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

Jump Canyon (4801)

I. Introduction

The Jump Canyon 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 A for a copy of the Standards and Guidelines).

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

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

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

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

The 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 B 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 IDT, 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.

The RRT, IAT, permittees and other interested parties were invited to attend an issue scoping meeting on March 31, 2004, and a field visit on September 1, 2004. In cases where

standards were not being met, the group identified which resource uses needed to be addressed, and teams presented recommendations to improve resource conditions.

II. Grazing Use

A. Total grazing privileges

Active Grazing Use: 1,862 AUMs
Suspended Non-use: 424 AUMs

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

B. Season(s) of use

10/16 – 6/15

C. Kind and class of livestock

276 Cows and Calves

D. Percent federal range

84%

III. Allotment Profile

A. Description

The Jump Canyon grazing allotment #4801 is located in northwest Arizona approximately 36 miles south of St. George, Utah. It is situated partially within the Grand Canyon-Parashant National Monument along the northeast boundary. Approximately two thirds of the Jump Canyon Grazing Allotment lies within the monument. The allotment management plan (AMP) was developed in 1982 and revised in 1989. The major topographical features of the allotment are Tweeds Points, Jump Canyon, Hobble Canyon and Sullivan Draw. Vegetatively, the allotment can be described as containing sagebrush in the draws, juniper-cliffrose on the rolling hills in the upper elevation, and black brush and Joshua in the lower elevations. Elevation ranges from 5,600 feet on the east side to 5,800 feet near shoe buckle reservoir to 5,500 feet in the mid part of the allotment on the Tweeds Points to a low of 3,200 feet in the west near the lower end of Jump Canyon.

The Jump Canyon Allotment Management Plan (AMP) was revised in 1989, because the Sullivan Tank Allotment was transferred out of the system. This resulted in loss of pastures and changes to the grazing system on Jump Canyon allotment.

B. Acreage

The allotment contains:

- 25,466 acres of federal land
- 1,904 acres of state land

C. Objectives

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.

GZ17 Allow 50% utilization on key forage species in allotments with rotational grazing systems.

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

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.

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.

WL13 Complete ecological site inventories in key areas to determine site potentials and present ecological conditions; establish desired plant community objectives for

various areas and include these objectives in Allotment Management Plans, Habitat Management Plans, watershed plans, and other plans. Prescribe management or improvement practices to achieve these objectives.

2. Specific Resource Objectives

California Condor Recovery Plan Objectives (April, 1996)

CC1 Provide foraging habitat for California condors. Re-establish extirpated native ungulate populations. Encourage livestock owners to leave dead livestock on rangelands.

CC-2 Maintain a healthy, self-sustaining population of California condors with a positive growth rate of at least 150 individuals with at least 15 breeding pairs.

Habitat Management Plan

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

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

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

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

Jump Canyon Allotment Management Plan

Key Area No. 1, located in the west end of Lower Jump Pasture
Increase warm-season grasses from 6% to 15% frequency
Increase cool-season grasses from 0% to 10% frequency

Key Area No. 2, located in the southeast end of Englestead Pasture
Increase desirable warm-season grasses from 30% to 50% frequency
Increase desirable cool-season grasses from 30% to 40% frequency

Key Area No. 3, located in the central portion of Englestead Pasture
Maintain desirable warm-season grasses from 60% to 75% frequency
Increase desirable cool-season grasses from 18% to 40% frequency

Key Area No. 4, located in the northeast portion of the Tweedie Pasture
Increase warm-season grasses from 32% to 40% frequency
Increase cool-season grasses from 4% to 15% frequency

Key Area No. 5, located in the east central portion of the Tweedie Pasture
Increase warm-season grasses from 36% to 40% frequency
Increase desirable cool-season grasses from 8% to 15% frequency

Key Area No. 6, located in the east central portion of the Tweedie Pasture
Maintain warm-season grasses from 42% to 50% frequency
Maintain cool-season grasses from 5% to 15% frequency

Key Area No. 7, located in the southeast portion of the Bin Pasture
Maintain desirable warm-season grasses from 7% to 15% frequency
Maintain desirable cool-season grasses from 40% to 60% frequency

Desired Plant Community Objectives.

Lands in the western portion of the Jump Canyon allotment are in the Grand Canyon Desert Shrub (Land Resource Unit D30B). This area is warm and arid characterized by a mix of desert shrubs and grasses. Blackbrush can dominate some upland soils in the northern portion of the area. Dominant shrubs on other upland areas include Joshua tree, creosotebush, ratany, yucca, white bursage, winterfat, and various cactus species. Dominant mid-grasses on upland soils include big galleta, bush muhly, black grama, Indian ricegrass, desert needlegrass, dropseeds and perennial threeawns. Many ephemeral species, mainly winter annuals and some summer annuals, occur also. Good rains during October and November provide mass seed germination of these winter annuals.

The eastern side of the Jump Canyon Allotment is in the Colorado Plateau Sagebrush-Grassland (Land Resource Unit 35-3AZ). This area is cooler and arid characterized by big sagebrush with an understory of mid grasses and short grasses. Utah juniper and Colorado pinyon are scattered across the shallower soils. Indian ricegrass, needle and thread and western wheatgrass are the dominant cool season grasses. Galleta, black grama, blue grama, and sand dropseed are the major warm season grasses. Winterfat, fourwing saltbush, and Wyoming big sagebrush are the dominant shrubs.

DPC objectives were quantified down to the key area level during this evaluation process by an interdisciplinary team of resource specialists. These objectives are tied to the indicators of rangeland health. They address multiple-use objectives from the Land Use Plan (LUP) 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. Vegetation attributes for composition and cover were used to detail a site specific plant community, which when obtained, will assure rangeland health, forage on a sustained yield basis and habitat for wildlife species. The key species listed below reflect plant species to be monitored to measure success of management actions.

Key Area No. 1, located in the west end of Lower Jump Pasture
Increase Orhy composition by dry weight to 1-3%
Maintain Perennial grasses (PPGG) composition by dry weight of 1-5%
(PPGG includes Stipa and Hija), (see site guide)
Increase Spcr composition by dry weight to 5-15%
Maintain Epne composition by dry weight of 1-5%
Maintain Yubr composition by dry weight of 1-5%
Maintain Latrt composition by dry weight of 15-35%
Maintain Forb composition by dry weight of 3-5%

Rational: The Ecological Site for this key area is a Limy Upland 6-9" precipitation zone (pz), that is situated within the Mojave Great Basin Transition Ecoregion based on the draft FEIS. The Indian ricegrass, Needlegrass, Sand dropseed, big galleta, and Mormon tea are key species recognized to be important for forage, watershed, and cover, and are components of the ecological site.

For the key species the site guide allows 1-2% composition by dry weight for Orhy, 1-1% for PPGG (which includes Hiri and Stipa), and 1-5% for Epne.

The grass component on this site has been impacted by the drought, however; it was determined that the potential exists to achieve the DPC objectives still under current management. The DPC objectives established will also promote attainment of the draft FEIS Desired Ecological Condition (DEC).

Key Area No. 2, located in the southeast end of Englestead Pasture
Maintain Orhy composition by dry weight of 5-15%
Maintain Sihy composition by dry weight of 10-25%
Maintain Agsm composition by dry weight of 15-25%
Maintain Hija composition by dry weight of 10-20%
Increase Spcr composition by dry weight to 1-5%
Maintain Atca2 composition by dry weight of 2-10%
Maintain Artr2 composition by dry weight of 5-15%
Maintain forbs composition by dry weight of 5-15%

Rational: The Ecological Site for this key area is a Loamy Bottom 10-14" pz, that is situated within the Great Basin Ecoregion based on the draft FEIS. This key area was burned during 1985 using a prescription fire. Based on the pace frequency studies there was good grass recover through the 1997

monitoring studies. Because of the drought, overall plant frequencies decrease between the 1997 monitoring studies and the 2004 monitoring studies.

The IAT determined that the potential exists to achieve the DPC objectives. The DPC objectives established will also promote attainment of the draft FEIS DECs.

The Indian ricegrass, bottlebrush Squirreltail, wheatgrass, galleta, sand dropseed, Blue grama, winterfat, and fourwing saltbush are key species recognized to be important for forage, watershed, and cover, and are components of the ecological site.

For the key species the site guide allows for from 5-15% composition by dry weight of Orhy, 5-15% for Sihy, 30-45% for Agsm, Hija is not mentioned, 5-10% for Spcr, 0-5% for Bogr2, and 5-15% for Atca2. The site guide allows for from 5-10% for Artr2, and the IAT feels that keeping it at that level would provide for greater species diversity.

Key Area No. 3, located in the central portion of Englestead Pasture
Maintain Orhy composition by dry weight of 2-10%
Maintain Sihy composition by dry weight of 10-20%
Maintain Stipa composition by dry weight of 1-5%
Maintain Hija composition by dry weight of 5-15%
Maintain Bogr2 composition by dry weight of 15-30%
Reduce Artr2 composition by dry weight to 5-15%
Maintain Juos composition by dry weight of 0-5%
Maintain forbs composition by dry weight of 5-15%

Rational: The Ecological Site for this key area is a Loamy Upland 10-14" pz, that is situated within the Great Basin Ecoregion based on the draft FEIS. This key area was burned and chained in 1986. Based on the pace frequency studies grasses remained static through the 1997 monitoring studies with some additional species added to the list. Because of the drought, overall plant frequencies decrease between the 1997 monitoring studies and the 2004 monitoring studies.

However, the team determined that the potential exists to achieve the DPC objectives if sagebrush is reduced. Sagebrush currently exceeds the 5-15% composition by dry weight allowable in the site guide, and while sagebrush is important for wildlife, it can often be too dominant. On this key area, sagebrush is the only species where a decrease is warranted. Other species of shrubs and trees found at the key area provide important thermal and hiding cover for wintering mule deer. Juniper in particular provides both cover and forage for mule deer in winter.

The DPC objectives established will also promote attainment of the draft FEIS DECs.

The Indian ricegrass, bottlebrush Squirreltail, Needlegrass, galleta, sand dropseed, and Blue grama are key species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The sagebrush community according to the draft FEIS, would be managed for no net loss (i.e., long-term or permanent removal from the landscape). Stands of pinyon-juniper according to the draft FEIS, would be managed for a balance between tree, shrub, and perennial grass cover to support wildlife populations.

For the key species, the site guide allows for from 5-20% composition by dry weight for Orhy, 5-10% for Sihy, 5-10% for Stipa, 5-15% for Hija, and 15-30% for Bogr2. The site guide allows for from 5-15% for Artr2 and 0-5% for Juos.

Key Area No. 4, located in the northeast portion of the Tweedie Pasture
Increase Sihy composition by dry weight to 1-10%
Increase Spcr composition by dry weight to 1-3%
Maintain Bocu composition by dry weight of 1-5%
Maintain Artr2 composition by dry weight of 0-5%
Maintain forbs composition by dry weight of 4-15%

Rational: The Ecological Site for this key area is a Loamy Upland 10-14" pz, that is situated within the Great Basin Ecoregion based on the draft FEIS. The bottlebrush Squirreltail, sand dropseed, side-oats grama and Cliffrose are key species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The sagebrush community according to the draft FEIS, would be managed for no net loss (i.e., long-term or permanent removal from the landscape).

For the key species, the site guide allows for from 5-10% composition by dry weight for Sihy, 1-3% for Spcr, and Bocu and Come are not mentioned in the site guide. The site guide allows for from 5-15% for Artr2.

The team determined that the potential exists to achieve the DPC objectives. The DPC objectives established will also promote attainment of the draft FEIS DECs.

Key Area No. 5, located in the east central portion of the Tweedie Pasture
Increase Sihy composition by dry weight to 1-5%
Maintain Spcr composition by dry weight of 5-15%
Increase Bocu composition by dry weight to 1-5%
Maintain forbs composition by dry weight of 1-5%

Rational: The Ecological Site for this key area is a Shallow Loamy 10-14" pz, that is situated within the Great Basin Ecoregion based on the draft FEIS. The bottlebrush Squirreltail, sand dropseed, and side-oats grama are key species recognized to be important for forage, watershed, and cover, and are components of the ecological site.

For the key species, the site guide allows for from 5-10% composition by dry weight for Sihy, 1-5% for Spcr, 2-10% for Bocu and 1-5% for forbs.

The team determined that the potential exists to achieve the DPC objectives. The DPC objectives established will also promote attainment of the draft FEIS DECs.

Key Area No. 6, located in the east central portion of the Tweedie Pasture
Increase Orhy composition by dry weight to 1-5%
Maintain Sihy composition by dry weight of 1-5%
Maintain Spcr composition by dry weight of 10-30%
Increase Bocu composition by dry weight to 1-5%
Increase Agsm composition by dry weight to 1-5%
Maintain forbs composition by dry weight of 1-10%
Maintain Juos composition by dry weight of 0-10%

Rational: The Ecological Site for this key area is a Shallow Loamy 10-14" pz, that is situated within the Great Basin Ecoregion based on the draft FEIS. The Indian ricegrass, bottlebrush Squirreltail, sand dropseed, and side-oats grama are key species recognized to be important for forage, watershed, and cover, and are components of the ecological site.

For the key species, the site guide allows for from 5-10% composition by dry weight for Sihy, 1-5% for Spcr, 5-10% for Orhy, 5-20% for Agsm, and 5-20% for Bocu, 1-5% for forbs, 5-10% for Juos, and 10-40% for shrubs/trees.

The team determined that the potential exists to achieve the DPC objectives. The DPC objectives established will also promote attainment of the draft FEIS DECs.

Key Area No. 7, located in the southeast portion of the Bin Pasture

Increase Orhy composition by dry weight to 1-5%
Maintain Sihy composition by dry weight of 1-5%
Maintain Hija composition by dry weight of 5-20%
Increase Spcr composition by dry weight to 1-3%
Increase Bogr2 composition by dry weight to 1-3%
Maintain forbs composition by dry weight of 5-10
Maintain Come composition by dry weight of 1-5%
Maintain Artr2 composition by dry weight of 0-15%
Reduce Juos composition by dry weight to 0-5%

Rational: The Ecological Site for this key area is a Loamy Upland 10-14" pz, that is situated within the Great Basin Ecoregion based on the draft FEIS. The Indian ricegrass, galleta, bottlebrush Squirreltail, sand dropseed, blue grama and Cliffrose are key species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The sagebrush community according to the draft LUP would be managed for no net loss (i.e., long-term or permanent removal from the landscape).

For the key species, the site guide allows for from 5-10% composition by dry weight for Sihy, 1-3% for Spcr, 5-20% for Orhy, 5-15% for Hija, 15-30% for Bogr2, 5-10% for forbs and Come is not mentioned in the site guide. The site guide allows for from 5-15% for Artr2, and 0-5% for Juos.

The team determined that the potential exists to achieve the DPC objectives. The DPC objectives established will also promote attainment of the draft FEIS DECs.

D. Key Species

Common Name	Scientific Name	Abbreviation
Grasses		
Bottlebrush Squirreltail	*Elymus elymoides*	Elele
	(Sitanion hystrix)	(Sihy)
Indian ricegrass	*Achnatherum hymenoides*	Achy
	(Oryzopsis hymenoides)	(Orhy)
Western Wheatgrasses	*Pascopyrum smithii*	*Pasm*
	Agropyron smithii	Agsm
Needlegrass	*Achnatherum* Species	Achna
	(Stipa) Species	(Stipa)
Galleta	Pleuraphis jamesii	Plja
	(Hilaria jamesii)	(Hija)
Big Galleta	*Pleuraphis rigida*	Plri3
	(Hilaria rigida)	(Hiri)
Sand dropseed	*Sporobolus cryptandrus*	Spcr
Side-oats	*Bouteloua curtipendula*	Bocu
Blue grama	Bouteloua gracilis	Bogr2
Browse		
Cliffrose	*Purshia mexicana*	Pume
	(Cowania mexicana)	(Come)
Mormon Tea	*Ephedra nevadensis*	Epne
Fourwing saltbush	*Atriplex canescens*	Atca2

E. Grazing System

Jump Canyon is used as a three pasture deferred rotation-grazing system. To some degree, portions of the allotment will have some flip-flop use and some areas (small portions) will have winter use only with horses and replacement heifers. System has the flexibility to compensate for water availability.

Three permittees use the Jump Canyon Grazing Allotment their preference is as follows:

Livestock	Season of Use			
Numbers	Begin	End	%Fed	AUM's
95 Cows	10/16	06/15	84	638
61 Cows	10/16	06/15	84	409
139 Cows	11/15	02/28	84	407
138 Cows	03/01	06/15	84	408
			Total	1,862

F. Other uses

1. Special Status Species

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.

Special status raptors such as bald eagles (*Haliaeetus leucocephalus*) (delisted in 2007), 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.

The Mojave population of desert tortoises (*Gopherus agassizii*) are presently federally listed as threatened, however it is believed unlikely that desert tortoises occur in this allotment. BLM GIS data indicates approximately 1600 acres of desert tortoise habitat in the southwest corner of this allotment west of Hidden Rim. The area is not considered essential to maintenance of viable populations because tortoise densities are low to medium and are not contiguous with higher density areas. Less than 6% of the allotment was designated as critical habitat for the desert tortoise on February 8, 1994, by the U.S. Fish and Wildlife Service.

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 Jump Canyon 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 Jump Canyon 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.

Pronghorn antelope are the other big game species germane to this allotment and they may be found in the less steep and more open southeast portion of this allotment. Pronghorn were extirpated from the Arizona Strip by 1920. Re-introduction efforts by AGFD and BLM began on the Strip starting in 1961 and currently there are three separate pronghorn populations of over 100 head located on the Arizona Strip, with this population in GMU 13B being the most western population. Pronghorn numbers are also believed to be stable to slightly increasing, despite the current drought.

Nongame wildlife found on the allotment is typical of the area, including a variety of small mammals, grassland birds, raptors, and reptiles.

3. Recreation

The Jump Canyon Allotment is considered to have recreation values for its geology, scenic view sheds, and remoteness. General recreation activities might include: Sight seeing, horseback riding, hiking, camping, hunting, rock collecting, photography, bird watching and nature study.

Off Highway Vehicles: This allotment falls in an area classified as Limited to Existing Roads and Trails.

Recreation Opportunity Spectrum: This allotment was classified as having the following Recreation Spectrum Classes in it: Semi Primitive – Non Motorized, Semi Primitive - Motorized, and Roaded Natural

Visual Resource Management: Class I, II and mostly Class IV. Most of the allotment is in Class IV visual resource management except for the lower Jump Canyon, which is Class II, and at the very end of lower Jump Canyon where it joins Hidden Canyon (Wilderness Area) it is VRM Class I.

3. Wilderness

A very small portion of the Grand Wash Cliffs Wilderness area is included within the Jump Canyon Allotment. This Wilderness area is wild and very remote. Many rugged canyons, scenic escarpments, miles of cliffs, and sandstone buttes mark the transition between the Colorado Plateau and Basin and Range provinces. The cliffs are important habitat for desert bighorn sheep and raptors, while the low desert area contains desert tortoise and Gila monsters.

