Standards for Rangeland Health and Guidelines for Grazing Administration
Implementation Project: Allotment Assessment
For
Imlay/Sullivan Tank AMP
Nos. 4817/4816

I. Introduction

The Imlay and Sullivan Tank Allotments were combined under one allotment management plan (AMP). Therefore this assessment addresses both allotments as one. This Grazing AMP 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 ensure the health of public rangelands. These standards help the Bureau of Land Management (BLM), rangeland users, and interested members of the public achieve a common understanding of acceptable resource conditions and work together to implement that vision (see Appendices for a copy of the Standards and Guidelines).

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

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

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

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

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

The BLM/RAC Implementation Strategy for Arizona states that the RRT's primary role is to assist BLM managers in assuring the S&Gs are consistently applied and technically sound. The IAT analyzed all available information in cooperation with the RRT. Based on field observations, team

members determined whether rangeland conditions were meeting, progressing toward meeting, or not meeting the Standards for Rangeland Health.

The RRT, IAT, permittees and other interested parties were invited to attend an issue scoping meeting for the Imlay portion of the AMP on January 15, 2003, and a field visit on August 27, 2003. The issue scoping meeting for the Sullivan Tank portion of the AMP was held on March 31, 2004 and a field visit on June 30, 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.

After consultation with interested persons, permittees, and the IAT, the authorized officer will select the appropriate actions. The selected management actions will be analyzed through the National Environmental Policy Act (NEPA) process and a proposed decision will be issued.

II. Grazing Use

A. Total grazing privileges

Active Grazing Use: 1190 AUMs
Suspended Non-use: 1164 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

10/16-6/9

C. Kind and class of livestock

154 Cows and Calves

D. Percent federal range (The percentage of public land use determined by the proportion of livestock forage available on public lands within the allotment compared to the total amount available from both public lands and those owned or controlled by the permittee or lessee).

95% for Imlay and 100% for Sullivan Tank

III. AMP Profile

A. Description

The AMP area is located in northwest Arizona approximately 30 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 AMP area lies

within the monument. The AMP initially was developed in 1988 and revised in 1990 when the Sullivan Tank Allotment was added to the system.

The major topographical feature of the AMP area is Hobble Canyon and Sullivan Draw. The allotment produces sagebrush in the draws and juniper-cliffrose on the rolling hills. Elevation ranges from a high of 6,000 feet in the southeast part of the AMP area to a low of 4,400 feet in the western half near Black Knoll Pond.

B. Acreage

The AMP area contains:

28,924 acres of federal land
480 acres of state land
29,404

C. Objectives

1. Land Use Plan Objectives

Within the national monument, BLM's Interim Management Policy for Newly Created National Monuments provides overall direction for the proper care of the monument pending completion of the required planning processes.

ARIZONA STRIP RESOURCE MANAGEMENT PLAN (RMP)

Manage public lands in a manner that responds to the nation's need for domestic sources of energy, minerals, and livestock products from the public lands and the importance of these industries to the local and regional economies.

Manage livestock grazing to maintain productive rangelands which meet forage, watershed, and wildlife needs.

SHIVWITS RESOURCE AREA IMPLEMENTATION PLAN (SRAIP)

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.

RR01 - Continue authorizing the organized recreational events now occurring on the Resource Area.

RR02 - Evaluate requests for additional recreation permits through the National Environmental Policy Act process and for their consistency with management goals and objectives and process on a case-by-case basis.

RR04 - Recreation management direction includes:

1. Accommodate current uses, protect cultural values, and complement wilderness management plans where appropriate.
2. Provide visitor information.
3. Use various methods to acquire visitor use data on an annual basis.
4. Maintain a system of traffic counters, monitor results monthly, and field-verify results annually.
5. Conduct compliance patrols by district ranger.
6. Consider visual impacts on all proposed actions and protect scenic values by using mitigation measures where feasible, including alternative locations, camouflage, vegetation or topographic screening and other measures.

