is a list of plant species (common and scientific names) included in this evaluation report.

Table 13. List of Plant Species Included in this Assessment Report

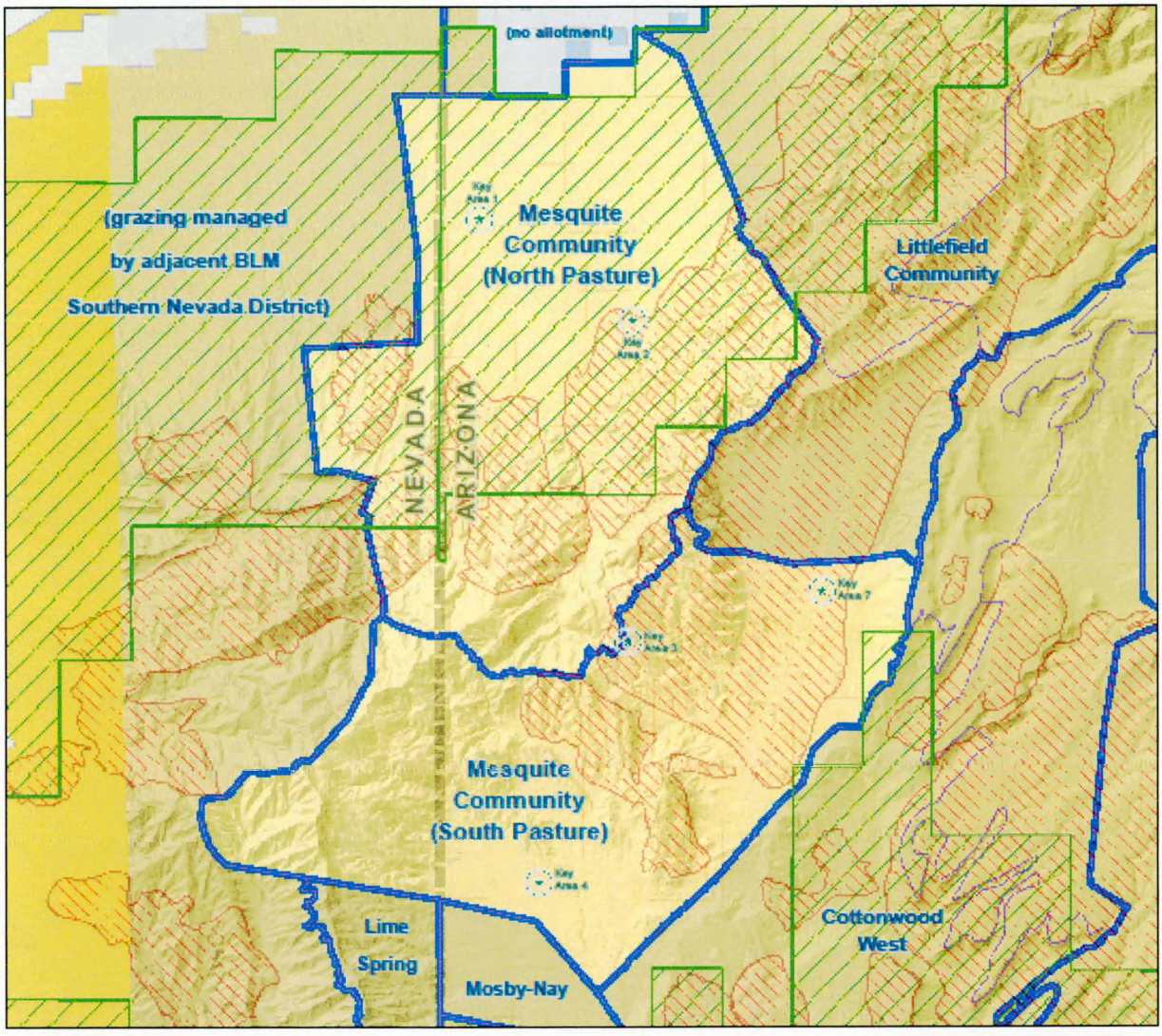
Grasses	
Perennial species	
Fendler threeawn	***Aristida longiseta***
Grama grass	***Bouteloua* sp.**
Fluffgrass	***Erioneuron pulchellum***
Galleta grass	***Hilaria jamesii***
Big galleta	***Hilaria rigida***
Bush muhly	***Muhlenbergia porteri***
Indian ricegrass	***Oryzopsis hymenoides* *(Achnatherum hymenoides)***
Sand dropseed	***Sporobolis cryptandrus***
Squirreltail	***Sitanion hystrix***
Desert needle grass	***Stipa speciosa***
Annual species	
Six-weeks three-awn	***Aristida adscensionis***
Red brome	***Bromus rubens***
Mediterranean grass	***Schismus barbatus***
Shrubs/Trees	
Catclaw	***Acacia gregii***
Rayless goldenhead	***Acamptopappus sphaerocephalus***
White bursage	***Ambrosia dumosa***
Buttonbush	***Cephalanthus* sp.**
Blackbrush	***Coleogyne ramosissima***
Cliffrose	***Cowania mexicana***
Cholla	***Cylindropuntia* sp.**
Hedgehog cactus	***Echinocereus* sp.**
Button brittlebush	***Encelia frutescens***
Narrowleaf Yerba Santa	***Eriodictyon angustifolium***
California buckwheat	***Eriogonum fasciculatum***
Mormon tea	***Ephedra* sp.**
Apache plume	***Fallugia paradoxa***
Barrel cactus	***Ferocactus cylindraceus***
Spiny hopsage	***Grayia spinosa***
Snakeweed	***Gutierrezia sarothrae***
Narrowleaf goldenbush	***Haplopappus linearifolius***
Burrobrush	***Hymenoclea salsola***
One-seed juniper	***Juniperus osteosperma***
Little-leaf ratany	***Krameria parvifolia***
Winterfat	***Krascheninnikovia lanata* *(Ceretoides lanata)***
Creosotebush	***Larrea tridentata***