G. Issues brought out in scoping.

1. Issues relating to Rangeland Health

a. De-watered springs at Upper Jump Spring and Lower Jump Spring.

b. Wildlife access to spring sources at Upper Jump Spring and Lower Jump Spring.

c. Vegetative diversity in Sec 36 and 35 in the western portion of the allotment.

d. Productivity low in treated/burned areas in Sec 21, 22, 16 (state) and 15 in the central portion of the allotment.

e. Erosion Sec 4, 3, 34 and 35 in the far eastern portion of the allotment.

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 Jump Canyon Allotment. If the current livestock grazing practices are determined to be causing non-attainment of Standards then they will be modified to comply with the Guidelines for Grazing Administration. This assessment will also evaluate and update existing Activity Plan objectives to ensure multiple use objectives are tied to the indicators for rangeland health. Evaluation of rangeland conditions are based on all available monitoring, inventory, and assessment data.

B. Summary of Studies Data

1. Livestock Actual Use

	Jump Canyon Actual Use			Anderson Brothers Approx % of Normal use for Jump Canyon	Hughes Brothers Approx % of Normal use for Jump Canyon	Approx % Use of both Jump Canyon together
Year	Anderson Brothers	Hughes Brothers	Total AUMs			
1988	1,665		1,665	89%		89%
1989	1,690		1,690	91%		91%
1990	1,225		1,225	66%		66%
1991	1,177		1,177	63%		63%
1992	1,228		1,228	66%		66%
1993	1,037		1,037	56%		56%
1994	1,092		1,092	59%		59%
1995	1,404		1,404	75%		75%
1996	808		808	43%		43%
1997	366	378	744	20%	20%	40%
1998	256	726	982	14%	39%	53%
1999	256	615	871	14%	33%	47%
2000	182	605	787	10%	32%	42%
2001	327	513	840	18%	28%	45%
2002	119	419	538	6%	23%	29%
2003	0	514	514	0%	28%	28%

2 Precipitation

Olaf Knolls and Sullivan Tank precipitation gauges will be used in this evaluation. Precipitation amounts are varied due to extremes in elevations found in the allotment. Yearly moisture accumulations range from a maximum of 13-inches on the higher elevations to a minimum average of 8 inches in the middle and southern portions of the allotment. Most of the allotment falls in a 12-inch precipitation zone, with most occurring either during the summer or winter months.

Recent drought has and still is playing a major role in modifying the vegetative community. For example, the Olaf Knolls rain gauge precipitation for the year 2000 was 65% of normal (0% for fall, 85% winter, 49% spring, and 82% for summer). The 2001 precipitation year was above normal for fall, winter, and spring, but summer again was below normal at 65%. That was followed by another year (2002) of below normal conditions with no effective precipitation received, (fall 12%, winter 33%, spring 5%, and summer 15%). As a result, the 2002 annual precipitation was only 19% of normal.

September 22, 2005	Sullivan Tank Precipitation Rain Gauge Number: 25														
Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Fall % Avg	75	86	78	63	48	122	129	85	148	107	191	49	31	49	111
Winter % Avg	206	198	206	47	99	82	35	134	31	97	40	90	43	94	84
Spring % Avg	167	89	72	165	136	148	31	83	135	168	158	54	66	55	193
Summer % Avg	48	116	119	113	163	145	181	78	85	85	82	75	163	72	99
Annual % Avg	133	138	138	90	118	119	92	101	82	108	95	73	82	74	112
Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005		
Fall % Avg	127	125	86	132	152	76	142		104	69	111	28	277		
Winter % Avg	234	72	189	96	77	124	30	74	95	41	93	75	113		
Spring % Avg	116	87	82	81	77	80	110	11	127	5	110	60	132		
Summer % Avg	37	32	106	35	167	231	90	70	19	20	115	154			
Annual % Avg	138	70	130	80	115	142	78	51	79	32	105	90	105		

September 22, 2005	Olaf Knolls Precipitation Rain Gauge Number: 08														
Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Fall % Avg		38	23	69	47	152	132	56	37	158	65	202		279	10
Winter % Avg	50	55	62	50	119	282	67	136	82	104	119	32	77	106	30
Spring % Avg	128	38	73	145	190	75	73	258	26	28	124	72	50	180	5
Summer % Avg	142	142	167	50	79	23	32	80	77	136	218	245	85	68	16
Annual % Avg	81	69	83	74	114	156	70	137	62	103	135	117	61	140	18
Year	2003	2004	2005												
Fall % Avg	23	41	467												
Winter % Avg	76	95	255												
Spring % Avg	177	30	126												
Summer % Avg	63	83	108												
Annual % Avg	87	70	225												

Utilization

Utilization data from 1982-2004 has been compiled for this evaluation and specific information is listed in appendices. 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.

Pasture	Lower Jump			Key Area Number 1									
	1982	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
ORHY	48	16	18	25	30	40	32	26	42	49	32	42	18	13
SPCR	39	23	20	25	37	35	34	30	41	50	31	38	16	13
HIRI	28	13	18	30	43	39	38	38	40	44	32	31	10	15
EPNE	34	15	29	15	50	41	42	45	51	51	48	38	8	17

Pasture	Englestead			Key Area Number 2								
	1982	1984	1985	1987	1989	1990	1991	1992	1997	1998	1999	2000
ORHY	30	29	32	44	59	54	49	34	23	29	29	27
SIHY	20	27	21	20	34	50	51	35	23	29		
AGROPY		51	22	25	46	45	51	31	18	31	25	14
HIJA	18	12	14	9	61	54	42	42	18	24	34	14

Pasture	Englestead				Key Area Number 3										
	1982	1983	1984	1985	1986	1987	1989	1990	1991	1992	1995	1997	1998	1999	2000
Orhy	30		42	53	28	20					27	23	25	29	38
Sihy	10	22	47	28	28	20	40	50	44	42	27	23	25	29	38
Agropy							41	44	49	45	27	22	30	28	34
Hija	18	14	15	32	28	20	40	57	51	30	24	24	29	30	8
Come							33	55	54	38			21	32	27

Pasture	Tweedie				Key Area Number 4											
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Sihy	32		70			77	90	70	58	35	31	31	45	50	35	32
Spcr	37	77	70	78	70	63	90	68	54	36	31	39	46	48	35	28
Bocu	28	70	61	61	70	61	89	67	54	35	39	36	39	45	26	27

Pasture	Tweedie				Key Area Number 5											
	1981	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1997	1998
Spcr	15	29	49	38	47	61	49	47	42	55	42	28	41	44	34	38
Bocu			16	22	23	52	52	13	37	53	40	33	23	41	28	31

Pasture	Tweedie				Key Area Number 6											
	1982	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1997	1998	1999
Orhy		46	65	39	46	42		48	57	35	23		22	23	31	13
Spcr	36	33	25	32	44	47	46	46	49	36	34	16	16	28	29	9
Bocu		12	10	32	45	47	20	50	55	40	28	18	35	30	31	4

Pasture	Bin	Key Area Number 7												
	1983	1984	1985	1986	1987	1988	1989	1990	1992	1993	1994	1997	1998	1999
Orhy		37	63	16	38	37		37	31	31	14	37	38	44
Sihy		28	44	11	31	32	63							
Poa	17	33	61	10	28	48	63	47	32	30	13	37	30	49
Hija	27		41	32	47	36	34	45	31	36	9	37	31	39
	Species that exceeded the 50% utilization level for a particular year.													

1. Trend

The trend of an area may be judged by noting changes in vegetation attributes such as species composition, density, cover, production, and frequency. Vegetation data is collected at different points in time on the same site (key area), and result 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 7 key areas over the allotment, 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 (1981 to 2004) from the Jump Canyon allotment indicates that drought and fires have had impacts on trends. Fire has been an influence on key areas 2, 3, 4, 5 and 6. Drought (1998 to 2004) has been an influence on all key areas.

Table #2 list changes in trends on key species comparing the recent data to the base year. To help illustrate the affects of drought on plant species a comparison of key species data from the base year of 1981 is made for both 1997/98 data (pre-drought) and the 2004 data (drought persisting). On 7 key areas, the 1997/98 data compared back to the base year of 1981 show that 9 key species showed improving trends, 27 remained static, and 6 were down. Comparing this trend data to the 2004 trend data, which also was compared back to the base year of 1981, reflects the changes in key species due to the drought , which showed no key species as having an upward trend, 11 key species showed a downward trend, and 31 were static.

The 2004 vegetative basal cover data, which is part of ground cover trended downward on 2 key areas and remained static on the remaining 5. Another

attribute of ground cover, litter, showed improvement on 5 key areas and was static on 2. Specific frequency and trend data is found in appendices.

Table #2 Changes to basal cover, litter and key plant species by key area from base year (1981) to 1998 and 2004						
Key Area	Key Species or Cover Category	Years plots were read				
		1981	1998	1998 trend	2004	2004 Trend
1	Litter	23	47	↑	60	↑
	Vegetation (basal cover)	3	6	→	0	→
	Orhy		4	↑		→
	Stipa		1	→		→
	Hiri	4	3	→		↓
	Spcr	3	9	↑		→
	Epne	2	5	→		→
	Yubr			→	0	→
	Latrt	5	4	→	4	→
2		1981	1997	1997 trend	2004	2004 Trend
	Litter	34	23	↓	45	↑
	Vegetation (basal cover)	6	8	→	2	→
	Orhy	1	17	↑	2	→
	Sihy	32	29	→	8	↓
	Agsm	11	5	↓		→
	Hija	10	20	↑	7	→
	Spcr	11	3	↓	1	↓
	Atca2	1	1	→	2	→
	Artr2	58	5	↓	6	↓
3		1981	1997	1997 trend	2004	2004 Trend
	Litter	20	24	→	42	↑
	Vegetation (basal cover)	6	10	→	3	→
	Orhy	2	4	→	4	→
	Sihy	17	52	↑	23	→
	Stipa		2	→	1	→
	Hija	15	15	→	10	→
	Bogr2	51	58	→	33	↓
	Artr2	45	32	↓	35	↓
	Juos	3	4	→	5	→
4		1981	1998	1998 trend	2004	2004 Trend
	Litter	16	29	↑	35	↑
	Vegetation (basal cover)	0	4	↑	1	→
	Sihy	2		→		→
	Spcr	21	4	↓	1	↓
	Bocu	13	13	→	3	↓
	Artr2			→		→

5		1981	1998	1998 trend	2004	2004 Trend
	Litter	65	47	↓	59	→
	Vegetation (basal cover)	5	4	→	1	→
	Sihy	1		→		→
	Spcr	36	92	↑	11	↓
	Bocu		1	→	1	→
6		1981	1998	1998 trend	2004	2004 Trend
	Litter	72	62	↓	65	→
	Vegetation (basal cover)	5	6	→	1	↓
	Orhy		1	→		→
	Sihy	3		→	1	→
	Agsm			→		→
	Spcr	43	61	↑	4	↓
7	Bocu		2	→		→
	Juos		0	→		→
7		1981	1997	1997 trend	2004	2004 Trend
	Litter	30	24	→	41	↑
	Vegetation (basal cover)	5	5	→	1	↓
	Orhy		4	↑	1	→
	Sihy	7	6	→	8	→
	Hija	6	21	↑	10	→
	Spcr	2	3	→	0	→
	Bogr2		2	→	0	→
	Come	4	5	→	4	→
	Artr2	12	13	→	3	↓
	Juos	20	12	↓	19	→

5. Ecological Site Inventory (Species Composition)

The "Dry Weight Rank" vegetative sampling method was used to measure composition, which is the proportions (percentages) of various plants in relation to the total on given area. This vegetation attribute is also used to describe ecological sites. Ecological site guides are provided by the Natural Resources Conservation Service, 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 as 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.

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 index[1], and ecological (successional) status or seral status rating. (See Appendices 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 Land Use Plan:

Ecological Status

Similarity Index	Seral Status Rating
0-25%	early
26-50%	mid
51-76%	late
77-100%	(potential natural community)

Table #3					
Key Area	Plant Species	Site-Guide Allowable Percent Composition	Composition		Desired Percent Composition Objective
Key Area #1			1988	2004	
	Orhy	1-2%	3%		1-3
	PPGG	1-1%			1-5
	Stipa	Group PPGG	5%		
	Hiri	Group PPGG			
	Spcr	-	11%		5-15
	Epne	1-5%	5%	4%	1-5
	Yubr	3-5%		1%	1-5%
	Latrt	15-25%	5%	33%	15-35%
Key Area #2			1988	2004	
	Orhy	5-15%	6%	6%	5-15
	Sihy	5-15%	28%	17%	10-25
	Agsm	30-45%	5%	17%	15-25
	Hija	-	17%	16%	10-20
	Spcr	5-10%			1-5
	Atca2	5-15%		2%	2-10
	Artr2	5-10%	17%	15%	5-15

[1] **Ecological Status** - The present state of 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.

Key Area #3			2004	NA	
	Orhy	5-20%	2%		2-10
	Sihy	5-10%	16%		10-20
	Stipa	5-10%	1%		1-5
	Hija	5-15%	9%		5-15
	Bogr2	15-30%	27%		15-30
	Artr2	5-15%	31%		5-15
	Juos	0-5%	3%		0-5
Key Area #4			2004	NA	
	Sihy	5-10%			1-10
	Spcr	1-3%			1-3
	Bocu	-	2%		1-5
	Artr2	5-15%			0-5
Key Area #5			1988	2004	
	Sihy	5-10%			1-5
	Spcr	1-5%	84%	12%	5-15
	Bocu	2-10%			1-5
Key Area #6			1988	2004	
	Orhy	5-10%			1-5
	Sihy	5-10%		2%	1-5
	Agsm	5-20%			1-5
	Spcr	1-5%	78%	10%	10-30
	Bocu	2-10%			1-5
	Juos	5-10%		4%	0-10
Key Area #7			2004	NA	
	Orhy	5-20%			1-5
	Sihy	5-10%	2%		1-5
	Hija	5-15%	16%		5-20
	Spcr	1-3%			1-3
	Bogr2	15-30%			1-3
	Come	-	3%		1-5
	Artr2	5-15%	2%		0-15
	Juos	0-5%	28%		0-5

Table #4			
Key Area	Ecological Site	Seral Status	Similarity to PNC
1	Limy Upland 6-9" pz	Mid	48%
2[a]	Loamy Bottom 10-14" pz	Late	71%
3[b]	Loamy Upland 10-14 pz	PNC	78%
4[c]	Loamy Upland 10-14 pz	Early	22%
5[d]	Shallow Loamy 10-14 pz	Early	22%
6[e]	Shallow Loamy 10-14 pz	Mid	34%
7	Loamy Upland 10-14" pz	Mid	47%

a. Area burned during 1985.
b. Area burned chained during 1986.
c. Area burned several times (1981, 1995, 1999).
d. Area burned in 1975.
e. Area seeded in 1960 and 1966, burned in 1975 and 1999 not rehabbed.

6. Special Status Species

Within the greater northern Arizona-southern Utah area, the re-introduced condor population overall is doing well and is increasing. Approximately ten captive reared additional young condors are released annually. In addition, between 1 and 3 wild condor chicks fledge annually. All condors in Arizona are marked with numbered wing tags and equipped with radio transmitters. Each bird is monitored daily, if possible. Condors currently range across the entire Arizona Strip, throughout the Grand Canyon, into adjacent Utah and Nevada, and south of the Grand Canyon in Arizona.

Some Arizona condors have been recently outfitted with satellite GPS transmitters, which plot an individual bird's location up to 12 times per day. These new transmitters have already shown that the condors are making much more use of the Grand Canyon-Parashant National Monument than previously believed. The current condor population in Arizona is 61.

Less is known about bald eagles (delisted June 28, 2007), and for that matter, golden eagles (which are federally protected, but not federally listed) on the Arizona Strip. Both species of eagles can be found in this allotment. Both are scavengers and predators. The bald eagles are only found here in the winter months. Golden eagles can be found on the Strip yearlong, but in the winter months their numbers increase as migrants from the north join the resident golden eagles.

7. Wildlife Habitat

There is no available allotment specific wildlife habitat or wildlife population data. AGFD annually collects big game data on a Game Management Unit (GMU) basis; in this case GMU 13B. The appendices provide mule deer and pronghorn information from AGFD for GMU 13B.

The mule deer data found in the appendices indicate since 1985 there has been an annual average of 42.5 fawns per 100 does, which is good. Buck ratios have also remained consistently high. However, this information is based on a very small sample size for a huge area. Nonetheless, the 13B mule deer population is believed stable to slightly increasing.

GMU 13B is one of the most desired places to hunt trophy mule deer in the Intermountain West. In the past six years the number of hunting permits has declined slightly, but the hunter success rates have remained high and nearly stable. In 2003, 38 buck deer were legally harvested in GMU 13B, but GMU 13B contains over 1.25 million acres of land so this piece of information also indicates what a low density deer population exists in GMU 13B. In 2003, averaged over the entire GMU, it took slightly over 51 sections of land per deer harvested. In 2004, 38 bucks were also reported harvested in GMU 13B.

In 2004, 102 mule deer were surveyed and the 13B herd composition was calculated at 34 bucks per 100 does, with 57 fawns per 100 does. The five-year composition average is 42:100:45.

Compared to the area's mule deer population and harvest data from the 1960s and 70s, there are presently far fewer mule deer. For example, 252 bucks were harvested in 1979. Reasons for the decline are not known and other mule deer populations in the west are known to have also declined. Possible reasons for the decline include the end of sheep grazing, the vegetation attaining an increased seral state, an increase in predators due to the banning of toxicants on federal land in 1972, an undetected disease, nuclear testing in Nevada, possible over harvesting, and changes in water distribution.

The appendices also include some population information on pronghorn in 13B, but the buck and fawn ratios compared to 100 does vary widely. The five-year average composition is 68:100:21, with the 2004 ratio for 13B being 32:100:51. Hunt information is more consistent and shows an annual hunter success rate of 82% over the past five years.

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

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

10. **Lithology and Soils**

Lithology

The Jump Canyon allotment consists of a plateau dissected by canyons and ravines in Kaibab limestone, basalt, shale and sandstone. The allotment is classified in the RMP as Watershed Category IV. This means that the

watershed units currently are in unsatisfactory erosion condition, and are susceptible to wind and water erosion following disturbance.