RR05 - Improve and increase road signs and develop a sign inventory system.

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

RR07 - Maintain primary access roads, particularly Quail Hill Road, on a year round basis.

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.

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.

VR04 - Consider designating backcountry byways as more information becomes available on environmental impacts and public need.

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

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

The allotment was classified in the RMP as category IV. This means that the watershed units currently are in unsatisfactory erosion condition and the soils would be responsive to treatment.

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.

WL04 - Conduct inventories to obtain information required to effectively manage habitat and incorporate wildlife habitat considerations into activities of other programs.

WL07 - Manage wildlife habitat through the Habitat Management Plan process to achieve desired plant community objectives.

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.

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.

Black Rock Habitat Management Plan (HMP) (1994) Objectives

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

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.

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

Allotment Management Plan Objectives (1990 AMP)

The overall resource goals are to improve vegetative conditions, increase the available amount of forage for livestock and wildlife, and improve the watershed conditions.

Imlay Allotment:

Key Area No. 1, located in the East Pasture of Imlay allotment
The Ecological Site is Shallow Loamy 10-14" precipitation zone (pz)
Increase Indian ricegrass from 2% to 10% frequency
Increase Galleta from 13% to 25% frequency
Increase Squirreltail from 11% to 15% frequency
Live Vegetation Cover (basal cover) from 3% to 10%

Key Area No. 2, located in the Middle Pasture of Imlay allotment
The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)
Increase Galleta from 7% to 15% frequency
Increase Squirreltail from 17% to 20% frequency
Increase Intermediate wheatgrass from 4% to 45% frequency
Live Vegetation Cover (basal cover) from 5% to 10%

Key Area No. 3, located in the West Pasture of Imlay allotment
The Ecological Site is Shallow Loamy 10-14" precipitation zone (pz)
Increase Indian ricegrass from 1% to 5% frequency
Increase Galleta from 0% to 10% frequency
Increase Squirreltail from 6% to 15% frequency
Increase Cliffrose from 3% to 5% frequency
Live Vegetation Cover (basal cover) from 4% to 10%

Sullivan Tank Allotment:

Key Area No. 1, located in the east end of Sullivan Tank
The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)
Increase Indian ricegrass from 1% to 5% frequency
Maintain or increase Galleta at 50% frequency
Increase Squirreltail from 10% to 15% frequency
Increase Sand dropseed from 6% to 10% frequency
Live Vegetation Cover (basal cover[1]) from 5% to 10%

[1] Basal cover is the area of ground surface occupied by the basal portion of the plants. Basal cover as used in this document is one component of ground cover (i.e., plants, litter, rocks, and gravel on a site).

Key Area No. 2, located in the south end of Sullivan Tank

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)
Maintain or increase Galleta at 40% frequency
Increase Squirreltail from 6% to 15% frequency
Increase Sand dropseed from 3% to 5% frequency
Live Vegetation Cover (basal cover) from 6% to 10%

Key Area No. 3, located in the northwest part of Sullivan Tank

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)
Increase Mutton grass from 3% to 5% frequency
Increase Squirreltail from 5% to 15% frequency
Increase Cliffrose from 8% to 15% frequency
Live Vegetation Cover (basal cover) from 3% to 10%

Key Area No. 4, located in the northern mid part of Sullivan Tank

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)
Increase Indian ricegrass from 1% to 5% frequency
Maintain or increase Galleta at 40% frequency
Increase Squirreltail from 5% to 15% frequency
Live Vegetation Cover (basal cover) from 4% to 10%

Desired Plant Community Objectives Developed during this process:

Desired Plant Community[1] Objectives (DPC) were developed during this evaluation process by an interdisciplinary team of specialists. These DPCs are to replace the 1990 AMP allotment specific vegetation frequency and cover objectives which focus on livestock forage needs. These objectives focus on the ecological site and its potential, which is a reflection of the biodiversity of the area. DPCs include Species Composition by Weight (CBW) using the Dry Weight Ranking method of data collection and live vegetative ground cover using the point step method of data collection to measure vegetative basal cover. DPCs will be used, from this point forward, to assess effectiveness of management actions.