Wolfberry	***Lycium torreyi***
Buckhorn cholla	***Opuntia acanthocarpa***
Beavertail cactus	***Opuntia basilaris***
Desert prickly pear	***Opuntia phaeacantha***
Cottonwood	***Populus* sp.**
Desert almond	***Prunus fasciculata***
White-stem paperflower	***Psilostrophe cooperi***
Indigobush	***Psorothamnus arborescens***
Turbinella oak	***Quercus turbinella***
Wirelettuce	***Stephanomeria pauciflora***
Longspine horsebrush	***Tetradymia axillaris***
Mojave desert rue	***Thamnosa montana***
Hairy crinklemat	***Tiquilia canescens***
Banana yucca	***Yucca baccata***
Joshua tree	***Yucca brevifolia***
Mojave yucca	***Yucca schidigera***
Forbs	
Annual species	
Filaree	***Erodium cicutarium***
Bottlestopper	***Eriogonum inflatum***
Pepperweed	***Lepidium* sp.**
Coulter's lupine	***Lupinus sparsiflorus***
Plantain	***Plantago* sp.**
Bi-annual or Perennial species	
Windmills	***Allionia incarnate***
Two-seeded milkvetch	***Astragalus didymocarpus***
Desert marigold	***Baileya multiradiata***
Sahara mustard	***Brassica tournefortii***
Lily	***Calochortus* sp.**
Woolly bottlebrush	***Camissonia boothii***
Evening primrose	***Camissonia claviformis***
Sedges	***Carex* sp.**
Desert pincushion	***Chaenactis fremontii***
Sandmat	***Chamaesyce* sp.**
Desert thistle	***Cirsium neomexicanum***
Nievitas	***Cryptantha* sp.**
Desert trumpet	***Eriogonum inflatum***
Rattlesnake weed	***Euphorbia albomarginata***
Sandmat	***Euphorbia micromera***
Biscuitroot	***Lomatium* sp.**
Deervetch	***Lotus strigosus***
Desert dandelion	***Malacothrix glabrata***
Combbur	***Pectocarya recurvata***
Plaintain	***Plantain* sp.**
Desert globemallow	***Sphaeralcea ambigua***
Narrowleaved wire lettuce	***Stephanomeria tenuifolia***
Goldeneye	***Viguiera* sp.**