Soils

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

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

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

18 Childers-Rizno association, 4 to 15 percent slopes, (plateaus), limestone and sandstone; Childers=Shallow Upland (calcareous), 9" to 13"ppt

45 Mellenthin-Rock outcrop-Torriorthents complex, 10 to 70 percent slopes (hills) Kiabab; Mellenthin=Shallow Loamy, 9" to 13"; Torriorthents=Breaks, 9" to 13"

51 Meriwhitica-Rock outcrop-Strych complex, 35 to 70 percent slopes, (cliffs, canyons) Callville & Redwall limestones; Meriwhitica=Breaks, 9" to 13"; Strych=Loamy Upland, 9" to 13"

52 Meriwhitica-RO-Strych complex, 35 to 70 percent slopes, warm, (scarps, cliffs, canyon walls), basalt, limestone, sandstone, gypsite, shale, conglomerates; Meriwhitica=Breaks (calcareous), 9" to 13"; Strych=Loamy Upland (calcareous), 9" to 13"

63 Radnik loam, 1 to 5 percent slopes (floodplain) mixed; Loamy Bottom, 9" to 13" ppt

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

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

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

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

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

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

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

1. Issues relating to Rangeland Health

a. De-watered springs at Upper Jump Spring and Lower Jump Spring. The IAT visited Upper Jump Spring assuming that it was completely dewatered and found that it was not. Similar assumptions were made for Lower Jump Spring though that spring was not visited during the field tour.

Spring inventory actually found four additional seep locations within 1500 feet of Upper Jump Springs, one actually had some dripping water, and the rest were described as very small seeps with very little water.

b. Wildlife access to spring sources at Upper Jump Spring and Lower Jump Spring. Wildlife do not have easy access to Upper Jump Spring, it is fenced off. However, water is in a trough approximately a hundred yards from spring source at the bottom of canyon, plus, there are four other seeps within 1,500 feet of Upper Jump Spring. There is no water available at Lower Jump Spring except for the livestock watering troughs, which have water in them year-round, and they are not fenced, so wildlife do have access.

c. Vegetative diversity in Sec 36 and 35, in the western portion of the allotment. Key area #1 is within the proximity of the area described. Study data from the pace frequency transects lists those species that are recorded while conducting those studies. Data sheets from these studies lists over 16 perennial plant species from the key area. These data sheets do not list the plants that were not within the plot frame, or the seasonal plants that may not have been present when study data was collected.

d. Productivity low in treated/burned areas in Sec 21, 22, 16 (state) and 15 in the central portion of the allotment. Concern exists that in some years there is a lack of herbaceous plants in the old burns. Based on the annuals present this was not the case this year. Annual production is based on timing, frequency, and amount of precipitation. As shown in key areas number 5 and 6, which was burned, and additional studies data collected in burned over areas, perennial plants are increasing; it just takes time. In the meantime, annuals usually abound if given adequate amounts of precipitation at the right time.

e. Erosion Sec 4, 3, 34 and 35 in the far eastern portion of the allotment. Concerns were expressed over the apparent erosion in the pinyon-juniper woodlands and sagebrush areas. This allotment is classified

in the 1992 RMP as Watershed Category IV. This means that the watershed units currently are in unsatisfactory erosion condition, and are susceptible to wind and water erosion following disturbance, but would be responsive to treatment. However, on the area identified to have issues, litter and essentially ground cover at key area #3, did show improving trends. Those who raised this issue felt that the site actually looked better than they had previously thought it would, but the site does need some form of land treatment (spike, burning etc.), and that current erosion conditions are not livestock grazing related.

V. Conclusions

A. Pertaining to Objectives

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.

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 partially met: The 50% utilization was exceeded several times at key areas. The 45% utilization level did not apply until after 1998 and it was not exceeded at the applicable key area.

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

This objective is partially being met. The allotment was classified in the 1992 RMP as Watershed Category IV. This means that the watershed units currently are in unsatisfactory erosion condition, and are susceptible to wind and water erosion following disturbance, but would be responsive to treatment. An area on the Tweeds Points has had some form of land treatment in the past. However, on the area identified to have issues (northeast portion of Englestead pasture on the west side of Sullivan Draw), litter and essentially ground cover at key area #3, does show improving trends. IAT determined that the site actually looked better than they had

previously thought it would, but the site does need some form of land treatment (spike, burning etc.), and that current erosion conditions are not livestock grazing related.

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

This objective is being met. This objective is a process that is an ongoing effort based on observations of range and other specialists and restoration actions are evaluated through the planning and NEPA process for interdisciplinary input and review.

RR08 - *Manage the majority of the resource area for extensive recreation while maintaining its naturalness/remoteness. The exception to this is the Cedar Pockets Campground.*

This objective is being met. Visitors to this AMP area engage in hunting, camping, and sightseeing and indulge in a variety of legitimate recreation activities and are monitored to see that the area's values are not degraded by overuse.

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

This objective is being met. As new requests for commercial special recreation use permits are received they are evaluated and reviewed for consistency with this objective and processed accordingly.

TE01 –*Carry out management consistent with multiple use for conservation of 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.*

This objective has been met. No actions which might contribute to the need to list candidate species have occurred. No adverse impacts to listed species are known.

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.*

This objective is being met. All proposed actions with potential to impact wildlife species are reviewed through the NEPA process. Biological evaluations would be prepared to document the effects of any proposed action on listed or proposed species.

WL06 *Continue restoration of native wildlife into historic range by transplanting wildlife in cooperation with Arizona Game and Fish Department.*

This objective is being met. No restorations of native wildlife have occurred in this allotment, but the re-introduction of the California condor, desert bighorn sheep, and pronghorn elsewhere on the Arizona Strip have led to increased wildlife diversity in this allotment. Condors and bighorn sheep occur at times in this allotment.

WL13 *Complete ecological site inventories in key areas to determine site potentials and present ecological conditions; establish desired plant community objectives for various areas and include these objectives in Allotment Management Plans, Habitat Management Plans, watershed plans, and other plans. Prescribe management or improvement practices to achieve these objectives.*

This objective has been met. The ecological site inventories have been completed at key areas. As described above desired plant community objectives are being cooperatively set as part of this S&G process and will be incorporated into the various activity plans as are revised upon completion of the new land use plan (RMP) which currently being developed.

2. Specific Resource Objectives

California Condor Recovery Plan Objectives (April, 1996)

CC-1 Provide foraging habitat for California condors. Re-establish extirpated native ungulate populations. Encourage livestock owners to leave dead livestock on rangelands.

Met. Adequate foraging habitat is provided. Pronghorn and desert bighorn sheep populations have been re-established. Because condors are very susceptible to lead poisoning, leaving carcasses which may contain lead is no longer encouraged.

CC-2 Maintain a healthy, self-sustaining population of California condors with a positive growth rate of at least 150 individuals with at least 15 breeding pairs.

Not met. The current population in northern Arizona and southern Utah is 62 (April 7, 2005). The population is growing on an annual basis due to the release of captive reared birds, but it will be several years before it reached 150. Some natural reproduction is occurring, but the population presently is not self-sustaining. There are currently 2 to 4 breeding pairs.

Clayhole Habitat Management Plan (December 1978)

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

Met. Factors have been identified. The decline has been reversed. The 13B mule deer population currently is stable to slightly increasing. Data is not available specifically for the HMP area, however.

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

Met. While no crucial summer range exists in this allotment, DPC objectives have been set as part of this S&G process. Key area data generally shows that the shrub species, which are in a downward trend (cholla and snakeweed) are not key species for deer.

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

Met. The mule deer population of 13B is static to slightly increasing and the fawn crops in 2003 and 2004 were very good, well exceeding AGFD management guidelines.

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

Met. The post-hunt buck to doe ratios exceed AGFD management guidelines, with the 2004 ratio being 34 bucks per 100 does. Game Management Unit 13B is maintaining its reputation for producing large buck mule deer.

Key Area No. 1, located in the west end of Lower Jump Pasture

Increase warm-season grasses from 6% to 15% frequency
Not met, frequency changed from 6% to 0%.

This objective was progressing towards meeting objectives based on the 1998 studies data. Desirable warm season grasses had increased in frequency to 12%. Then, because of the prolonged extreme drought, warm season grasses decreased in frequency. However, sand dropseed, big galleta, and blue grama are present on the site and the potential exists for there frequency to increase.

Increase cool-season grasses from 0% to 10% frequency
Not met, frequency remained static at 0%.

This objective was progressing towards meeting objectives based on the 1998 studies data. Desirable cool season grasses had increased in frequency to 12%. Then, because of the prolonged extreme drought, cool season grasses decreased in frequency. However, Indian ricegrass, and Needlegrass are present on the site and the potential exists for there frequency to increase.

Summary for Key Area #1:

The drought has had a major influence on this site even Gusa2 decreased from 26% frequency in 1998 to 2% in 2004.

Standard number one is being met. The soils did exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover (ground cover had changed from 29% to 66%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 2, located in the southeast end of Englestead Pasture

Increase desirable warm-season grasses from 30% to 50% frequency
Not met, frequency changed from 35% to 10%.

This objective was progressing towards meeting objectives based on the 1997 studies data. Desirable warm season grasses had increased in frequency to 43%. Then, because of the prolonged extreme drought, warm season grasses decreased in frequency. However, sand dropseed, galleta, and blue grama are present on the site and the potential exists for there frequency to increase.

Increase desirable cool-season grasses from 30% to 40% frequency
Not met, frequency changed from 43% to 23%.

This objective was exceeded based on the 1997 studies data. Desirable cool season grasses had increased in frequency to 50%. Then, because of the prolonged extreme drought, cool season grasses decreased in frequency. However, Indian ricegrass, bottlebrush squirreltail, and wheatgrasses are present on the site and the potential exists for there frequency to increase.

Summary for Key Area #2:

This key area burned during 1985 using a prescription fire, but there was good grass recover through the 1997 monitoring studies. As a result of the drought overall plant frequencies decrease from the 1997 monitoring studies to the 2004 monitoring studies.

Standard number one is being met. The soils do exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover (ground cover had changed from 43% to 48%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 3, located in the central portion of Englestead Pasture

Maintain desirable warm-season grasses from 60% to 75% frequency
Not met, frequency changed from 66% to 43%.

Met, based on the 1997 studies data. Desirable warm season grasses had increased in frequency to 81%. Then, because of the prolonged extreme drought, warm season grasses decreased in frequency. However, sand dropseed, galleta, and blue grama are present on the site and the potential exists for there frequency to increase.

Increase desirable cool-season grasses from 18% to 40% frequency
Not met, frequency changed from 18% to 27%.

This objective was exceeded based on the 1997 studies data. Desirable cool season grasses had increased in frequency to 64%. Then, because of the prolonged extreme drought, cool season grasses decreased in frequency. However, Indian ricegrass, bottlebrush squirreltail, needlegrass, and wheatgrasses are present on the site and the potential exists for there frequency to increase.

Summary for Key Area #3:

This key area was burned and chained in 1986, by the grazing permittee. Grasses remained static through the 1997 monitoring studies, with some additional species added to the list. However, as a result of the drought overall plant frequencies decrease from the 1997 monitoring studies to the 2004 monitoring studies.

Standard number one is being met. The soils do exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover (ground cover had changed from 30% to 56%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 4, located in the northeast portion of the Tweedie Pasture

Increase warm-season grasses from 32% to 40% frequency
Not met, frequency changed from 33% to 4%.

This objective was met based on the 1990 studies data. Desirable warm season grasses had increased in frequency to 39%. Then, because of the prolonged extreme drought, warm season grasses decreased in frequency. However, sand dropseed, galleta, and blue grama are present on the site and the potential exists for there frequency to increase.

Increase cool-season grasses from 4% to 15% frequency
Not met, frequency changed from 4% to 0%.

The cool season grasses frequency has been low through the study period. This is reflected in the low winter precipitation overall since 1982.

Summary for Key Area #4:

This key area appears to have burned several different times. Based on the monitoring photos this area was burned by wildfire prior to December 1981. A note in the case file indicated that the area burned again in 1995. There appears to also have been a wildfire in 1999 (Beaver fire). The warm season grass frequency stayed fairly consistent even with fire up to the 1990 studies, then dropped off during the drought. The best years for warm season grasses were the four years following 1981, where spring and summer moisture was well above normal, which is reflected in the 1984 monitoring studies. The cool season grasses have also been consistent through the same period, but at a lower frequency. This is reflected in the low winter precipitation overall since 1982.

Standard number one is being met. The soils do exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover (ground cover had changed from 47% to 50%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 5, located in the east central portion of the Tweedie Pasture

Increase warm-season grasses from 36% to 40% frequency
Not met, frequency changed from 36% to 11%.

This objective was exceeded based the 1985, 1988, 1993, and 1998 studies data. Desirable warm season grasses had increased in frequency to 93%, 98%, 81%, and 93% respectively. Then, because of the prolonged extreme drought since 1999, warm season grasses decreased in frequency. However, sand dropseed, and side-oats grama are present on the site and the potential exists for there frequency to increase back to what it was pre-drought.

Increase desirable cool-season grasses from 8% to 15% frequency
Not met, frequency changed from 7% to 0%.

The cool season grasses frequency has been low through the study period. This is reflected in the low winter precipitation overall since 1982.

Summary for Key Area #5:

This key area was seeded in 1976 following the 1975 Tweedie Points burn. Sand dropseed was the major grass component through the 1998 monitoring studies. Because of the drought, overall plant frequencies decrease between the 1998 monitoring studies and the 2004 monitoring studies.

Standard number one is being met. The soils do exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover (ground cover had changed from 76% to 71%, which is static) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 6, located in the east central portion of the Tweedie Pasture

Maintain warm-season grasses from 42% to 50% frequency
Not met, frequency changed from 43% to 4%.

This objective was achieved based the 1984, 1987, 1988, 1993 and 1998 studies data. Then, because of the prolonged extreme drought since 1998, warm season grasses decreased in frequency. However, sand dropseed, and side-oats grama are present on the site and the potential exists for there frequency to increase back to what it was pre-drought.

Maintain cool-season grasses from 5% to 15% frequency
Not met, frequency remained at 3%.

The cool season grasses frequency has been low, but static, through the study period. This is reflected in the low winter precipitation overall since 1982.

Summary for Key Area #6:

This area has received several treatments because of wildfires. This key area was seeded in 1960 following a fire, seeded again in 1966, and again following the 1975 Tweedie Points burn. The last wildfire occurred in 1999, but was not rehabbed. Sand dropseed was the major grass component through the 1998 monitoring studies. Then, as a result of the drought and/or fire, overall plant frequencies decrease from the 1998 monitoring studies to the 2004 monitoring studies.

Standard number one is being met. The soils do exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover (ground cover had changed from 89% to 88%, which is static) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 7, located in the southeast portion of the Bin Pasture

Maintain desirable warm-season grasses from 7% to 15% frequency
Met, frequency changed from 8% to 11%.

Desirable warm season grasses had increased in frequency to 26% in 1997. Then, because of the prolonged extreme drought, warm season grasses decreased in frequency to the current 11%, which is still with in the range set for the objectives. However, sand dropseed, galleta, and blue grama are present on the site and the potential exists for there frequency to increase.

Maintain desirable cool-season grasses from 40% to 60% frequency
Not met, frequency changed from 41% to 32%.

Desirable cool season grasses decreased in frequency from 1981 to the 1985, based on monitoring studies, 41% to 29% respectfully, and have remained static since. This is reflected in the low winter precipitation overall since 1982. This decrease in frequency is due to a decrease in Poa grass.

Summary for Key Area #7:

The drought has had an influence on this site even Gusa2 and Artr2 decreased in frequency comparing studies completed in 1985 to 2004, from 39% to 13% for Gusa2 and 20% to 3% for Artr2.

Standard number one is being met. The soils did exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover (ground cover had changed from 69% to 81%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Desired Plant Community Objectives:

Key Area No. 1, located in the west end of Lower Jump Pasture
Increase Orhy composition by dry weight to 1-3%
Not met. Currently it is at 0%.

Maintain PPGG group composition by dry weight of 1-5%
Includes Stipa and Hija, (see site guide)
Met. Currently it is at 5%.

Increase Spcr Composition by dry weight to 5-15%
Not met. Currently it is at 0%.

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

Maintain Yubr composition by dry weight of 1-5%
Met. Currently it is at 1%.

Maintain Latrt composition by dry weight of 15-35%
Met. Currently it is at 33%.

Maintain forbs composition by dry weight of 3-5%
Met. Currently it is at 4%.

Increase vegetative basal cover to between 3-8%
Not met. Basal cover is currently at 0%.

Summary key area #1

Overall, this key area, because of the prolonged drought only met 5 of the 8 DPC objectives. Overall, this key area is progressing towards meeting Standard Number 3. Compare this data with the pace frequency data, which shows that the drought was a major impact to plant frequencies.

Key Area No. 2, located in the southeast end of Englestead Pasture
Maintain Orhy composition by dry weight of 5-15%
Met. Currently Orhy is at 6%.

Maintain Sihy composition by dry weight of 10-25%
Met. Currently Sihy is at 17%.

Maintain Agsm composition by dry weight of 15-25%
Met. Currently Agsm is at 17%.

Maintain Hija composition by dry weight of 10-20%
Met. Currently Hija is at 17%.

Increase Spcr composition by dry weight to 1-5%
Not met. Currently Spcr is at 0%

Maintain Atca2 b composition by dry weight of 2-10%
Met. Currently Atca2 is at 2%.

Maintain Artr2 composition by dry weight of 5-15%
Met. Currently Artr2 is at 15%.

Maintain forbs composition by dry weight of 5-15%
Met. Currently forbs are at 10%.

Increase vegetative basal cover to 3-8%
Not met. Currently basal cover is at 2%

Summary key area #2

This key area burned during 1985 using a prescription fire, but there was good grass recover through the 1997 monitoring studies. Because of the prolonged drought, this key area only met 7 of the 9 DPC objectives. The 2 objectives not met are each only 1% away from actually meeting standards. Overall, this key area is progressing towards meeting Standard Number 3.

Compare this data with the pace frequency data, which shows that the drought was a major impact to plant frequencies.

Key Area No. 3, located in the central portion of Englestead Pasture
Maintain Orhy composition by dry weight of 2-10%
Met. Currently Orhy is at 2%.

Maintain Sihy composition by dry weight of 10-20%
Met. Currently Sihy is at 16%.

Maintain Stipa composition by dry weight of 1-5%
Met. Currently Stipa is at 1%.

Maintain Hija composition by dry weight of 5-15%
Met. Currently Hija is at 9%.

Maintain Bogr2 composition by dry weight of 15-30%
Met. Currently Bogr2 is at 27%.

Reduce Artr2 composition by dry weight to 5-15%
Not met. Currently Artr2 is at 31%.

Maintain Juos composition by dry weight of 0-5%
Met. Currently Juos is at 3%.

Maintain forbs composition by dry weight of 5-15%
Met. Currently forbs are at 6%.

Maintain vegetative basal cover of 3-8%
Met. Currently basal cover is at 3%.

Summary key area #3

This key area was burned and chained in 1986. Grasses remained static through the 1997 monitoring studies, with some additional species added to the list. Overall, this key area, because of the prolonged drought, is just meeting Standard Number 3. Only 1 of the 9 objectives is not meeting, and that objective is to reduce the percent composition of sagebrush, which can only be accomplished by some form of land treatment. Compare this data with the pace frequency data, which shows that the drought was a major impact to plant frequencies.

