

Standards for Rangeland Health and Guidelines for Grazing Administration
Implementation Project: Allotment Assessment
Mosby-Nay – 4836

I. Introduction

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

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

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

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

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

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

The Standard Assessment was conducted in consultation and coordination with the Rangeland Resource Team (RRT); a diverse group of local residents representing environmental, wildlife groups, recreation etc. and provided for under the RAC charter (see appendices for a list of members on both teams). The RRT is a sub group appointed by the Resource Advisory Council and may provide informal advice to the BLM IAT, and recommendations to the RAC regarding assessment results.

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

This Standards and Guide assessment covers the entire Mosby-Nay Allotment including portions within the Pakoon Desert Wildlife Management Area/Area of Critical Environmental Concern (DWMA/ACEC), established in a 1998 amendment to the Arizona Strip District Resource Management Plan. This DWMA/ACEC was created in order to implement the goals and objectives of the Desert Tortoise Recovery Plan (June 1994). The 1998 RMP amendment closed the DWMA/ACEC to livestock grazing; however, there is no DWMA/ACEC boundary fence and the implementation decision (1999), to adjust livestock numbers on the remaining portion of the Mosby-Nay Allotment, was "Stayed". Because of the "Stay", livestock permit numbers are at the same levels as they were prior to the decision.

Data presented in this document represent pre-1999 use levels, and resource conditions evaluated on the entire allotment. However, due to the DWMA/ACEC, established in the 1998 amendment to the Arizona Strip District Resource Management Plan, this assessment is also to determine the appropriate livestock carrying capacity on the remainder of the allotment outside of the Pakoon DWMA/ACEC.

II. Grazing Use

A. Total grazing privileges

Active Grazing Use: 1,148 AUMs
Suspended Non-use: 54 AUMs

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

B. Season(s) of use

3/1 to 2/28 (yearlong)

C. Kind and class of livestock

102 Head of cattle
2 Horses

D. Percent federal range

92% of the acreage in this allotment is BLM lands.

III. Allotment Profile

A. Description

The Mosby-Nay grazing allotment is located in northwest Arizona, within the Grand Canyon Parashant National Monument, approximately 25 miles southeast of Mesquite, Nevada. Whitney Pass, Cockscomb ridge are a few of the topographical features found close to the allotment. It is generally considered to be within the land region known as the Pakoon Basin. A good variety and diversity of vegetation exist in the allotment ranging from mountain Pinyon-Juniper and chaparral vegetation in the higher elevations to desert shrub and annual grasses in the lower elevations due to past wildfires. The lower portion of the allotment is within the Pakoon DWMA/ACEC. (See map page 31).

B. Acreage

The allotment contains:

- DWMA/ACEC federal land 12,706 acres
- Outside ACEC federal land 15,617 acres
- Outside ACEC State land 1,863 acres
- Private land 0 acres

C. Land Use Plan and Implementation plan Guidance applicable to the Mosby-Nay Allotment

Shivwits Resource Area Implementation Plan for the Arizona Strip Resource Management Plan

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

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

WL06 In cooperation with AGFD, continue restoration of native wildlife into their historic ranges by supporting and assisting in the releases of native species.

RR06 Implement actions to restore and/or maintain natural conditions or appearance in all areas.

RR08 Manage the majority of the Resource Area for extensive recreation while maintaining its naturalness/remoteness.

RR09 Commercial recreation permits would be issued to the extent that their cumulative impacts are consistent with the overall objectives of this plan and in the public interest.

WS01 Manage vegetation cover towards ecological stability and sound long-term protective soil cover using mechanical, biological or fire as tools for accomplishment.

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

Arizona Strip Resource Management Plan Mojave Amendment (1998), to implement the Desert Tortoise Mojave Population Recovery Plan.

98 RMP 1 Designate the Pakoon DWMA/ACEC as 76,525 acres, of which 12,706 acres are in this allotment (119.6 sq. mi). This included tortoise habitat on public lands in the Pakoon Basin. Activities administered by the Arizona Strip on Lake Mead NRA and on public lands in Nevada would be managed in accordance with the DWMA/ACEC prescriptions.

98 RMP 2 Eliminate desert tortoise habitat categories with resulting changes in compensation rates.

98 RMP GM2 Beginning March 1, 1999, BLM closed the Pakoon DWMA to grazing, and would not authorize domestic livestock grazing within the Pakoon DWMA. This includes all of the Tassi allotment, about half of the Mosby-Nay allotment, as well as small portions of the Pakoon and Pakoon Springs allotments.

98 RMP GM4 Continue a vegetation-monitoring program to evaluate livestock grazing and relationships to vegetation condition.

98 RMP GM5 Issue new grazing decisions to modify grazing permits and revise or develop new allotment management plans or grazing systems where necessary to conform to the amended RMP.

98 RMP GM7 Conduct research into the impacts of livestock grazing on tortoises and their habitat as funding levels permit.

98 RMP GM9 Administer grazing in compliance with the Arizona Standards and Guidelines for Rangeland Health, including guideline 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

98 RMP GM10 Outside the DWMA/ACEC grazing would be managed in accordance with the grazing decisions issued August 11, 1995.

Guidance from Implementation Plans:

Release California condors (*Gymnogyps californianus*) in northern Arizona (Houserock Valley) in order to reduce the risk to the overall population and to facilitate their optimal genetic and demographic management. Maintain a self-sustaining population with a positive rate of growth of at least 150 individuals with at least 15 breeding pair.

D. Resource Objectives

1. Land Use Plan

Shivwits Resource Area Implementation Plan for the Arizona Strip Resource Management Plan

GZ13 Establish desired plant community objectives and include them in the allotment management plan.

GZ17 Allow 50% utilization on key forage species in allotments with rotational grazing systems. On allotments in tortoise habitat, or being less intensively managed, utilization is set at 45%.

Arizona Strip Resource Management Plan Mojave Amendment (1998). To implement the Desert Tortoise Mojave Population Recovery Plan.

98 RMP GM3 Monitor use to ensure that utilization of key species by wildlife and livestock would remain below 45% of the current year's growth.

2. Specific Resource Objectives

California Condor Recovery Plan Objectives (April, 1996)

Provide foraging habitat for California condors. Re-establish extirpated native ungulate populations. Encourage livestock owners to leave dead livestock on rangelands.

Virgin River – Pakoon Basin Habitat Management Plan (HMP) Objectives

VM1 Enhance wildlife forage conditions on all allotments with a downward or static trend to achieve DPC by 2010.

AHM-5 Maintain or enhance the quality of springs along the Virgin River and Grand Wash to ensure suitable habitat conditions for native wildlife.

BOP Maintain or enhance nesting and wintering habitats (BOP-1) for birds or prey, including cliff sites for nesting (BOP-3), desert ranges (BOP-4), and riparian areas for foraging (BOP-2).

UGB Manage the habitat to ensure healthy, viable populations of upland game birds. Where practical, enhance habitat quality.

CARN-1 Protect and manage habitat to ensure viable populations of carnivores.

RA Maintain or enhance habitat conditions for reptiles (RA-2) and amphibians (RA-4) in the HMA.

DT-3 Maintain or enhance forage conditions for desert tortoises.

Allotment Management Plan

Because of the 1998 Mojave amendment to the RMP and the decision to close the Pakoon DWMA/ACEC to grazing, the existing AMP was no longer valid. Revision of the AMP was deferred until resolution of the appeal. In addition, the AMP did not identify any key species objectives. As a result, DPC objectives listed below were developed for this evaluation process and should be incorporated into the AMP.

Desired Plant Community (DPC) Objectives (to be obtained by 2025)

Lands in the Mosby-Nay Allotment are in the Grand Canyon Desert Shrub (Land Resource Unit D30B). This area is warm and arid characterized by the presence of creosote bush and associated species of low shrubs such as white bursage, Anderson wolfberry, and spiny hopsage. Joshua tree's and other yucca species are present in certain areas. Cacti are represented by a variety of hedgehogs, chollas, beavertail cactus, and Mojave prickly pear. Many ephemeral species, mainly winter annuals and some summer annuals, also occur. Good rains during October and November provide mass seed germination of these winter annuals.

DPC objectives flow from the Resource Management Plan (RMP) down to the key area level and are articulated by an interdisciplinary team of resource specialists. These objectives, which, in essence, implement multiple use decisions from the RMP, are tied to the indicators of rangeland health.

Vegetation attributes for composition, structure and cover are used to detail a site specific plant community, which when obtained, will assure rangeland health, provide forage on a multiple use sustained yield basis and habitat for wildlife. These attributes address multiple-use objectives from the RMP and are used to determine if standards for

rangeland health are being met or not met and determine if significant progress is being made towards meeting a standard.

DPC objectives consider ecological sites and their potentials, which reflect the vegetative diversity of the area.

Key areas 2, 5, & 6 are in the Pakoon DWMA/ACEC and DPC objectives reflect vegetative composition and attributes important to desert tortoise habitat. Key areas 1 and 3 are on the remainder of the allotment outside of the ACEC. The key species listed below reflect plant species to be monitored to measure success of management actions.

Key forage Species:

Common Name Scientific Name Abbreviation _____

Grasses

Indian ricegrass	<i>Achnatherum hymenoides</i> (<i>Oryzopsis hymenoides</i>)	Achy (Orhy)
Big Galleta	<i>Pleuraphis rigida</i> (<i>Hilaria rigida</i>)	Plri3 (Hiri)
Sand dropseed	<i>Sporobolus spp.</i>	Sporo
Bush muhly	<i>Muhlenbergia porteri</i>	Mupo2

Browse

Mormon tea	<i>Ephedra nevadensis</i>	Epne
Range Ratany	<i>Krameria erecta</i> (<i>Krameria parvifolia</i>)	Krer (Krupa)
Gray Ratany	<i>Krameria grayi</i>	Krggr
Winterfat	<i>Krascheninnikovia lanata</i> Krla2 (<i>Ceretoides lanata</i>) (Cela4) (<i>Eurotia lanata</i>)	(Eula5)
Burrobush	<i>Ambrosia dumosa</i> Am	du2

Key Area No. 1. located **outside** the DWMA/ACEC in SWNE sec. 29, T. 36 N., R. 16 W.

Attain overall Grass composition by dry weight of 5-10% or above
 Maintain overall shrub composition by dry weight of 50-60% or above
 Maintain Epne composition by dry weight of 1-5%
 Increase Krer composition by dry weight to 1-5%
 Maintaining forbs composition by dry weight of 5-10% or above
 Maintain vegetation cover (basal) between 3-5%.

Rationale: The Ecological Site for this key area is a Limy Upland 9-12 inch pz. This site also burned prior to the mid seventies, which set the ecological processes on the site back to an earlier successional stage.

The team determined that the DPC objectives established would also promote attainment of the RMP objectives and provides for sufficient plant cover and litter accumulation to protect soils from wind and water erosion, encouraging nutrient cycling and productivity. Ecological processes and functions would be fostered within the current plant

community.

Key Area No. 2, located within the DWMA/ACEC in SESE sec. 4, T. 35 N., R. 16 W.

Attain an overall perennial native grass composition by dry weight of 5-15%

Maintain an overall shrub composition by dry weight of 80-95%

Maintain Krer &/or Krgr composition by dry weight of 1-10%

Maintain Amdu2 composition by dry weight of 30-45%

Maintain forbs composition by dry weight of 5-10% or above

Increase vegetation cover (basal) to between 3-5%.

Rationale: The Ecological Site for this key area is a Limy Upland (Deep) 6-9 inch pz. The team determined that the DPC objectives as quantified at the key area would allow for the attainment of the RMP objectives and provide for sufficient plant cover and litter accumulation to protect soils from wind and water erosion, encouraging nutrient cycling and productivity. Ecological processes and functions would be fostered within the current plant community including maintenance or enhancement of desert tortoise habitat.

These key species are either known desert tortoise forage plants, closely related to known desert tortoise forage plants, or those important to their needs for shrub cover. The Blue Ribbon task force (1990) recommended 5-15% native perennial grass composition by weight in desert tortoise habitat to sustain their ecological needs. The key species listed are also recognized to be important for watershed, and cover, and are components of the ecological site.

Key Area No. 3, located outside the DWMA/ACEC in SWNW sec. 11, T. 36 N., R. 16 W.

Attain an overall perennial native grass composition by dry weight of 1-5%

Increase Plri3 composition by dry weight to 1-2% CBW

Increase Shrub composition by dry weight to 40-60%

Increase Krla2 composition by dry weight to 1-5%

Maintain Epne composition by dry weight of 1-5%

Increase Krer/Krgr composition by dry weight to 1-5%

Maintaining forbs composition by dry weight of 3-5% or above

Increase vegetation cover (basal) between 3-8%.

Rationale: The Ecological Site for this key area is a Limy Upland 6-9 inch pz. This site burned during 2005 from a wildfire. The team determined that the present plant community does not meet DPC for standard 3. However, with gravely soils the soil remains quite stable, many of the shrubs are resprouting and the fire moved through the area quite fast leaving some litter to protect soils from wind and water erosion. The team determined that the DPC objectives established would promote attainment of the RMP objectives.

Key Area No. 5, located within the DWMA/ACEC in NESW sec. 32, T. 35 N., R. 16 W.

Attain an overall perennial native grass composition by dry weight of 5-15%

Increase Plri3 composition by dry weight to 1-5%

Maintain overall Shrub composition by dry weight of 60-80%

Maintain Krer & Krgr composition by dry weight of 1-5%
Maintain Amdu2 composition by dry weight of 30-45%
Maintaining forbs composition by dry weight of 5 to 10% or above
Maintain ground cover above 50%
Maintain live vegetation cover (basal cover) to between 3-8%.

Rationale: The Ecological Site for this key area is a Limy Upland (deep) 6-9 inch pz. The team determined that the present plant community provides sufficient plant cover and litter accumulation to protect soils from wind and water erosion, encouraging nutrient cycling and productivity. Ecological processes and functions are fostered with the current plant community.

The team determined that the DPC objectives established would also promote attainment of the RMP objectives, including maintenance or enhancement of desert tortoise habitat.

These key species are either known desert tortoise forage plants, closely related to known desert tortoise forage plants, or those important to their needs for shrub cover. The Blue Ribbon task force (1990) recommended 5-15% native perennial grass composition by weight in desert tortoise habitat to sustain their ecological needs. The key species listed are also recognized to be important for to provide ground cover and protect watershed values. They are also components of the ecological site.

Key Area No. 6, located within the DWMA/ACEC in SWSE sec. 20, T. 35 N., R. 16 W.

Maintain an overall perennial native grass (PPGG) composition by dry weight of 5-15% (PPGG includes Achy, Spcr, Mupo2, & Plri3)
Maintain overall Shrub composition by dry weight of 85-95%
Maintain Krer &/or Krgr composition by dry weight of 1-5%
Maintain Amdu2 composition by dry weight of 35-45%
Maintaining forbs composition by dry weight of 3-5% or above
Maintain vegetation cover (basal) between 3-8%.

Rationale: The Ecological Site for this key area is a Limy Upland 6-9 inch pz. The team determined that the present plant community provides sufficient plant cover and litter accumulation to protect soils from wind and water erosion, encouraging nutrient cycling and productivity. Ecological processes and functions are fostered with the current plant community.

The team determined that the DPC objectives established would also promote attainment of the RMP objectives, including maintenance or enhancement of desert tortoise habitat.

These key species are either known desert tortoise forage plants, closely related to known desert tortoise forage plants, or those important to their needs for shrub cover. The key species listed are also recognized to be important to provide ground cover and protect watershed values. They are also components of the ecological site. The Blue Ribbon task force (1990) recommended 5-15% native perennial grass composition by weight in desert tortoise habitat to sustain their ecological needs. However, the site guide only allows for 1-5% composition by dry weight for all grasses. Attaining an increase in perennial grass and forbs species from the current low levels will be difficult. As indicated by the ecological site description, this site is dominated by shrubs and in its

current state does not have the potential to produce a significant amount of perennial grass and forbs.

E. Grazing System

The existing AMP outlined a grazing system for the entire allotment, which was to graze two years from 1/1 to 2/28 in the south end of the allotment and the third year from 2/16 to 4/15 then repeat the cycle. Following the grazing cycle is subject to adjustment based on water, drought conditions, and high or low production of annual forage. Flexibility was allowed to use the area as early as December 1 or pull out before April 15 depending on conditions. Essentially a deferred system of grazing is being used by limiting the available water sources at different times of the season. Some years an effort is made to drive cattle to the north end of the allotment and confine them to the North Pasture.

F. Other uses

1. Special Status Species

The Mosby-Nay Allotment includes 20,789 acres (69%) of habitat for the Mojave Desert tortoise (*Gopherus agassizii*), federally listed as threatened in 1990. Some 8,260 acres in the southwestern portion of the allotment is identified as Category I habitat, meaning that the habitat is considered essential to maintenance of large, viable populations. To the north and east of Category I habitat is some 12,529 acres of Category III habitat, meaning that the area is not considered essential to maintenance of viable populations; tortoise densities are low to medium and are not contiguous with higher density areas. Over 80 percent of the allotment was designated as critical habitat for desert tortoise in 1994.

Special status raptors such as bald eagles (*Haliaeetus leucocephalus*) (threatened), California condor (endangered – experimental population), and peregrine falcon (*Falco peregrinus anatum*) (delisted in 1999) are not known to nest or roost on the allotment, but may occasionally fly over the area.

Condors may be found year-round in the area and are federally listed as endangered. The condors were re-introduced to this area in 1996 and the population is designated as an experimental non-essential population as defined under section 10(j) of the Endangered Species Act. There are presently 62 California condors (June 1, 2005) in northern Arizona and southern Utah.

BLM Sensitive and State Species of Concern

Sensitive species are usually rare within at least a portion of their range. Listed below are the sensitive species that may occur within or adjacent to the Mosby-Nay Allotment:

- Ferruginous hawks (*Buteo regalis*)
- Swainson's hawks (
- Western burrowing owls (*Athene cunicularia hypugea*)
- Spotted bat (*Euderma maculatum*)
- Western small-footed myotis (*Myotis ciliolabrum*)
- Fringed myotis (*Myotis thysanodes*)
- California leaf-nosed bat (*Macrotis californicus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)

- Big free-tailed bats (*Nyctinomops macrotis*)

Ferruginous hawks, Swainson's hawk, and western burrowing owls are known to use habitat similar to that found on the Mosby-Nay Allotment, though specific sightings have not been recorded for any of these species.

A variety of sensitive bat species have been captured on this and neighboring allotments including Townsend's big-eared, spotted bats, small-footed myotis, fringed myotis, and big free-tailed bats. To date, no California leaf-nosed bats have been captured on this or neighboring allotments.

Herpetological inventories have not been done for the spring sites found on the allotment. No other sensitive reptiles or amphibians are known or suspected to occur on this allotment.

2. Other Wildlife Species

Mule deer are the primary big game species found in this allotment. The allotment is within Arizona Game & Fish Department's (AGFD) much larger Game Management Unit (GMU) 13B.

Desert bighorn sheep may be found in small numbers in the northern portion of this allotment near springs and other areas near the Virgin Mountains.

Small game, such as rabbits and quail, are hunted in this allotment. Their populations vary widely depending on the year. Raptors, small reptiles, small birds, and small mammals are also found here. Coyotes are common. Mountain lions and bobcats also can be found in this allotment. In May of 2005, a BLM employee reported black bear tracks and sign near Mount Bangs, within approximately 15 miles of this allotment.

Several small springs exist on the Allotment that provide habitat for a variety of wildlife species, particularly quail and non-game birds. Gambel quail populations are dependent upon accessibility to springs, as well as other water developments for their survival. Populations do fluctuate widely sometimes from year-to-year, but this allotment is part of the overall core area for quail in the Pakoon Basin. Mule deer and many other species also rely upon these waters for survival. With the DWMA/ACEC closed to livestock grazing, all livestock water developments in the DWMA/ACEC area would be shut off and no longer maintained by the permittee for livestock use, as such, water troughs would no longer contain water for wildlife use.

3. Recreation

Camping is an activity enjoyed mainly during spring and fall on this allotment although no problems have occurred. Camping is limited to 14 days at any one location unless otherwise authorized.

General Management: Manage as an extensive recreation area while maintaining naturalness/remoteness qualities. Regulate visitor use only when monitoring indicates a trend towards unacceptable change to desired recreation settings brought about by such use.

Off-Highway Vehicle Management: Two OHV designations are incorporated within the boundaries of this allotment. They are limited to designated roads and trails and limited to existing roads and trails.

Recreation Opportunity Spectrum Classes: Roaded Natural; Semi-primitive Motorized; and Semi-Primitive Non-Motorized.

Trails: None

Visual Resource Management: Class III and Class IV

Wild and Scenic Rivers: None

4. Wilderness

This allotment does not include any congressionally designated wilderness.