Mesquite Community Allotment
Scale = 1:112,000
July 2013 - TLC
Bucket Precip Gauge
Cattleguard
Corral
Windmill
Developed Spring
Fenced Reservoir
Livestock Trough
Undeveloped Spring
Unfenced Reservoir
Water Storage Tank
Well
Wildlife Drinker
Exclosure
Key Area
Fence
Pipeline
Primary Road
Secondary Road
Tertiary Road
State Boundary
Grazing Allotment
Fire History Polygons - Since 1992
BLM
BLM Wilderness
Private
State
Miles
Arizona Strip District
NEVADA
ARIZONA
MOUNTAINS
VIRGIN MOUNTAIN
NATIONAL NATURAL AREA
Bunkerville
Hungry Valley
Lime Kiln Mtn
Load Mine Mtn
Red Pockets Mtn
Hacks Hole
Bradley Well
Jacobs Well
Hatchet Valley
299
1299
1004
1041
242
101

Mesquite Community Allotment

Bureau of Land Management - Arizona Strip District



Grazing Management Features

- Grazing Allotments
- Pasture Boundaries
- Key Area

Land Health Features

- Desert Tortoise Critical Habitat - FWS 2010
- Fire Perimeters 1995-2014

Surface Management Agency

- Bureau of Land Management
- State
- Private
- (areas outside of allotment shaded darker)

Reference Features

- PLSS Sections (only shown in Arizona)
- State Boundary



Map Produced by: BLM - Arizona Strip District GIS Program
User: bhansen
File Path: \\blm\dfs\loc\EGIS\AZ\Arizona_Strip_DO\Projects\LandHealth\2015_LHR\Data\GIS\Maps\Certs\MCA_2015_LHR_letter_port_1.mxd
Date: March 2015

Coordinate System: NAD 1983 UTM Zone 12N
ReferenceSystem: U.S. PLSS GSRB&M
Ratio Scale: 1:140,000 at 8.5x11 page output

Data Sources
Range Features, SMA: BLM-ASDO Corporate Geodatabases
Fire Perimeters: AZ and NV FPER Geodatabases
Desert Tortoise Critical Habitat: FWS GIS Data Portal - 2010 update downloaded March, 2015

0 0.5 1 2 3 Miles
0 0.5 1 2 3 4 5 Kilometers

The Bureau of Land Management (BLM) makes no representations or warranties regarding the accuracy or completeness of this map. This map does not address encroachments or questions of location, boundary, and area, which an accurate survey may disclose. This map is intended and is to be used as an illustration only. The map is merely representational, it and the data from which it was derived are not binding on the BLM and may be revised at any time in the future. The BLM shall not be liable under any circumstances for any direct, indirect, special, incidental, or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map or the data from which it was derived.

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

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

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

As indicated by such factors as:

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

Signs of erosion
- flow pattern
- gullies
- rills
- plant pedestaling

Exceptions and exemptions (where applicable):

None

Guidelines:

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

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

Standard 2: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

Criteria for meeting Standard 2:

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

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

The checklist for riparian areas is in Technical Reference 1737-9 "Process for Assessing Proper Functioning Condition." The checklist for wetlands is in Technical Reference 1737-11 "Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas."

As indicated by such factors as:

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

Exceptions and exemptions (where applicable):

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

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

Guidelines:

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.
2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

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

Standard 3: Desired Resource Conditions

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

Criteria for meeting Standard 3:

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

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

As indicated by such factors as:

Composition
Structure
Distribution

Exceptions and exemptions (where applicable):

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

Guidelines:

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

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

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

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

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

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

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

serviceable waters are capable of providing for proper grazing distribution;

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

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

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

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

Appendix B

TEAM MEMBERSHIP

Interdisciplinary Assessment Team[9]

Linda Price	Project Coordinator (BLM) – Transferred
Whit Bunting	Vegetation and Rangeland Management Team Lead
Jeff Hatch	Vegetation/Grazing Administration (BLM)
Michael Herder	Wildlife Biologist (BLM) – Transferred
Diana Hawks	Recreation, Wilderness, and Cultural Resources Team Lead (BLM)
Lee E Hughes	Vegetation/Grazing Administration (BLM) – Retired
Robert Smith	Soil Scientist/Watershed Management (BLM) – Retired
Luke Thompson	Field Supervisor (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

[9] Several members of the IAT have either retired or transferred since the scoping and field meetings were conducted. These individuals participated in the early phases of this evaluation assessment, but not in the actual writing of this report.