Key Area No. 4, located in the northeast portion of the Tweedie Pasture
Increase Sihy composition by dry weight to 1-10%
Not met. Sihy is at 0%.

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

Maintain Bocu composition by dry weight of 1-5%
Met. Bocu is at 2%

Maintain Artr2 composition by dry weight of 0-5%
Met. Artr2 is at 0%

Maintain forbs composition by dry weight of 4-15%
Met. Forbs are at 4%

Increase vegetative basal cover to 3-8%
Not met. Basal cover is at 1%

Summary key area #4

This key area appears to have burned several different times. Based on the monitoring photos this area was burned by wildfire prior to December 1981. A note in the case file indicated that the area burned again in 1995. There appears to also have been a fire in 1999 (Beaver fire). Overall, this key area, because of the prolonged drought only met 3 of the 6 DPC objectives. Overall, this key area is progressing towards meeting Standard Number 3. Compare this data with the pace frequency data, which shows that the drought was a major impact to plant frequencies.

Key Area No. 5, located in the east central portion of the Tweedie Pasture
Increase Sihy composition by dry weight to 1-5%
Not met. Sihy is at 0%

Maintain Spcr composition by dry weight of 5-15%
Met. Spcr is at 12%

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

Maintain forbs composition by dry weight of 1-5%
Met. Forbs are at 3%

Increase vegetative basal cover to 3-8%
Not met. Basal cover is at 1%

Summary key area #5

This key area was seeded in 1976 following the 1975 Tweedie Points burn. Overall, this key area, because of the prolonged drought only met 2 of the 5 DPC objectives. Overall, this key area is progressing towards meeting Standard Number 3. Compare this data with the pace frequency data, which shows that the drought was a major impact to plant frequencies.

Key Area No. 6, located in the east central portion of the Tweedie Pasture
Increase Orhy composition by dry weight to 1-5%
Not met. Orhy is at 0%

Maintain Sihy composition by dry weight of 1-5%
Met. Sihy is at 2%

Maintain Spcr composition by dry weight of 10-30%
Met. Spcr is at 10%

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

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

Maintain forbs composition by dry weight of 1-10%
Met. Forbs are at 54%

Maintain Juos composition by dry weight of 0-10%
Met. Juos is at 4%

Increase vegetative basal cover to 3-8%
Not met. Basal cover is at 1%

Summary key area #6

This area has received several treatments because of wildfires. This key area was seeded in 1960 following a fire, seeded again in 1966, again following the 1975 Tweedie Points burn. The last wildfire occurred in 1999, but was not rehabbed afterwards. Overall, this key area, because of the prolonged drought only met 4 of the 8 DPC objectives. Overall, this key area is progressing towards meeting Standard Number 3. Compare this data with the pace frequency data, which shows that the drought was a major impact to plant frequencies.

Key Area No. 7, located in the southeast portion of the Bin Pasture

Increase Orhy composition by dry weight to 15%
Not met. Orhy is at 0%

Maintain Sihy composition by dry weight of 1-5%
Met. Sihy is at 2%

Maintain Hija composition by dry weight of 5-20%
Met. Hija is at 16%

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

Increase Bogr2 composition by dry weight to 1-3%
Not met. Bogr2 is at 0%

Maintain forbs composition by dry weight of 5-10
Not met. Forbs are at 1%

Maintain Come composition by dry weight of 1-5%
Met. Come is at 3%

Maintain Artr2 composition by dry weight of 0-15%
Met. Artr2 is at 2%

Reduce Juos composition by dry weight to 0-5%
Not met. Juos is at 28%

Increase vegetative basal cover 3-8%
Not met. Basal cover is at 1%

Summary key area #7

Overall, this key area, because of the prolonged drought only met 4 of the 10 DPC objectives are being met. Overall, this key area is progressing towards meeting Standard Number 3. Compare with the pace frequency data, which shows that the drought was a major impact to plant frequencies.

B. Pertaining to Issues

1. Issues relating to Rangeland Health

a. De-watered springs at Upper Jump Spring and Lower Jump Spring.

This is essentially a legal issue concerning water rights that involves the State of Arizona and is beyond the scope of this document.

b. Wildlife access to spring sources at Upper Jump Spring and Lower Jump Spring.

Wildlife do not have ready access to one of the five springs in the Upper Jump Spring area, because that spring is fenced, and access for big game would be difficult. The IAT discussed if the fence was really needed, because of the way it is situated on the hillside, and the small size of the source and the amount of water at the source. Team members whom knew some of the history of the area thought that the area was fenced to better control domestic sheep when they were herded through the area. However, if water is not available in the ring tanks once the cattle are moved, wildlife may not have access to water in the allotment.

No water is available at Lower Jump Spring except for the livestock watering troughs, which due have water in them year-round, and they are not fence.

c. Vegetative diversity in Sec 36 and 35, in the western portion of the allotment.

Diversity based on study information for key area #1 is actually quite good. The key area data sheets describes over 16 perennial plant species actually recorded from the study transects, if all plants in the key area would have be recorded, even if they were not detected within the plot frame, then several more species would have been noted. The site guide lists 25 perennial plant species not counting plant categories such as "other grasses"; "other shrubs"; or annual grasses and forbs. All plants listed in the site guide are present in the plant communities maybe just not within the key area.

d. Productivity low in treated/burned areas in Sec 21, 22, 16 (state) and 15 in the central portion of the allotment.

The recent fires have removed much of the overstory shrubs and pinyon/juniper resulting in low productivity of perennial vegetation. However, during the field tour, it was noticed that there was an

almost continuous presence of forbs in areas where wildfires have burned. At key areas 5 & 6 where a wildfire burned about 6 years ago there was a substantial amount of forbs. Other key areas contained adequate amounts of forbs.

Annual production is based on timing, frequency, and amount of precipitation. As shown in key areas 5 & 6, which was burned and currently in a major drought , and additional studies data collected in burned over areas, perennial plants are increasing. Annuals usually abound if given adequate amounts of precipitation at the right time.

A similar determination was made on an S&G field trip to the Sullivan Tank Allotment on June 30, 2004, that burned/treated areas are recovering adequately.

Further, the IAT felt that these sites were meeting Standard Number 1. The IAT did feel that due to land treatments, drought, sagebrush and pinyon-juniper encroachment that Standard Number 3 was only progressing slowly towards meeting on many sites. However, new DPC objectives were established at the time of this assessment based on the site potential at each key area. Many of these objectives would not be attainable for several years. The IAT felt that lack of attainment for DPC objectives was do to past vegetation treatments and drought. The IAT felt that current livestock grazing was not precluding attainment based on supporting documentation and on site observation.

d. <u>Erosion Sec 4, 3, 34 and 35 in the far eastern portion of the allotment.</u>

Key area #3 is within the area identified as having erosion concerns. At key area #3 litter and essentially ground cover, are showing improving trends. The IAT determined that the site did not necessarily show accelerated erosion, but to some members the area actually looked better than they had remembered it as. The IAT also, determined that current erosion conditions are not related to current livestock grazing practices, but was consistent with site guide, which identifies the erosion hazard of being from slight to moderate. The IAT further determined that grazing practices alone would not likely provide for better infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites, but that the site would need some form of land treatment (spike, burning etc.) to the sagebrush and pinyon-juniper vegetation communities to restore areas of low infiltration or permeability.

CONCLUSIONS

Arizona Standards for Rangeland Health

Standard 1. Upland Sites.

This allotment is classified in the 1992 RMP as Watershed Category IV. This means that the watershed units currently are in unsatisfactory erosion condition, and are susceptible to wind and water erosion following disturbance, but would be responsive to treatment.

Ground cover was measured at all 7 key areas. Litter accumulation, one attribute of ground cover, was improving on 5 key areas, but remained static on 2. Ground cover was improving at 3 key areas, but remained static on 4. All four key areas where ground cover remained static has burned at least once since the 1980's some key areas have burned more than three times. However, on most key areas plants, litter, and rock are present in pattern, kind, and amount sufficient to prevent accelerated erosion. The vegetative cover (basal) at the study sites were similar to or lower than what is suggested in the ecological site guides. One key area is at PNC, one is in late seral, three are at mid seral, and two key areas are in early seral. All but two key areas have burned once to more than three times.

While some key areas have been burned over in the past and still suffer to some degree from wildfires, all key areas suffered from the drought as evidenced by analyses and supporting documentation referenced herein where the data shows that drought has played a major role in vegetation changes particularly between 1998 and 2004. All key areas are considered to be functioning properly or trending towards attainment of Standard 1.

Standard 2. Riparian-Wetland sites

There are no riparian areas in the Jump Canyon Allotment.

Standard 3. Desired Resource Conditions.

About 60% of the DPC objectives are being met, this is due in part to past wildfires and the recent drought as evidenced by analyses and supporting documentation referenced herein where the data shows that drought has played a major role in vegetation changes particularly between 1998 and 2004. An assessment at key areas relative to criteria for meeting standards, and indicators of rangeland health, resulted in a determination that key areas are making significant progress towards meeting standard #3. However, because of the affects of drought this process was set back some. In spite of the drought, the IAT determined based on supporting documentation and on site observation that native species are present; and re-sprouting was occurring, which is moving the community in the desired direction.

In conclusion, the amount and timing of precipitation has affected the frequency of plant species and other vegetation attributes, past wildfire too has had an impact. However, it was drought, not livestock grazing that was the causal factors in the area not meeting DPC objectives, and current livestock grazing would not be a limiting factor in the area achieving DPC objectives. Between 1992 and 1996, utilization levels were only above the 50% allowable twice (51%) on one key area and the same key species both years. By 1993 livestock grazing permittees were using just over 50% of their permitted AUMS, except for 1995 where precipitation was 131% of average and 75% of permitted AUMs were used. By the year 2000 the permittees use of the allotted AUMs had dropped down to 42%, and by 2003 permittees were only using 28% of their AUMs.

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

Based on the analyses and supporting documentation referenced herein, resource conditions on the Jump Canyon allotment:

[ ] Meet all applicable standards for rangeland health

[X] Are making significant progress toward meeting the applicable standards for rangeland health

Do not meet the standards for rangeland health for:

[ ] No. 1: Upland sites
[ ] No. 2: Riparian-Wetland sites
[ ] No. 3: Desired Resource Conditions

[ ] Have not been sufficiently documented to make a specific determination, but there is no reason to believe that current management would preclude meeting the standards for rangeland health

VI. Recommendations

A. Renew the ten-year grazing permit on Jump Canyon allotment with current terms and conditions.

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

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

B. In areas that burned during the summer of 2005, and were seeded, allow 2 years of rest at a minimum to allow recovery of the vegetation. When livestock grazing is allowed back in to the burned areas these areas should be monitored more intensely to see just what the vegetative response would ultimately be and ensure livestock use is not negatively affecting the vegetation recovery.

D. All waters in this allotment should be modified as needed so that waters are safe and available for wildlife.

AUTHORIZED OFFICER CONCURRENCE:

X I concur with the conclusions and recommendations as written.

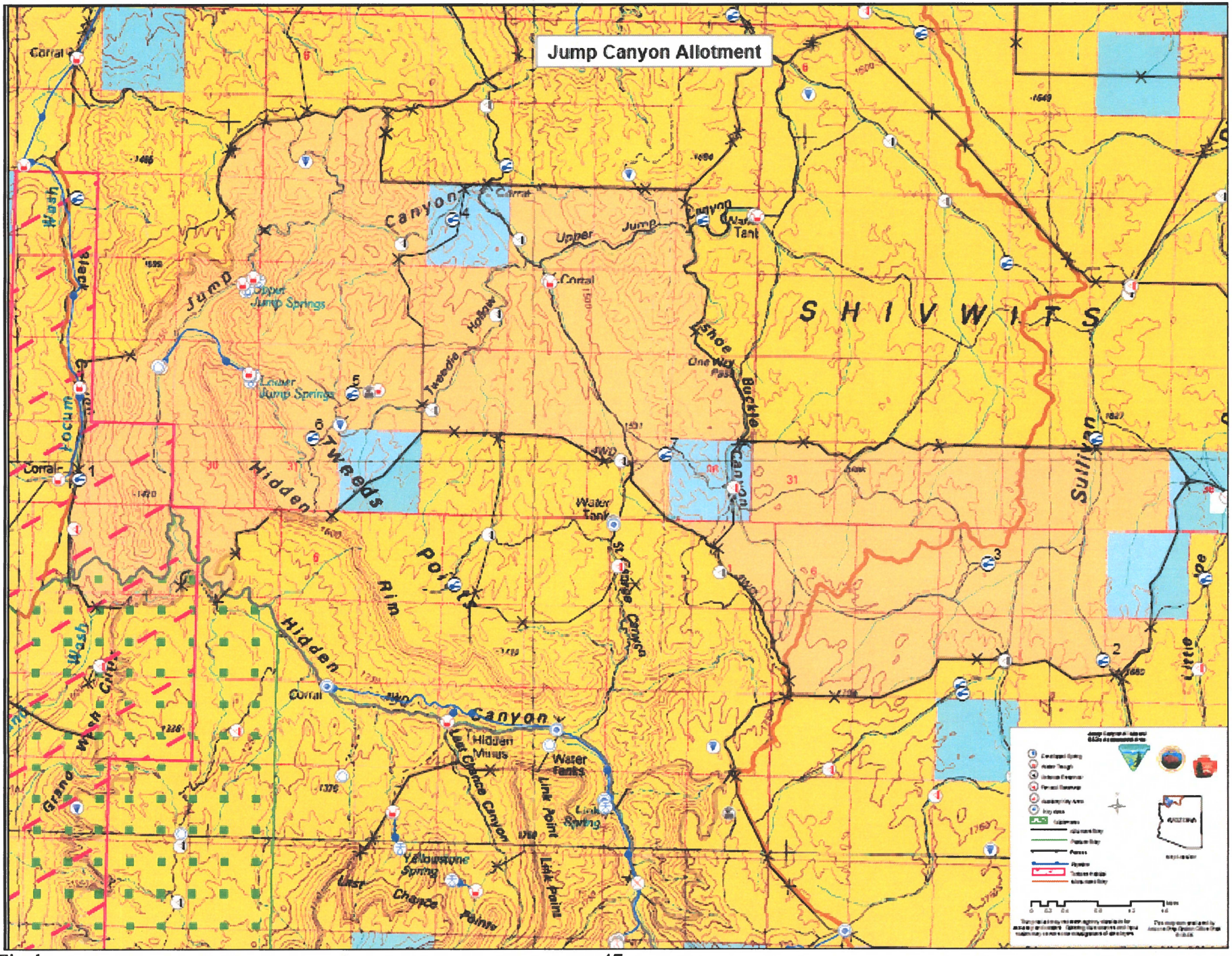
_____ I do not concur.

_____ I concur, with the following modifications:

Dennis Curtis 9/28/07

Manager
Grand Canyon Parashant National Monument

Date


Jump Canyon Allotment
Corral
Upper Jump Springs
Lower Jump Springs
Corral
Water Tank
Corral
Water Tank
Corral
Water Tanks
Link Spring
Yellowstone Spring
Hidden Mesa
Jump Canyon
Upper Jump Canyon
Hidden Canyon
Tweeds Canyon
Hidden Rim
Point
St George Canyon
Focum Wash
Grand Wash Cliffs
Link Point
Little Ope
Sullivan
Bugsle
Shoe
One Way Pass
Last Chance Canyon
Last Chance
Paiute
S H I V W I T S

Appendix A

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." These checklists are reprinted on the pages following the Guidelines for Standard 3.

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 435-688-3241	Project Coordinator (BLM)
Mike Small 435-688-3224	Wildlife Biologist (BLM)
Michelle Bailey 435-688-3260	Wilderness/Recreation Specialist (BLM)
Bob Smith 435-688-3245	Soils and Hazmat (BLM)
John Sims	Wildlife Manager (Arizona Game and Fish Department)
Kyle Spencer 520-643-7062	Soils and Vegetation (Natural Resource Conservation Service)
Rob Grumbles 520-753-3788	Vegetation and Social Economics (Mohave County Extension Service)
Vernon Parent 435-634-5706	Vegetation and Social Economics (Washington County Extension Service)
Robert Price 928-774-5045	Field Supervisor (Arizona Game and Fish Department)

Rangeland Resource Team

Commodity Interests

Bill Gubler, Grazing
Rancher, St. George, UT

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

Local Area Interests

Kent McComb, Public-at-Large
Retired, St. George, UT

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

Non-Commodity Interests

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

Spence Esplin, Historical
Retired, St. George, UT

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

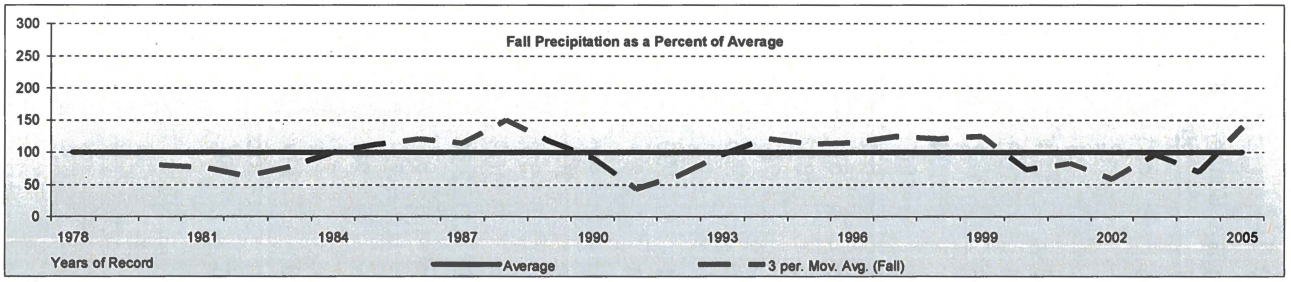
Appendix C:

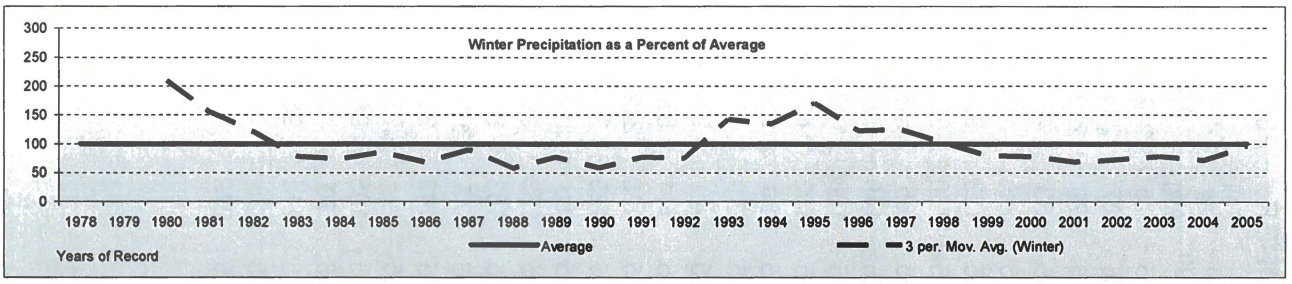
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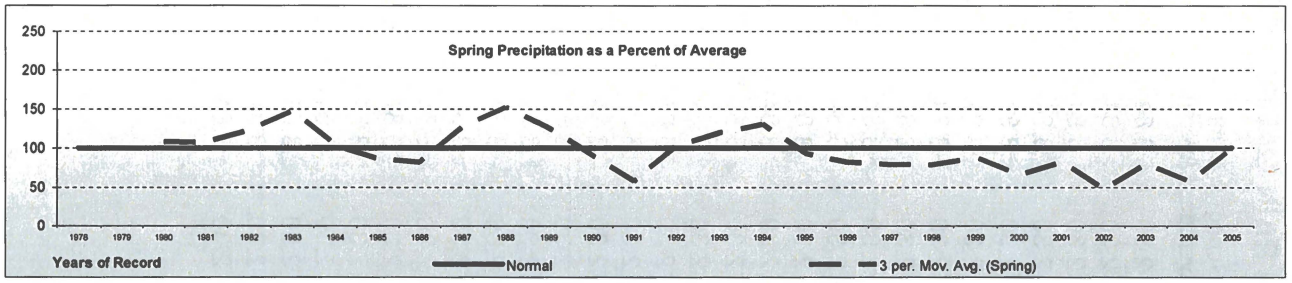
Sullivan Tank PRECIPITATION RAIN GAUGE NUMBER: 25 Page 1

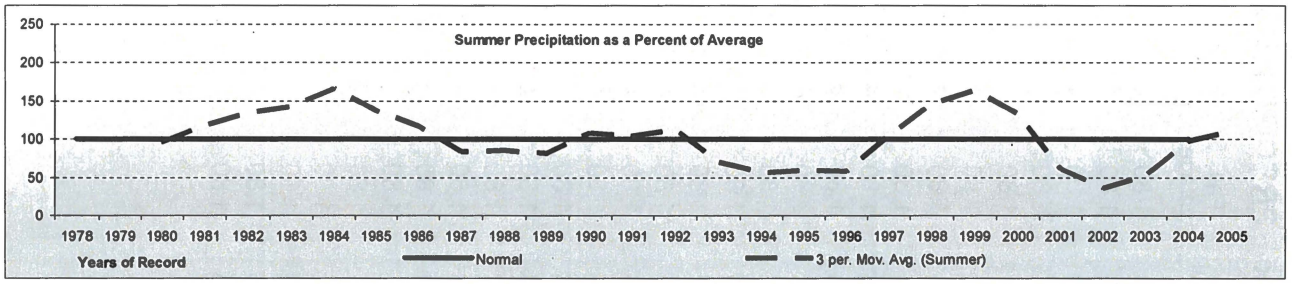
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1978	1.4	10.0	3.8	1.9	17.0	1.80	4.71	2.30	3.84	12.65	75	212	165	49	134
1979	1.6	9.6	2.0	4.5	17.8	1.80	4.71	2.30	3.84	12.65	87	204	87	118	140
1980	1.4	10.0	1.6	4.6	17.7	1.80	4.71	2.30	3.84	12.65	79	212	71	121	140
1981	1.1	2.3	3.7	4.4	11.5	1.80	4.71	2.30	3.84	12.65	63	48	163	114	91
1982	0.9	4.8	3.1	6.4	15.1	1.80	4.71	2.30	3.84	12.65	48	102	134	166	120
1983	2.2	4.0	3.4	5.7	15.2	1.80	4.71	2.30	3.84	12.65	123	85	146	147	120
1984	2.3	1.7	0.7	7.1	11.8	1.80	4.71	2.30	3.84	12.65	130	36	30	184	93
1985	1.5	6.5	1.9	3.1	13.0	1.80	4.71	2.30	3.84	12.65	85	138	82	80	102
1986	2.7	1.5	3.1	3.3	10.6	1.80	4.71	2.30	3.84	12.65	149	32	133	87	84
1987	1.9	4.7	3.8	3.3	13.8	1.80	4.71	2.30	3.84	12.65	108	100	166	87	109
1988	3.5	1.9	3.6	3.2	12.2	1.80	4.71	2.30	3.84	12.65	192	41	156	83	96
1989	0.9	4.4	1.2	2.9	9.4	1.80	4.71	2.30	3.84	12.65	50	93	53	76	74
1990	0.6	2.1	1.5	6.4	10.5	1.80	4.71	2.30	3.84	12.65	31	44	65	165	83
1991	0.9	4.6	1.2	2.8	9.5	1.80	4.71	2.30	3.84	12.65	49	97	54	73	75
1992	2.0	4.1	4.4	3.9	14.3	1.80	4.71	2.30	3.84	12.65	111	87	191	100	113
1993	2.3	11.4	2.6	1.4	17.8	1.80	4.71	2.30	3.84	12.65	128	242	114	37	140
1994	2.3	3.5	2.0	1.3	9.0	1.80	4.71	2.30	3.84	12.65	125	75	86	33	71
1995	1.6	9.2	1.9	4.1	16.8	1.80	4.71	2.30	3.84	12.65	86	195	81	108	132
1996	2.4	4.7	1.8	1.4	10.3	1.80	4.71	2.30	3.84	12.65	133	99	80	36	81
1997	2.8	3.8	1.8	6.5	14.8	1.80	4.71	2.30	3.84	12.65	153	80	76	169	117
1998	1.4	6.1	1.8	9.0	18.3	1.80	4.71	2.30	3.84	12.65	77	128	79	234	144
1999	2.6	1.4	2.5	3.5	10.0	1.80	4.71	2.30	3.84	12.65	143	31	109	91	79
2000		3.6	0.3	2.7	6.6	1.80	4.71	2.30	3.84	12.65		77	11	71	52
2001	1.9	4.6	2.9	0.8	10.1	1.80	4.71	2.30	3.84	12.65	105	98	125	20	80
2002	1.3	2.0	0.1	0.8	4.2	1.80	4.71	2.30	3.84	12.65	70	42	5	20	33
2003	2.0	4.5	2.5	4.5	13.5	1.80	4.71	2.30	3.84	12.65	111	95	109	117	107
2004	0.5	3.7	1.4	6.0	11.5	1.80	4.71	2.30	3.84	12.65	28	77	60	156	91
2005	5.0	5.5	3.0	2.3	15.8	1.80	4.71	2.30	3.84	12.65	279	117	131	59	125

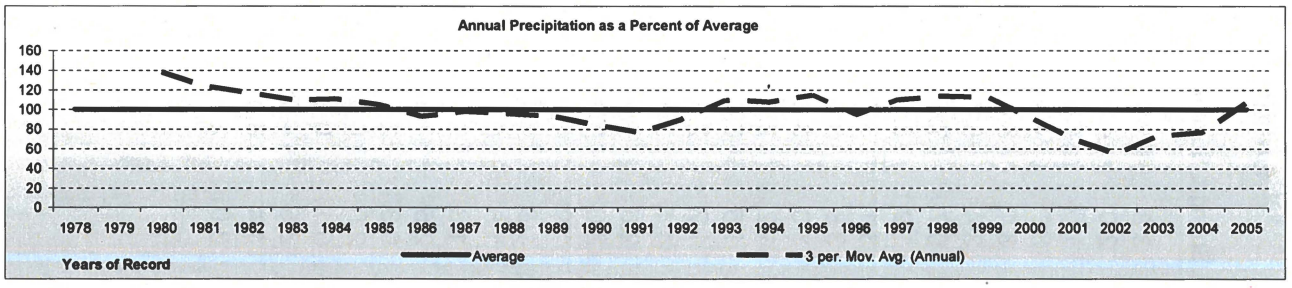
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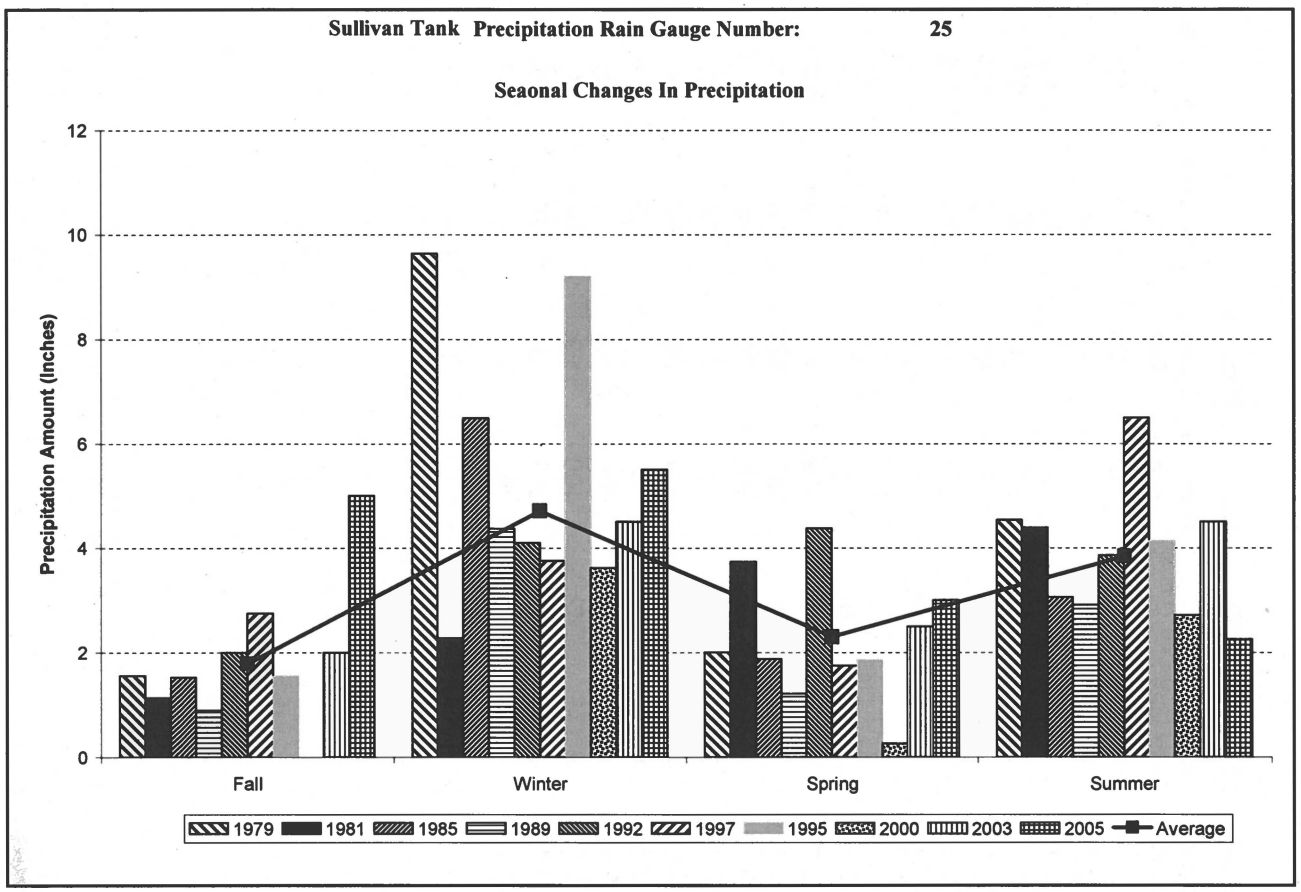


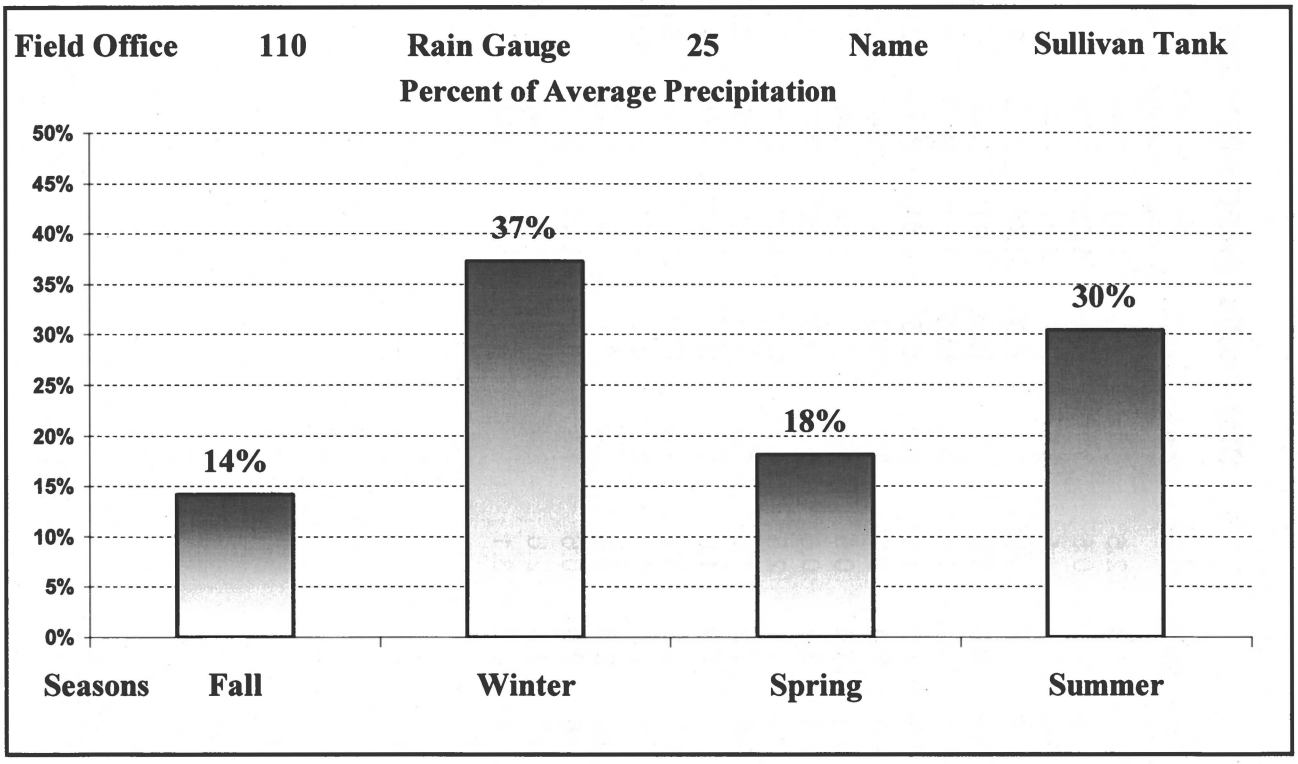








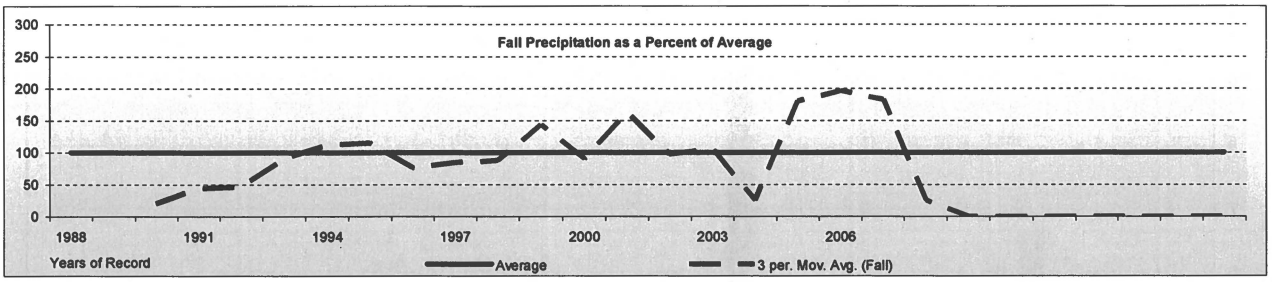

Sullivan Tank Precipitation Rain Gauge Number: 25
Seaonal Changes In Precipitation
Precipitation Amount (Inches)
12
10
8
6
4
2
0
Fall
Winter
Spring
Summer
1979 1981 1985 1989 1992 1997 1995 2000 2003 2005 Average

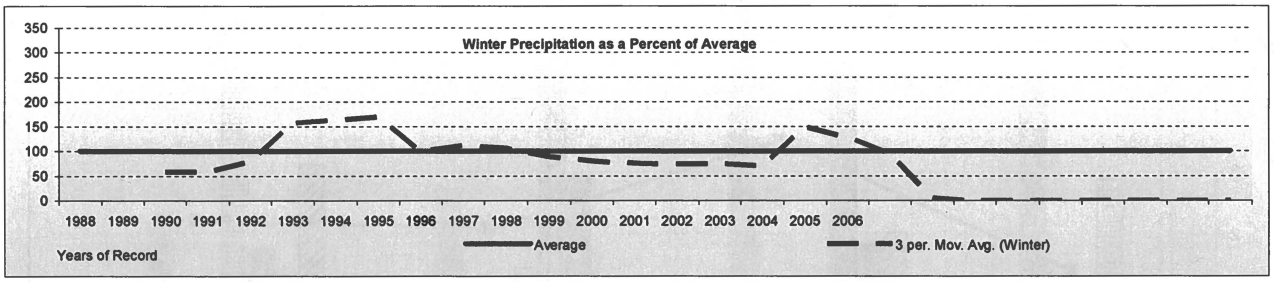

Field Office 110 Rain Gauge 25 Name Sullivan Tank
Percent of Average Precipitation
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
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14%
37%
18%
30%
Seasons Fall Winter Spring Summer

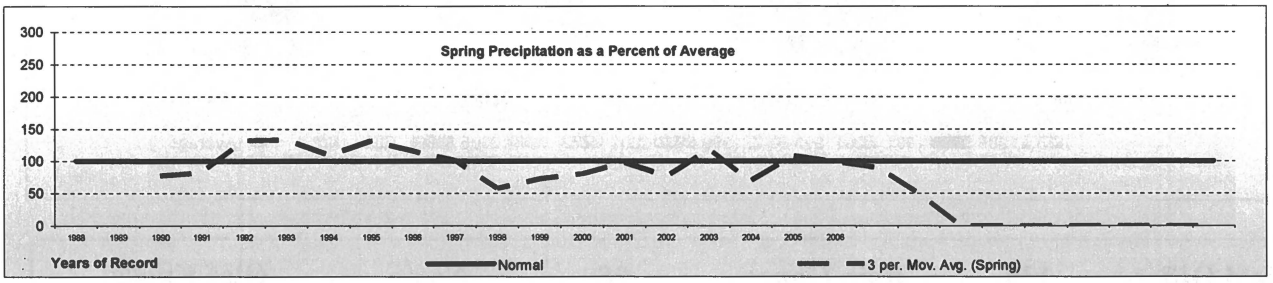
Olaf Knolls PRECIPITATION RAIN GAUGE NUMBER: 08 Page 1