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

The DPC approach is used as complementary information that specifically addresses management goals, rather than as a replacement to assessing ecological status.

Imlay Allotment:

Key Area No. 1, located in the East Pasture of Imlay Allotment

Increase Sihy to between the range of 5 to 10% CBW
Increase Orhy to between the range of 5 to 10% CBW
Increase Hija to between the range of 10 to 15% CBW
Increase Agsm to between the range of 1 to 5% CBW
Maintain Artr to between the range of 0 to 10% CBW
Maintain Juos to between the range of 0-5% CBW
Maintaining forbs to between the range of 1 to 5% or above CBW
Maintain ground cover above 50%
Increase live vegetation cover (basal cover) to between 3 and 8% on perennial vegetation.
Increase canopy cover to between the range of 10 to 30% on perennial vegetation

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 GCPNM EIS/LUP (currently being drafted) that according to the draft LUP is to be managed for a mosaic of early and mid seral stage plant communities. This site was burned using a prescribed fire during 1995 and was seeded. However, do to drought the seeding didn't get established. As a result of the treatment the site changed from a predominately shrub community to forb community with native grasses spreading. Without the shrubs competing the grasses have the potential to increase in composition. The team looked at the site and determined that the potential exists to achieve the DPC objectives. The DPC objectives established will also promote attainment of the GCPNM EIS/LUP (currently being drafted) Desired Ecological Condition (DRC).
The key species listed are the species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The site guide allows for from 5 to 10% CBW for Sihy, 5-15% for Hija, 5 to 10% for Orhy, 5-20% for Agsm.

Key Area No. 2, located in the Middle Pasture of Imlay Allotment

Increase Sihy to between the range of 5 to 10% CBW
Increase Orhy to between the range of 5 to 10% CBW
Increase Hija to between the range of 5 to 15% CBW
Increase Agsm to between the range of 10 to 20% CBW
Decrease Artr CBW from 63% to between the range of 1 to 15%
Maintain Juos to between the range of 2 to 5% CBW
Maintaining the forbs to between the range of 5 to 10% or above CBW
Maintain ground cover above 65%
Maintain live vegetation cover (basal cover) to between 5 and 10% on perennial vegetation.
Maintain canopy cover to between range of 25 to 35% on perennial vegetation

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 GCPNM EIS/LUP (currently being drafted) that according to the draft LUP is to be managed for a mosaic of early and mid seral stage plant communities. Sagebrush on this site is at 63% CBW with few other plants species present. The team has looked at the site and determined that the potential exists to achieve the DPCs, because of the site's capability. However, attainment of DPCs would only be possible if vegetation treatments are implemented to increase grasses and forbs. With treatment, the DPC objectives established are felt to be attainable and will promote attainment of the GCPNM EIS/LUP (currently being drafted) Desired Ecological Condition (DEC).

The key species listed are the species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The site guide allows for 5 to 10% CBW for Sihy, 5-20% CBW for Orhy, 20-30% CBW for Agropy, and 5-15% CBW Hija, and only 5 to 15% for Sagebrush.