Appendix C:

PRECIPITATION DATA

Historical Precipitation Report

Field Office 300 **Rain Gauge** Cottonwood Wash Ex **Rain Gauge Number:** 04

	Seasonal Precipitation					Annual					Percent of Normal				
Year	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.14	15.41	2.91	2.66	22.12	1.75	4.63	1.92	3.35	11.65	65%	333%	152%	79%	190%
1979	3.88	5.14	4.00	2.25	15.27	1.75	4.63	1.92	3.35	11.65	221%	111%	208%	67%	131%
1980	0.50	0.90	1.09	3.04	5.53	1.75	4.63	1.92	3.35	11.65	29%	19%	57%	91%	47%
1981	1.59	2.00	3.00	2.90	9.49	1.75	4.63	1.92	3.35	11.65	91%	43%	156%	87%	81%
1982	0.98	2.75	2.40	5.63	11.76	1.75	4.63	1.92	3.35	11.65	56%	59%	125%	168%	101%
1983	3.95	5.75	2.86	4.16	16.72	1.75	4.63	1.92	3.35	11.65	225%	124%	149%	124%	144%
1984	2.38	0.98	0.55	7.28	11.19	1.75	4.63	1.92	3.35	11.65	136%	21%	29%	217%	96%
1985	1.93	6.50	0.75	2.15	11.33	1.75	4.63	1.92	3.35	11.65	110%	140%	39%	64%	97%
1986	3.25	2.10	3.70	3.33	12.38	1.75	4.63	1.92	3.35	11.65	185%	45%	193%	99%	106%
1987	1.19	4.38	1.80	3.19	10.56	1.75	4.63	1.92	3.35	11.65	68%	95%	94%	95%	91%
1988	3.94	3.12	3.07	4.12	14.25	1.75	4.63	1.92	3.35	11.65	225%	67%	160%	123%	122%
1989	0.60	4.14	0.64	3.52	8.90	1.75	4.63	1.92	3.35	11.65	34%	89%	33%	105%	76%
1990	0.43	2.60	2.17	3.90	9.10	1.75	4.63	1.92	3.35	11.65	25%	56%	113%	116%	78%
1991	1.32	3.36	1.91	4.62	11.21	1.75	4.63	1.92	3.35	11.65	75%	73%	99%	138%	96%
1992	1.17	5.50	5.16	1.45	13.28	1.75	4.63	1.92	3.35	11.65	67%	119%	269%	43%	114%
1993	3.20	12.30	1.88	1.24	18.62	1.75	4.63	1.92	3.35	11.65	183%	266%	98%	37%	160%
1994	2.00	2.40	1.36	7.75	13.51	1.75	4.63	1.92	3.35	11.65	114%	52%	71%	231%	116%
1995	1.54	9.46	1.50	2.50	15.00	1.75	4.63	1.92	3.35	11.65	88%	204%	78%	75%	129%
1996	1.12	2.88	0.63	2.37	7.00	1.75	4.63	1.92	3.35	11.65	64%	62%	33%	71%	60%
1997	2.25	4.85	1.15	5.50	13.75	1.75	4.63	1.92	3.35	11.65	128%	105%	60%	164%	118%
1998	1.00	5.52	2.40	5.33	14.25	1.75	4.63	1.92	3.35	11.65	57%	119%	125%	159%	122%
1999	2.80	1.45	2.25	4.00	10.50	1.75	4.63	1.92	3.35	11.65	160%	31%	117%	119%	90%
2000	0.00	3.87	0.26	3.10	7.23	1.75	4.63	1.92	3.35	11.65	0%	84%	14%	93%	62%
2001	3.45	8.45	4.10	5.50	21.50	1.75	4.63	1.92	3.35	11.65	197%	183%	214%	164%	185%
2002	0.50	0.88	0.63	1.74	3.75	1.75	4.63	1.92	3.35	11.65	29%	19%	33%	52%	32%
2003	1.13	3.37	2.50	1.00	8.00	1.75	4.63	1.92	3.35	11.65	64%	73%	130%	30%	69%
2004	0.70	4.42	1.01	0.87	7.00	1.75	4.63	1.92	3.35	11.65	40%	96%	53%	26%	60%
2005	6.50	12.25	2.75	2.75	24.25	1.75	4.63	1.92	3.35	11.65	371%	265%	143%	82%	208%
2006	1.25	0.50	2.50	4.25	8.50	1.75	4.63	1.92	3.35	11.65	71%	11%	130%	127%	73%
2007	1.25	1.00	0.38	2.88	5.50	1.75	4.63	1.92	3.35	11.65	71%	22%	20%	86%	47%
2008	0.00	6.50	0.25	1.88	8.63	1.75	4.63	1.92	3.35	11.65	0%	140%	13%	56%	74%
2009	1.38	4.12	0.50	0.50	6.50	1.75	4.63	1.92	3.35	11.65	79%	89%	26%	15%	56%
2010	0.25	7.63	4.37	0.58	12.83	1.75	4.63	1.92	3.35	11.65	14%	165%	228%	17%	110%
2011	2.68	9.08	1.25	1.80	14.80	1.75	4.63	1.92	3.35	11.65	153%	196%	65%	54%	127%
2012	2.00	3.00	1.50	5.00	11.50	1.75	4.63	1.92	3.35	11.65	114%	65%	78%	149%	99%
2013	2.00	2.38	0.63	6.50	11.50	1.75	4.63	1.92	3.35	11.65	114%	51%	33%	194%	99%
2014	1.25	0.25	1.25	2.75	5.50	1.75	4.63	1.92	3.35	11.65	71%	5%	65%	82%	47%
2015	0.10					1.75	4.63	1.92	3.35	11.65	6%				