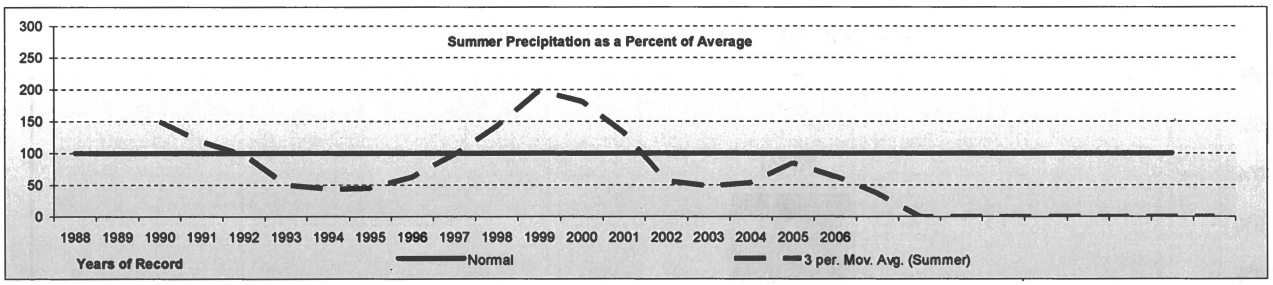
Year	Fall	Winter	Spring	Summer	Annual	Fall Average	Winter Average	Spring Average	Summer Average	Annual Average	Fall % Avg	Winter % Avg	Spring % Avg	Summer % Avg	Annual % Avg
1988		1.8	2.6	3.1	7.5	1.41	3.49	2.08	2.19	9.17		53	125	141	82
1989	0.5	2.0	0.8	3.1	6.4	1.41	3.49	2.08	2.19	9.17	38	58	37	141	70
1990	0.3	2.3	1.5	3.6	7.7	1.41	3.49	2.08	2.19	9.17	23	65	71	166	84
1991	1.0	1.8	2.9	1.1	6.8	1.41	3.49	2.08	2.19	9.17	70	53	141	49	75
1992	0.7	4.3	3.9	1.7	10.6	1.41	3.49	2.08	2.19	9.17	48	124	185	78	115
1993	2.2	10.3	1.5	0.5	14.5	1.41	3.49	2.08	2.19	9.17	154	296	73	23	158
1994	1.9	2.5	1.5	0.7	6.5	1.41	3.49	2.08	2.19	9.17	134	70	71	31	71
1995	0.8	5.0	5.2	1.8	12.7	1.41	3.49	2.08	2.19	9.17	57	142	252	80	139
1996	0.5	3.0	0.5	1.7	5.7	1.41	3.49	2.08	2.19	9.17	38	86	25	77	62
1997	2.3	3.8	0.6	3.0	9.6	1.41	3.49	2.08	2.19	9.17	160	109	27	135	104
1998	0.9	4.4	2.5	4.7	12.6	1.41	3.49	2.08	2.19	9.17	66	125	121	216	137
1999	2.9	1.2	1.5	5.3	10.9	1.41	3.49	2.08	2.19	9.17	205	34	70	243	118
2000		2.8	1.0	1.9	5.7	1.41	3.49	2.08	2.19	9.17		81	49	84	62
2001	4.0	3.9	3.7	1.5	13.0	1.41	3.49	2.08	2.19	9.17	283	111	176	67	142
2002	0.1	1.1	0.1	0.3	1.7	1.41	3.49	2.08	2.19	9.17	10	32	5	15	18
2003	0.3	2.8	3.6	1.4	8.1	1.41	3.49	2.08	2.19	9.17	23	79	173	63	88
2004	0.6	3.5	0.6	1.8	6.5	1.41	3.49	2.08	2.19	9.17	42	100	29	82	71
2005	6.7	9.3	2.6	2.4	20.9	1.41	3.49	2.08	2.19	9.17	474	267	123	107	228
2006	1.1	0.6	3.1		4.7	1.41	3.49	2.08	2.19	9.17	75	16	147		51

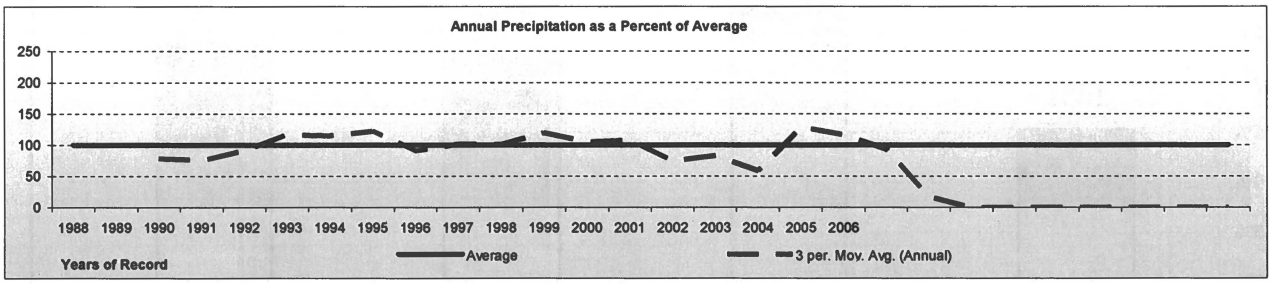
Olaf Knolls Precipitation rain gauge number 08





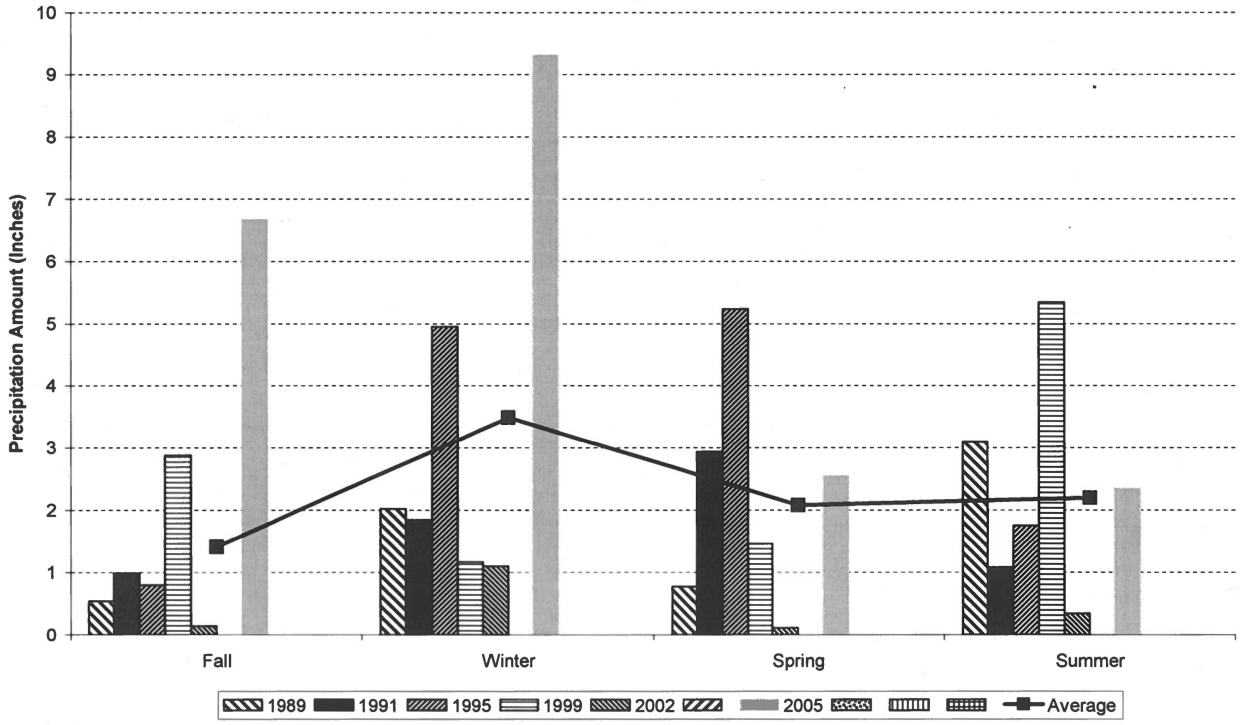






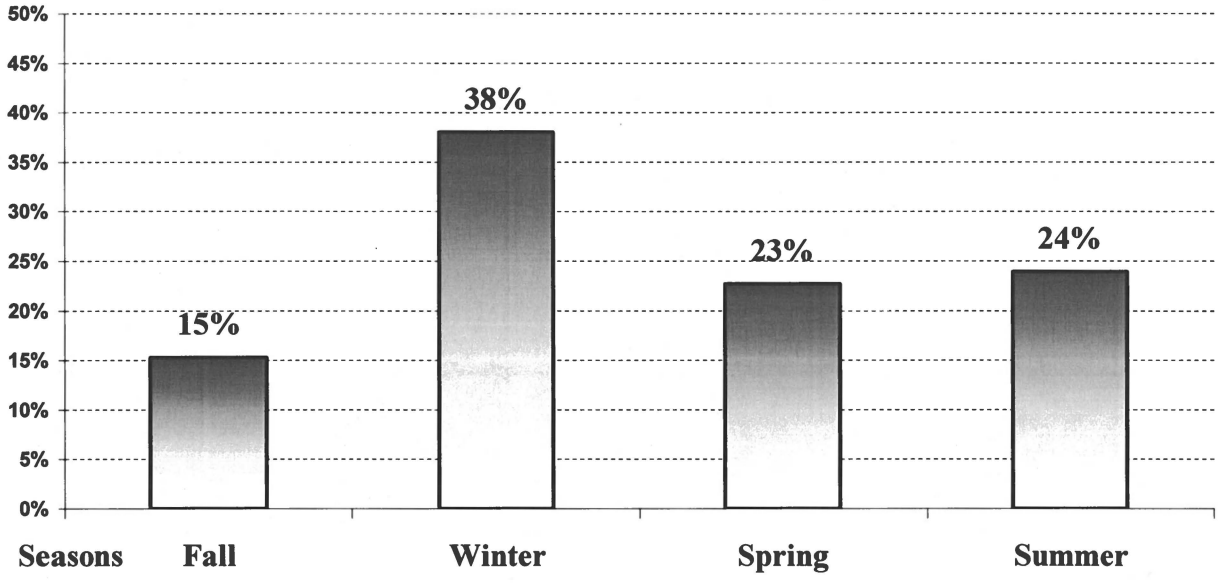
Olaf Knolls Precipitation Rain Gauge Number: 08

Seaonal Changes In Precipitation



Field Office 130 Rain Gauge 08 Name Olaf Knolls

Percent of Average Precipitation



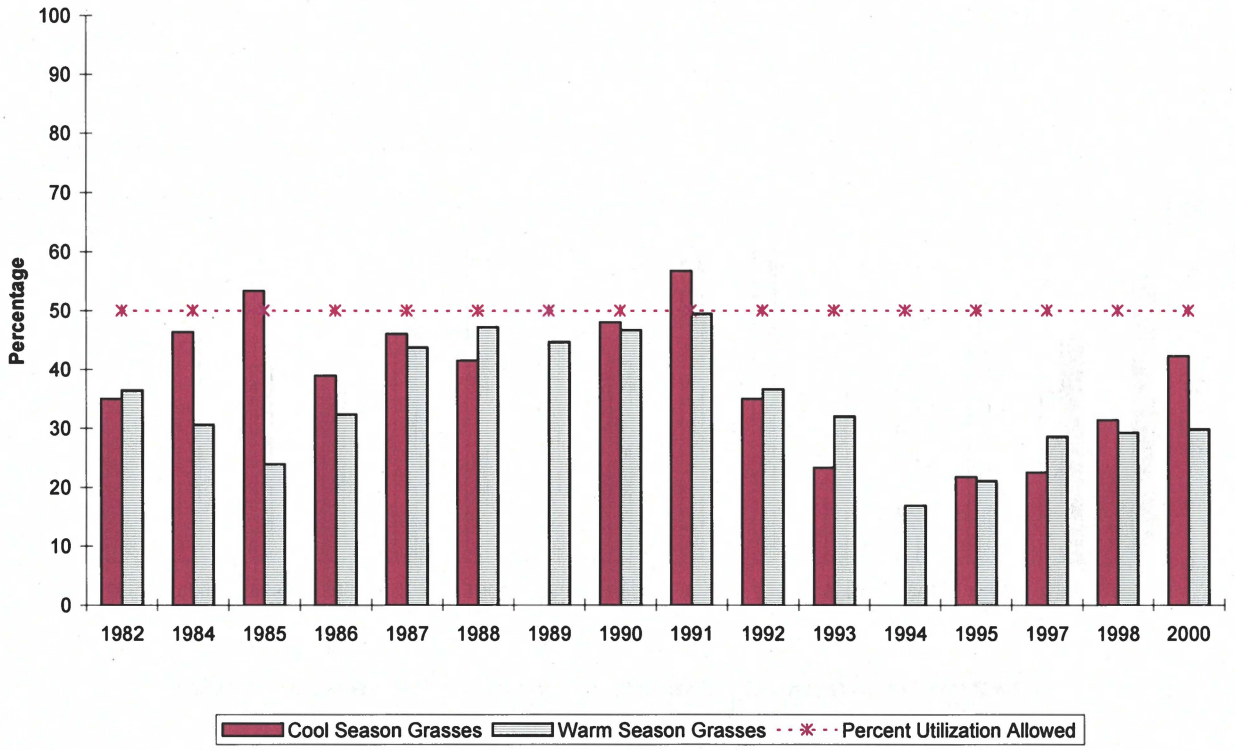
Appendix D:

Utilization Data

ARIZONA STRIP					UTILIZATION STUDY SUMMARY												09/01/04	
ALLOTMENT = JUMP CANYON					PASTURE = TWEEDIE							KEY AREA NUMBER = 6				Page 1		
Utilization expressed as a percent use for each species as of the particular year read.																		
Cool Season Grasses																		
	1982	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1997	1998	2000		
ORHY		46	65	39	46	42		48	57	35	23		22	23	31	42		
SIHY			30															
AGCR	63																	
POA	32																	
AVERAGE	35	46	53	39	46	42		48	57	35	23		22	23	31	42		
WARM SEASON GRASSES																		
SPCR	36	33	25	32	44	47	46	46	49	36	34	16	16	28	29	30		
BOCU		12	10	32	45	47	20	50	55	40	28	18	35	30	31	29		
AVERAGE	36	31	24	32	44	47	45	47	49	37	32	17	21	29	29	30		

Allotment: JUMP CANYON **Pasture: TWEEDIE** **Key Area: 6**

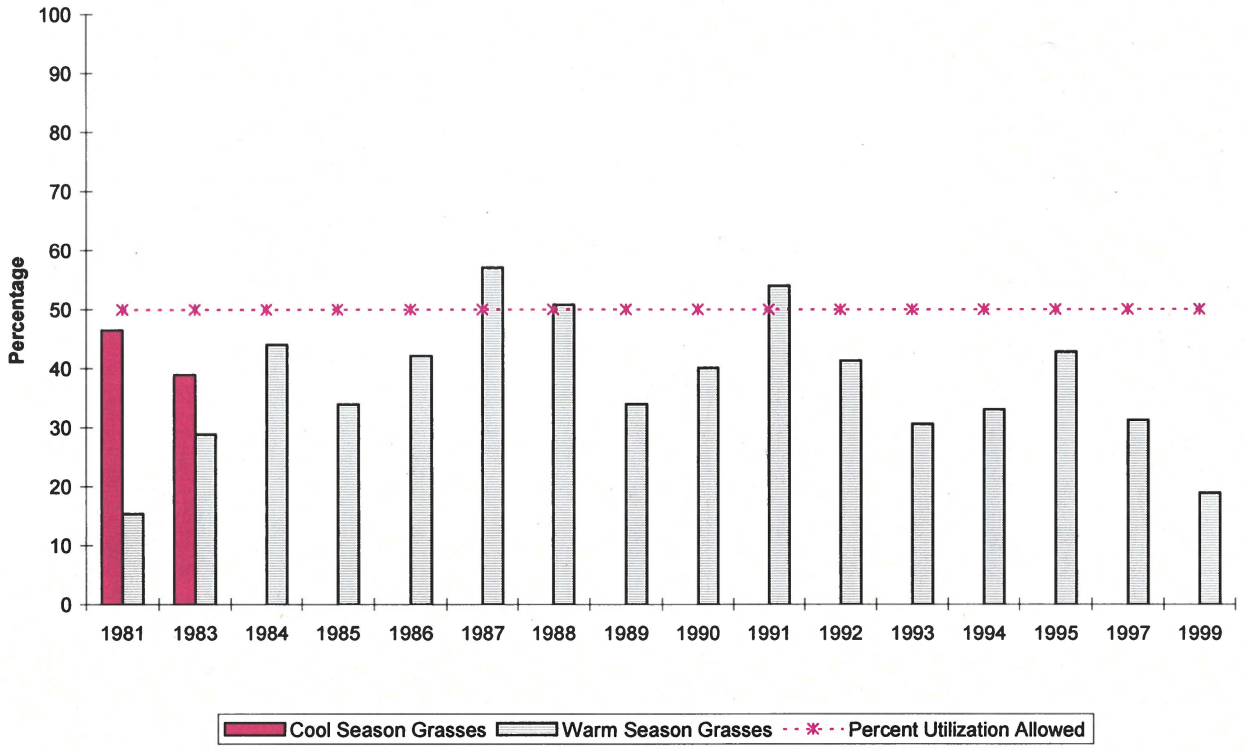
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY													09/01/04
ALLOTMENT = JUMP CANYON					PASTURE = TWEEDIE						KEY AREA NUMBER = 5					Page 1		
Utilization expressed as a percent use for each species as of the particular year read.																		
Cool Season Grasses																		
	1981	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1997	1999		
AGCR	47	39																
AVERAGE	47	39																
WARM SEASON GRASSES																		
SPCR	15	29	49	38	47	61	49	47	42	55	42	28	41	44	34	22		
BOCU			16	22	23	52	52	13	37	53	40	33	23	41	28	14		
AVERAGE	15	29	44	34	42	57	51	34	40	54	41	31	33	43	31	19		
BROWSE																		