G. Issues brought out in scoping meeting.

1. Issues relating to Rangeland Health

- a. The proposed fence to prevent livestock from entering the Pakoon DWMA/ACEC has not been built.
- b. Wildfires have burned numerous acres and are setting vegetation back to an early seral stage.
- c. Red brome and cheat grass continue to expand due to wildfires.
- d. Desert tortoise/livestock conflict and the reduction of livestock use for tortoise protection.
- e. Wildlife access to water at Lower Cove Spring.
- f. Livestock water facilities and tortoise predators vs. water for other wildlife species.
- g. Springsnail at Middle Spring.
- h. Western Burrowing Owl.
- i. Three Corners area is underused by Livestock.

IV. Management Evaluation

A. Purpose of Evaluation

The purpose of this assessment is to determine if the existing soil, water, and vegetative resources are meeting/making progress toward meeting or are not meeting the Arizona Standards for Rangeland Health. These resources are managed according to Resource Management Plans, Allotment Management Plans, and other activity plans, which identify terms and conditions for management on public lands within the Mosby-Nay Allotment. If the current livestock grazing

practices are determined to be causing non-attainment of Standards the appropriate action will be taken in conformance with the Guidelines for Grazing Administration. This assessment will also evaluate and update existing Activity Plan objectives to ensure multiple use objectives are tied to the indicators for rangeland health. Evaluation of land health standards is based on all available monitoring, inventory, and assessment data.

- B. Summary of Studies Data.** No actual use data was collected; it was not specifically required under the old AMP. The use in AUMs represents what the permittee was billed for at the beginning of the grazing year.

1. Livestock Licensed Use (1,148 AUMs permitted)

Year AUMS	
1982 thru 1989	1,148
1990	994
1991	996
1992	994
1993	1,118
1994 to 2002	1,148
2003	552
2004	1,148
2005	1,148

2. Precipitation

Average annual precipitation for at least the most northern portion of the allotment is approximately ~12", with most precipitation occurring during winter, as depicted by the data from the Cottonwood Wash Exclosure precipitation gauge. The southern portion of the allotment averages approximately ~8" based on the Pakoon precipitation rain gauge located in the Tassi Allotment approximately 5 miles south of the Mosby-Nay Allotment.

The Cottonwood Wash Exclosure rain gauge is located in T. 37 N., R. 15 W., Sec. 17, northeast of Brumley Well, at the exclosure in the middle of the Cottonwood Allotment. Average precipitation for this area is 1.92 inches for the fall season, 4.88 inches for the winter season, 2.09 inches for the spring, and 3.49 inches for the summer. The average total annual is 12.38 inches.

The Pakoon rain gauge is located in T. 34 N., R. 16 W., Sec. 34, ½ mile west of Seven Springs Ranch. Average precipitation for this area is 1.43 inches for the fall season, 3.08 inches for the winter season, 1.39 inches for the spring, and 1.93 inches for the summer. The average total annual is 7.82 inches.

Data shows that drought has played a major role in vegetation changes particularly between 1998 and 2005. Summer average precipitation has been similar, as has the annual precipitation.

Specific precipitation data is located in Appendix E.

3. Utilization

Utilization data from 1984-2005 has been compiled for this evaluation and specific information is listed in Appendix F. The Key Species Grazed Class method was used to

collect the data. Utilization is read at or around the designated key area for each pasture.

No utilization in excess of allowable levels of 50% prior to development of LUP in 1992 and 45% thereafter was noted on any key areas. These utilization levels are attributed to better management under the grazing system developed in 1987 on the allotment.

Table #1 below shows the highest utilization levels recorded on an individual key perennial plant species for the years¹ the studies were completed.

Table #1 Utilization by key area, and year, listing highest use on a key species.									
Key Area	1984	1985	1986	1987	1988	1989	1990	1991	2005
1	32%	32%	25%	44%	45%	27%	40%	16%	24%
2	26%		30%	50% (Achy)	13%		39%	4%	2%
3			49% (Epne)	42%	39%	23%	37%		wildfire
4									35%
5			22%	22%		45%	52% (Achy), 47% (Plri3)	10%	3%
6				42%		48% (Plri3)	46% (Plri3)	46% (Plri3)	2%

However, on the Mosby-Nay Allotment the overall utilization for each key area for the evaluation period was key area #1, 33%; #2, 14%; #3, 39%; #4, 33%; #5, 16%; and #6 is 37%.

4. Trend of frequency and cover data

The trend of an area may be judged by noting changes in vegetation attributes such as species composition, density, cover, production, and frequency. Vegetation data is collected at different points in time on the same site (key area), and results are then compared to detect change. (Analysis assumes the use of a binomial confidence limits table to evaluate significant differences in frequency readings for different years.)

Trend monitoring was conducted at five key areas over the AMP area, using the pace-frequency method. Cover data is collected to determine the percent of bare ground, litter, rock and live basal vegetation. 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. In addition, the occurrence frequency of all plant species is collected. A trend up, down, or static refers to the direction of change to the key plant frequency at the key area, which is toward or away from the stated objective.

Monitoring data (1982 to 2006) from the Mosby-Nay indicates that drought and fires have had impacts on trends. Fire has been an influence on key area #3 (2005) and key area #1 (prior to 1976). Drought (1998 to 2005) has been an influence on all key areas.

Table #2 list changes in trends on key species comparing the most recent data to the base year. On 5 key areas, 3 key species showed improving trends, 21 remained static. Vegetative cover, which is one of the key ground cover indicators improved on 1 key

¹ No studies were completed between 1991 and 2005 at any key areas on the Mosby-Nay allotment. Therefore, only one year represents livestock utilization following the closure of the ACEC.

area and remained static on the remaining 4, other attributes of ground cover, litter and rock, showed improvement on all 5 of key areas. Specific frequency and trend data is found in Appendix G.

Table #2 changes to basal cover, litter and key plant species by key area from base year			
Key Species or Cover Category	Years plots were read		Key Species Trend
Key Area #1	1982	2006	
Litter 1	1	41	↑
Vegetation (basal cover)	1	2	→
Epne 8		9	→
Krer		1	→
Key Area #2	1982	2006	
Litter 1	7	37	↑
Vegetation (basal cover)	T	T	→
Mupo2 T			→
Epne 5		2	→
Krer T		5	↑
Krgr			→
Amdu2 9		11	→
Key Area #3	1982	2006	
Litter 3	2	42	↑
Vegetation (basal cover)	T		→
Plri3			→
Krla2			→
Epne 2		2	→
Krer 1			→
Key Area #5	1985	2006	
Litter 3		31	↑
Vegetation (basal cover)	1	5	→
Plri3 1		1	→
Epne 5		5	→
Krer 3		5	→
Krgr		5	↑
Amdu2 13		40	↑
Key Area #6	1985	2006	
Litter 6		51	↑
Vegetation (basal cover)		5	↑
Achy T			→
Plri3 6		6	→
Spcr			→
Mupo2 T			→
Epne			→
Krer		1	→
Krgr			→
Amdu2 23		28	→

T=the frequency recorded was less than 1%.

5. Ecological Site Data

The Natural Resources Conservation Service developed ecological site guides, which define and describe soil, species composition, and production emphasis. An ecological site is defined as a kind of rangeland with a specific potential natural community and specific physical site characteristics, differing from other kinds of rangeland in its ability to produce vegetation and respond to management. The ecological site's potential for change in composition over time was considered along with other vegetation attributes to quantify desired plant community objectives for each key area. The potential composition is determined by the applicable soil type and precipitation zone. These potentials are described in Ecological Site Guides provided by the Natural Resources Conservation Service. The dry-weight-rank (DWR) procedure was used for estimating species composition by weight at key areas. It is similar to direct estimation of composition by species in quadrats except that in DWR the observer only ranks the three species, which contribute the highest percentage to the weight of the quadrat.

Table #3 compares the most recent key species composition data with the base year, at key areas in relation to allowable percent composition from the site-guide and the DPC objectives. Table #4 lists by key area the ecological site, similarity index², and ecological (successional) status or seral status rating. (See Appendix: Section H for specific ecological site information).

Ecological status is the present state of the vegetation at an ecological site in relation to the potential natural community. Ecological status is also defined in terms of different seral stages. Seral stages are the developmental stages, of ecological succession. The following four ecological status classes correspond to percent similarity to the potential natural community and correlate with seral status ratings used in the RMP:

<u>Ecological Similarity Index</u>	<u>Status</u> <u>Seral Status Rating</u>
0-25%	early
26-50%	mid
51-76%	late
77-100%	PNC (potential natural community)

² **Ecological Status** - The present state of the vegetation of an ecological site, in relation to the climax (natural potential) plant community, or potential natural community (PNC) for that site. 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. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of the PNC. Ecological status is also defined in terms of different seral stages.

Table #3				
Plant Species	Site-Guide Allowable Percent Composition	Composition		Desired Percent Composition Objective
Key Area 1		1998	2006	
Epne 1-	5%	5%	4%	1-5%
Krer 1-	5%			1-5%
Key Area 2		2001	2006	
Krer	Group Krgr	Group Krgr	4%	Group Krgr
Krgr 1-	5%	1-5%		1-10%
Amdu2 35	-45%		31%	30-45%
Key Area 3		1998	2006	
Plri3 Gr	oup PPGG	1%		1-2%
Krla2	1-5%			1-5%
Epne 1-	5%	2%	2%	1-5%
Krer/Krgr	1-5% 3%			1-5%
Key Area 5		2001	2006	
Plri3 1-	5%			0-5%
Krer Gr	oup Krgr		3%	1-5%
Krgr 1-	5%		4%	1-5%
Amdu2 35	-45%		38%	30-45%
Key Area 6		2001	2006	
Achy 0-	2%			0-2%
Plri3 Gr	oup PPGG		10%	5-10%
Spcr Gr	oup PPGG			0-1%
Mupo2 Gr	oup PPGG			0-1%
Amdu2				35-45%
Krer			.4%	Group Krer
Krgr 1-	5%			1-5%

Table #4			
Key Area	Ecological Site	Seral Status	Similarity to PNC
1* Lim	y Upland	Mid*	42%*
2	Limy Upland (Deep)	PNC	79%
3** Li	my Upland	Early**	15%**
5	Limy Upland (Deep)	Late	59%
6 Li	my Upland	Late	62%

* This site burned prior to the mid seventies

**Area burned during summer of 2005.

6. Ecological Site Inventory:

The ecological site inventory (ESI) method involves the use of soils information to map ecological sites and plant communities and involves the collection of natural resource and vegetation attributes described above in the Ecological Site Data section. The sampling data from each of these soil-vegetation units, referred to as site write-up areas (SWAs), become the baseline data for natural resource management and planning.

ESI was completed for the entire allotment during 1992 and field checked in 2005. During the ESI production and composition by air-dry weight by species was collected.

Presented in table #5 is a summary by SWA for the Mosby-Nay allotment. The Site Write Up Area (SWA) is a specific geographic area on a map represented transect data information from the transects completed within a SWA were used to determine seral status and percent similarity to PNC as defined in the previous section IV.,B.,5. (See also Ecological Status map in appendix D.)

Table #5				
SWA	Transect	Ecological Site	Seral Status	Similarity to PNC
A086 1		Basalt Slopes	Late	51%
A086 2		Rock Outcrop	-	n/a
A087 1		Breaks	PNC	82%
A087 2		Badlands	-	n/a
A087 3		Limy Upland	Late	68%
A088 1		Limestone Hills	Late	71%
A088 2		Rock Outcrop	-	n/a
A089 1		Limy Upland Deep	PNC	88%
A090 1		Limy Upland	PNC	77%
A122 1		Riverwash	-	n/a
A122 2		Sandy Wash	Late	67%
A122 3		Limy Upland Deep	Late	74%
A123 1		Limy Upland	Late	66%
A123 2		Breaks	Late	74%
H001 1		Sandy Wash	Late	57%
H001 2		Sandy Wash	Late	65%
H001 3		Sandy Wash	Mid	45%
H002 1		Shallow Upland	Late	63%
H003 1		Limy Upland	Late	65%
H003 2		Shallow Upland	Mid	48%
H004 1		Limy Upland	PNC	79%
H005 1		Shallow Upland	Mid	28%
H005 2		Shallow Upland	Late	64%
H006 1		Shallow Upland	PNC	89%
H007 1		Basalt Slopes	Late	52%
H008 1		Limy Upland	PNC	79%
H010 1		Shallow Upland	PNC	93%
H011 1		Limy Upland	Late	62%
H012 1		Limy Upland	Mid	37%
H012 2		Limy Upland	Mid	49%
H015 1		Shallow Upland	Mid	40%
H015 2		Shallow Upland	Late	68%
H001 1		Sandy Wash	Late	57%
H001 2		Sandy Wash	Late	65%
H001 3		Sandy Wash	Mid	45%
H002 1		Shallow Upland	Late	63%
H003 1		Limy Upland	Late	65%
H003 2		Shallow Upland	Mid	48%
H004 1		Limy Upland	PNC	79%
H005 1		Shallow Upland	Mid	28%
H005 2		Shallow Upland	Late	64%
H006 1		Shallow Upland	PNC	89%
H007 1		Basalt Slopes	Late	52%

H009 1		Shallow Upland	Mid	33%
H009 2		Shallow Upland	PNC	87%
H010 1		Shallow Upland	PNC	93%
H012 1		Limy Upland	Mid	37%
H012 2		Limy Upland	Mid	49%
H013 1		Shallow Upland	PNC	76%
H014 1		Shallow Upland	PNC	84%
H015 1		Shallow Upland	Mid	40%
H015 2		Shallow Upland	Late	68%
H016 1		Shallow Upland	Mid	50%
H017 1		Shallow Upland	Late	74%
H018 1		Shallow Upland	Late	64%
H018 2		Shallow Upland	Early	25%
H019 1		Breaks	PNC	82%
H020 2		Limy Upland Deep	Mid	44%
H021 1		Gypsum Upland	Late	70%
H022 1		Shallow Upland	PNC	80%
H022 2		Shallow Upland	Late	52%
H023 1		Breaks	Late	75%
H024 1		Shallow Upland	PNC	76%
P020 1		Limy Upland Deep	Late	68%

6. Special Status Species

Animals:

Desert tortoise: Information on desert tortoise distribution and abundance in the Arizona Strip area is derived primarily from triangular, 1.5 mi by 10-yard, line transects, as well as from three study plots, one in the Pakoon Basin and two on the Beaver Dam and Virgin Slopes. The transect data provide distributional information and rough estimates of relative density throughout the range of the tortoise on the Arizona Strip, while the plot data detail densities, demographics, and trends at specific sites. Population data are not gathered at the individual allotment level.

As a result, surrogate measures are used to infer population data for this species with data from nearest similar plots and transects. Desert tortoise surveys were conducted on a study plot on the Pakoon Allotment in Category II habitat (T. 34 N., R. 15 W., sections 3 & 4) in 1991, which is similar to and in proximity to the Mosby-Nay Allotment, and is used to approximate tortoise densities on the Mosby-Nay Allotment.

On the Pakoon Allotment, ten live tortoises and 11 sets of shell remains were recorded from 60 person days of searching using standard field techniques in 1991. The sex ratio was 67% male to 33% female. The size class structure was 10% immature and 90% adult. One tortoise had definite symptoms of upper respiratory tract disease (URTD) and two had possible symptoms. Tortoise densities were extrapolated from observation rates and mark-recapture information at six to eight tortoises on Section 3 and nine to 12 tortoises on Section 4.

By comparison with surveys on the Pakoon Allotment, the south and west portion of the Mosby-Nay Allotment within Category I habitat could reasonably be expected to have higher tortoise densities than those in Category II habitat on the Pakoon Allotment. Tortoise densities in Category III habitat on the Mosby-Nay Allotment could reasonably

be expected to be less than those in Category II habitat on the Pakoon Allotment. However, since most eastern Mojave tortoise populations are reportedly declining due to diseases such as URTD and loss of habitat from invasion of exotic annual grasses, tortoise densities could be reduced from what would be expected from 1991 levels.

Habitat on the Mosby-Nay Allotment consists of large stands of Joshua trees and creosote bush dominated scrub. Numerous gravel washes dissect the habitat and are favored by desert tortoises. Grasses, forbs, and water are adequate. Caliche caves are plentiful but soil burrows are very scarce, particularly in Category III habitat areas on the northern portion of the allotment. Throughout much of the northern portion of the allotment, there is only a shallow substrate of soil over a solid substrate of caliche. As a result, soil burrows where tortoises can lay eggs at a proper depth are thought to be a limiting resource (Advantage Environmental 1991). The southern portion of the allotment contains deep soils and desert vegetation typical of the tortoise's range in California and Nevada, while the northern portion contains more shallow soils and is primarily covered with blackbrush, not an important plant for tortoises. While tortoises occur throughout the allotment, only the southern portion (that portion within the Pakoon DWMA/ACEC) has been determined to be essential for recovery of the species.

More than 1,200 acres of Category III desert tortoise habitat in the northeastern portions of the Mosby-Nay Allotment burned in 2005. It is unknown how many desert tortoises may have been injured or killed during these wildfires. While the burned areas were previously not considered high quality tortoise habitat, wildfire further reduced their suitability for desert tortoise. Wildfire in the eastern Mojave Desert has led to widespread conversion of native plant communities to exotic annual grasses, such as cheat grass and red brome. While these species are known forage plants of desert tortoise, the loss of native shrubs that provide cover and shade for tortoise has increased surface temperatures, and provides greater exposure to predation. Exotic annual grass communities also have a greater fire frequency. As a result, the primary constituent elements of critical habitat for desert tortoise are lost and the probability for natural regeneration to perennial grass communities is low. Most burned areas in the eastern Mojave are no longer considered suitable for desert tortoise habitat. Fortunately, none of the Category I desert tortoise habitat on this allotment burned in 2005. However, these areas continue to be vulnerable.

All of the Category I habitat on the allotment is within the Pakoon DWMA/ACEC. The 1998 Mohave Amendment to the Arizona Strip RMP closed the Pakoon DWMA/ACEC to livestock grazing. However, an appeal of this decision has allowed grazing to continue.

Special Status Raptors: Bald eagles, California condors, and peregrine falcons are not known to nest or roost on the Mosby-Nay Allotment. There are no records of occurrence of any of these species on the allotment. Habitat for nesting or roosting is not present on the allotment. There are no riparian areas that would provide foraging habitat. The probability of occurrence of these species on the Mosby-Nay Allotment is extremely low.

BLM Sensitive and State Species of Concern

BLM Sensitive Raptors: Ferruginous hawks, Swainson's hawk, and western burrowing owls are known to use habitat similar to that found on the Mosby-Nay Allotment, though

specific sightings have not been recorded for any of these species. All of these species are potential predators of desert tortoise.

BLM Sensitive Bats: A variety of sensitive bat species have been captured on this and neighboring allotments including Townsend's big-eared, spotted bats, small-footed myotis, fringed myotis, and big free-tailed bats. To date, no California leaf-nosed bats have been captured on this or neighboring allotments.

7. Wildlife Habitat

In 2005, AGFD classified 98 mule deer in GMU 13B as a whole. The five-year average buck:doe:fawn ratio is 39:100:48. AGFD bases permit allocations on hunter success, age of harvest, and fawn production. Permit levels will fluctuate based on this data. In 2005, 55 permits were issued annually throughout GMU 13B, with hunter success above 60%. No 13B population estimate is available, nor is an estimate available for the Mosby-Nay Allotment. See Appendix E for more information.

For bighorn sheep: In 2005, a total of 121 bighorn were classified in 13B north. The five-year average ram:ewe:lamb:yearling ram ratio is 38:100:27:14. The population is stable and doing well, but much of the available suitable sheep habitat is unused by sheep.

8. Riparian/Fisheries Habitat

Upper and Lower Cove spring do not normally have surface water to support riparian areas, however, because of the extremely wet year during the winter of 2004 and 2005 there is surface water there now. Both Upper and Lower Cove spring are fenced; however, livestock do have access through a corral to Lower Cove Spring. Access to springs could easily be fixed and fences maintained to exclude livestock. The area does support stringers of *Tamarix* (salt cedar), which may affect availability of surface water etc, and some *Baccharis* (desert baccharis). The potential riparian area is small at Lower and Upper Cove Springs, less than ¼ to ½ acre at each. Other springs on this allotment are North Spring (fenced) and Cedar Spring; both produce less than a gallon per minute. All springs on the allotment are used by the grazing permittee as base water.

9. Wild Horse and Burro Habitat - None

This allotment is outside of the herd management area. However, an occasional burro may wander in.