Appendix D:

Vegetation Data

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture

Site ID: 1

% Ground Cover						Quadrat Size:
Species	**Transect**					
	09/25/84	**06/02/88**	**10/22/91**	**11/07/01**	**05/25/04**	**05/10/10**
Bare Ground	71	80	56	65	39	27
Cryptogam						1
Litter						35
Litter - Non-Persistent	11	14	7	19	22	
Litter - Persistent					12	
Live Basal Veg.	2	6	19	11	2	5
Rock >= 1/2"	16		19	5	26	34

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture **Site ID:** 1

% Frequency						Quadrat Size: 40x40 cm
Species	Transect					
	09/25/84	06/02/88	10/22/91	11/07/01	05/25/04	05/10/10
Acacia greggii					1	
Acamptopappus sphaerocephalus				2	7	14
Ambrosia dumosa	22	10	19	20	54	32
Annual forb(s)					18	12
Bromus rubens					7	
Echinocereus					1	
Eriogonum fasciculatum					1	
Erodium cicutarium					89	55
Ferocactus cylindraceus						1
Haplopappus	5	3	4			
Krameria parvifolia	1	1	5		11	3
Larrea tridentata	8	4	13	14	32	9
Lycium andersonii				1		
Opuntia	6	2	10			
Opuntia acanthocarpa				7	9	7
Opuntia basilaris					1	
Opuntia ramosissima			1		1	
Schismus barbatus					75	
Stephanomeria pauciflora					1	1
Thamnosma montana	1			2	1	1
Yucca		1	2			
Yucca baccata	1				1	1
Yucca brevifolia	1					
Yucca schidigera				1	2	1

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture

Site ID: 2

% Ground Cover						Quadrat Size:
Species	**Transect**					
	09/25/85	**06/02/88**	**12/22/91**	**11/07/01**	**11/07/07**	**03/21/12**
Bare Ground	60	18	46	29	88	20
Cryptogam						1
Litter					8	45
Litter - Non-Persistent	18	66	15	58		
Litter - Persistent						
Live Basal Veg.	3	5	9	7		1
Rock >= 1/2"	19	11	29	6	3	35