Allotment: JUMP CANYON **Pasture: TWEEDIE** **Key Area: 5**

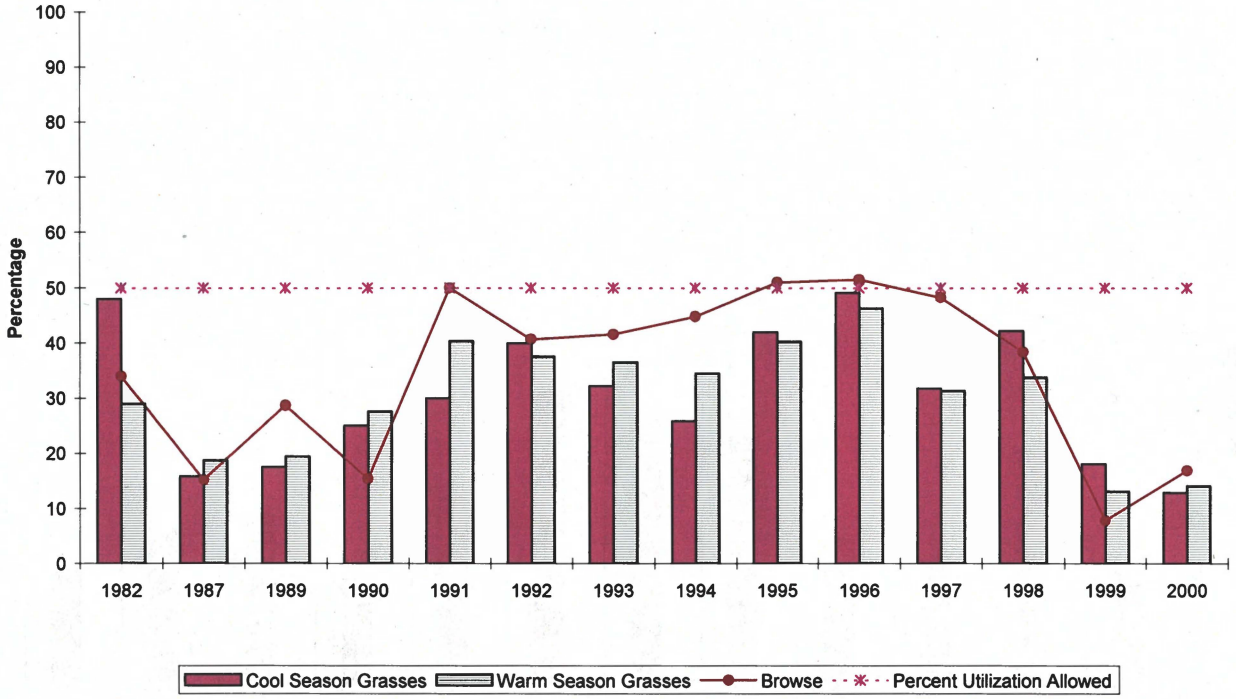
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY													09/01/04
ALLOTMENT = JUMP CANYON					PASTURE = TWEEDIE						KEY AREA NUMBER =			1	Page 1			
Utilization expressed as a percent use for each species as of the particular year read.																		
Cool Season Grasses																		
	1982	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000				
ORHY	48	16	18	25	30	40	32	26	42	49	32	42	18	13				
AVERAGE	48	16	18	25	30	40	32	26	42	49	32	42	18	13				
WARM SEASON GRASSES																		
SPCR	39	23	20	25	37	35	34	30	41	50	31	38	16	13				
HIRI	28	13	18	30	43	39	38	38	40	44	32	31	10	15				
AVERAGE	29	19	19	28	40	38	37	34	40	46	31	34	13	14				
BROWSE																		
EPNE	34	15	29	15	50	41	42	45	51	51	48	38	8	17				
AVERAGE	34	15	29	15	50	41	42	45	51	51	48	38	8	17				

Allotment: JUMP CANYON **Pasture: TWEEDIE** **Key Area: 1**

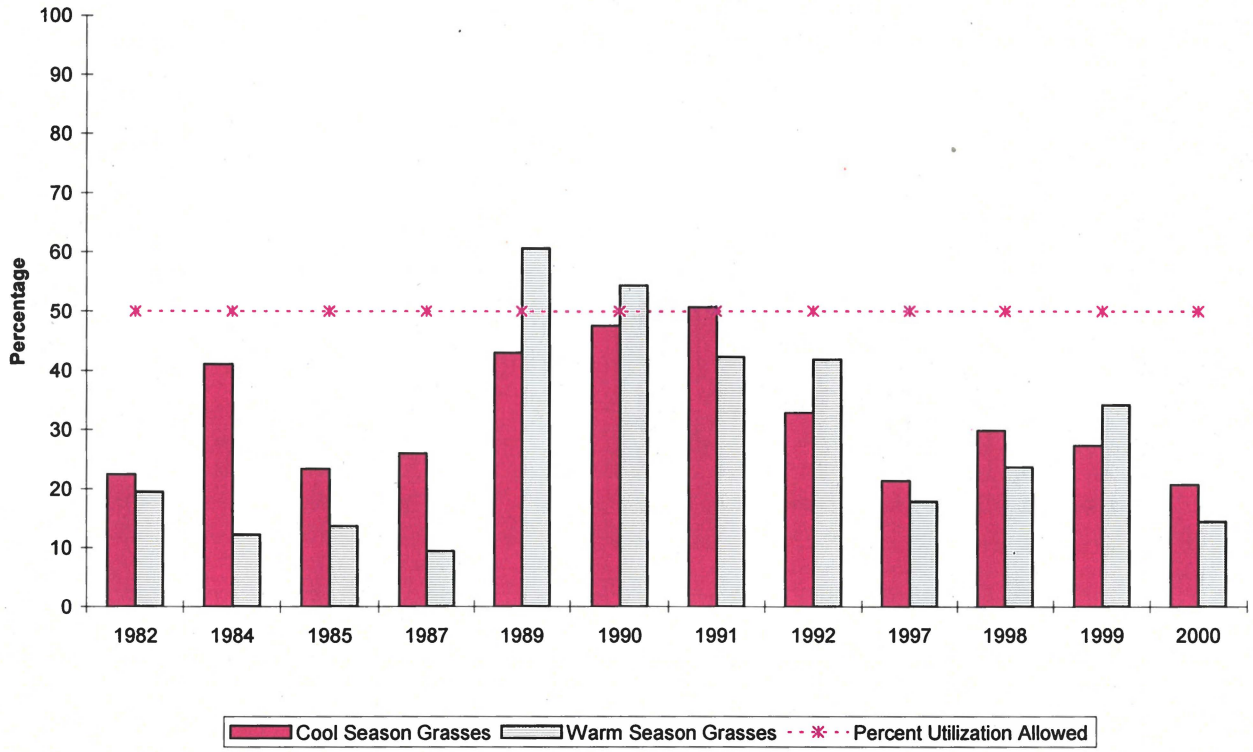
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY													09/01/04
ALLOTMENT = JUMP CANYON					PASTURE = ENGLESTEAD					KEY AREA NUMBER = 2			Page 1					
Utilization expressed as a percent use for each species as of the particular year read.																		
Cool Season Grasses																		
	1982	1984	1985	1987	1989	1990	1991	1992	1997	1998	1999	2000						
ORHY	30	29	32	44	59	54	49	34	23	29	29	27						
SIHY	20	27	21	20	34	50	51	35	23	29								
AGSM	23																	
AGROPY		51	22	25	46	45	51	31	18	31	25	14						
AVERAGE	22	41	23	26	43	47	51	33	21	30	27	21						
WARM SEASON GRASSES																		
HIJA	18	12	14	9	61	54	42	42	18	24	34	14						
BOGR	20																	
AVERAGE	20	12	14	9	61	54	42	42	18	24	34	14						

Allotment: JUMP CANYON **Pasture: ENGLESTEAD** **Key Area: 2**

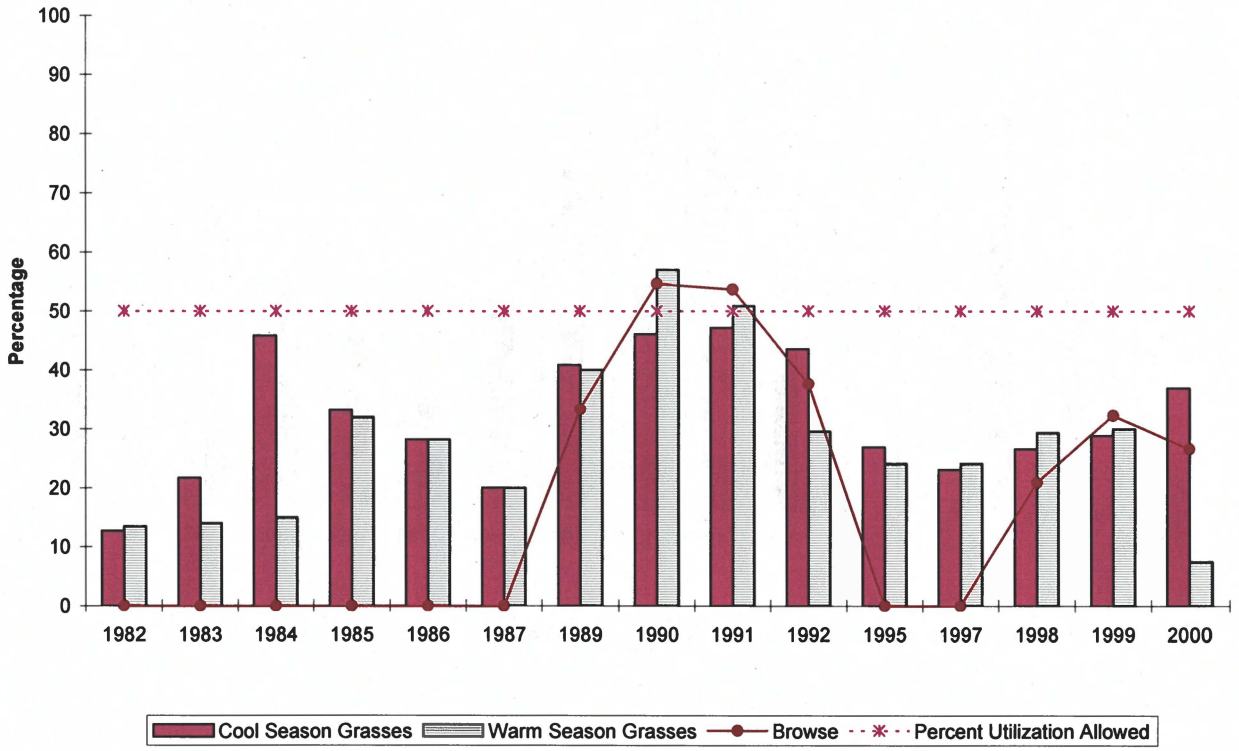
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY										09/01/04			
ALLOTMENT = JUMP CANYON					PASTURE = ENGLESTEAD						KEY AREA NUMBER = 3				Page 1			
Utilization expressed as a percent use for each species as of the particular year read.																		
Cool Season Grasses																		
	1982	1983	1984	1985	1986	1987	1989	1990	1991	1992	1995	1997	1998	1999	2000			
ORHY	30		42	53	28	20					27	23	25	29	38			
SIHY	10	22	47	28	28	20	40	50	44	42	27	23	25	29	38			
AGROPY							41	44	49	45	27	22	30	28	34			
AVERAGE	13	22	46	33	28	20	41	46	47	44	27	23	27	29	37			
WARM SEASON GRASSES																		
HIJA	18	14	15	32	28	20	40	57	51	30	24	24	29	30	8			
BOGR	10																	
AVERAGE	13	14	15	32	28	20	40	57	51	30	24	24	29	30	8			
BROWSE																		
COME							33	55	54	38			21	32	27			
AVERAGE							33	55	54	38			21	32	27			

Allotment: JUMP CANYON **Pasture: ENGLESTEAD** **Key Area: 3**

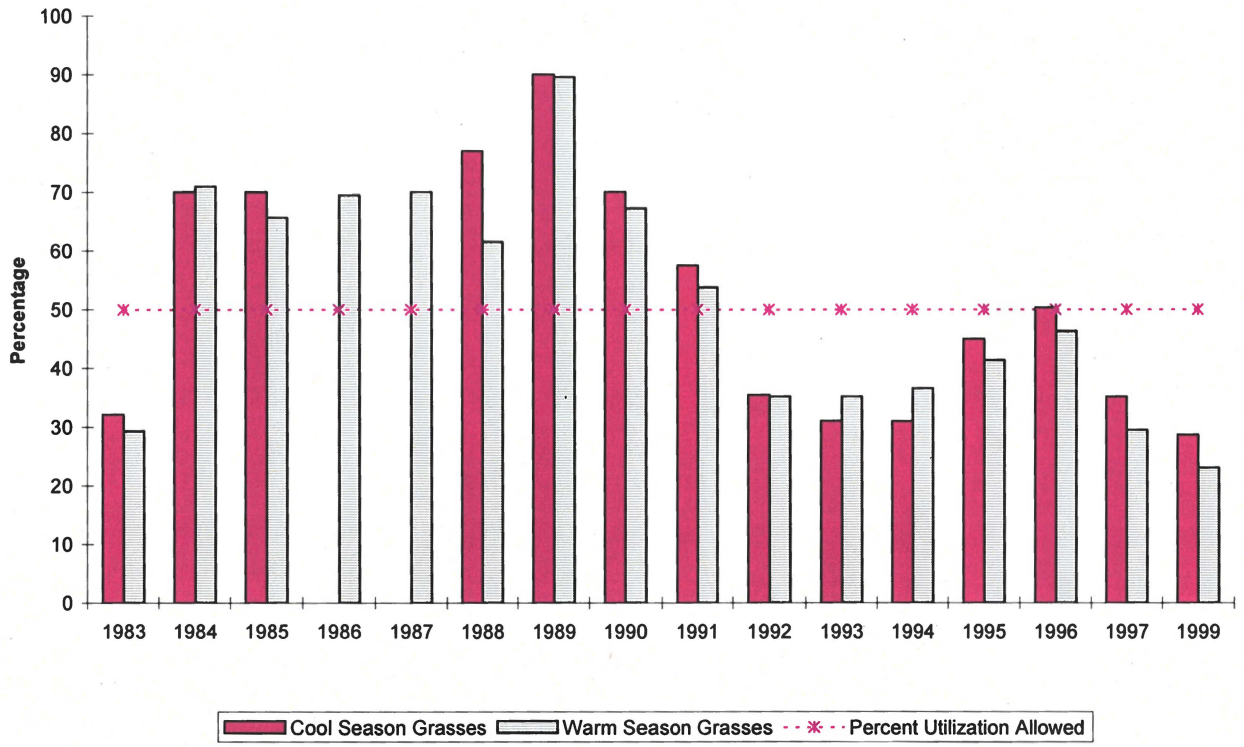
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY									09/01/04				
ALLOTMENT = JUMP CANYON					PASTURE = TWEEDIE						KEY AREA NUMBER = 4			Page 1				
Utilization expressed as a percent use for each species as of the particular year read.																		
Cool Season Grasses																		
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1999		
ORHY		70																
SIHY	32		70			77	90	70	58	35	31	31	45	50	35	29		
AVERAGE	32	70	70			77	90	70	58	35	31	31	45	50	35	29		
WARM SEASON GRASSES																		
SPCR	37	77	70	78	70	63	90	68	54	36	31	39	46	48	35	30		
BOCU	28	70	61	61	70	61	89	67	54	35	39	36	39	45	26	14		
AVERAGE	29	71	66	69	70	62	90	67	54	35	35	37	41	46	29	23		

Allotment: JUMP CANYON **Pasture: TWEEDIE** **Key Area: 4**

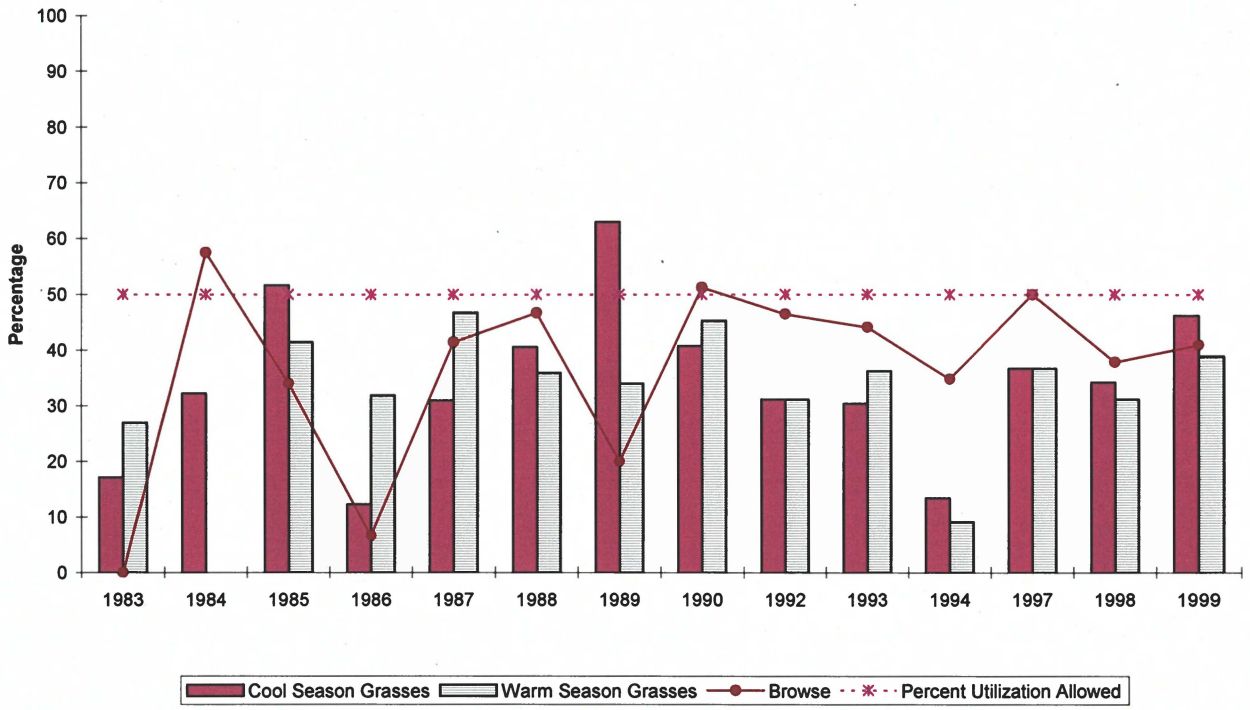
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY													09/01/04
ALLOTMENT = JUMP CANYON					PASTURE = BIN						KEY AREA NUMBER = 7			Page 1				
Utilization expressed as a percent use for each species as of the particular year read.																		
Cool Season Grasses																		
	1983	1984	1985	1986	1987	1988	1989	1990	1992	1993	1994	1997	1998	1999				
ORHY		37	63	16	38	37		37	31	31	14	37	38	44				
SIHY		28	44	11	31	32	63											
POA	17	33	61	10	28	48	63	47	32	30	13	37	30	49				
AVERAGE	17	32	52	12	31	41	63	41	31	30	13	37	34	46				
WARM SEASON GRASSES																		
HIJA	27		41	32	47	36	34	45	31	36	9	37	31	39				
AVERAGE	27		41	32	47	36	34	45	31	36	9	37	31	39				
BROWSE																		
EPNE		58																
COME			34	7	41	47	20	51	46	44	35	50	38	41				
AVERAGE		58	34	7	41	47	20	51	46	44	35	50	38	41				