10. Lithology and Soils

a. Lithology

The Mosby-Nay West Allotment consists mainly of limestone, sandstone, gypsum, granite and gneiss. Landforms are mesas, ridges, fan and stream terraces, plateaus, fan terrace dunes, and cliffs that have slopes ranging from one to seventy percent. Soils are gravelly or cobbly, shallow to very deep and 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
- 27 Grapevine-Shelley complex, 1 to 5 percent slopes (fan terrace), LS, Moenkopi; Grapevine and Shelley=Limey Upland (Deep), 6" to 9"
- 28 Gypill-Badland association, 10 to 70 percent slopes (hills, escarpments) Moenkopi; Gypsum Hills (Alkaline), 6" to 9" ppt
- 34 Hindu-RO-Gypill complex, 35 to 70 percent slopes, (cliffs, scarps, mtns), gyp, LS, SS, CG; Hindu=Limestone Hills, 6" to 9"; Gyphill=Gypsum Hills, 6" to 9"
- 38 Hobog-Tidwell fam complex, 8 to 35 percent slopes, (plateau, mesa, ridge), limestone; Hobog and Tidwell=Limey Upland, 6" to 9"
- 39 Hobog very gravelly sandy loam, 5 to 30 percent slopes, (plateau, mesa), limestone; Shallow Upland, 9" to 12"
- 44 Meadview very gravelly sandy loam, 2 to 18 percent slopes, (fan terraces) LS, Moenkopi; Limey Upland (Deep), 6" to 9"
- 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"
- 67 Ruesh very gravelly fine sandy loam, 3 to 20 percent slopes, (fan terrace), mixed sediment; Gypsum Fan, 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
- 87 Winkel_RO complex, 2 to 35 percent slopes, moist, (summits, shoulders), basalt; Shallow Upland, 9" to 12" ppt
- 89 Winkel very gravelly loam, 2 to 25 percent slopes, moist, (plateaus, mesas), mixed alluvium; Shallow Upland, 9" to 12" ppt
- 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"
- 96 Yurm family-Meadview association, 15 to 40 percent slopes, (fan terraces, mesas), LS; Yurm family=Limey Upland, 6" to 9" ppt; Meadview=Limey Upland (Deep), 6" to 9" ppt
- 97 Yurm family-Meadview association, 15 to 40 percent slopes, moist,(fan terraces, mesas), LS; Yurm family=Shallow Upland, 9" to 12" ppt; Meadview=Sandy Loam (Gravelly), 9" to 12" ppt
- 98 Yurm family very gravelly loam, 15 to 35 percent slopes, (fan terraces), LS, conglomerate; Limey Upland, 6" to 9" ppt
- 99 Yurm family very gravelly loam, 15 to 35 percent slopes, moist, (fan terraces), LS; Shallow Upland, 9" to 12" ppt

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

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

- a. The proposed fence to prevent livestock from entering the Pakoon DWMA/ACEC has not been built. The Pakoon ACEC was established in a 1998 amendment to the Arizona Strip District Resource Management Plan. The DWMA/ACEC was created in order to implement the goals and objectives of the Desert Tortoise Recovery Plan (June 1994), which among other things recommended the cessation of livestock grazing in DWMA/ACEC in an effort to recover the species.

The Decision Record for the RMP Amendment (December 1998) closed the DWMA/ACEC to livestock grazing. In a May 27, 1999 final grazing decision, the grazing preference on the permit for the Mosby-Nay allotment was reduced by 52% or 552 AUMs (Animal Unit Months) due to the DWMA/ACEC being closed to livestock grazing. The permittees request to stay the final decision was denied by The Interior Board of Land Appeals (IBLA) in 1999. The Final Grazing Decision gave two years notice to the permittee, with the effective date of the closure set for March 1, 2001. The Interior Board of Land Appeals, in an order dated March 27, 2001, stayed the reduction in permit numbers, as per May 27, 1999, final grazing decision, pending a final determination on the merits. The stay only pertained to the area designated as open for grazing as per 1998 RMP amendment. The BLM petitioned to vacate the May 27, 1999 final decision pertaining to permit numbers in the open area, along with the associated appeal and stay, in order to complete a full Rangeland Health Assessment and Evaluation and forage allocation study. This petition was docketed and vacated by order the Office of Hearing and Appeals dated October 28, 2005, in anticipation of new decision making the 1999 decision moot. The proceeding is continued as agreed to by all parties pending completion of a new permit decision.

To separate the DWMA/ACEC (closed area) from the remainder of the area open to livestock grazing in the allotment the need for a fence was identified along the northern boundary of the DWMA/ACEC. However, in all probability livestock would have access to the DWMA/ACEC pending completion of a boundary fence to exclude livestock.

- b. Wildfires burning numerous acres and setting vegetation back to an early seral stage. During 2005, wildfires burned 2,863 acres or 18% of the area open to livestock grazing. These fires burned in areas where the red brome was abundant due to the high precipitation received during the fall and winter of that year.
- c. Red brome and cheat grass continue to expand due to wildfires. During wet winters, annual grasses grow under shrubs and fill the interspaces between shrubs, creating fine fuels that enables wildfires to spread killing desert vegetation, and changing the fire frequency. Fire frequency in the desert community is very long, possibly over 100 years. Expansion of the fine fuels increase the fire frequency, to only a few years, resulting in the elimination of native perennial vegetation due to repeated burning.
- d. Desert Tortoise/ Livestock conflict and the reduction of livestock use for tortoise protection. The Recovery Plan for the Mojave Population of Desert Tortoise

identifies threats to the species and the accumulated effects from livestock grazing and related actions. Among the threats described 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.

There are two completed studies of diet on the Arizona Strip, the earliest by Hansen et. al. (1976). They found that in the Pakoon tortoise fecal pellets, threeawn (*Aristida* sp.), globemallow (*Sphaeralcea* sp.), slim tridens (*Tridens muticus*), and red brome (*Bromus rubens*) accounted for over 80 % of the material. On the Beaver Dam Slope, red brome and redstem filaree (*Erodium cicutarium*) made up 90% of the fecal material. Tortoises generally consumed the succulent leaves and flowering parts of plants and occasionally root fragments. Desert tortoises show definite food preferences within a vegetation type, but like most herbivores, they feed on a variety of plants (Hansen et. al 1976).

Avery (1998) found that competition for forage (mostly annual grasses and forbs and perennial grasses) occurs in early spring and late spring of years of low rainfall and annual plant production. He found that tortoise foraging (i.e., behavior and food selection) was altered in areas where cattle were present. Tracy (1996) found that in years of low rainfall, and hence annual plant production, cattle grazing may reduce tortoise forage sufficiently to cause tortoises to lay fewer eggs, thereby reducing reproductive potential.

Hohman and Ohmart (1980) reported that forbs comprised the largest percentage of the diet of cattle and tortoises on the Beaver Dam Slope. 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, were 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, less than 109 lbs/ac, indicating some competition for forage was likely occurring.

Desert tortoises require approximately 28 lbs/acre of a variety of forage plants in order to maintain a viable population (Tracy 1996). While there is some dietary forage overlap between cattle and tortoises, the average annual production consistently meets or exceeds 28 lbs/acre³ on this allotment, and can be many times higher than this in years of adequate precipitation. Hansen et. al. write, "the parts of plants consumed were primarily the succulent portions such as leaves and flowering parts of plants." This means that tortoises are quite selective and not just any 28 lbs of forage per acre will suffice for maintenance of healthy tortoises. Utilization levels are set at 45% of current year's growth on desert tortoise allotments to further reduce potential for overlap. Utilization guidelines are not management objectives; they are used to define levels of grazing that have been shown to be reasonable to protect the physiological well-being of key forage plants and/or the community characteristics of range vegetation. Utilization that consistently exceeds guidelines in certain areas or over time may be used as a warning to examine the need for livestock management changes.

³ The 1992 production data suggest that there was 295 lbs/acre (air-dry weight) inside the ACEC and 427 lbs/acre outside the ACEC.

According to Oftedal (2003), apparently tortoises as a group require periodic access to drinking water, access to high moisture foods, and/or protein-rich foods for potassium excretion via urate production (Potassium Excretion Potential or PEP) in order to eliminate the potassium loads associated with feeding. During droughts or infrequent summer rainfall events in the Mojave Desert not only is drinking water not available but high PEP plants are not either, resulting in tortoises remaining in a negative nitrogen balance, gradually losing body lean mass and condition increasing their susceptibility to disease and reduced egg production. If true, the Mojave tortoises are fighting a losing battle with environmental nitrogen, unable to accumulate enough in their body protein to consistently offset losses in dry years. As a result, simple management solutions, such as restrictions on grazing in low-rainfall years, may not address the underlying problem. Altering abundance of high PEP plants and/or other potential management actions should warrant careful consideration.

Potentially, cattle can step on tortoises and injure or kill them. The likelihood of this is greater for hatchling or juvenile tortoises that are small and presumably difficult for cattle to see. Similarly, cattle can potentially step on and cause burrows to cave in, thereby disturbing essential thermal cover or even entrapping a tortoise within. Avery (1998), comparing inside and outside of an exclosure, found significantly (statistical) more damaged burrows and found that tortoises spent more nights in the open outside of a cattle grazing exclosure.

There are no records of tortoise being injured or killed as a result of trampling by livestock on this or neighboring allotments, although there are records from elsewhere on the Beaver Dam Slope in both Arizona and Utah. Tortoise burrows and cover sites are typically on the side slopes of washes or beneath shrub or other vegetation mounds. 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. The probability of this type of occurrence is considered low. There is a greater likelihood that livestock would step on and crush a portion of a tortoise burrow away from the opening. Burrows may be as much as 30 feet long.

Use of ATVs in cattle ranching operations is not common on this allotment. All vehicles traffic is limited to existing roads within the Grand Canyon – Parashant National Monument with no off-road vehicle use allowed. Speed limits apply to Bureau authorized actions within desert tortoise habitat. While the probability of a livestock operator hitting a desert tortoise is greater than that of the average visitor to the area, the occurrence is considered very rare. No such encounters have been reported on this allotment.

All of the Category I desert tortoise habitat on the Mosby-Nay Allotment is included within the Pakoon ACEC and is closed to grazing, through the 1998 RMP amendment.

- e. Wildlife access to water at Lower Cove Spring. The corral at Cove Spring includes a non-wildlife passable fence of six to eight foot tall poles with little or no space between them. The corral also has a finger trap style gate that allows livestock and wildlife to enter the corral for water, but offers no means for escape. The livestock operator uses the trap at the corral for up to three weeks each year to trap and

transport livestock. There are also two springs with available water within one-quarter mile of the corral. The short duration of time that the finger traps are in use is not a significant issue for wildlife access as long as the trap is blocked open when not in use and water is available at the nearby spring sources. Modifications to the fence surrounding the box canyon immediately west of Cove Spring would improve wildlife access to the water at the head of that canyon.

- f. Livestock water facilities and tortoise predators vs. water for other wildlife species. Predators of desert tortoise are known to use waters developed for livestock and/or wildlife use. Increasing access and availability to water for predators may lead to an increase in the number of tortoise predations. The 1998 Mohave Amendment to the Arizona Strip RMP addressed this issue. The resulting biological opinion directed the BLM to identify water developments in desert tortoise habitat that were attracting predators and make modifications that would reduce or eliminate predation opportunities. None of the developed waters on this allotment were determined to be contributing to enhanced predation on desert tortoise.
- g. Springsnail at Middle Spring. Middle Spring is not on the Mosby-Nay grazing allotment, it is on the Mosby allotment, and would be assessed during that allotment assessment. No further discussion at this time is warranted.
- h. Western burrowing owl. Burrowing owls are likely present on the Mosby-Nay Allotment, though specific sightings of this BLM sensitive species have not been recorded. There is no evidence suggesting that current livestock grazing levels are having any effect on burrowing owls. Since this species, likely preys upon desert tortoise hatchlings, no efforts are proposed to enhance habitat for burrowing owls. No other issues have been identified with this species on the Mosby-Nay Allotment.
- i. Three Corners Area is underused by Livestock. The northeastern corner of the allotment receives very little use due to distance from water and the necessity of climbing up a steep Dugway to get there.

V. Conclusions

- A. **The following determinations** are based on the analyses and supporting documentation referenced herein, conclusions on the attainment of land health standards and RMP multiple use resource conditions objectives. Refer to Resource Objectives under Section III-D of the document.

1. Land Use Plan Objectives

Shivwits Resource Area Implementation Plan for the Arizona Strip Resource Management Plan

GZ13 Establish desired plant community objectives and include them in the allotment management plan.

The DPC site-specific objectives as stated in this evaluation will be incorporated into the AMP. The AMP will also be revised to reflect the changes in management necessary to implement the 1998 RMP amendment closing the DWMA/ACEC to livestock grazing.

GZ17 Allow 50% utilization on key forage species in allotments with rotational grazing systems. On allotments in tortoise habitat, or being less intensively managed, utilization is set at 45%.

This objective was met. The 45% utilization level did not apply until after 1998.

Arizona Strip Resource Management Plan Mojave Amendment (1998) to implement the Desert Tortoise Mojave Population Recovery Plan.

98 RMP GM3 Monitor use to ensure that utilization of key species by wildlife and livestock would remain below 45% of the current year's growth.

Met. See response to GZ17.

2. Specific Resource Objectives from Activity Plans

California Condor Recovery Plan Objectives (April, 1996)

Provide foraging habitat for California condors. Re-establish extirpated native ungulate populations. Encourage livestock owners to leave dead livestock on rangelands.

Met. The habitat is being provided. Pronghorn and bighorn sheep have been re-established. However, because condors are very susceptible to lead poisoning, the leaving of dead livestock that may have been shot is no longer encouraged.

Virgin River – Pakoon Basin Habitat Management Plan (HMP) Objectives

VM1 Enhance wildlife forage conditions on all allotments with a downward or static trend to achieve DPC by 2010.

Progressing Towards Meeting. Progress continues to enhance forage conditions for wildlife on this allotment. However, most forage enhancement projects would lead to adverse affects to listed species such as desert tortoise. Forage enhancement projects in tortoise habitat are limited to efforts to reduce or limit spread of invasive exotics and occasional re-seeding projects for rehabilitation following wildfire.

AHM-5 Maintain or enhance the quality of springs along the Virgin River and Grand Wash to ensure suitable habitat conditions for native wildlife.

Progressing Towards Meeting. Springs are properly functioning based on the presents of adequate vegetation, suitable landform and presents of woody debris to dissipate stream energy associated with high water flows. However, Upper and Lower Cove springs do receive some livestock use and species density and diversity could be improved. These springs are fenced but would need some fence maintenance and modification to allow wildlife improved access and preclude livestock. Actions to remedy this situation are being formulated.

BOP Maintain or enhance nesting and wintering habitats (BOP-1) for birds or prey, including cliff sites for nesting (BOP-3), desert ranges (BOP-4), and riparian areas for foraging (BOP-2).

Progressing Towards Meeting. There are no known nesting or roosting locations for raptors on this allotment. In the event that any such locations are identified, efforts would be made to enhance such sites, except where doing so would contribute to predation of desert tortoise.

UGB Manage the habitat to ensure healthy, viable populations of upland game birds. Where practical, enhance habitat quality.

Progressing Towards Meeting. Progress continues to enhance forage conditions for upland game birds on this allotment. Forage enhancement projects in tortoise habitat are limited to those actions that would not promote or contribute to predation of tortoise. However, the IAT determined that the uplands are properly functioning capable of sustaining natural biotic communities; based all available monitoring, inventory, and assessment data, inferring that the habitat is being managed to ensure healthy, viable populations of upland game birds.

CARN-1 Protect and manage habitat to ensure viable populations of carnivores.

Met. All carnivore populations in the region are at or above viable levels.

RA Maintain or enhance habitat conditions for reptiles (RA-2) and amphibians (RA-4) in the HMA.

*Progressing Towards Meeting. The IAT determined that the uplands were making significant progress towards meeting standards, except the areas that burned were not meeting standard 3, but were capable of sustaining natural biotic communities; based on all available monitoring, inventory, and assessment data, inferring that the habitat is being managed to ensure the maintenance of healthy, viable populations of reptiles etc. Most key areas indicate **a static trend** over the past 5 years due to drought or because they are at late seral or PNC. However, management emphasis continues to focus on protection of desert tortoise and other reptile and amphibian species. The 1998 Mohave Amendment to the Arizona Strip RMP provides enhanced protection and habitat improvement measures for desert tortoise habitat. Road/route closures have been implemented, though there is reason to believe that closing routes in desert tortoise habitat may be restricting access for fire suppression efforts.*

DT-3 Maintain or enhance forage conditions for desert tortoises.

Progressing Towards Meeting. Again, the IAT determined that the uplands are capable of sustaining natural biotic communities on seventy-two percent of the allotment; based all available monitoring, inventory, and assessment data, inferring that the habitat is being managed to ensure healthy, viable populations of desert tortoise. The remaining areas have usually some kind of fire history over the last 30 plus years and have sustained a significant loss of perennial grasses and shrubs, which have been replaced by red brome. Opportunities for enhancement of forage conditions for tortoises on those portions of the allotment impacted by fire are limited. If attempted, most forage enhancement projects would lead to adverse affects to the species. Mechanical vegetation enhancement and use of prescribed fire are limited to cases where desert tortoise or their habitat would benefit. Forage enhancement projects in tortoise habitat are limited to efforts to reduce or limit spread of invasive exotics and occasional re-seeding projects for rehabilitation following wildfire.

Allotment Management Plan DPC Objectives

Most key areas indicate a static trend indicating that no change or improvement in the plant community has taken place over the past 5 years primarily due to drought effects. Those areas burned by wildfire over the past 30 plus years are not fully meeting all upland land health standards but are fairly stable.

Key Area No. 1, located outside the DWMA/ACEC in SWNE sec. 29, T. 36 N., R. 16 W.

Attain overall Native Grass composition by dry weight of 5-10% or above
Not Met. Grasses overall is at 2%

Maintain overall shrub composition by dry weight of 50-60% or above
Met. Shrubs are at 65%

Maintain Epne composition by dry weight of 1-5%
Met. Epne is at 4%

Increase Krer Composition by dry weight to 1-5%
Not met. Krer is a 0%

Maintaining forbs composition by dry weight of 5-10% or above
Met. Forbs are at 33%

Maintain live perennial vegetation cover (basal cover) between 3-10%.
Met. Basal cover is at 3%

Key Area No. 2, located within the DWMA/ACEC in SESE sec. 4, T. 35 N., R. 16 W.

Attain an overall perennial native grass composition by dry weight of 5-15%
Not met. Native grasses are at 0%

Maintain an overall shrub composition by dry weight of 80-90%
Met. Shrubs are at 100%

Maintain Krer &/or Krgr composition by dry weight of 1 to 10%
Met. Krer is at 4%

Maintain Amdu2 composition by dry weight of 30-45%
Met. Amdu2 is at 31%

Maintaining forbs composition by dry weight of 5-10% or above
Met. Forbs were at 51%

Maintain live perennial vegetation cover (basal cover) between 0-5%.
Met. Basal cover is at 0%

Key Area No. 3, located outside the DWMA/ACEC in SWNW sec. 11, T. 36 N., R. 16 W.

Attain an overall perennial native grass composition by dry weight of 1-5%
Met. Perennial native grass is at 1%

Increase Plri3 composition by dry weight to 1 to 2% CBW
Not Met due to fire. Plri3 is at 0%.

Increase Shrub composition by dry weight to 40-60%
Not Met due to fire. Shrubs are at 9%.

Increase Krla2 composition by dry weight to 1-5%

Not met due to fire. Krla2 is at 0%

Maintain Epne composition by dry weight of 1-5%

Met. Epne is at 2%

Increase Krer &/or Krgr composition by dry weight to 1-5%

Not met due to fire. Krer & Krgr 0%

Maintaining forbs composition by dry weight of 3-5% or above

Met. Forbs are at 91%

Increase live perennial vegetation cover (basal cover) between 3-8%.

Not met due to fire. Basal cover is at 0%

Key Area No. 5, located within the DWMA/ACEC in NESW sec. 32, T. 35 N., R. 16 W.

Attain an overall perennial native grass composition by dry weight of 5-15%

Not met. Perennial native grasses are at 1%

Maintain Plri3 composition by dry weight of 1-5%

Not met. Plri3 is at 0%

Maintain overall Shrub composition by dry weight of 60-80%

Met. Shrubs are at 64%

Maintain Krer & Krgr composition by dry weight of 1-5%

Met. Krer is at 3% and Krgr is at 4%

Maintain Amdu2 composition by dry weight of 30-45%

Met. Amdu2 is at 38%

Maintaining forbs composition by dry weight of 5-10% or above

Met. Forbs are at 35%

Maintain live perennial vegetation cover (basal cover) between 3 and 8%.

Met, basal cover is at 5%

Key Area No. 6, located within the DWMA/ACEC in SWSE sec. 20, T. 35 N., R. 16 W.

Maintain PPGG (which includes Achy, Spcr, Mupo2, & Plri3) composition by dry weight of 1 to 10%

Met. Plri3 is at 10%

Maintain overall Shrub composition by dry weight of 88-100%

Met. Shrubs are at 90%

Maintain Krer and/or Krgr composition by dry weight of 1-5%

Not met. Krer/Krgr is at .4%

Maintain Amdu2 composition by dry weight of 35-45%

Met. Amdu2 is at 44%

Maintaining forbs composition by dry weight of 3-5% or above

Met. Forbs were at 54%

Maintain live perennial vegetation cover (basal cover) between 3-8%.