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture

Site ID: 2

% Frequency						Quadrat Size: 40x40 cm
Species	Transect					
	09/25/85	06/02/88	12/22/91	11/07/01	11/07/07	03/21/12
Acacia				5	8	
Acacia greggii						15
Acamptopappus sphaerocephalus				2		1
Ambrosia dumosa	2	1	1	1		1
Aristida longiseta	6	6	11	1	1	
Baileya multiradiata	7	1	7	3	2	15
Bromus rubens						96
Coleogyne ramosissima	1	1	1	1	1	
Encelia frutescens	3	3	4	2	1	3
Ephedra fasciculata					2	
Ephedra nevadensis	4	5	5	4		1
Eriogonum - shrub #1	3					
Eriogonum inflatum		1	5	2	6	16
Gutierrezia sarothrae	1	1		1		
Haplopappus	2	3	2			
Hilaria rigida	1	1	1		1	
Hymenoclea salsola			3	2		1
Krameria parvifolia	1	1	1	3		1
Larrea tridentata	1			1		1
Lupinus sparsiflorus						6
Opuntia			1	1		
Opuntia acanthocarpa	1			1	1	
Opuntia basilaris					1	1
Perennial forb#1					1	
Prosopis juliflora	1	2	8			

Psilostrophe cooperi	2	1		1		1
Salazaria mexicana	1					
Schismus barbatus			49			1
Sphaeralcea				1		1
Sporobolus cryptandrus	1					
Stephanomeria tenuifolia						1
Thamnosma montana	13	11	21		1	2
Tridens pulchellus	22	30	23		16	

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture

Site ID: 3

% Ground Cover						Quadrat Size:
Species	Transect					
	09/19/84	06/03/88	10/22/91	11/07/01	11/27/07	03/21/13
Bare Ground	34	31	41	41	49	15
Cryptogam						
Litter	1				37	56
Litter - Non-Persistent	26	48	15	44		
Litter - Persistent			1			
Live Basal Veg.	2	1	19	6	1	4
Rock >= 1/2"	38	20	26	9	13	26

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture

Site ID: 3

% Frequency						Quadrat Size: 40x40 cm
Species	Transect					
	09/19/84	06/03/88	10/22/91	11/07/01	11/27/07	03/21/13
Annual forb(s)						3
Aristida longiseta	5	2	5	3	6	38
Artemisia tridentata				2		
Baileya	1					
Bromus rubens						42
Calochortus						7
Chrysothamnus viscidiflorus				1		
Cirsium neomexicanum						1
Coleogyne ramosissima				2		
Comandra umbellata		1				
Coryphantha				1		
Cowania mexicana	5	3	8	19	4	3
Ephedra viridis						1
Eriodictyon angustifolium	24	9	12	7	1	
Erodium cicutarium						44
Fallugia paradoxa	2	1	2	3	4	
Gutierrezia sarothrae	44	48	71	9	1	28
Krameria parvifolia						1
Lomatium						15
Lycium andersonii	1	1	2			
Oenothera					1	
Onopordum acanthium		1				
Opuntia	1	1	1	5		4
Opuntia echinocarpa				1		
Opuntia erinacea					1	

Oryzopsis hymenoides			1		1	4
Penstemon		1	1			
Perennial grass(es)						1
Prunus fasciculata				1		
Quercus turbinella			1			
Shrub #1					2	
Sitanion hystrix	1	10	7			
Sphaeralcea	16	13	12	30	39	69
Stipa			1			
Tetradymia axillaris						2
Thamnosma montana		1			1	
Tridens muticus			1		1	
Unknown 1					1	
Verbena					2	
Yucca baccata	1				1	

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture

Site ID: 4

% Ground Cover						Quadrat Size:
Species	**Transect**					
	09/19/84	**06/03/88**	**10/23/91**	**11/20/01**	**12/03/08**	**03/21/13**
Bare Ground	66	78	40	57	40	33
Cryptogam						
Litter					46	41
Litter - Non-Persistent	18	17	10	16		
Litter - Persistent	1		4			
Live Basal Veg.	2	5	27	18	2	3
Rock >= 1/2"	14		20	9	12	24