Allotment: JUMP CANYON **Pasture: BIN** **Key Area: 7**

Utilization by Plant Category



Appendix E:

Pace Frequency Data

PACE FREQUENCY TREND ANALYSIS								
ALLOTMENT: Jump Canyon					PASTURE: Lower Jumps			
10/27/2004	KEY AREA 1							
Limy Upland 6-9" pz								
COVER CATEGORIES	Listed in Eco-Site Guide	years plots were read						
		1981	1985	1988	1993	1998	2004	Trend
Bare Ground		71	45	47	49	43	34	
Litter		23	50	44	42	47	60	
Rock		4	1	3	3	3	5	
Basal Cover		3	3	6	7	6	0	
% Ground Cover		29	55	53	52	57	66	
FREQUENCY OF GRASSES								
Orhy	Yes		1	3	3	4		
Stipa	Yes			3	2	1		
Hiri	Yes	4	1	1	3	3		
Spcr	No	3	4	6	8	9		
Bogr2	No			0				
Arist	Yes	1	1		2	2		
Trpu	Yes	3	1	1	2	1		
FREQUENCY OF FORBS								
Saka	No						0	
Sphae	No		0		3	4		
AAFF	Yes		2			4	0	
AAGG	Yes			35	35	40		
Eriog	Yes		3	2	4	5		
Mustard	No		6					
PPFF	Yes		6	2	8	9	0	
Aster	No			2	3			
FREQUENCY OF SHRUBS								
Epne	Yes	2	4	5	6	5	0	
Gusa2	Yes	32	50	41	36	26	2	
Chvi8	No	3	2	5	5	3	4	
Cora	No	1		1	2	1		
Opunt	Yes	1	0	1	1	1	0	
Yucca	Yes				6	5		
Yubr	Yes		3	7			0	
Latrt	Yes	5	4	5	6	4	4	
Cholla	Yes	6	11	7	6	5	1	

PACE FREQUENCY TREND ANALYSIS								
ALLOTMENT: Jump Canyon					PASTURE: Englestead			
10/27/2004	KEY AREA 2							
Loamy Bottom 10-14" pz								
COVER CATEGORIES	**Listed in Eco-Site Guide**	years plots were read						
		1981	1985	1988	1992	1997	2004	Trend
Bare Ground		57	60	31	36	55	53	
Litter		34	31	55	52	38	45	
Rock		4	1	4	4	1	2	
Basal Cover		6	9	10	7	8	2	
% Ground Cover		43	40	69	64	46	48	
FREQUENCY OF GRASSES								
Orhy	Yes	1	14	7	15	17	2	
Sihy	Yes	32	40	22	26	29	8	
Agcr	Yes						1	
Agsm	Yes	11	12	3	2	5		
Seeded	Yes						13	
Hija	No	10	9	11	16	20	7	
Spcr	Yes	11	5	2	3	3	1	
Bogr2	Yes	15	14	6	16	20	3	
Arist	Yes		2		3	5		
Scbr	No	5	3	4	3	2	2	
FREQUENCY OF FORBS								
Saka	No						1	
Sphae	Yes	9	1	5	4	9	5	
AAFF	Yes						80	
PPFF	Yes						1	
Aster	No		2	1	4	6		
FREQUENCY OF SHRUBS								
Cela	Yes						1	
Atca2	Yes	1				1	2	
Gusa2	Yes	4	8	3	5	5	4	
Chvi8	Yes						1	
Chryso	Yes		1	2	1	1		
Artr2	Yes	58	52	6	7	5	6	
Lycium	No			1	2	2		
Juos	No		1					

PACE FREQUENCY TREND ANALYSIS									
ALLOTMENT: JUMP CANYON					PASTURE: Englestead				
10/28/2004	KEY AREA 3								
Loamy Upland 10-14" pz									
COVER CATEGORIES	**Listed in Eco-Site Guide**	years plots were read							
		1981	1984	1987	1989	1992	1997	2004	Trend
Bare Ground		71	49	62	61	38	50	44	
Litter		20	32	30	30	24	33	42	
Rock		4	7	0	4	7	8	12	
Basal Cover		6	12	7	5	32	10	3	
% Ground Cover		30	51	38	39	62	50	56	
FREQUENCY OF GRASSES									
Orhy	Yes	2	2	3	5	5	4	4	
Sihy	Yes	17	49	49	47	40	52	23	
STIPA	Yes					1	2	1	
Agsm	Yes					8	8		
Kocr	No			1	2		3		
Hija	Yes	15	8	6	8	16	15	10	
Spcr	Yes		1	1	2	6	8		
Bogr2	Yes	51	48	58	55	46	58	33	
FREQUENCY OF FORBS									
Astra	Yes					0	2	1	
Sphae	Yes		10	13	13	12	24	7	
AAFF	Yes			4	2	0	3		
Eriog	No			2	4		1		
Penst	No					1			
Plantago	No			3					
PPFF	Yes							2	
Spurge	No						2	3	
FREQUENCY OF SHRUBS									
Gusa2	Yes	3	13	13	17	22	24	10	
Artr2	Yes	45	48	34	38	20	32	35	
Opunt	Yes							2	
Juos	Yes	3	4	1	1	3	4	5	

PACE FREQUENCY TREND ANALYSIS								
ALLOTMENT: JUMP CANYON					PASTURE: Tweedies			
10/28/2004	KEY AREA 4							
Loamy Upland 10-14" pz								
COVER CATEGORIES	**Listed in Eco-Site Guide**	years plots were read						
		1981	1984	1987	1990	1998	2004	Trend
Bare Ground		53	47	57	63	50	51	
Litter		16	23	29	23	34	35	
Rock		31	20	10	12	13	14	
Basal Cover			10	4	3	4	1	
% Ground Cover		47	53	43	37	51	50	
FREQUENCY OF GRASSES								
Sihy	Yes	2		0	1			
Agcr	No			1				
Poa	Yes	2			1			
Spcr	Yes	21	44	38	29	4	1	
Bocu	No	13	26	15	10	13	3	
Arist	Yes		2	0	1	2		
FREQUENCY OF FORBS								
Saka	No						1	
Sphae	Yes	2	0	2	3	4	4	
AAFF	Yes			0		2		
PPFF	Yes			3				
Spurge	No						1	
Aster	No					1		
FREQUENCY OF SHRUBS								
Come	NO						1	
Gusa2	Yes	4	56	72	52	34	59	
Artr2	Yes		0					
Lyan	Yes		3	2	3	5	5	
Qutu	No	1						
Berberis	Yes			1	1	1	6	

PACE FREQUENCY TREND ANALYSIS								
ALLOTMENT: Jump Canyon					PASTURE: Tweedies			
10/28/2004	KEY AREA 5							
Shallow Loamy 10-14" pz								
COVER CATEGORIES	**Listed in Eco-Site Guide**	years plots were read						
		1981	1985	1988	1993	1998	2004	Trend
Bare Ground		24	18	20	20	18	29	
Litter		65	63	55	67	70	59	
Rock		7	5	15	8	7	12	
Basal Cover		5	15	10	5	4	1	
% Ground Cover		76	83	80	80	82	71	
FREQUENCY OF GRASSES								
Sihy	Yes	1			0			
Agcr	No	6			1			
Seeded	No	1						
Spcr	Yes	36	93	98	81	92	11	
Bocu	Yes					1	1	
Arist	Yes		9	8	7	7	5	
FREQUENCY OF FORBS								
Saka	No		4	2	3	3	1	
Sphae	Yes	6	32	20	18	15	2	
AAFF	Yes			1	2	2	10	
AAGG	No			75			75	
Eriog	No			1	2	2		
PPFF	Yes		5	6	8	7	1	
FREQUENCY OF SHRUBS								
Gusa2	Yes	1	1	1	3	3	62	

PACE FREQUENCY TREND ANALYSIS									
ALLOTMENT: Jump Canyon						PASTURE: Tweedies			
10/28/2004	KEY AREA 6								
Shallow Loamy 10-14" pz									
COVER CATEGORIES	**Listed in Eco-Site Guide**	years plots were read							
		1981	1984	1987	1988	1993	1998	2004	Trend
Bare Ground		11	15	21	19	30	23	12	
Litter		72	62	74	73	31	67	65	
Rock		13	15	3	4	34	4	23	
Basal Cover		5	9	1	4	5	6	1	
% Ground Cover		89	86	79	81	70	77	88	
FREQUENCY OF GRASSES									
Orhy	Yes		1	1	1	1	1		
Sihy	Yes	3						1	
Agsm	No		1						
Poa	Yes							2	
Spcr	Yes	43	50	50	53	46	61	4	
Bocu	Yes		1	1	1	1	2		
Arist	Yes	1	6	6	9	5	3	10	
Trpu	No		16		2		1		
FREQUENCY OF FORBS									
Saka	No							13	
Sphae	Yes	1	1			2	1	11	
AAFF	Yes								
AAGG	No	3			96				
PPFF	Yes				4		1		
Spurge	No								
Brte								97	
Mimu								1	
Phlox								1	
Euphor								4	
Erde								3	
Erci6									
Chenop								1	
FREQUENCY OF SHRUBS									
Gusa2	Yes			0	1	1	1	2	
Opunt	Yes		2	1	1	1	1	1	
Juos	Yes	2	3	2	1		0	2	
Fapa	Yes		1	0			0	1	
Berberis	Yes		1						
Pop	Yes				0		1		

PACE FREQUENCY TREND ANALYSIS							
ALLOTMENT: Jump Canyon					PASTURE: Bin		
10/29/2004	KEY AREA 7						
Loamy Upland 10-14" pz							
COVER CATEGORIES	**Listed in Eco-Site Guide**	years plots were read					
		1981	1985	1989	1997	2004	Trend
Bare Ground		31	14	18	23	19	
Litter		30	31	33	40	41	
Rock		34	50	47	33	39	
Basal Cover		5	5	2	5	1	
% Ground Cover		69	86	82	77	81	
FREQUENCY OF GRASSES							
Orhy	Yes		3		4	1	
Sihy	Yes	7	15	5	6	8	
Poa	Yes	34	10	24	25	22	
Hija	Yes	6	13	19	21	10	
Spcr	Yes	2	3	5	3	0	
Bogr2	Yes		0	1	2	0	
Arist	Yes		0	1	2		
FREQUENCY OF FORBS							
Sphae	Yes	1		2	3		
AAFF	Yes		28	2	2	17	
AAGG	No					90	
PPFF	Yes					1	
Spurge	No		1				
FREQUENCY OF SHRUBS							
Come	No	4	4	5	5	4	
Gusa2	Yes	23	39	24	20	13	
Chvi8	Yes					1	
Artr2	Yes	12	20	17	13	3	
Opunt	Yes	1		1	3	0	
Yucca	Yes					0	
Juos	Yes	20	17	11	12	19	
Fapa	No					0	
Epvi	Yes	2	8	7	9	3	
Berberis	Yes		0				

Appendix F:

Ecological Site Data

Key Area # 1		Allotment: Jump Canyon	
10/29/2004		Pasture: Lower Jump	
		Range Site: Limy Upland 6-9" pz	
Plant Species	Site-Guide Allowable Percent Composition	1988	2004
Grasses	1-5%	19%	
Orhy	1-2%	3%	
Stipa	1-1%	5%	
Hiri	Group Stipa		
Spcr	-	11%	
Bogr2	-		
Arist	Group Stipa		
Trpu	1-1%		
Forbs	3-5%	19%	4%
Saka	-		
Sphae	1-3%		
AAFF	1-3%		
AAGG	1-3%		
Eriog	Group AAFF		
Mustard	-		
PPFF	1-2%	19%	4%
Aster	-		
Shrubs/Trees	85-95%	62%	96%
Epne	1-5%	5%	4%
Gusa2	5-10%	25%	18%
Chvi8	-	5%	29%
Cora	-		
Opunt	2-6%	2%	4%
Yucca	Group Gusa2	8%	
Yubr	3-5%		1%
Latrt	15-25%	5%	33%
Cholla	-		
Opac	Group Opunt	11%	7%
	Similarity	31	48

Key Area # 2		Allotment: Jump Canyon	
10/29/2004		Pasture: Englestead	
		Range Site: Loamy Bottom 10-14" pz	
Plant Species	Site-Guide Allowable Percent Composition	1988	2004
Grasses	65-80%	67%	63%
Orhy	5-15%	6%	6%
Sihy	5-15%	28%	17%
Agcr	-		
Agsm	30-45%	5%	17%
Seeded	-		
Hija	-	17%	16%
Spcr	5-10%		
Bogr2	0-5%	7%	5%
Arist	0-5%		
Scbr	-	4%	2%
Forbs	5-15%	12%	11%
Saka	-		
Sphae	Group AAFF	12%	10%
AAFF	5-15%		1%
PPFF	Group AAFF		
Aster	-		
Shrubs	20-35%	21%	26%
Cela	0-10%		
Atca2	5-15%		2%
Gusa2	1-5%	4%	8%
Chvi8	Group Gusa2		3%
Chryso	Group Gusa2		
Artr2	5-10%	17%	15%
Lycium	-		
Juos	-		
Similarity		59%	71%

Key Area # 3		Allotment: Jump Canyon		
10/29/2004		Pasture: Englestead		
		Range Site: Loamy Upland 10-14 pz		
Plant Species	Site-Guide Allowable Percent Composition	2004	N/A	N/A
Grasses	70-80%	55%		
Orhy	5-20%	2%		
Sihy	5-10%	16%		
Stipa	5-10%	1%		
Agsm	20-30%			
Kocr	-			
Hija	5-15%	9%		
Spcr	1-3%			
Bogr2	15-30%	27%		
Forbs	5-15%	6%		
Astra	5-10%			
Sphae	5-10%	6%		
AAFF	5-10%			
Eriog	Group AAFF			
Penst	Group PPFF			
Plantago	Group AAFF			
PPFF	5-10%			
Spurge	Group AAFF			
Spco	Group Sphae			
Shrubs	20-35%	39%		
Gusa2	0-5%	5%		
Artr2	5-15%	31%		
Opunt	0-10%			
Juos	0-5%	3%		
	Similarity	78%		

Key Area # 4		Allotment: Jump Canyon		
10/29/2004		Pasture: Tweedie		
		Range Site: Loamy Upland 10-14 pz		
Plant Species	Site-Guide Allowable Percent Composition	2004	N/A	N/A
Grasses	70-80%	2%		
Sihy	5-10%			
Agcr	20-30%			
Poa	5-10%			
Spcr	1-3%			
Bocu	-	2%		
Arist	0-5%			
Forbs	5-15%	4%		
Saka	Group AAFF			
Sphae	5-10%	4%		
AAFF	5-10%			
PPFF	5-10%			
Spurge	Group AAFF			
Aster	Group PPFF			
Shrubs	20-35%	94%		
Come	-			
Gusa2	0-5%	81%		
Artr2	5-15%			
Lyan	0-10%	10%		
Qutu	-			
Berberis	0-3%	3%		
	Similarity	22%		

Key Area # 5		Allotment: Jump Canyon		
10/29/2004		Pasture: Englestead		
		Range Site: Shallow Loamy 10-14 pz		
Plant Species	Site-Guide Allowable Percent Composition	1988	2004	N/A
Grasses	60-75%	87%	17%	
Sihy	5-10%			
Agcr	-			
Seeded	-			
Spcr	1-5%	84%	12%	
Bocu	2-10%			
Arist	1-5%	2%	6%	
Forbs	1-5%	11%	3%	
Saka	Group AAFF			
Sphae	1-5%	7%	1%	
AAFF	1-5%	3%		
AAGG	-			
Eriog	Group AAFF			
PPFF	1-5%		1%	
Shrubs	10-40%	3%	80%	
Gusa2	5-10%	3%	80%	
	Similarity	18%	22%	

Key Area # 6		Allotment: Jump Canyon		
10/29/2004		Pasture: Tweedie		
		Range Site: Shallow Loamy 10-14 pz		
Plant Species	Site-Guide Allowable Percent Composition	1988	2004	N/A
Grasses	60-75%	96%	34%	
Orhy	5-10%			
Sihy	5-10%		2%	
Agsm	5-20%			
Poa	5-10%		3%	
Spcr	1-5%	78%	10%	
Bocu	2-10%			
Arist	1-5%	15%	20%	
Trpu	1-5%	3%		
Forbs	1-5%	1%	54%	
Saka	Group AAFF			
Sphae	1-5%		50%	
AAFF	1-5%			
AAGG	-	1%		
PPFF	1-5%			
Spurge	Group AAFF			
Brte	Group AAGG			
Mimu	Group AAFF		3%	
Phlox	Group PPFF		1%	
Euphor	Group AAFF			
Erde6	Group AAFF			
Erci6	Group AAFF			
Chenop	Group AAFF			
Shrubs	10-40%	3%	11%	
Gusa2	5-10%		4%	
Opunt	1-5%	3%	1%	
Juos	5-10%		4%	
Fapa	5-10%		1%	
Berberis	5-10%			
Opph	Group Opunt			
	Similarity	16%	34%	

Key Area # 7		Allotment: Jump Canyon		
10/29/2004		Pasture: Bin		
		Range Site: Loamy Upland 10-14" pz		
Plant Species	Site-Guide Allowable Percent Composition	2004	N/A	N/A
Grasses	70-80%	44%		
Orhy	5-20%			
Sihy	5-10%	2%		
Poa	5-10%	27%		
Hija	5-15%	16%		
Spcr	1-3%			
Bogr2	15-30%			
Arist	0-5%			
Forbs	5-10%	1%		
Sphae	5-10%			
AAFF	5-10%			
AAGG	-			
PPFF	5-10%	1%		
Spurge	Group AAFF			
Shrubs	15-25%	55%		
Come	-	3%		
Gusa2	0-5%	13%		
Chvi8	-	1%		
Artr2	5-15%	2%		
Opunt	0-10%			
Yucca	0-10%	1%		
Juos	0-5%	28%		
Fapa	-			
Epvi	1-10%	4%		
Berberis	0-3%			
Hedgehog	Group Opunt	2%		
	Similarity	47%		

Appendix G:

Wildlife Data

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

Arizona Game & Fish Unit 13B Pronghorn Antelope Population Counts

Year	Total Animals Surveyed	Fawns / 100 does	Bucks / 100 does	Population Estimate
1985	---	N/A	39	N/A
1986	---	N/A	35	156
1987	129	N/A	28	N/A
1988	192	N/A	54	172
1989	142	N/A	38	256
1990	131	N/A	34	166
1991	51	21	55	189
1992	77	26	69	192
1993	151	67	58	253
1994	84	17	58	210
1995	81	34	43	203
1996	119	13	27	295
1997	79	42	33	196
1998	76	45	100	190
1999	58	6	65	121
2000	23	0	229	58
2001	60	27	55	58
2002	60	14	53	121
2003	70	50	69	139
2004	104	51	32	NA
2005	75	54	60	218