Met. Basal cover is at 5%

B. Response to Issues

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

- a. The proposed fence to prevent livestock from entering the Pakoon DWMA/ACEC has not been built. BLM would build a fence separating the Pakoon DWMA/ACEC (closed area) from the remainder of the area outside of the DWMA/ACEC (open area). A new decision would be issued by the BLM identifying the AUM's and number of livestock that would be authorized to graze in the remaining open area of the Mosby-Nay Allotment. Livestock use of the DWMA/ACEC in all probability would continue until a fence is built on the north DWMA/ACEC boundary to exclude livestock.
- b. Wildfires burning numerous acres and setting vegetation back to an early seral stage. Burned area will receive different rehabilitation treatments to determine success in rehabilitating Mojave Desert sites (broadcast seeding, seed and stir, and not seeded for control etc.). Treatment areas will be fenced (to protect treatments from livestock for a minimum of two years), and seeded. Areas not treated will also be rested for a minimum of two growing seasons. Areas are already starting to show signs of recovery and many perennial plants are resprouting. Current wildfire suppression policy is to take aggressive suppression measures in desert tortoise habitat.
- c. Red brome and cheat grass continue to expand due to wildfires. Wetter winters and springs encourage annual grasses to flourish. Fire has a negative effect on the native vegetation of this ecozone and results in a landscape more dominated by these aggressive annual species due to their competitiveness and phenological characteristics. Aggressively fight wildfires to minimize spread and reduce size of areas being burned. It was consensus of the IAT that the livestock grazing was not the causal factor in any increase of the brome species, since they have existed or become naturalized throughout the system for years, but increase based on available moisture and reduced competition from native vegetation due to removal by fire.
- d. Desert Tortoise/ Livestock's conflict and the reduction of livestock use for tortoise protection. The closure and reduction of livestock use on Category I desert tortoise habitat on the allotment has not yet been fully implemented due to appeals. Once resolved, it may be possible to determine the effects of removal of livestock grazing on desert tortoise in this allotment and make a determination what effects are or are not occurring.
- e. Wildlife access to water at Lower Cove Spring. The short duration of time that the finger traps on the corral at Lower Cove Spring are in use is not a significant issue for wildlife access as long as the trap is blocked open when not in use and water is available at the nearby spring sources. Modifications to the fence surrounding Lower

Cove Spring would improve wildlife access to the water at the source (fence around source is on a side hill resulting in easy access in, but difficult access out so that animals have to jump uphill to get out). Other fenced springs or seeps should be checked for accessibility of wildlife and modified if necessary to ensure wildlife do have access and livestock are excluded.

- f. Livestock water facilities and tortoise predators vs. water for other wildlife species. The 1998 Mohave Amendment to the Arizona Strip RMP and resulting biological opinion directed the BLM to identify water developments in desert tortoise habitat that were attracting predators and make modifications that would reduce or eliminate predation opportunities. None of the developed waters on this allotment were determined to be contributing to enhanced predation on desert tortoise.
- g. Springsnail at Middle Spring. N/A see page 19 of this document.
- h. Western burrowing owl. Since burrowing owls likely prey upon desert tortoise hatchlings, no efforts are proposed to enhance habitat for burrowing owls. No other issues have been identified with this species on the Mosby-Nay Allotment.
- i. Three Corners Area receives little use by Livestock. The northeastern corner of the allotment receives very little use due to distance from water and the necessity of climbing up a steep Dugway to get there. Completing the catchment proposed in the AMP or by extending the existing pipeline up out of the cedar wash, approximately 1 mile to 1½ miles, up onto the bench area burying the pipeline along an existing road, would allow better use of the area and reduce pressure on the remaining portion of the allotment.

C. Forage production based on the 1992 ESI

As part of this land health evaluation BLM completed a forage allocation study. The forage allocation study is based on the Ecological Site Inventory (ESI) methods as described in Technical Reference 1734-7. One of the attributes collected during the ESI is the weight of that year's growth of individual plant species, which through application of adjustment factors an air-dry weight (ADW) for each species or total ADW for each SWA can be determined. When a proper use factor is applied to each plant species a usable ADW can be determined. Usable ADW divided by 810⁴ pounds results in AUMs.

Table #6 lists acreage in and out of the ACEC, taking into account issue #1 (section: III.F.1.a.). Data tabulated is for BLM administered lands only. Listed for each SWA is the acres, total and usable ADW (air-dry pounds of total production and usable production) and AUMs. Average total production is 295 pounds ADW pounds per acre in the ACEC area and 427 pounds per acre outside of the ACEC, with average usable production at 28 pounds per acre in the ACEC and 35 pounds per acre outside of the ACEC, after applying the PUF for each plant species.

⁴ The quantity of forage required by one mature cow (810 lbs) or the equivalent for 30 days.

Table #6 Area under ACEC designation				
SWA	Public land Acres	Pounds Total Annual Production	Pounds Annual Usable Production	Public AUMs
A086 3	15	66,142	9,181	11
A087 1	,190	202,766 2	6,131	32
A088 2	,815	499,312	62,949	78
A089 2	73	110,174	10,581	13
A090 4	66	157,017	18,101	22
A122 4	13	116,960	6,520	8
A123 1	,413	325,083	33,074	41
H001 6	67	277,562	14,308	18
H003 1	,715	687,893	48,887	60
H004 5	98	364,106	22,630	28
H005 4	3	13,621	920	1
H006 6	41	271,259	23,535	29
H007 4	0	12,112	1,659	2
H008 1	82	70,558	4,292	5
H010 1	61	84,462	8,189	10
H011 4	07	128,118	10,188	13
H012 9	56	231,659	41,071	51
H015 1	02	39,753	1,154	1
NV BLM*	311	91,796	8,615	11
Sub Totals	12,706	3,750,354	351,983	435
Area outside ACEC				
A088 1	1	1,964	248	0
H001 7	14	297,509	15,336	19
H002 1	88	217,869	12,160	15
H003 4	60	184,595	13,119	16
H004 1	7	10,521	654	1
H005 1	,261	397,297	26,825	33
H006 2	,362	999,211	86,693	107
H007 1	,676	502,696	68,869	85
H009 3	,567	1,071,550	92,553	114
H010 5	6	29,266	2,837	4
H012 7	0	17,075	3,027	4
H014 5	26	312,959	23,590	29
H015 1	,517	591,798	17,174	21
H016 1	22	31,256	2,344	3
H017 3	82	395,089	33,848	42
H018 6	43	572,705	51,263	63
H019 2	13	144,123	11,006	14
H020 8	72	403,493	54,735	68
H021 6	8	27,188	1,414	2
H022 5	9	42,354	3,728	5
H023 1	41	152,437	14,017	17
H024 5	8	34,739	2,484	3
P020 63	3	232,788	9,662	12
Sub Totals	15,617	6,670,485	547,587	676
Allotment Totals	28,323	10,420,839	899,569	1,111

*Based on the assumption that the Nevada BLM lands are similar to the Arizona BLM lands, productions figures are extrapolated for the 311 acres of NV BLM lands.

D. Arizona Standards For Rangeland Health

Standard 1. Upland Sites.

This allotment was classified in the RMP as category I. This means that the watershed units currently are in satisfactory erosion condition and the soils are not especially susceptible to wind and water erosion. The soils are resistant to compaction and have not been negatively altered by grazing.

Ground cover was measured at five key areas, and plants, litter, and rock are present in pattern, kind, and amount sufficient to prevent accelerated erosion. At all sites ground cover increased from the base year. The vegetative cover (basal) at the study sites were similar to or exceeded what was listed in the ecological site guides. Ground cover data collected (1981 to 1998) compared to similar years from a key area located within an area noted to be the "Type" (reference area) for the limy upland (deep) 6-9" ecological site showed similar results. However, ground cover at these same key areas on the Mosby-Nay Allotment has improved from then to now. Based on this comparison, the amount of ground cover is appropriate at each study site. Even key area #3 after the wildfire had a higher ground cover rating than in the past due to litter that remained after the fire. One key area is at PNC, two are in late seral, one is at mid seral (it burned prior to the mid seventies), and the last key area is in early seral (burned in 2005).

In addition, Standard #1, documentation worksheet was completed at key area #2 and #3. At key area #2, all seven indicators were rated at "None to Slight". At key area #3, litter and bare ground were rated at "Moderate" the remaining five indicators were rated at "None to Slight". The overall determinations for both key areas were that they were meeting Standard #1.

All key areas are considered to be functioning properly or trending towards attainment of Standard 1. At key area #3, while the vegetation was not recovered from the effects of the fire, it was moving toward recovery based on the data, and on site observation indicating native species were present, re-sprouting was occurring and moving the community in the desired direction, and based on all the indicators is making significant progress towards meeting Standard 1.

Standard 2. Riparian-Wetland sites

Priority riparian areas under the present RMP are those areas greater than two surface acres or with flows extending more than 1,000 feet. There are none of these areas within the Mosby-Nay Grazing Allotment. However, areas within the Mosby-Nay allotment that contain even a remote resemblance of being a riparian-wetland site are fenced. Two such areas are Upper Cove and Lower Cove Springs. Based on the checklist both springs are properly functioning based on presents of adequate vegetation, suitable landform and presents of woody debris to dissipate stream energy associated with high water flows. However, both springs do received some livestock use and species density and diversity could be improved. Fenced springs would need some fence maintenance and modification to allow wildlife better access and preclude livestock.

Standard 3. Desired Resource Conditions.

At four key areas (1, 2, 5, & 6) 20 DPC objectives have been met, 6 are not meeting, based on the analysis of cover and composition data, but these 6 are making significant progress towards meeting standard 3.

Key area #3 is meeting 3 out of 8 DPC objectives. Key area #3 is not meeting due to 2005 wildfire, which removed the shrub component.

An assessment at key area #3, relative to criteria for meeting standards, and indicators of rangeland health, resulted in a determination that the area was not meeting standard #3, because of the effects of the wildfire. While the vegetation was not recovered from the effects of the fire, it was moving toward meeting standard #3, as indicated by composition data and on site observation that native species are present; and re-sprouting was occurring, which is moving the community in the desired direction. It was determined by the IAT that livestock grazing is not the causal factor in the area not meeting DPC objectives and that current livestock grazing would not be a factor in the areas achieving DPC objectives.

The group again conducted an assessment at key area #2, relative to the criteria for meeting standards, and indicators of rangeland health. The IAT had consensus that the area was meeting #3 for rangeland health. The plant composition was such that it met the desired plant community objectives, which focused on providing appropriate habitat for desert tortoise and burrowing owls.

As a result, the IAT felt that standard #3 was being met throughout the allotment except for areas burned during the 2005 wildfires.

In conclusion, the amount and timing of precipitation has affected the frequency of plant species and other vegetation attributes, wildfire too has had an impact.

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

Table 1			
Categories for Reporting	Standard #1 Soils	Standard #2 Riparian	Standard #3 DPC
1. Public Land Acres/Miles Meeting	28,323 Acres	0 Acres/0 miles	25,460 Acres
a. Acres/Miles Meeting	25,460 Acres	0 Acres/0 miles	25,460 Acres
a. Acres/Miles making Significant Progress towards Meeting	2,863 Acres	0 Acres/0 miles	0 Acres
2. Public Land Acres/Miles Not Meeting	0 Acres	0 Acres/0 miles	2,863 Acres
a. Livestock is Significant Factor	0 Acres	0 Acres/0 miles	0 Acres
b. Combination of Livestock + Other is Significant Factor	0 Acres	0 Acres/0 miles	0 Acres
c. Other Land Uses are Significant Factor	0 Acres	0 Acres/0 miles	0 Acres
d. Significant Factor is Undetermined	0 Acres	0 Acres/0 miles	0 Acres
e. Natural process (Wildfire 2005)	0 Acres	0 Acres/0 miles	2,863 Acres

Based on the analyses and supporting documentation referenced herein, resource conditions on the Mosby-Nay allotment are making significant progress toward meeting the applicable standards for rangeland health:

VI. Recommendations

The following technical recommendations are based on the results and findings of the interdisciplinary team during the evaluation process.

- A. Issue a new 10 year grazing permit authorizing 676 active (526 Suspended) for the public lands, recognizing an additional 96 AUMs on state lands totaling 772 AUMs. Authorizing 676 active AUMs on the area outside of the DWMA/ACEC is based on the evaluation of rangeland conditions, using all available monitoring, inventory and assessment data. Require actual use be submitted to

the BLM by March 15, each year.

- B. Revise the AMP and during the interim manage those areas remaining open to livestock grazing with emphasis on providing water in the three corners area. Incorporate the new DPC's objectives into the AMP and continue to monitor the vegetative response to grazing management in relationship to attainment of DPC'S.
- B The current management practices (as defined in section III.3. this document), based on authorizing 676 AUMs conform to Arizona's Guidelines for Grazing administration. The season and frequency of use and distribution of grazing use should continue to allow for growth and reproduction of the vegetative resource.
- C. In areas that burned during the summer of 2005, the IAT felt that the level of livestock grazing, which is currently authorized would not preclude the area from returning to the desired plant community. However, the IAT wanted these areas to be monitored frequently to see just what the vegetative response would ultimately be to ensure livestock use was not negatively affecting the vegetative recovery.
- D. Continue identifying and monitoring water developments in desert tortoise habitat that may be attracting tortoise predators. When problems are identified, use an interdisciplinary team to try to determine what an appropriate action might be in order to reduce or eliminate predation opportunities.
- E. Implement modifications to the fence surrounding Lower Cove Spring to ensure livestock exclusion and improve wildlife access to the water.
- F. As required by Arizona's Guidelines for Grazing administration, maintain and/or modify all fenced springs and seeps on the Mosby-Nay Allotment to exclude livestock, yet still allow wildlife suitable access.
- G. Install a division fence between the Pakoon ACEC/DWMA along the southern boundary of the Arizona State section 32 T. 36 N., R. 16 W on east on the southern end of section 33 and tying into the Cocks Comb ridge in section 34. Most of the area to the north of this line is in a shallow upland range site not as suitable as desert tortoise habitat. A fence along this line would still be north of and outside the area that was identified as Category 1. Doing this would also save the cost of two miles of fence and provide for conservation of desert tortoise habitat and the maintenance or restoration of their habitats in conformance with Arizona's Guidelines for Grazing Administration.
- H. The grazing preference for the Pakoon Springs allotment has been relinquished to BLM, and the future status as to what portions of this allotment would be available for livestock grazing is pending completion of the DEIS (2005). Therefore, if a portion of the Pakoon Springs allotment outside of the Pakoon DWMA/ACEC remains available for livestock grazing then reconfigure that portion of the Pakoon Springs allotment with the remaining open area in the Mosby-Nay allotment. Reconfiguring these two allotments together would improve grazing management practices for the Mosby-Nay allotment and possibly bring resolution to the grazing appeal. The remainder of the Pakoon Springs allotment would be incorporated into the Pakoon DWMA/ACEC for the protection of Desert Tortoises.

AUTHORIZED OFFICER CONCURRENCE:

_____ I concur with the conclusions and recommendations as written.

_____ I do not concur.

_____ I concur, with the following modifications:

Dennis Curtis
Monument Manager
Grand Canyon-Parashant National Monument

11/6/06
Date

The determination represents an administrative process and is not a decision document.

DETERMINATION

Achieving Standards for Rangeland Health and Conforming with Guidelines for Grazing Administration

Field Office: Arizona Strip District, Grand Canyon-Parashant National Monument

Grazing Allotment Name/Number: Mosby-Nay Grazing Allotment #4836

Public Land (acres):

Upland: 28,322.

Riparian/Wetland: 1. (less than an acre)

Total: 28,323.

Streams on Public Land (miles): N/A

Date(s) of Determination: November 6, 2006

Name of Permittee(s): Bingham and Taylor

Assessment Participants:

<u>Name</u>	<u>Discipline</u>	<u>Interest</u>
Bill Gubler,	Commodity Interests	Grazing
Bill Howes	Commodity Interests	Off Road Vehicle Use
Kent McComb	Commodity Interests	Grazing
Scott Hansen	Non-Commodity Interests	Environmental Conservation
Spence Esplin	Non-Commodity Interests	Historical
Phil Squire	Non-Commodity Interests	Dispersed Recreation/Wildlife
Frank Malan	Local Area Interests	Public-at-Large
Roger McPeck	Local Area Interests	Public-at-Large
Dennis Becenti	Local Area Interests	Native American Interests

Alternates:

Maggie Sacher	Commercial Recreation/Tourism
Paul Weaver	Non-Commodity

Interdisciplinary Assessment Team:

<u>Name</u>	<u>Title</u>	<u>Agency</u>
Linda Price	Project Coordinator	BLM
Mike Herder	Wildlife Biologist	BLM
Michelle Bailey	Wilderness/Recreation Specialist	BLM
Phil Seegmiller	Vegetation/Grazing Administration	BLM
Robert Smith	Soil Scientist	BLM
Luke Thompson	Wildlife Manager	Arizona Game and Fish Department
Kyle Spencer	Soils and Vegetation	Natural Resource Conservation Service
Rob Grumbles	Vegetation and Social Economics	Mohave County Extension Service

Standard 1 (Upland Sites)

- ☒ Meeting the Standard at 4 key areas (1, 2, 5, and 6).
- ☐ Not Meeting the Standard, Livestock Grazing Management Practices are Significant Factors.
- ☒ Not Meeting the Standard, but Making Significant Progress towards meeting the standard at key area #3 (Vegetative Cover data)
- ☐ Not Meeting the Standard, Livestock Grazing Management Practices are not Significant Factors.

Rationale/Information Sources:

This allotment was classified in the RMP as category I. This means that the watershed units currently are in satisfactory erosion condition and the soils are not especially susceptible to wind and water erosion. The soils are resistant to compaction and have not been negatively altered by grazing.

Ground cover was measured at five key areas, and plants, litter, and rock are present in pattern, kind, and amount sufficient to prevent accelerated erosion. At all sites ground cover increased from the base year. The vegetative cover (basal) at the study sites were similar to or exceeded what was listed in the ecological site guides. Ground cover data collected (1981 to 1998) compared to similar years from a key area located within an area noted to be the "Type" (reference area) for the limy upland (deep) 6-9" ecological site showed similar results. However, ground cover at these same key areas on the Mosby-Nay Allotment has improved from then to now. Based on this comparison, the amount of ground cover is appropriate at each study site. Even key area #3 after the wildfire had a higher ground cover rating than in the past due to litter that remained after the fire. One key area is at PNC, two are in late seral, one is at mid seral (it burned prior to the mid seventies), and the last key area is in early seral (burned in 2005).

In addition, Standard #1, documentation worksheet was completed at key area #2 and #3. At key area #2, all seven indicators were rated at "None to Slight". At key area #3, litter and bare ground were rated at "Moderate" the remaining five indicators were rated at "None to Slight". The overall determinations for both key areas were that they were meeting Standard #1.

All key areas are considered to be functioning properly or trending towards attainment of Standard 1. At key area #3, while the vegetation was not recovered from the effects of the fire, it was moving toward recovery based on the data, and on site observation indicating native species were present, re-sprouting was occurring and moving the community in the desired direction, and based on all the indicators is making significant progress towards meeting Standard 1.

Standard 2 (Riparian-Wetland Sites)

- ☒ Meeting the Standard.
- ☐ Not Meeting the Standard, Livestock Grazing Management Practices are Significant Factors
- ☐ Not Meeting the Standard, but Making Significant Progress towards the standard..
- ☐ Not Meeting the Standard, Livestock Grazing Management Practices are not Significant Factors

Rationale/Information Source.

Priority riparian areas under the present RMP are those areas greater than two surface acres or with flows extending more than 1,000 feet. None of these areas within the Mosby-Nay Grazing Allotment. However, areas within the Mosby-Nay allotment that contain even a remote resemblance of being a riparian-wetland site are fenced. Two such areas are Upper Cove and Lower Cove Springs. Based on the checklist both springs are properly functioning based on presents of adequate vegetation, suitable landform and presents of woody debris to dissipate stream energy associated with high water flows. However, both springs do received some livestock

use and species density and diversity could be improved. Fenced springs would need some fence maintenance and modification to allow wildlife better access and preclude livestock.

Standard 3 (Desired Resource Conditions)

- ☒ Meeting the Standard at Key Area 1, 2, 5, and 6
- ☒ Not Meeting the Standard, but Making Significant Progress towards at Key Area 3.
- ☐ Not Meeting the Standard, Livestock Grazing Management Practices are significant factors at Key Areas
- ☒ Not Meeting the Standard, Livestock Grazing Management Practices are not Significant Factors at Key Area 3

Rationale/Information Sources:

An assessment at key area #3, relative criteria for meeting standards, and indicators of rangeland health, resulted in a determination that the area was not meeting standard #3, because of the effects of the wildfire. While the vegetation was not recovered from the effects of the fire, it was moving toward meeting standard #3, as indicated by composition data and on site observation that native species are present; and re-sprouting was occurring, which is moving the community in the desired direction. It was determined by the IAT that livestock grazing is not the causal factor in the area not meeting DPC objectives and that current livestock grazing would not be a factor in the areas achieving DPC objectives.

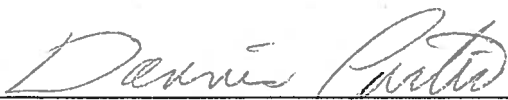
The group again conducted an assessment at key area #2, relative to the criteria for meeting standards, and indicators of rangeland health. The IAT had consensus that the area was meeting #3 for rangeland health. The plant composition was such that it met the desired plant community objectives, which focused on providing appropriate habitat for desert tortoise and burrowing owls.