Key Area No. 3, located in the West Pasture of Imlay Allotment

Maintain Sihy to between the range of 5 to 10% CBW
Maintain Orhy to between the range of 1 to 5% CBW
Maintain Hija to between the range of 1 to 10% CBW
Maintaining Artr to between the range of 15 to 25% CBW
Maintaining Juos to between the range of 15 to 20% CBW
Maintaining the forbs to between the range of 1 to 5% CBW or above
Maintain ground cover above 55%
Increase live vegetation cover (basal cover) to between 3 and 8% on perennial vegetation.
Maintain canopy cover at range of 25 to 35% on perennial vegetation

Rational: The Ecological Site for this key area is a Shallow Loamy 10-14" pz that is situated within the Transition Ecoregion based on the GCPNM EIS/LUP (currently being drafted) and according to the draft LUP is to be managed for late seral stage plant communities. This site is currently in the late seral stage. The team, after looking at the site, determined that maintaining the site at its present condition provides a DPC within the site's capability and could be maintained through management of the various uses BLM authorizes. Therefore the DPC objectives established are felt to be attainable and will promote attainment of the GCPNM EIS/LUP (currently being drafted) Desired Ecological Condition (DEC).

The key species listed are the species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The site guide allows for 5 to 10% CBW for Sihy, 5-15% for Hija, 5 to 10% for Orhy, and 15 to 25% for Artr.

Sullivan Tank Allotment:

Key Area No. 1, located in the east end of Sullivan Tank

Increase Sihy to between the range of 5 to 10% CBW
Increase Orhy to between the range of 5 to 10% CBW
Maintain Hija to between the range of 30 to 50% CBW
Maintain Spcr to between the range of 1 to 3% CBW
Maintain Artr to between the range of 0-15% CBW
Maintaining forbs to between the range of 5 to 10 percent CBW
Maintain ground cover above 65%
Maintain basal cover to between 5 to 10% on perennial vegetation
Increase canopy cover to between the range of 25 to 35% on perennial vegetation

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 GCPNM EIS/LUP (currently being drafted) that according to the draft LUP is to be managed for a mosaic of early and mid seral stage plant communities. This site burned during 1998 and was seeded. Due to drought, the seeding did not establish. As a result of the treatment the site changed from a predominately shrub community to forb community with native grasses spreading. Without the shrubs competing the grasses have the potential to increase. The team looked at the site and determined that the potential exists to achieve the DPC objectives. The DPC objectives established will also promote attainment of the GCPNM EIS/LUP (currently being drafted) Desired Ecological Condition (DRC).

The key species listed are the species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The site guide allows for from 5 to 10% CBW for Sihy, 5-15% for Hija, 5 to 10% for Orhy, and 1 to 3% for Spcr. Maintaining ground cover above 65% will aid in improving the watershed conditions. In addition, increasing canopy cover of perennial vegetation will provide for better watershed conditions.

Key Area No. 2, located in the south end of Sullivan Tank

Increase Sihy to between the range of 5 to 10% CBW
Increase Orhy to between the range of 5 to 10% CBW
Maintain Hija to between the range of 25 to 35% CBW
Increase Bogr to between the range of 1 to 5% CBW
Reduce Artr to between the range of 5 to 10% CBW
Maintaining forbs to between the range of 5 to 10 percent CBW
Maintain ground cover above 65%
Maintain basal cover to between 5 and 10% on perennial vegetation
Maintain canopy cover to between the range of 25 to 35% on perennial vegetation

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 GCPNM EIS/LUP

(currently being drafted) that according to the draft LUP is to be managed for a mosaic of early and mid seral stage plant communities. Sagebrush on this site is at 58% CBW (site guide allows 5-15% CBW). The site is presently in mid seral status because of sagebrush expansion, which out competes other desirable species. The site guide list only 5 to 15% for Sagebrush, which currently is at 58% CBW. The team has looked at the site and determined that the potential exists to achieve the DPCs, because of the site's capability. However, attainment of DPC would only be possible if vegetation treatment is implemented. With treatment the DPC objectives established are felt to be attainable and will promote attainment of the GCPNM EIS/LUP (currently being drafted) Desired Ecological Condition (DEC).

The key species listed are the species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The site guide allows for 5 to 10% CBW for Sihy, 5-20% CBW for Orhy, and 5-15% CBW for Hija, and 15 to 30% CBW for Bogr2. Maintaining ground cover above 65% will aid in improving the watershed conditions.