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture

Site ID: 4

% Frequency						Quadrat Size: 40x40 cm
Species	Transect					
	09/19/84	06/03/88	10/23/91	11/20/01	12/03/08	03/21/13
Arctostaphylos					1	
Aristida longiseta				1		
Astragalus						1
Bromus rubens						18
Calochortus						14
Ceanothus greggii				1		
Coleogyne ramosissima	2	2	2	3	3	1
Cowania mexicana	1		1		2	
Cylindropuntia						4
Echinocereus						1
Ephedra nevadensis	1					
Ephedra viridis					1	2
Eriodictyon					6	
Eriodictyon angustifolium	15	12	9	12		18
Eriogonum fasciculatum			4	3	5	1
Euphorbia		1				
Gutierrezia sarothrae	29	24	19	14	6	12
Haplopappus linearifolius	2		3	8	4	20
Juniperus osteosperma	11	3	15	16	19	16
Krameria parvifolia						8
Lycium andersonii			1			
Opuntia	5	2	8	3		
Opuntia acanthocarpa				2	1	
Opuntia phaeacantha					5	8
Oryzopsis hymenoides		1				

Thamnosma montana	4	3	14	9	11	9
Yucca	2	2	3	2		
Yucca baccata					3	4

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture **Site ID:** 7

% Ground Cover							Quadrat Size:
Species	**Transect**						
	09/25/81	**09/19/84**	**06/03/88**	**10/22/91**	**11/20/01**	**11/14/07**	**03/14/12**
Bare Ground	49	57	49	57	45	71	31
Cryptogam							1
Litter						22	44
Litter - Non-Persistent	25	10	40	9	27		
Litter - Persistent	5	4		4	3		
Live Basal Veg.	6	9	4	22	16	1	2
Rock >= 1/2"	15	20	6	10	10	6	24

Site Class: BLM || Arizona State Office || Arizona Strip District || Arizona Strip Field Office || Mesquite Community Allotment || Mesquite Community Pasture **Site ID:** 7

% Frequency							Quadrat Size: 40x40 cm
Species	Transect						
	09/25/81	09/19/84	06/03/88	10/22/91	11/20/01	11/14/07	03/14/12
Annual forb(s)							3
Aristida longiseta	30	12	3	2	2	5	9
Baileya multiradiata	2	5	6	8	2	1	
Bouteloua curtipendula						1	1
Bromus rubens				1		1	73
Coleogyne ramosissima	1	5	1	4	7	1	1
Cowania mexicana	15	17	5	20	17		2
Ephedra nevadensis	1	3	3	3	1	1	1
Erodium cicutarium						1	
Fallugia paradoxa	2	1			3	2	2
Gaura						1	
Gutierrezia sarothrae	61	51	45	35	25	3	19
Hilaria jamesii							1
Lycium		1					
Mimulus			3				
Opuntia		1		1			1
Opuntia		1					1
Opuntia acanthocarpa					1		
Oryzopsis hymenoides	1	1					
Prunus fasciculata		1			1	1	2
Schismus barbatus				3			
Sitanion hystrix			3				1
Spartina patens						15	
Sphaeralcea	7	22	11	11	1		10
Thamnosma montana	10	4	6	15	9	2	4

Yucca	5						4
Yucca baccata		5			9	5	
Yucca brevifolia			3	8			

Appendix E:

Monitoring Data Sheets

(Standard 1 Determination Worksheets)

Standards for Rangeland Health
Indicators of Standard #1
Documentation Worksheet

Arizona Bureau of Land Management
Arizona Strip Field Office
Mngmnt Unit: AZ010 AZ100 AZ300

Date: 2/3/09

Location: Key Area #1 (circle one)
Mesquite Allotment

Mesquite Community

Legal T _____, R _____, Sec _____, _____1/4, _____1/4

Observers:
Lee Hughes — Robert Smith
Kiti Jensen — Lorraine Christian
Kari Yanskey — Bob Price

Standard #1: *Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform (ecological site).*

Ecological Site: _____

Indicators	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Ground Cover					
1. Litter					X
Comments					
2. Bare Ground (Live Veg Cover)					X
Comments					
3. Rock					X
Comments					
Sign					
4. Flow Pattern					
Comments					
5. Gullies					
Comments					
6. Rills					
Comments					
7. Plant Pedestalling					
Comments					

Lee, these are from the field trips to Littlefield, mesquite + Mosby. It would be good to mention these in the S+G reports LRP

(X) Meeting Standard #1 ( ) Making Progr ...ards Meeting Standard #1
( ) Not Meeting Standard #1