As a result, the IAT felt that standard #3 was being met throughout the allotment except for areas burned during the 2005 wildfires.

In conclusion, the amount and timing of precipitation has affected the frequency of plant species and other vegetation attributes, wildfire too has had an impact.

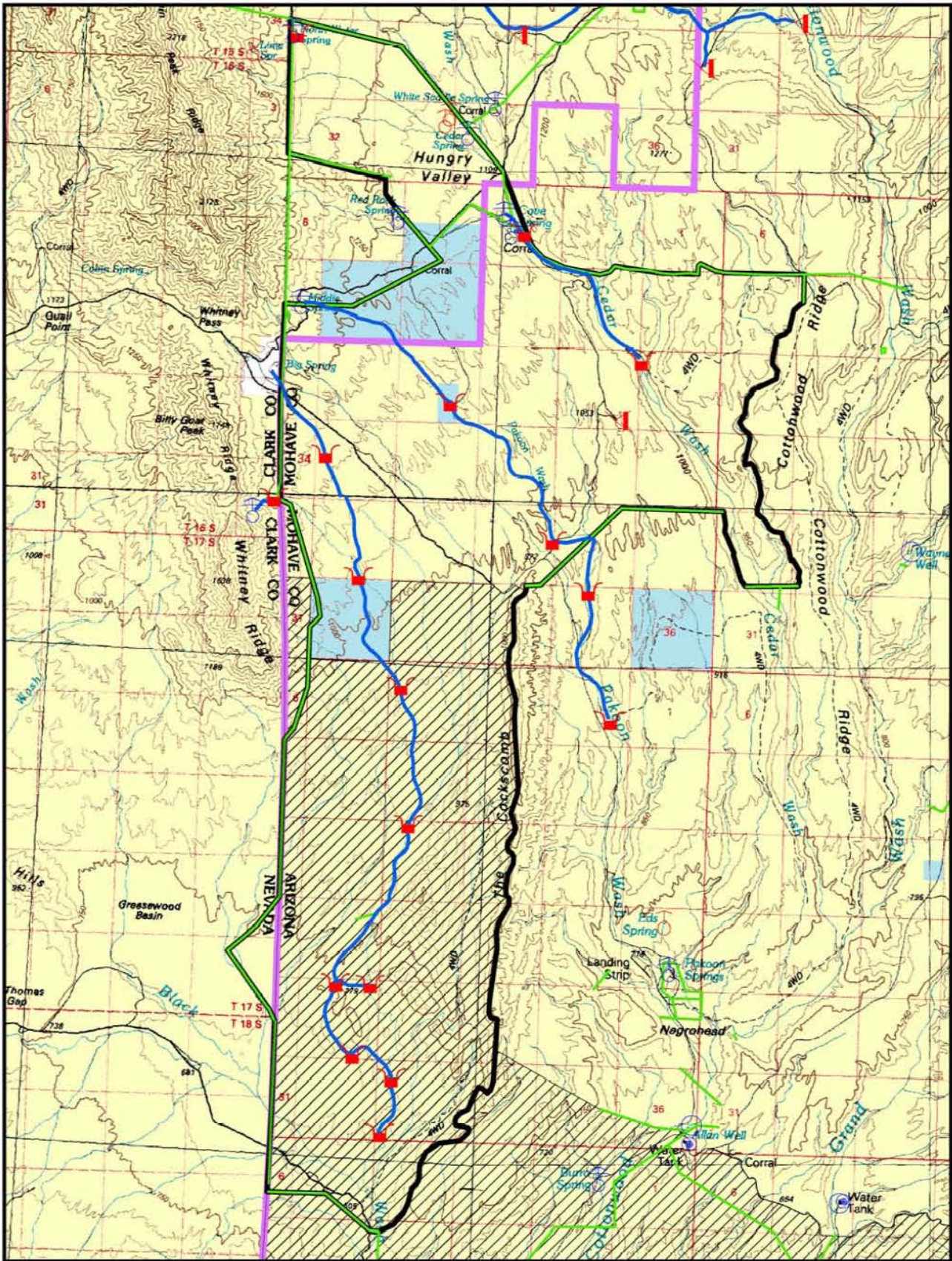
Determination:

I have determined that 4 of the 5 Key Areas are meeting Standard 1 and significant progress is being made towards meeting Standard 3 on the remaining key area. Approximately, 90% of the allotment is meeting or making significant progress toward meeting Standard 3, 10% of the allotment is not meeting Standard 3 due to wildfires in 2005 on the Mosby-Nay Grazing Allotment.



Monument Manager
Grand Canyon-Parashant National Monument

11/6/06
Date

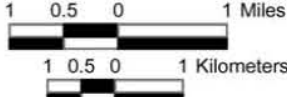


Mosby-Nay Allotment

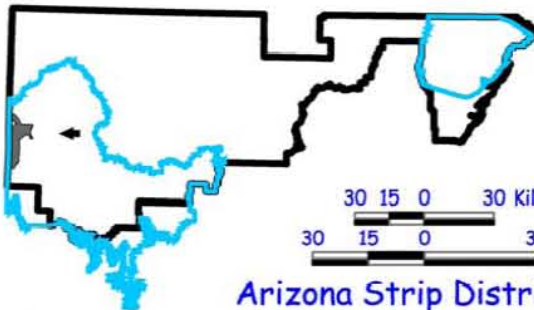
Bureau of Land Management
Arizona Strip District



1:100,000



- Key Area
- Fence
- Pipeline
- DT Critical Habitat
- Pakoon ACEC
- Monument Boundary
- Allotment Boundary
- Wilderness Boundary
- Ownership
 - BLM
 - Forest Service
 - Indian Reservation
 - National Park
 - Private
 - Recreation Area
 - State
- Fenced Reservoir
- Trough
- Undeveloped Spring
- Unfenced Reservoir
- Water Storage Tank
- Well
- Wildlife Catchment
- Wildlife Drinker
- Cattleguard
- Corral
- Developed Spring
- Noxious Weeds
- Livestock Catchment



Arizona Strip District

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

Produced by
Linda Price
February 2, 2006

Appendix A

ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION

ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION

INTRODUCTION

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

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

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

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

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

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

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

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

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

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

FUNDAMENTALS AND DEFINITION OF RANGELAND HEALTH

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

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

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

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

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

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

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

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

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

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

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

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

STANDARD AND GUIDELINE DEFINITIONS

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

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

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

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

IMPLEMENTING STANDARDS AND GUIDELINES

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

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

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

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

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

ARIZONA STANDARDS AND GUIDELINES

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

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

Standard 1: Upland Sites

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

Criteria for meeting Standard 1:

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

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

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

As indicated by such factors as:

Ground Cover

litter

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

rock

Signs of erosion

flow pattern

gullies

rills

plant pedestaling

Exceptions and exemptions (where applicable):

none

Guidelines:

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

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

Standard 2: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

Criteria for meeting Standard 2:

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

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

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

As indicated by such factors as:

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

Exceptions and exemptions (where applicable):

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

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

Guidelines:

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

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

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

Standard 3: Desired Resource Conditions

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

Criteria for meeting Standard 3:

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

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

As indicated by such factors as:

Composition
Structure
Distribution

Exceptions and exemptions (where applicable):

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

Guidelines:

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

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

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

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

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

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

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

serviceable waters are capable of providing for proper grazing distribution;

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

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

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

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

Appendix B

TEAM MEMBERSHIP

Team Membership

Interdisciplinary Assessment Team

Linda Price	Project Coordinator (BLM)
Mike Herder	Wildlife Biologist (BLM)
Michelle Bailey	Wilderness/Recreation Specialist (BLM)
Phil Seegmiller	Vegetation/Grazing Administration (BLM)
Robert Smith	Soil Scientist (BLM)
Luke Thompson	Wildlife Manager (Arizona Game and Fish Department)
Kyle Spencer	Soils and Vegetation (Natural Resource Conservation Service)
Rob Grumbles	Vegetation and Social Economics (Mohave County Extension Service)

Rangeland Resource Team

Commodity Interests

Bill Gubler, Grazing Rancher, St. George, UT	Bill Howes Off Road Vehicle Use Wizards Motorcycle Club	Kent McComb, Grazing Retired, St. George, UT
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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
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Local Area Interests

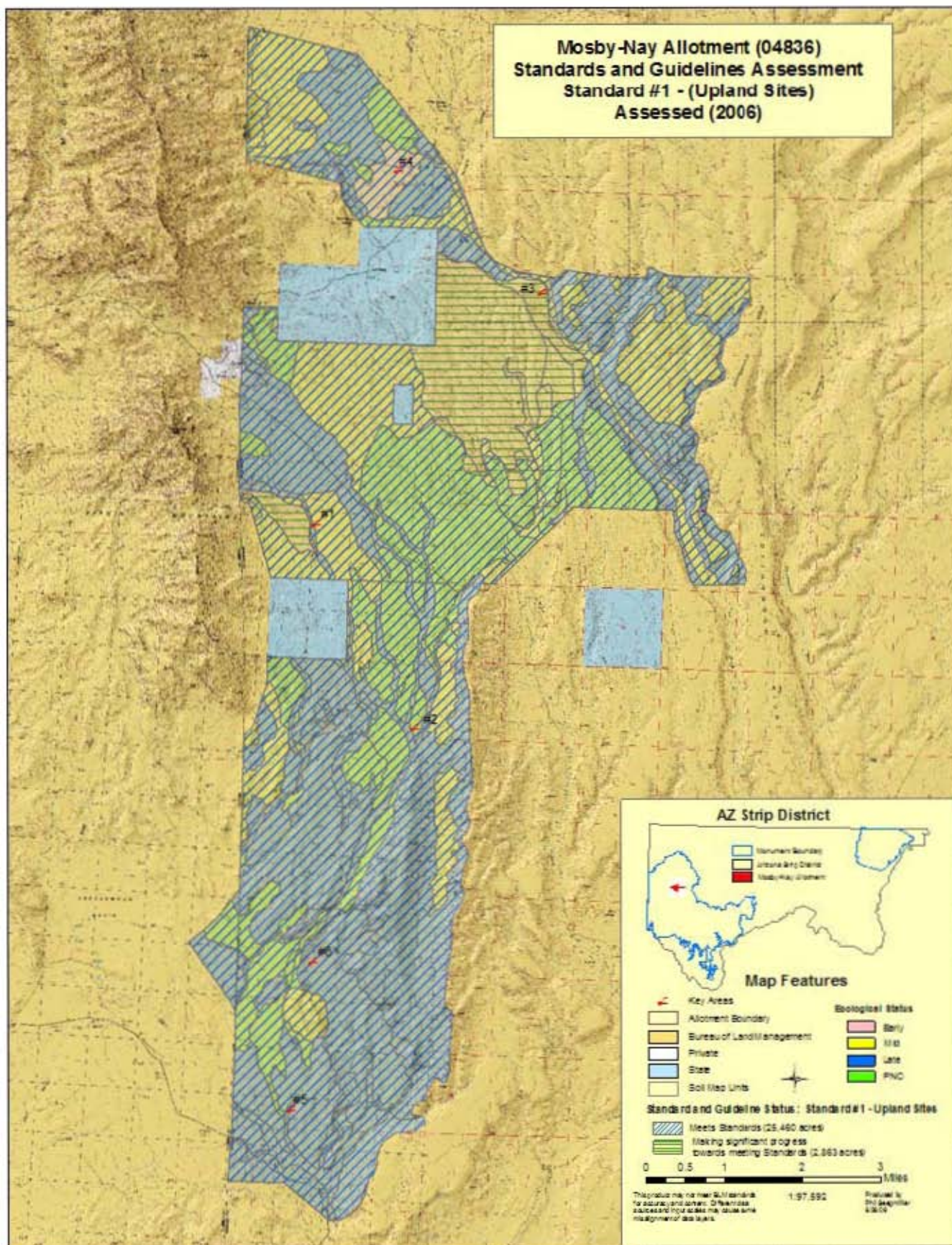
Frank Malan, Public-at-Large Retired, St. George, UT	Roger McPeck Public-at-Large Retired, St. George, UT	Dennis Becenti Native American Interests Hopi and Navajo Tribes, AZ
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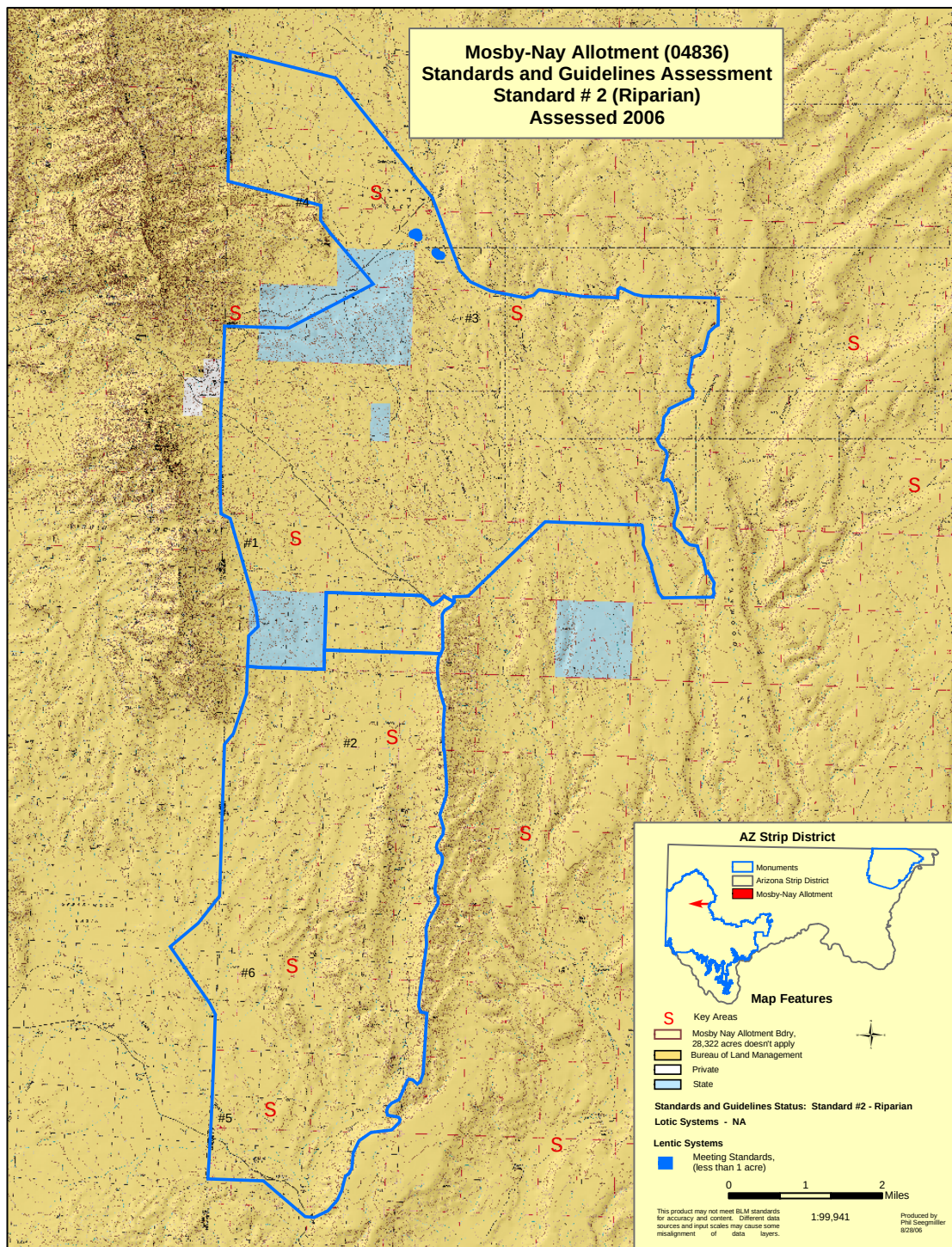
Alternates

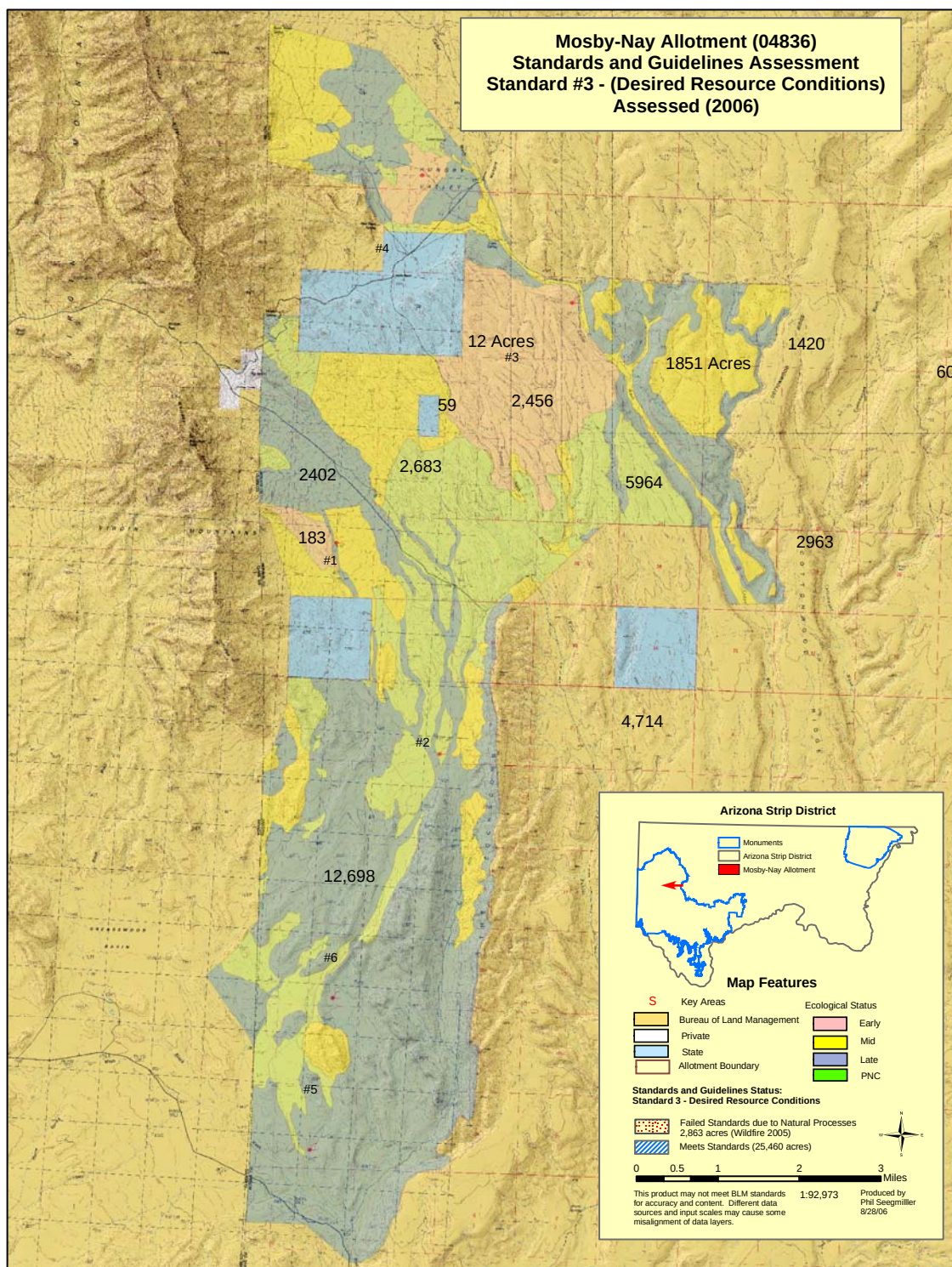
Maggie Sacher, Commercial Recreation/Tourism Owner: Lee's Ferry Lodge, Marble Canyon, AZ	Paul Weaver Non-Commodity St. George, UT
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Appendix C:

MEETING STANDARDS

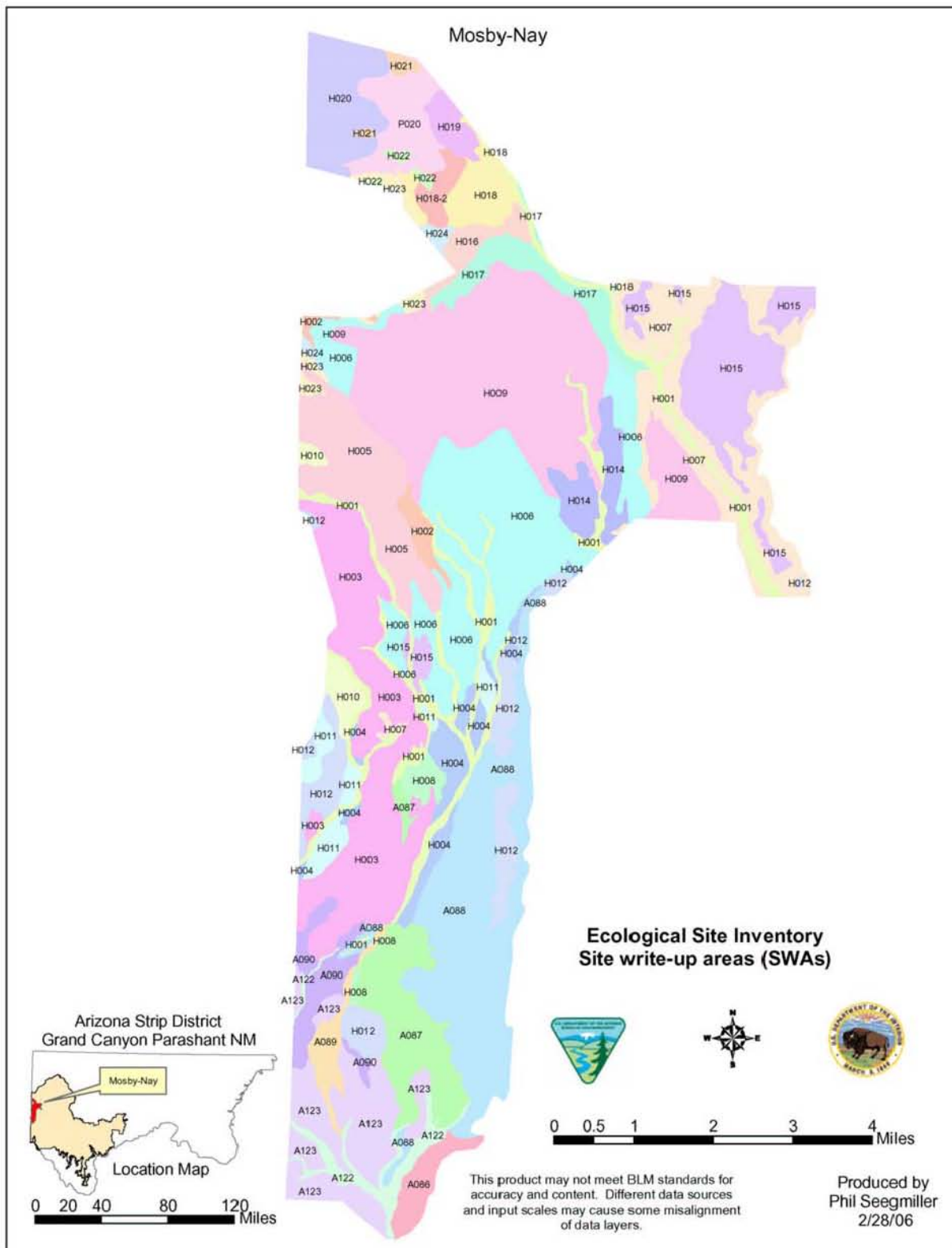


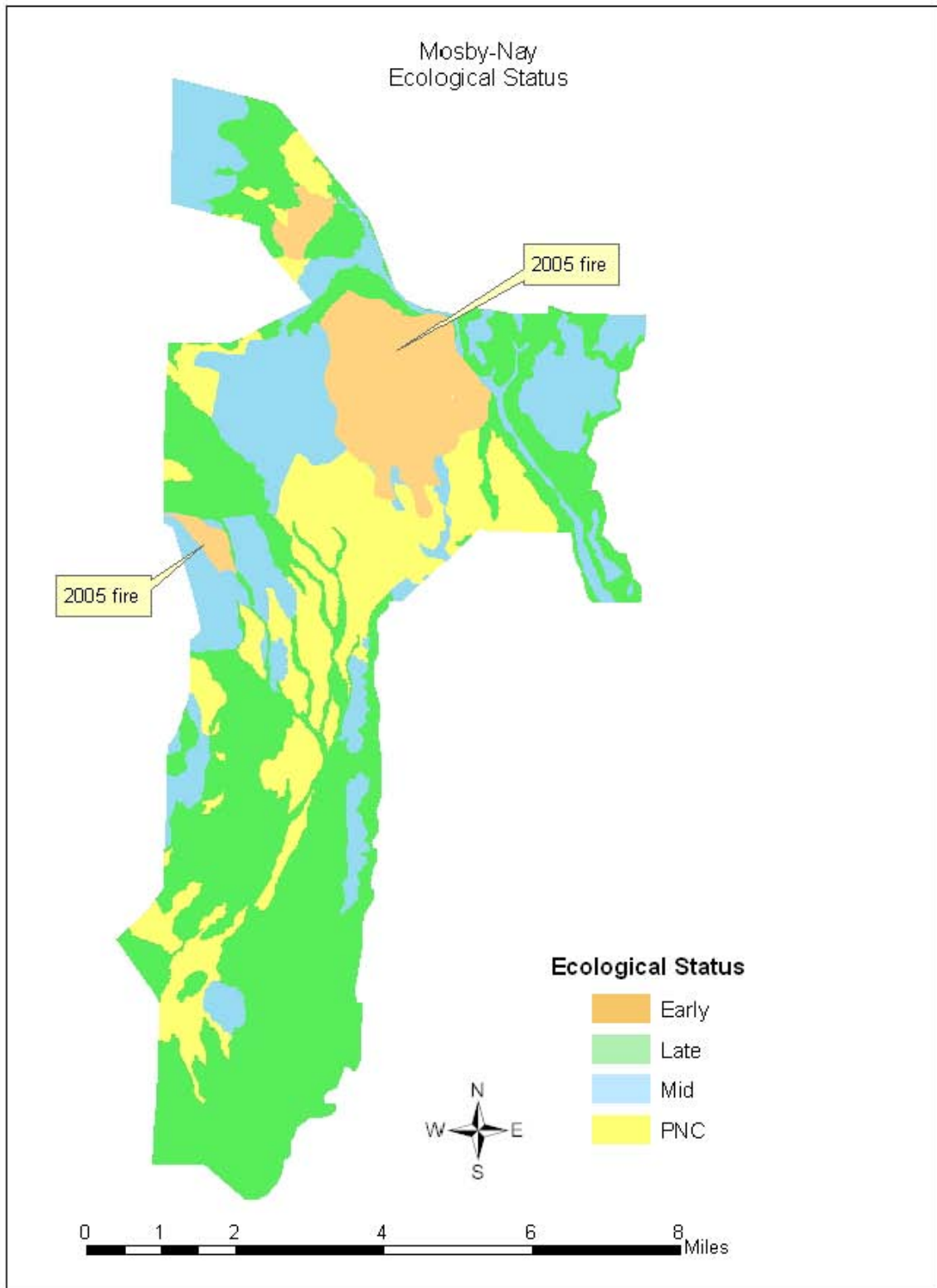




Appendix D:

ECOLOGICAL SITE DATA





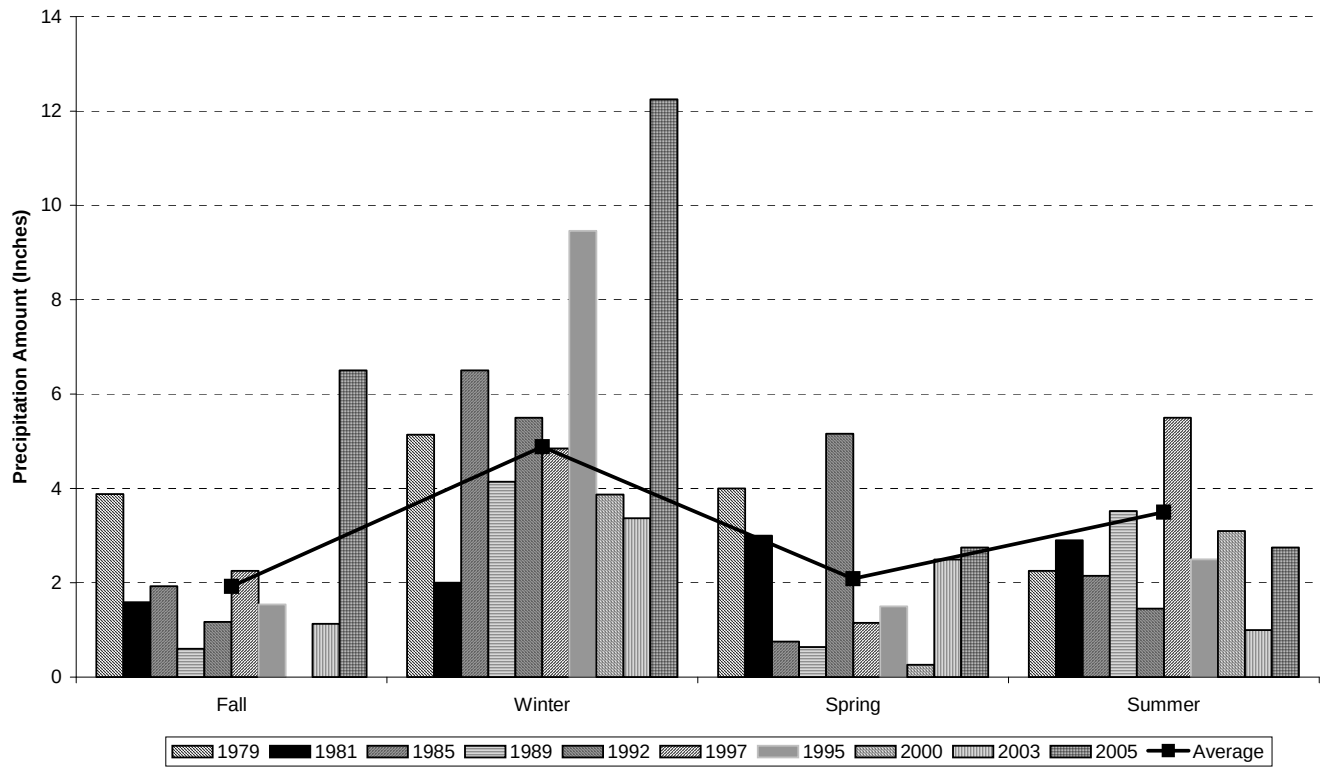
Appendix E:

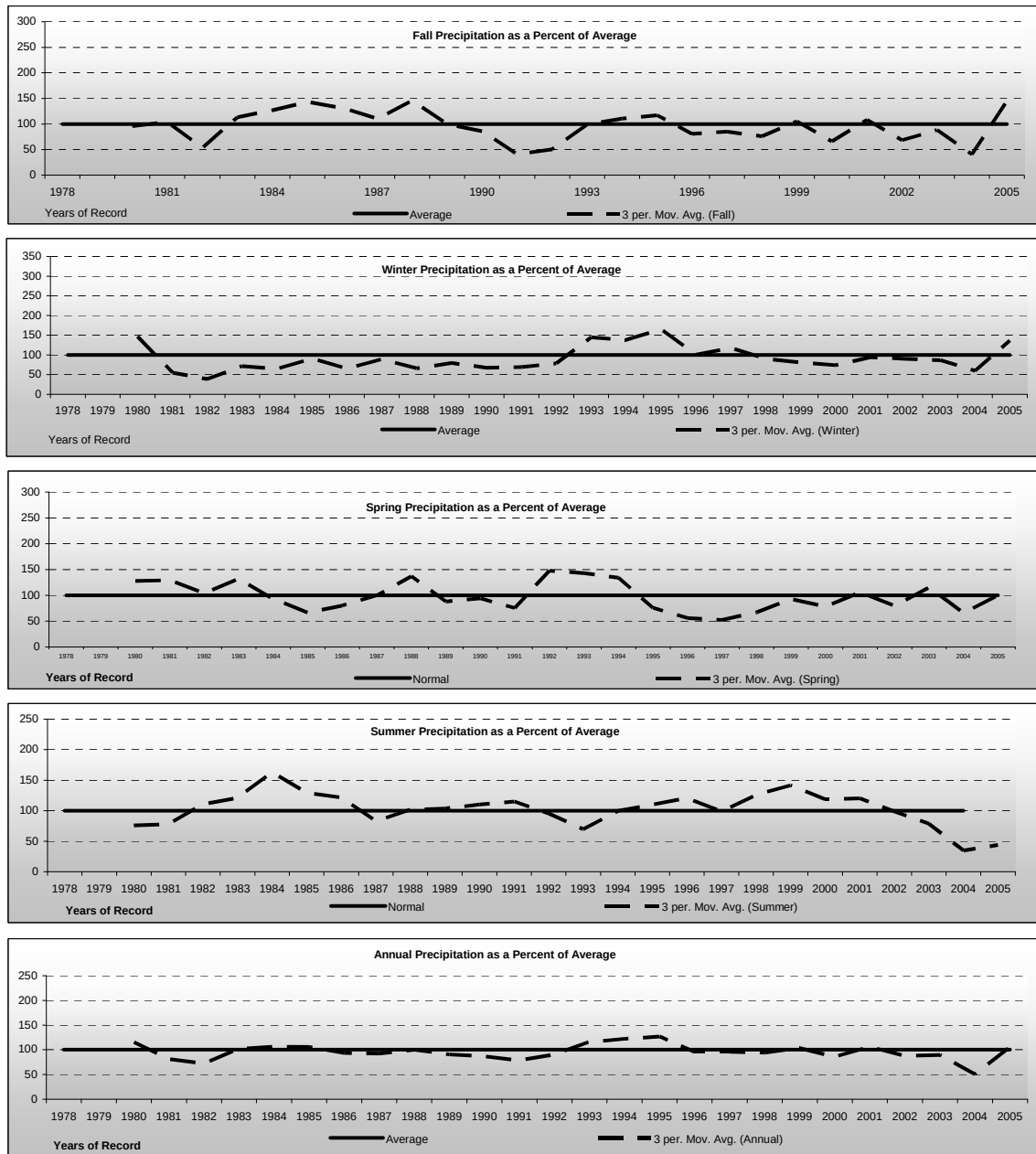
PRECIPITATION DATA

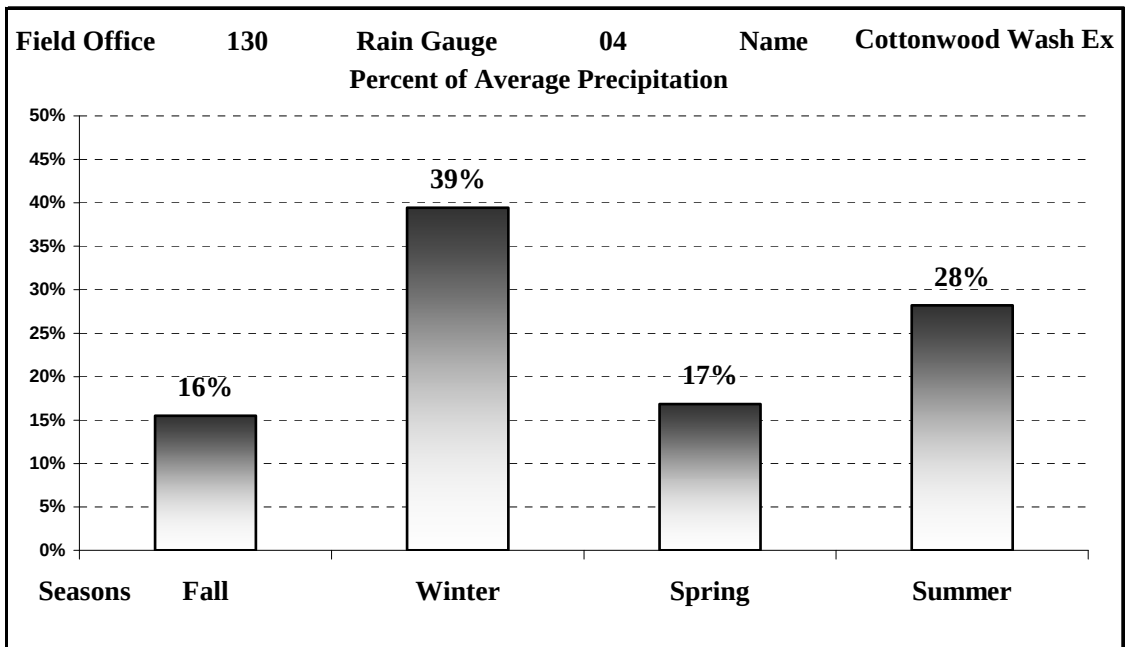
Cottonwood Wash Ex Precipitation Rain Gauge Number: 04

Year	Fall	Winter	Spring	Summer	Annual	Fall Average	Winter Average	Spring Average	Summer Average	Annual Average	Fall % Avg	Winter % Avg	Spring % Avg	Summer % Avg	Annual % Avg
1978	1.1	15.4	2.9	2.7	22.1	1.92	4.88	2.09	3.49	12.38	59	316	139	76	179
1979	3.9	5.1	4.0	2.3	15.3	1.92	4.88	2.09	3.49	12.38	202	105	192	64	123
1980	0.5	0.9	1.1	3.0	5.5	1.92	4.88	2.09	3.49	12.38	26	18	52	87	45
1981	1.6	2.0	3.0	2.9	9.5	1.92	4.88	2.09	3.49	12.38	83	41	144	83	77
1982	1.0	2.8	2.4	5.6	11.8	1.92	4.88	2.09	3.49	12.38	51	56	115	161	95
1983	4.0	5.8	2.9	4.2	16.7	1.92	4.88	2.09	3.49	12.38	206	118	137	119	135
1984	2.4	1.0	0.6	7.3	11.2	1.92	4.88	2.09	3.49	12.38	124	20	26	208	90
1985	1.9	6.5	0.8	2.2	11.3	1.92	4.88	2.09	3.49	12.38	101	133	36	62	91
1986	3.3	2.1	3.7	3.3	12.4	1.92	4.88	2.09	3.49	12.38	169	43	177	95	100
1987	1.2	4.4	1.8	3.2	10.6	1.92	4.88	2.09	3.49	12.38	62	90	86	91	85
1988	3.9	3.1	3.1	4.1	14.3	1.92	4.88	2.09	3.49	12.38	205	64	147	118	115
1989	0.6	4.1	0.6	3.5	8.9	1.92	4.88	2.09	3.49	12.38	31	85	31	101	72
1990	0.4	2.6	2.2	3.9	9.1	1.92	4.88	2.09	3.49	12.38	22	53	104	112	73
1991	1.3	3.4	1.9	4.6	11.2	1.92	4.88	2.09	3.49	12.38	69	69	92	132	91
1992	1.2	5.5	5.2	1.5	13.3	1.92	4.88	2.09	3.49	12.38	61	113	247	41	107
1993	3.2	12.3	1.9	1.2	18.6	1.92	4.88	2.09	3.49	12.38	167	252	90	35	150
1994	2.0	2.4	1.4	7.8	13.5	1.92	4.88	2.09	3.49	12.38	104	49	65	222	109
1995	1.5	9.5	1.5	2.5	15.0	1.92	4.88	2.09	3.49	12.38	80	194	72	72	121
1996	1.1	2.9	0.6	2.4	7.0	1.92	4.88	2.09	3.49	12.38	58	59	30	68	57
1997	2.3	4.9	1.2	5.5	13.8	1.92	4.88	2.09	3.49	12.38	117	99	55	157	111
1998	1.0	5.5	2.4	5.3	14.3	1.92	4.88	2.09	3.49	12.38	52	113	115	153	115
1999	2.8	1.5	2.3	4.0	10.5	1.92	4.88	2.09	3.49	12.38	146	30	108	114	85
2000		3.9	0.3	3.1	7.2	1.92	4.88	2.09	3.49	12.38		79	12	89	58
2001	3.5	8.5	4.1	5.5	21.5	1.92	4.88	2.09	3.49	12.38	180	173	196	157	174
2002	0.5	0.9	0.6	1.7	3.8	1.92	4.88	2.09	3.49	12.38	26	18	30	50	30
2003	1.1	3.4	2.5	1.0	8.0	1.92	4.88	2.09	3.49	12.38	59	69	120	29	65
2004	0.7	4.4	1.0	0.9	7.0	1.92	4.88	2.09	3.49	12.38	36	91	48	25	57
2005	6.5	12.3	2.8	2.8	24.3	1.92	4.88	2.09	3.49	12.38	338	251	132	79	196