Key Area No. 3, located in the northwest part of Sullivan Tank

Increase Sihy to between the range of 5 to 10% CBW
Increase Orhy to between the range of 5 to 10% CBW
Increase Pofe to between the range of 3 to 7% CBW
Increase Hija to between the range of 3 to 7% CBW
Maintain Artr to between the range of 5- 15% CBW
Maintain Come to between the range of 5 to 10% CBW
Maintaining forbs to between the range of 5 to 10 percent CBW
Maintain ground cover above 80%
Maintain basal cover to between 5 and 10% on perennial vegetation
Maintain canopy cover to between the range of 25 to 35% on perennial vegetation

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 GCPNM EIS/LUP (currently being drafted) that according to the draft LUP is to be managed for a mosaic of early and mid seral stage plant communities. This site burned during 1998 and was seeded. Due to drought, the seeding did not establish. As a result of the fire, the area was set back to the very early stages of plant succession. The area will gradually progress through the plant community successional stages and at this point is at Mid seral. The team has looked at the site and determined that potential to achieve the DPC objectives exists, based on the site capability and through management of the various uses BLM authorizes. The DPC objectives established are felt to be attainable and will promote attainment of the GCPNM EIS/LUP (currently being drafted) Desired Ecological Condition (DEC).

The key species listed are the species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The site guide allows for 5 to 10% CBW for Sihy, 5-15% for Hija, 5 to 10% for Orhy, 5 to 10%

for Pofe, and 0% for Come. Maintaining ground cover above 85% will maintain the watershed conditions. Improving the canopy cover will also improve the watershed conditions.

Key Area No. 4, located in the northern mid part of Sullivan Tank

Maintain Sihy to between the range of 5 to 10% CBW
Increase Orhy to between the range of 5 to 10% CBW
Increase Pofe to between the range of 1 to 5% CBW
Maintain Hija to between the range of 40 to 50% CBW
Maintain Artr to between the range of 1-15% CBW
Maintain Juos to between the range of 1-3% CBW
Maintaining forbs to between the range of 5 to 10 percent CBW
Maintain ground cover above 65%
Maintain basal cover to between 5 and 10% on perennial vegetation
Maintain canopy cover to between the range of 35 to 45% on perennial vegetation

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 GCPNM EIS/LUP (currently being drafted) that according to the draft LUP is to be managed for a mosaic of early and mid seral stage plant communities. This site burned during 1995 and again in 1998 and was seeded. Due to drought, the seeding did not establish. As a result of the fire, the area was set back to the very early stages of plant succession. The area will gradually progress through the plant community successional stages and at this point is in Mid seral stage. The team has looked at the site and determined that potential to achieve the DPC objectives exists, based on the site capability and through management of the various uses BLM authorizes. The DPC objectives established are felt to be attainable and will promote attainment of the GCPNM EIS/LUP (currently being drafted) Desired Ecological Condition (DEC).

The key species listed are the species recognized to be important for forage, watershed, and cover, and are components of the ecological site. The site guide allows for 5 to 10% CBW for Sihy, 5-20% CBW for Orhy, and 5-15% CBW for Hija, and 5 to 10% CBW for Pofe. Maintaining ground cover above 65% will aid in improving the watershed conditions.

D. Key Species

Plant Category	Common Name	Scientific Name	Abbreviation
Cool season Grasses	Bottlebrush Squirreltail	Sitanion hystrix	Sihy
	Indian ricegrass	Oryzopsis hymenoides	Orhy
	Mutton grass	Poa fendleriana	Pofe
	Wheatgrass	Agropyron spp.	Agropy
Warm Season Grasses	Galleta	Hilaria jamesii	Hija
	Sand dropseed	Sitanion hystrix	Spcr
	Blue Grama	Bouteloua gracilis	Bogr2
Browse	Cliffrose	Cowania mexicana	Come

E. Grazing System

The grazing season is from October 16 through June 9. The Imlay Allotment is divided into two pastures and is used in conjunction with the Sullivan Tank Allotment under the Imlay/Sullivan Tank AMP. As a result, there are three pastures being used no more than three months each year during the grazing season. The following year the timing of use for each pasture is rotated. This rotation assures that each pasture in a three year rotation receives rest during the spring growing season one year in three. All three pastures are then rested from mid June through September of each year.