Standards for Rangeland Health
Indicators of Standard #1
Documentation Worksheet

Arizona Bureau of Land Management
Arizona Strip Field Office
Mngmnt Unit: AZ010 AZ100 AZ300
(circle one)

Date: 2/3/09

Location: Key Area #7
mesquite allotment

Legal T _____ , R _____ , Sec _____ , _____1/4, _____1/4

Observers:
Keri Yanskey — Robert Smith
Kitti Jensen — Lorraine Christian
Lee Hughes — Bob Price

Standard #1: *Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform (ecological site).*

Ecological Site: _____

Indicators	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Ground Cover					
1. Litter					X
Comments					
2. Bare Ground (Live Veg Cover)					X
Comments					
3. Rock					X
Comments					
Signs of Erosion					
4. Flow Pattern					X
Comments					
5. Gullies					X
Comments					
6. Rills				X	
Comments					
7. Plant Pedestalling					X
Comments: some soil movement immediately after the fire					

X (X) Meeting Standard #1 ( ) Making Progress towards Meeting Standard #1
( ) Not Meeting Standard #1

Standards for Rangeland Health
Indicators of Standard #1
Documentation Worksheet

Arizona Bureau of Land Management
Arizona Strip Field Office
Mngmnt Unit: AZ010 AZ100 AZ300
(circle one)

Date: 2/3/09 Location: Ecocline contrast u/ Cottonwood alk, Mesquite allotment.

Legal T _____ , R _____ , Sec _____ , _____1/4, _____1/4

Observers:
Lee Hughes Robert Smith _____
Kitti Jensen Lorraine Christian _____
Kari Yanesky Bob Price _____

Standard #1: *Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform (ecological site).*

Ecological Site: _____

Indicators	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Ground Cover					
1. Litter					X
Comments					
2. Bare Ground (Live Veg Cover)					X
Comments					
3. Rock					X
Comments					
Signs of Erosion					
4. Flow Pattern					X
Comments					
5. Gullies					X
Comments					
6. Rills					X
Comments					
7. Plant Pedestalling					X
Comments					

X (X) Meeting Standard #1 ( ) Making Progress towards Meeting Standard #1
( ) Not Meeting Standard #1

Appendix F:

Wildlife Data

Arizona Game & Fish Unit 13B Mule Deer Population Counts				
Year	**Number of Animals Surveyed**	**Bucks/100 Does**	**Fawns/100 Does**	**Population Estimate**
1985	108	30	50	1000-1500
1986	41	29	18	1000-1500
1987	63	31	44	1163
1988	--	No Data	No Data	No Data
1989	112	71	31	900
1990	63	68	32	900
1991	85	27	37	900
1992	31	24	59	<1000
1993	117	126	52	800-1000
1994	143	69	52	No Estimate
1995	88	183	79	No Estimate
1996	154	87	33	No Estimate
1997	64	77	29	No Estimate
1998	156	43	45	No Estimate
1999	145	51	35	No Estimate
2000	155	49	36	No Estimate
2001	275	34	67	No Estimate
2002	118	46	20	No Estimate
2003	84	29	46	No Estimate
2004	102	34	57	No Estimate
2005	128	65	72	No Estimate
2006	143	68	64	No Estimate
2007	152	79	41	No Estimate
2008	158	45	63	No Estimate
2009	150	28	42	No Estimate
2010	183	39	57	1,100
2011	176	58	83	1,300
2012	199	50	93	No Estimate
2013	328	27	59	No Estimate
2014	308	42	58	No Estimate

Arizona Game & Fish Unit 13B North Desert Bighorn Sheep Population Counts							
Year	**Total Rams**	**Ewes**	**Lambs**	**Yearling Male**	**Yearling Female**	**Unclassified**	**Total**
2003	Insufficient Data						
2004	Insufficient Data						
2005	35	58	19	3	6	0	121
2006	32	90	18	3	10	0	153
2007	36	93	17	6	8	0	160
2008	34	44	8	0	0	0	86
2009	No data – no counts conducted*						
2010	No data – no counts conducted*						
2011	26	66	14	3	4	0	113
2012	No data – no counts conducted*						
2013	34	87	18	9		0	148
2014	No data – no counts conducted*						

* AGFD no longer conducts annual population surveys of bighorn sheep in this unit.