Seasonal Changes In Precipitation



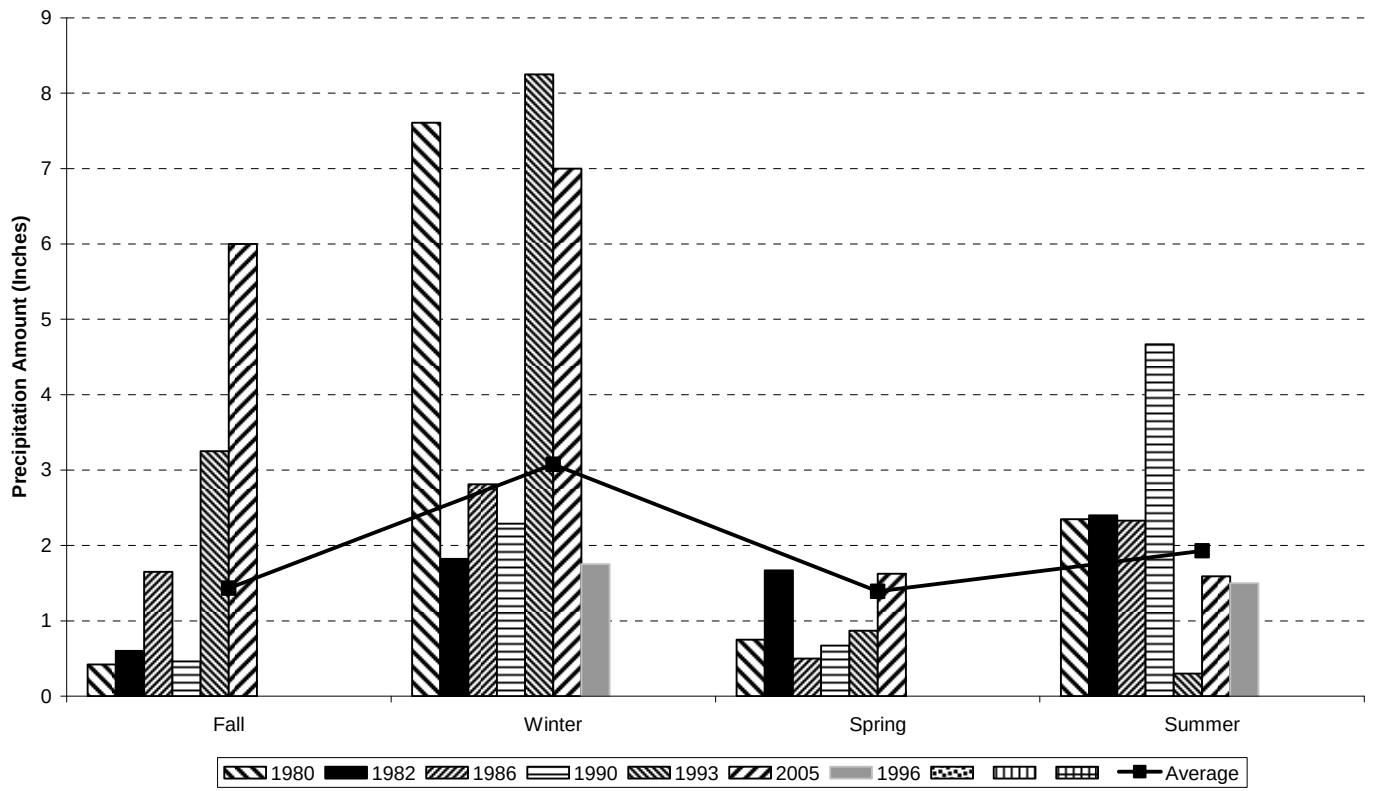


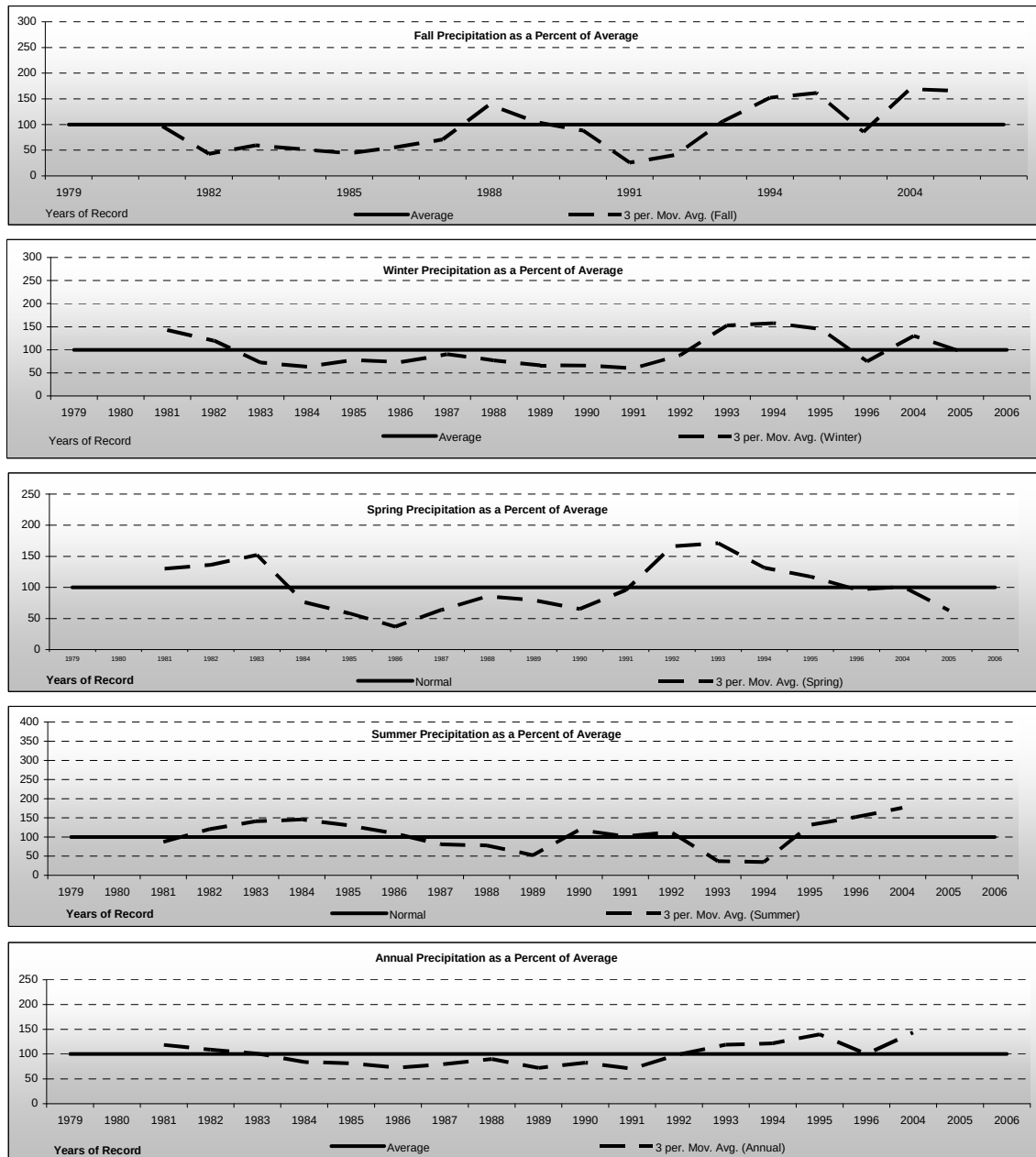


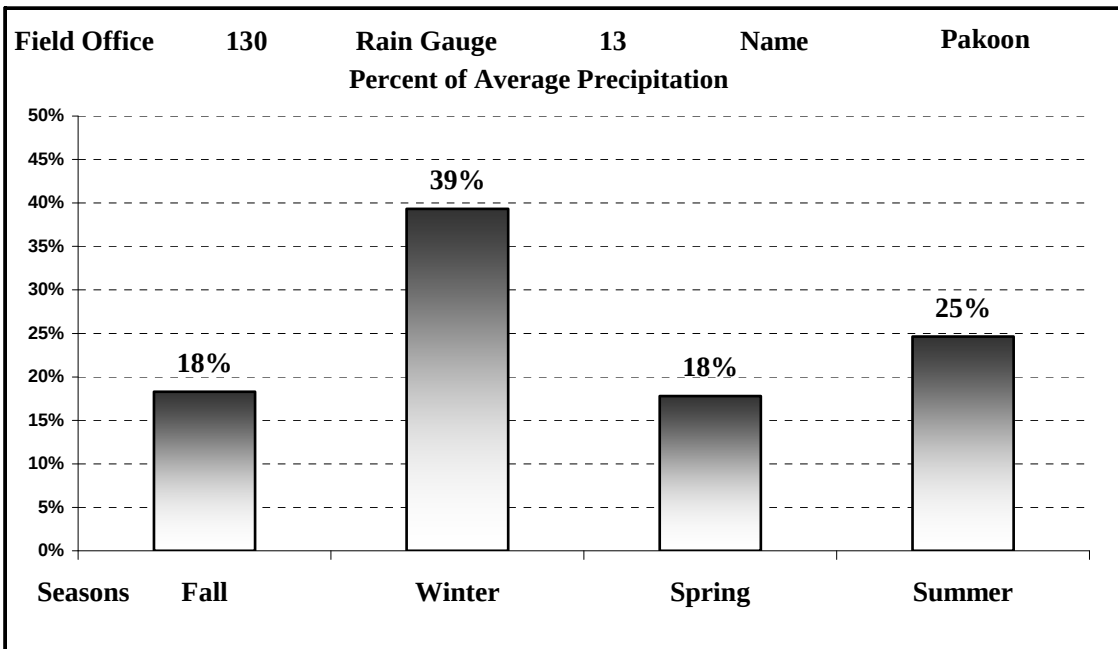
Pakoon Precipitation Rain Gauge Number: 13

Year	Fall	Winter	Spring	Summer	Annual	Fall Average	Winter Average	Spring Average	Summer Average	Annual Average	Fall % Avg	Winter % Avg	Spring % Avg	Summer % Avg	Annual % Avg
1979	2.9	4.0	1.4	0.5	8.8	1.43	3.08	1.39	1.93	7.82	203	129	102	25	112
1980	0.4	7.6	0.8	2.4	11.1	1.43	3.08	1.39	1.93	7.82	29	247	54	122	142
1981	0.8	1.6	3.3	2.2	7.9	1.43	3.08	1.39	1.93	7.82	58	52	235	114	101
1982	0.6	1.8	1.7	2.4	6.5	1.43	3.08	1.39	1.93	7.82	42	59	120	125	83
1983	1.1	3.2	1.4	3.6	9.3	1.43	3.08	1.39	1.93	7.82	79	105	101	184	119
1984	0.5	0.8	0.1	2.5	3.9	1.43	3.08	1.39	1.93	7.82	35	25	9	129	50
1985	0.3	3.2	0.9	1.5	5.9	1.43	3.08	1.39	1.93	7.82	17	104	65	78	75
1986	1.7	2.8	0.5	2.3	7.3	1.43	3.08	1.39	1.93	7.82	115	91	36	121	93
1987	1.2	2.3	1.3	0.8	5.6	1.43	3.08	1.39	1.93	7.82	80	76	91	43	71
1988	3.2	2.0	1.8	1.3	8.3	1.43	3.08	1.39	1.93	7.82	220	64	129	70	106
1989	0.2	1.8	0.3	0.9	3.1	1.43	3.08	1.39	1.93	7.82	13	59	19	44	40
1990	0.5	2.3	0.7	4.7	8.1	1.43	3.08	1.39	1.93	7.82	32	74	48	242	103
1991	0.5	1.4	3.1	0.4	5.3	1.43	3.08	1.39	1.93	7.82	33	46	221	19	68
1992	0.9	4.4	3.2	1.5	9.9	1.43	3.08	1.39	1.93	7.82	59	143	230	77	127
1993	3.3	8.3	0.9	0.3	12.7	1.43	3.08	1.39	1.93	7.82	227	268	63	16	162
1994	2.4	1.9	1.4	0.2	6.0	1.43	3.08	1.39	1.93	7.82	170	61	103	10	76
1995	1.3	3.3	2.6	7.1	14.2	1.43	3.08	1.39	1.93	7.82	87	106	187	368	181
1996		1.8		1.5	3.3	1.43	3.08	1.39	1.93	7.82		57		78	42
2004				1.0	1.0	1.43	3.08	1.39	1.93	7.82				52	13
2005	6.0	7.0	1.6	1.6	16.2	1.43	3.08	1.39	1.93	7.82	419	228	117	83	207
2006	1.1	0.1	1.0		2.3	1.43	3.08	1.39	1.93	7.82	79	4	72		29

Seasonal Changes In Precipitation







Appendix F:

Utilization Data

Utilization Study Summary										
Key Areas	Key Species	1984	1985	1986	1987	1988	1989	1990	1991	2005
#1	Trpu			45	48	59			6	
	Arist				28	31			10	
	Epne	32	32 25	44		45 27	40		16 24	
	Encela									20
	Sphae				48	43		27	19	
#2	Achy		17		50		39			
	Spcr			5						
	Plri3			30						
	Mupo2			12						
	Epne	26 13			16	13	22		4 2	
	Krer				10	4			1	1
	Amdu2	31		4 9		9	1	9	1	
#3	Trpu		46		29	57	25			
	Epne			49 42		39 23	37			
	Arist		47		29	73	24			
#4	Epne									35
	Come									29
	Encela									13
#5	Achy		21				52			
	Plri3		16		22 45			47	10	3
	Krla2		2	2	2		4	5		
	Epne			4	12 11			41	5 3	
	Amdu2				16					
#6	Achy			30			38		2	
	Plri3			42	48			46	46	2
	Epne			24			37		15	1

Appendix G:

Pace Frequency Trend Data

PACE FREQUENCY TREND ANALYSIS									
Allotment: Mosby Nay					Key Area #1				
COVER CATEGORIES	Listed in Eco-Site Guide	Years plots were read							Key Species Trend
		1982	1986	1990	1998	2001	2004	2006	
Bare Ground		68	47	51	79	62	57	18	
Litter		11	33	29	13	12	16	41	↑
Rock		20	18	19	2	15	23	39	
Vegetation (basal cover)		1	1	2	6	10	4	2	→
% Ground Cover		32	53	50	21	38	43	82	↑
FREQUENCY OF GRASSES									
Stipa	No			1	1	0	0		
Arist	No	1	4	5		2	0	1	
Trpu	Yes	0	11	9		1			
FREQUENCY OF FORBS									
Sphae	No	13	4	11	2			1	
AAFF	Yes	1	0	2				15	
AAGG	No							98	
Eriog	No		18					1	
Plantago	No							1	
PPFF	Yes	3	2	7	2	0	0		
FREQUENCY OF SHRUBS									
Epne	Yes	8	10	11	7	11	5	9	→
Krer	Yes							1	→
Encela	No		1	2		0		1	
Prfa	No					1	1		
Gusa2	Yes	21	28	33	6	6	6	10	
Cora	Yes	1	1	2	5	2	3	1	
Opunt	No		1	2				1	
Lyan	Yes	2	1	2	1	1			
Eriog_Shrub	Yes			3		0		1	
Happ_Acamp	Yes	1	4	5	5	2	3	7	
Yucca	Yes	2	1	3	5	0	4	2	
Hysa	No	5	2	3	3	5	5	8	
Yubr	No						0	1	
Latr2	Yes			1		2	0		
Thmo	No	4	9	11	4	8	8	14	
Tica3	No	7	2	15	15	18	11	19	

PACE FREQUENCY TREND ANALYSIS									
Allotment:		Mosby Nay					Key Area #2		
COVER CATEGORIES	Listed in Eco-Site Guide	Years plots were read							Trend
		1982	1986	1989	1997	2001	2004	2006	
Bare Ground		68	58	71	70	54	46	30	
Litter		17	27	12	9	31	30	37	↑
Rock		14	14	13	6	11	23	34	
Vegetation (basal cover)		0	1	4	15	3	0		→
% Ground Cover		32	42	29	30	46	54	71	↑
FREQUENCY OF GRASSES									
Mupo2	No	0	0			0	0		→
Arist	Yes	0	1	1					
Trpu	Yes	4	38	8	8	1			
FREQUENCY OF FORBS									
Sphae	Yes	2	0	1	5				
AAFF	Yes	0	0		15			18	
AAGG	No				16			100	
Eriog	Yes	1	0		10			1	
PPFF	No	2			24				
Aster	No	0	3						
FREQUENCY OF SHRUBS									
Epne	Yes	5	3	3	6	3	3	2	→
Krer	No	0	1	0	1		2	5	↑
Krgr	Yes					1			→
Amdu2	Yes	9	12	10	7	11	6	11	→
Acgr	No					1	1		
Encela	No	0	0						
Opunt	Yes	2	1	2	3	1	1	1	
Lyan	Yes	0		0	0				
Eriog_Shrub	Yes							1	
Happ_Acamp	Yes	7	6	2	0	1	2	3	
Hysa	No	0			0	1			
Yubr	Yes	0	0	2	1	2	3	2	
Latr2	Yes	13	10	9	10	15	9	9	
Psc02	No				0				
Thmo	No	1	2	6	4	3	3	4	
Same	No						1		
Tica3	No	3		0	0		1		

PACE FREQUENCY TREND ANALYSIS									
Allotment: Mosby Nay					Key Area: #3				
COVER CATEGORIES	Listed in Eco-Site Guide	Years plots were read							Trend
		1982	1986	1990	1998	2001	2004	2006	
Bare Ground		52	41	45	51	35	35	26	
Litter		32	40	37	30	39	50	42	
Rock		15	16	16	8	11	10	33	
Vegetation (basal cover)		0	2	3	11	16	6		→
% Ground Cover		48	59	55	49	66	65	75	↑
FREQUENCY OF GRASSES									
Sihy	No	0							
Plri3	Yes				1				→
Arist	Yes		9		1	2			
Trpu	Yes	1	31		3	24	1		
FREQUENCY OF FORBS									
Sphae	Yes	1	2	4	1	1			
AAFF	Yes	9	7	8	2	1			
AAGG	Yes				35			90	
Eriog	Yes	0	1	1	1		1		
PPFF	Yes	2	6	6	0	1	1		
FREQUENCY OF SHRUBS									
Krla2	Yes						1		→
Epne	Yes	2	4	6	3	3	3	2	→
Krer	No	1	4	6	8	23	10		→
Amdu2	Yes				0				
Encela	Yes	1	4	4	3	5	2	1	
Gusa2	Yes		1	2		1			
Cora	No					1	3		
Opunt	Yes	1	2	3	1	7			
Lyan	Yes	3	1	2	1	2	2		
Eriog_Shrub	No		0						
Happ_Acamp	Yes	1	1	2	1				
Save	No				3				
Dafr	No	0			0				
Hysa	No	5	2	2	2		2		
Yubr	Yes	1	0	1	0		1	1	
Latr2	Yes	2	2	4	2	1		1	
Psco2	Yes				4	6		1	
Thmo	Yes	28	44	36	24	32	33	1	
Tica3	No	9	7	8	2	1	2		
Same	No	5	5	5	1	6	2	1	

PACE FREQUENCY TREND ANALYSIS								
Allotment: Mosby Nay					Key Area: #5			
COVER CATEGORIES	Listed in Eco-Site Guide	Years plots were read						Trend
		1985	1989	1997	2001	2004	2006	
Bare Ground		67	74	87	55	37	15	
Litter		3	8	1	23	31	31	
Rock		28	14	5	17	29	49	
Vegetation (basal cover)		1	3	6	5	2	5	→
% Ground Cover		33	26	13	45	63	85	↑
FREQUENCY OF GRASSES								
Plri3	Yes	1	3		1	1	1	→
Mupo2	No						1	
Arist	Yes	3	1				1	
Trpu	Yes	7	7				1	
FREQUENCY OF FORBS								
Sphae	Yes		0				1	
AAFF	Yes			29			25	
AAGG	No		1	30			29	
Eriog	Yes		1					
Plantago	No						18	
PPFF	No			29				
FREQUENCY OF SHRUBS								
Epne	Yes	5	4	1	1	1	5	→
Krer	No	3	3	3	4	2	5	→
Krgr	Yes				5		5	↑
Amdu2	Yes	13	16	11	14	4	40	↑
Acgr	No						1	
Opunt	Yes		1	0	1		2	
Lyan	No	1		0		0		
Happ_Acamp	Yes		0		1	0		
Dafr	No	1	1		1		2	
Latr2	Yes	6	7	8	12	12	8	
Thmo	No		1					
SSSS	Yes					2		

PACE FREQUENCY TREND ANALYSIS								
Allotment: Mosby Nay					KEY AREA: #6			
COVER CATEGORIES	Listed in Eco-Site Guide	Years plots were read						Trend
		1985	1989	1997	2001	2004	2006	
Bare Ground		94	85	76	62	64	43	
Litter		6	6	2	22	24	51	
Rock			2	7	10	10	1	
Vegetation (basal cover)			6	15	6	2	5	↑
% Ground Cover		6	15	24	38	36	57	↑
FREQUENCY OF GRASSES								
Achy	Yes	0						→
Plri3	Yes	6	4	0	2	2	6	→
Spcr	No		1	0				→
Mupo2	Yes	0						→
FREQUENCY OF FORBS								
AAFF	Yes			5			38	
AAGG	Yes		4	27			62	
Eriog	Yes			6				
Plantago	Yes						12	
PPFF	Yes			5				
FREQUENCY OF SHRUBS								
Epne	Yes		0					→
Krer	No				2		1	→
Krgr	Yes					1		→
Amdu2	Yes	23	21	7	25	6	28	→
Acgr	No			0				
Other Browse	No			0				
Opunt	Yes	1			1		2	
Lycium	Yes	0						
Happ_Acamp	Yes				1		1	
Hysa	No			1		1		
Yubr	Yes						1	
Latr2	Yes	11	14	6	14	15	13	
Opac	No					1		
SSSS	No				2	1		

Appendix H:

Ecological Site Data

Key Area #1		Allotment: Mosby Nay				
		Range Site: Limy Upland 9-12 inch pz				
Plant Species	Site-Guide Allowable Percent Composition	1998	2001	2004	2006	Desired Percent Composition Objective
Grasses	30-40%		17%	5%	2%	5-10%
Stipa	Group PPGG			1%		
Arlo	Group PPGG			4%	2%	
Trpu	1-3%		17%			
PPGG	1-5%					
Forbs	5-10%	67%	3%	11%	33%	5-10%
Sphae	Group PPFF	2%			2%	
AAFF	1-3%	47%			3%	
Eriog	1-2%					
PPFF	1-5%	17% 3%	11%			
Erci6	Group AAFF				5%	
Plin3	Group AAFF					
Scba	-				1%	
Brru2	5-10%				23%	
Shrubs/Trees	50-60%	33%	79%	85%	65%	50-60%
Epne 1-5%		5%	23%	17%	4%	1-5%
Encela	Group SSSS		4%			
Prfa	Group SSSS			6%		
Gusa2	1-3% 5%		13%	15%	17%	
Cora	1-10%	12% 4%	14%			
Opunt	Group SSSS					
Lyan	1-5%					
Eriog-Shrub	0-5%				2%	
Happ_Acamp	5-10%	3%		4%	14%	
Yucca	5-10%	3%		4%		
Hysa	Group SSSS		13%	11%	14%	
Latrt	10-15%		13%			
Thmo	Group SSSS	6%	8% 14%	6%		
SSSS	5-10%					
Tica3	Group SSSS				6%	
Yubr	Group SSSS				1%	
Krer	1-5%					1-5%
Similarity		37%	41%	41%	42%	
Status		Mid	Mid	Mid	Mid	

Key Area #2		Allotment: Mosby Nay			
		Range Site: Limy Upland (Deep) 6-9" pz			
Plant Species	Site-Guide Allowable Percent Composition	2001	2004	2006	Desired Percent Composition Objective
Grasses	5-15%				5-15%
Mupo2					
Arlo	0-2%				
Trpu	0-2%				
Forbs	5-10%				5-10%
Sphae	1-5%				
AAFF	1-5%				
AAGG	-				
Eriog	-				
PPFF	Group AAFF				
Aster	-				
Erin4	-				
Brru2	-				
Erci6	-				
Plin3	-				
Scba	-				
Shrubs/Trees	80-91%	100%	100%	100%	80-90%
Epne 1-3%		1%	5%	8%	
Krer	Group Krgr			4%	Group Krgr
Krgr 1-5%		10%	20%		1-10%
Amdu2 35-45%		33%	9%	31%	30-45%
Acgr	Group SSSS	5%			
Encela	Group SSSS				
Opunt	1-3%	3%		1%	
Lyan	0-3%				
Happ-Acamp 3-8%		5%	7%	14%	
Hysa	Group SSSS				
Yubr	1-3%	5%	13%	3%	
Latrt	25-35%	33%	20%	28%	
PSCO2	Group SSSS				
Thmo Group	SSSS	5%	20%	11%	
Same	Group SSSS				
Cyan	Group SSSS		7%		
SSSS	1-5%				
Eriog	-				
Similarity		88%	55%	79%	
Status		PNC	Late	PNC	

Key Area #3		Allotment: Mosby Nay				
		Range Site: Limy Upland 6-9" pz				
Plant Species	Site-Guide Allowable Percent Composition	1998	2001	2004	2006	Desired Percent Composition Objective
Grasses	1-5%	3%	21%		1%	1-5%
Sihiy	-					
Plri3	Group PPGG	1%				1-2%
Arlo	Group PPGG		2%			
Trpu 1-1%		2%	18%		1%	
PPGG	1-1%					
Forbs	3-5%	40%	2%	11%	91%	3-5%
Sphae	1-3%	2%				
AAFF	1-3%					
AAGG	1-3%	14%			84%	
Eriog	Group AAFF			5%		
PPFF	1-2%		2%			
Erci6	Group AAFF	24%			7%	
Bamu	Group PPFF			5%		
Shrubs	85-95%	57%	77%	89%	9%	40-60%
Krla2	1-5%					1-5%
Epne	1-5%	2%	2% 5%	2%		1-5%
Krer/Krgr	1-5%	3%	32%			1-5%
Amdu2	25-35%	2%				
Encela	Group SSSS		7%		2%	
Gusa2	Group SSSS					
Cora	-					
Opunt	2-6%	2%	3%			
Lyan	1-3%		5%	5%		
Eriog/Shrub	Group SSSS					
Happ/Acmp	Group SSSS	4%				
Same	-			6%		
Dafr	-					
Hysa	-					
Yucca	Group SSSS					
Latrt	15-25%				2%	
Psco2	Group SSSS	2%	11%		2%	
Thmo	2-5%	41% 17%	67%			
Cyac	Group Opunt			5%		
SSSS	5-10%					
Moss	-					
Similarity Status		35% Mid	32% Mid	23% Early	15% Early	

Key Area #5		Allotment: Mosby Nay			
		Range Site: Limy Upland (deep) 6-9" pz			
Plant Species	Site-Guide Allowable Percent Composition	Years data collected			Desired Percent Composition Objective
		2001	2004	2006	
Grasses	5-15%			1%	5-15%
Plri3 1-5%					1-5%
Arlo 0-2%					
Trpu -				1%	
Forbs	5-10%			35%	5-10%
Sphae 1-5%					
AAFF 1-5%				17%	
AAGG -				11%	
Eriog 0-2%					
PPFF -					
Plantago				6%	
Shrubs	80-91%	100%	100%	64%	60-80%
Epne 1-3%		9%		6%	
Krer Group	Krgr	9%		3%	1-5%
Krgr 1-5%		30%		4%	1-5%
Amdu2 35-45%		25%	9%	38%	30-45%
Opunt 1-3%				1%	
Lyan 0-3%					
Happ-Acamp 3-8%					
Dafr -				3%	
Latrt 25-35%		27%	73%	8%	
Thmo -					
SSSS 1-5%					
Cyec -			9%		
Ecen 1-3%			9%		
Similarity		60%	47%	59%	
Status		Late	Mid	Late	

Key Area #6		Allotment: Mosby Nay			
		Range Site: Limy Upland 6-9" pz			
Plant Species	Site-Guide Allowable Percent Composition	2001	2004	2006	Desired Percent Composition Objective
Grasses	1-5%	6%		10%	5-15%
Achy	0-2%				0-2%
Plri3 Group	PPGG	6%		10%	5-10%
Spcr	Group PPGG				0-1%
Mupo2	Group PPGG				0-1%
PPGG	1-1%				
Forbs	3-5%				3-5%
AAFF	1-3%				
AAGG	1-3%				
Eriog	Group AAFF				
PPFF	1-3%				
Plin3	Group AAFF				
Brru2	Group AAGG				
Shrubs/Trees	88-100%	94%	100%	90%	88-100%
Epne	1-5%				
Krer	-			.4%	Group Krer
Krgr 1-5%		2%			1-5%
Amdu2	25-35%	37% 42%	44%		35-45%
Acgr	-				
Opunt	2-6%	1%	1%		
Lycium	1-3%				
Hysa	-		5%		
Latrt	15-25%	48% 47%	43%		
SSSS	5-10%				
Cyac	Group Opunt				
Chryso	-		5%		
Acsp	Group SSSS	6%	1%		
Similarity		64%	70%	62%	
Status		Late	Late	Late	

Appendix I:

Wildlife Data

A. Mule Deer Data From AGFD

AGFD MULE DEER DATA FOR GMU 13B

YEAR	# 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	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	Unknown	29	46	No estimate

AGFD RECENT MULE DEER HUNT DATA FOR GMU 13B

YEAR	# OF PERMITS	HUNT SUCCESS (%)
1998 70		68
1999 75		66
2000 75		78
2001 65		55
2002 65		68

Appendix J:

ADDITIONAL SOURCES OF INFO FROM LITERATURE

Tracy, C. R. 1996. Nutritional ecology of the desert tortoise. Natl. Biol. Service. Rept., Reno.

Boarman, W.I. 2002. Desert Tortoise (*Gopherus agassizii*). In: Boarman, W.I. and K. Beaman, editors. The sensitive plant and animal species of the Western Mojave Desert. U. S. Geological Survey, Western Ecological Research Center, Sacramento, CA.

Tortoises eat primarily annual forbs, but also perennials (e.g., cacti and grasses). Forage species selected by tortoises in the west Mojave Desert include: *Astragalus didymocarpus*, *Astragalus layneae*, *Camissonia boothii*, *Euphorbia albomarginatus*, *Lotus humistratus*, and *Mirabilis bigelovii* (Jennings 1993). In the east Mojave Desert, tortoises showed a preference for *Camissonia boothii*, *Cryptantha angustifolia*, *Malacothrix glabrata*, *Opuntia basilaris*, *Rafinesquia neomexicana*, *Schismus barbata*, *Stephanomeria exigua* and other species (Avery 1998). On rare occasions they have been observed eating other items such as caterpillars, lizards, and cow dung, but these make up a very small proportion of their diets (Jennings 1993, Esque 1994, Avery 1998). Although they will eat exotic plants, tortoises generally prefer native forbs when available (Jennings 1993, Avery 1998, cf. Esque 1994). The dietary preference may place them at a nitrogen and water deficit. Droughts frequently occur in the desert, resulting in extended periods of low water availability. Periods of extended drought place tortoises at even

greater water and nitrogen deficit than during moderate or high rainfall years (Peterson 1996, Henen 1997). During a drought, more nitrogen than normal is required to excrete nitrogenous wastes, thus more rapidly depleting nitrogen stored in body tissues.

Hansen, R. M., Johnson, M. K. and Van Devender, T.R (1976) Foods of the Desert tortoise *Gopherus agassizii* in Arizona and Utah. *Herpetologica* 32:247-251

Numerous studies have shown an overlap in the diet of cattle and tortoises (Coombs 1979, Sheppard 1981, Medica *et al.* 1982, Avery and Neibergs 1998), and many others have documented food of cattle (e.g., Burkhardt and Chamberlain 1982, Avery and Neibergs 1998) or of desert tortoise (e.g., Woodbury and Hardy 1948, Jennings 1993, Nagy and Medica 1986, Esque 1994). Avery (1998) found that competition for forage (mostly annual grasses and forbs and perennial grasses) occurs in early spring and late spring of years of low rainfall and annual plant production. He found that tortoise foraging (i.e., behavior and food selection) was altered in areas where cattle were present. Tracy (1996) found that in years of low rainfall, and hence annual plant production, cattle grazing may reduce tortoise forage sufficiently to cause tortoises to lay fewer eggs, thereby reducing reproductive potential. The elimination of grazing would reduce the effects on vegetation cover and composition. Cattle potentially reduce plant cover. Plant cover is used by tortoises for thermoregulation (i.e., shade) and predator avoidance, especially by hatchling and juvenile tortoises. Durfee (1988) found more bare ground, more introduced plants, and fewer perennial in ungrazed areas along fenced highways. However, Avery (1998) found that the differences are more complex with some plants (e.g., creosotebush) being larger and others (e.g., Galleta grass) being smaller in grazed areas. Gifford and Hawkins (1978) found that grazing reduces soil infiltration rates and water holding capacity and that this correlates with total vegetation present. Other studies have shown the effects of heavy grazing, but grazing intensity in allotments in the CDCA is generally light, except around water sites. Negative effects of grazing on soil temperature, soil chemistry and soil nutrients are possible but more difficult to assess from the literature.

TEMPORARY MODIFICATION TO LIVESTOCK GRAZING USE IN THE CALIFORNIA DESERT CONSERVATION AREA

ENVIRONMENTAL ASSESSMENT NUMBER

CA-610-01-02

California Desert District

April 9, 2001

Durfee, J. A. 1988. Response of Mohave Desert communities to release from grazing pressure. MS Thesis, Brigham Young University, Provo.

Esque, T. C. 1994. Diet and diet selection of the desert tortoise (*Gopherus agassizii*) in the northeast Mojave Desert. MS Thesis, Colorado State University, Fort Collins.

PLANTS EATEN BY JUVENILE DESERT TORTOISES IN THE CENTRAL MOJAVE DESERT by E. Karen Spangenberg

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Paper presented at the National Biological Service

Desert Tortoise Symposium, 1995

During 1994, nineteen juvenile tortoises were observed to take only 47 forage bites. Of these, 3 (6.4%) forage bites were of wet green forage (Table 1). The remainder of all forage bites were of dried grasses, dried annuals and dried stems remaining from the 1993 growing season.

In 1995, twenty-five juvenile tortoises were observed to eat 833 plants from 15 different plant species (Table 2) and several non-plant items including scats, bones, rocks, and dead lizards (*Callisaurus* and *Cnemidophorus*). For all forage observations combined, the 5 plants most eaten were *Schismus barbatus* (51.0%), *Erodium cicutarium* (13.3%), *Cryptantha angustifolia* (7.0%), *Plantago ovata* (6.9%), and *Chaenactis fremontii* (6.5%). Tortoises were also observed to eat, though in much smaller quantity, *Camissonia boothii* (1.7%), *C. claviformis* (1.2%), *Malacothrix glabrata* (0.8%), *Pleuraphis rigida* (0.7%), *Chaenactis carphoclinia* (0.6%), *Loeseliastrum schottii* (0.2%), *Filago depressa* (0.2%), *Mentzelia albicaulis* (0.1%), and *Ambrosia dumosa* (0.1%). Dried stems from 1994 were eaten 0.6% of the time. Plants unable to be identified accounted for 9.1% of plant foods eaten. Outside of hour class observations, one tortoise frequently foraged on *Camissonia campestris*.

Plants eaten varied by month during 1995. *S. barbatus* (dried stems and leaves) was the plant eaten the most each month (Figure 2). *S. barbatus* consumption increased each month, May to July, from 34% to 55% to 77% of total plants eaten. *E. cicutarium* was the second most eaten plant, but percentage eaten decreased May to June (21% to 13%). By July, none of the tortoises were observed to forage on *E. cicutarium* which had senesced and dried by this time. Consumption of *C. fremontii* and *P. ovata* decreased each month from May to July (10%, 5.1%, and 3.3% for *P. ovata* and 12%, 3.4% and 1.2% for *C. fremontii*). Consumption of *Cryptantha angustifolia* peaked in June (4.4%, 11%, and 6.7%).

In 1995, only 1.2% of all observation time was spent foraging. Foraging decreased from 1.3% and 1.4% of observation time in May and June to 0.8% during July. Each study group; actively released, passively released, and penned, showed similar decreases in the percentage time spent foraging May-June to July. Each group, had similar total combined time spent foraging during the three-month study: actively released 1.0%, passively released 1.4%, and penned 1.3%.

Table 1. Number of forage plants eaten by juvenile desert tortoises during May, June, and July, 1994, at FISS, San Bernardino County, California. (Most dried stems and annuals were *Malacothrix* and *Chaenactis* which grew in 1993.)

Plant species	Number of plants eaten	Percentage total
<i>Schismus barbatus</i> (dry)	21	44.7%
<i>Schismus barbatus</i> (wet)	3	6.4%
Dried <i>Malacothrix glabrata</i> 8		17.0%
Dried <i>Amsinckia tessellata</i> 1		2.1%
Dried annuals and stems	12	25.5%
Dried scat	2	4.3%
TOTAL 47		100%

Table 2. Number of forage plants eaten by juvenile desert tortoises during May, June, and July, 1995, at FISS, San Bernardino County, California.

Plant species	Number of plants eaten	Percentage total
<i>Schismus barbatus</i>	425 51.0%	
<i>Erodium cicutarium</i>	111 13.3%	
<i>Cryptantha angustifolia</i>	58 7.0%	
<i>Plantago ovata</i>	57 6.9%	
<i>Chaenactis fremontii</i>	54 6.5%	
<i>Camissonia boothii</i>	13 1.7%	
<i>Camissonia claviformis</i>	10 1.2%	
<i>Malacothrix glabrata</i>	7 0.8%	
<i>Pleuraphis rigida</i>	6 0.7%	
<i>Chaenactis carphoclinia</i>	5 0.6%	
<i>Loeseliastrum schottii</i>	2 0.2%	
<i>Filago dipressa</i>	2 0.2%	
<i>Mentzelia albicaulis</i>	1 0.1%	
<i>Ambrosia dumosa</i>	1 0.1%	
Dried stems	5	0.6%
Unknown 76		9.1%
TOTAL 833		100%

28th Annual Meeting and Symposium of the Desert Tortoise Council, February 21-23, 2003
Abstracts

Does Nutritional Ecology Underlie the Greater Susceptibility of Mojave Tortoises than Sonoran Tortoises to Population Crashes?

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It is apparent that tortoises as a group are particularly susceptible to dietary nutrient imbalance due to their inability to excrete potassium, a ubiquitous plant constituent, either via salt gland secretions or via concentration of urine. In most circumstances, tortoises require periodic access to drinking water, access to high moisture foods, and/or access to protein-rich foods in order to eliminate the potassium loads associated with feeding.

In most if not all of the Mojave Desert, summer rainfall events are rare and localized and thus cannot be depended on as a source of water. In the absence of drinking water, the ability of tortoises to utilize dietary protein for anything other than potassium excretion via urate production will depend on the relative proportions of potassium, water and protein (nitrogen) in the food. This relationship may be approximated by the Potassium Excretion Potential or PEP index. In moderately dry years, when high PEP plants are not available, tortoises may feed but remain in negative nitrogen balance, gradually losing body lean mass and condition, as demonstrated by Nagy and Medica (1986), Peterson (1996) and Henen (1994, 1997).

In good rainfall years, Mojave tortoises may be able to locate patchy or dispersed plants of high PEP, as demonstrated by Jennings (1993) and Oftedal et al. (in press; unpublished data from 2001). Diets of high PEP plants will allow positive nitrogen balance, and provide protein for growth and reproduction. However, Avery's data (1998) indicate that cattle grazing may selectively remove high PEP plants, such as desert dandelion (Oftedal et al., in press). Unfortunately, we have no good data to indicate the extent to which the abundance of high PEP plants has been affected by such factors as livestock grazing, soil compaction, invasive exotic species, air pollution, fire, climate change, or other human-impacted variables. The higher water needs of many high PEP plants may make them particularly susceptible to anything that reduces soil moisture retention. I believe it is likely that many high PEP plants that were essential components of diets that once allowed recovery of tortoise body condition in wet years are now greatly reduced, not only in terms of above-ground biomass, but also in terms of the available seed bank. This may be especially true of species with large seeds (such as legumes) that are not easily dispersed back into areas of former abundance.

If this is true, Mojave tortoises may be fighting a losing battle with environmental nitrogen, being unable to accumulate enough in body protein to consistently offset losses in dry years. A series of dry years, or a change in local flora due to invasive plants, or increased nitrogen losses associated with infection may be enough to initiate a health crisis that has been building over a long time period. Poor nitrogen status may also increase tortoise susceptibility to disease, as it does in other species. Both juvenile growth and egg production require substantial amounts of protein nitrogen. Thus long-term changes in nutritional ecology may ultimately cause population crises in terms of morbidity and mortality even though the proximal causes may vary from place to place.

This hypothesized scenario predicts that access to drinking water would reduce the dependence on high PEP plants, because tortoises that can drink can dispose of potassium without needing to utilize dietary or stored protein. Several studies also suggest that drinking of water frees tortoises to consume large amounts of dry or senescent material that can be used to generate body fat. Preliminary analysis of summer foraging observations

at Ragged Top, AZ, in the Sonoran desert are consistent with the idea that tortoises that drink may be less selective in feeding (Oftedal, Averill-Murray and Christopher, unpublished data). Thus it appears that tortoises in the Sonoran desert where summer rainfall is regular would not have the same dependence on high PEP plants as do Mojave tortoises. Given the trend for summer rainfall to decline in the Sonoran desert from southeast to northwest, the only area in which a loss of high PEP plants might be critical is the Colorado subdivision of the Sonoran desert.

This hypothesized scenario is consistent with historical patterns of population crashes north and west of the Colorado River. If true, it suggests that tortoise health may be closely linked to changes in plant communities, and that simple management solutions, such as restrictions on grazing in low-rainfall years, may not address the underlying problem. Should attempts be made to experimentally alter the abundance of high PEP plants, or to look at the relation between disease prevalence and abundance of high PEP plants? These and other potential management and research actions warrant careful consideration.

NB: For further elaboration on the fundamental considerations underlying this hypothesized scenario, and for references cited, see Oftedal review chapter (pp. 194-241) on tortoise nutritional ecology in Van Devender, T. (2002) *The Sonoran Desert Tortoise: Natural History, Biology and Conservation*. University of Arizona Press.

Desert Tortoise

Interagency Desert Tortoise Team

<http://www.blm.gov/az/asfo/wildlife/tortoise.htm>

Food

There are two completed studies of diet on the Arizona Strip, the earliest by Hansen, Johnson and Van Devender in 1976. They found that in the Pakoan tortoise fecal pellets, threeawn (*Aristida* sp.), globemallow (*Sphaeralcea* sp.), slim tridens (*Tridens muticus*), and red brome (*Bromus rubens*) accounted for over 80 % of the material. On the Beaver Dam Slope, red brome and redstem filaree (*Erodium cicutarium*) made up 90% of the fecal material.