F. Other uses

1. BLM Sensitive and State Species of Concern

a. Plant
There are none listed for this area.

b, Animal

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 AMP area; however, none of the raptors are likely:

- Ferruginous hawks (*Buteo regalis*)
- Northern goshawk (*Accipiter gentilis*)
- Spotted bat *(Euderma maculatum)*
- Western small-footed myotis *(Myotis ciliolabrum)*
- Fringed myotis (*Myotis thysanodes*)
- Allen's lappet-browed bat (*Idionycteris phyllotis*)
- Townsend's big-eared bat *(Corynorhinus townsendii)*
- Big free-tailed bats (*Nyctinomops macrotis*)

Inventories were conducted in 1993, 1994, and 2000 for northern goshawks on Black Rock Mountain, which is located approximately eight miles north and west of the AMP area. No nesting goshawks were detected. Goshawks are found in Ponderosa pine and mixed conifer forests; they nest in tall trees, often in a dominant stand, frequently 40 feet above the ground. However, they may pass through this AMP area. Terrain on this AMP area is too steep and broken to serve as suitable habitat for ferruginous and Swainson's hawks.The California condor *(Gymnogyps californianus)*), federally listed as endangered (10-J), occurs yearlong on the Arizona Strip and may fly over and forage for food in these allotments. Condors were re-introduced to Northern Arizona in 1996 following a 72 year absence.

Condors are strictly scavengers and they range widely, easily covering over 100 miles in a day. Condors prefer to scavenge large mammalian carcasses such as dead deer or cattle.

The bald eagle (*Haliaeetus leucocephalus)* (proposed for de-listing) is federally listed as threatened and may also fly over and forage for food in the AMP area. Bald eagles are winter migrants in these allotments, where they would be primarily scavengers. They can be predators of small animals, such as jackrabbits. They do not nest in this area, but may be seen during the colder months.

2. Other Wildlife Species:

Big Game – Mule deer are the main big game species found in this AMP area. This AMP area is located within the Arizona Game and Fish Department's (AGFD's) Game Management Unit (GMU) 13B. GMU 13B is widely regarded as one of the most desirable places to hunt trophy mule deer in the Intermountain West. In recent years, many of the hunters with special tags hunt in Unit 13B. AGFD does not provide deer population numbers by GMU, but the 13B deer herd one of low density. Appendix E provides recent population parameters, such as buck, doe and fawn ratios, for the deer population in GMU 13. AGFD collects their data on a GMU basis: no allotment specific deer population data is available. In general, the mule deer population here is currently thought to be stable or slightly increasing. However, mule deer populations have significantly declined throughout the West since the 1950's.

Mule deer are ruminants which inhabit desert, prairie, and mountain terrain. Grasses and forbs are important summer food, but in the winter they feed more heavily upon browse plants. Cliffrose is the most important browse species in this AMP area. Mule deer fawns are usually born in June and July. The breeding season in this area is in November and December, with the pronounced rut usually beginning in late November. Winter range is not considered limiting in this area.

Black Rock Mountain to the north and west provides habitat for a herd of from 600 to 800 mule deer (*Odocoileus hemionus*). Deer tend to concentrate in the limited conifer and mountain shrub communities during the summer months. These areas are considered crucial summer mule deer habitat.

Non-game – wildlife found on the AMP area is typical of the area, including a variety of small mammals, birds, raptors, and reptiles. Predators include coyotes, bobcats, and mountain lions. All waters within this arid region are important for wildlife.

3. Recreation

The AMP area 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 AMP area falls in an area classified as Limited to Existing Roads and Trails.

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

4. Wilderness

No Formally designated wilderness resources are located in this AMP area.

G. Issues brought out in scoping.

1. Issues relating to Rangeland Health

a. Noxious weeds, scotch thistle.
b. Lack of herbaceous plants in old treatments and pinyon juniper stands. Sec 6, 7, & 8 north end of Hobble canyon and Sullivan Draw south of Sullivan Reservoir.
c. Erosion in the bottoms. Sec 6, 7, & 8 north end of Hobble canyon and Sullivan Draw south of Sullivan Reservoir.

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

a. Skeletons of burned trees "look's bad"
Mostly a visual concern and not a rangeland health issue. One option would be to just ignore this issue and allow nature to take it course. Another way would be to try to solve the visual issue. This at the simplest form would be

to allow people to harvest the dead trees adjacent to roads. Harvesting dead trees only adjacent to roads would still allow plenty of dead trees for other natural processes to continue deeper within the burned areas.

Options concerning this issue will be discussed with affected programs outside this S&G process.

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 Imlay and Sullivan Tank allotments. If the current livestock grazing practices are determined to be causing non-attainment of Standards they will be modified to comply with the Guidelines for Grazing Administration. This assessment will also evaluate and update existing Activity Plan objectives to ensure multiple use objectives are tied to the indicators for rangeland health.

B. Summary of Studies Data

1. **Livestock Actual Use on AMP** (Sullivan Tank Allotment was added to the Imlay AMP in 1990, actual use started in 1989).

Year	Sullivan Tank Actual AUMs Used	Imlay Actual AUMs Used	Actual Total AUMS Used	Percentage of the 456 AUMs Authorized Sullivan*	Percentage of the 734 AUMs Authorized Imlay*	Percentage of the 1190 AUMs Authorized Imlay/Sullivan
1986		472	472	0%	64%	40%
1987		610	610	0%	83%	51%
1988		706	706	0%	96%	59%
1989	209	734	943	46%	100%	79%
1990	543	296	839	119%	40%	71%
1991	384	290	674	84%	40%	57%
1992	70	634	704	15%	86%	59%
1993	381	155	536	84%	21%	45%
1994	90	90	180	20%	12%	15%
1995	181	199	380	40%	27%	32%
1996	426	311	737	93%	42%	62%
1997	380	461	841	83%	63%	71%
1998	557	174	731	122%	24%	61%
1999		678	678	0%	92%	57%
2000	255	367	622	56%	50%	52%
2001	458	302	760	100%	41%	64%
2002		437	437	0%	60%	37%
2003	519	85	604	114%	12%	51%

*Data is based on billing and may not reflect correct usage in each allotment; however the overall AMP use should be correct.

Actual livestock use on the AMP has been below what is authorized during the period of this evaluation.

2. Precipitation

Most of the AMP area falls in a 12-inch precipitation zone with most precipitation occurring during winter, as depicted by the data from two precipitation gauges located just off the AMP area at opposite ends. The Mud Mountain rain gauge is located west by northwest of the AMP area, and the Sullivan tank rain gauge is located on the east boundary of the AMP area. Data shows that drought has played a major role in vegetation changes particularly over the last five years. For the last six years winter precipitation has been below average for the Sullivan Tank rain gauge. Summer average precipitation has been similar as has the annual precipitation. The Mud Mountain rain gauge information shows similar drought conditions.

September 7, 2004	Sullivan Tank Precipitation Rain Gauge Number:											25			Page 1
Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Fall % Avg	80	92	84	67	51	130	138	91	158	115	204	53	33	52	119
Winter % Avg	207	199	207	47	100	83	35	134	31	97	40	90	43	94	85
Spring % Avg	169	90	73	167	137	150	31	84	137	170	160	54	67	55	195
Summer % Avg	49	119	121	115	167	148	185	80	87	87	83	76	166	74	101
Annual % Avg	135	141	140	92	120	121	94	103	84	110	97	75	83	76	114

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004			
Fall % Avg	136	133	92	141	163	82	152		111	74	119	30			
Winter % Avg	235	73	190	96	78	125	30	75	96	41	93	75			
Spring % Avg	117	88	83	82	78	81	112	12	129	5	112	61			
Summer % Avg	37	33	108	36	170	236	92	71	20	20	118				
Annual % Avg	141	72	133	81	117	145	79	52	80	33	107	44			

Precipitation Average by Percent for each Season.			
Fall	Winter	Spring	Summer
13%	38%	18%	30%

September 10, 2004	Mud Mountain Precipitation Rain Gauge Number:											06			Page 1
Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Fall % Avg	89	223	30	78	62	212	111	108	168	107	220	33	33	52	52
Winter % Avg	263	100	187	45	56	116	28	121	36	86	52	95	61	74	100
Spring % Avg	182	192	74	189	141	171	30	41	150	110	134	36	92	78	224
Summer % Avg	35	66	88	77	112	143	141	58	120	135	136	94	131	111	46
Annual % Avg	160	125	116	84	87	147	72	88	99	107	115	75	82	81	100

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004			
Fall % Avg	98	153	192	30	134	92	157		171	12	49	34			
Winter % Avg	276	65	178	84	109	138	30	86	156	27	54	78			
Spring % Avg	106	86	159	11	11	137	143	27		11	122	47			
Summer % Avg	33	310	59	89	119	165	66	85	79	40	63				
Annual % Avg	153	149	144	65	98	138	78	63	110	25	67	45			

Precipitation Average by Percent for each Season.			
Fall	Winter	Spring	Summer
15%	40%	17%	28%

3. Utilization

Utilization in excess of allowable levels (45% prior to AMP development in 1988 and 50% after) has decreased from the 1980's through the 1990's and into the 2000's. This change in utilization levels is contributed to better management under the AMP. The grazing system developed in 1988 on the Imlay allotment, which later in 1990 was revised adding the Sullivan Tank allotment to the system provided better management, changing the season-of-use from yearlong to winter spring and incorporated additional pasture rotations.

The table's below shows the highest utilization levels recorded on key plant species for the year the studies were completed and the potential AUMs. The shaded area shows where the limits were exceeded. Note that since the implementation of the 1990 AMP utilization has been at or below the authorized level.

Imlay Allotment																		
Key Area	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	23%	41%	40%	68%	72%	53%	36%	41%	47%	47%	45%	10%			30%			31%
2	23%	32%	54%	58%	66%	36%	51%	53%	50%	44%	43%	32%				35%	27%	43%
3		52%	63%	55%	48%	50%	45%	49%	49%	38%	41%	30%	17%			30%	29%	35%
Actual AUMS (Potential AUMs*)				472 (347)	610 (424)	706 (666)	734 (720)	296 (279)	290 (290)	634 (674)	155 (172)	90 (141)	199 (585)	311	461 (768)	174 (249)	678 (1,169)	367 (427)

However, on the Imlay allotment the overall utilization for each key area for the evaluation period was key area #1, 33%; #2, 34%; and #3, 36%.

Sullivan Tank Allotment																		
Key Area	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
#1	38%	31%	51%	4%	31%		27%	35%	43%	5%	18%	43%			32%	27%	19%	
#2	38%	15%	51%	39%	31%		14%	35%	43%			43%						
#3	36%		34%	26%	7%			9%	3%	5%	9%				32%	24%	19%	
#4	31%	31%	51%	4%	3%		27%	21%	27%			19%			19%	27%	12%	
Actual AUMS (Potential AUMs*)					472 (761)	610	706 (1,307)	734 (1,049)	296 (344)	290 (290)	634 (1,761)	155 (180)	90	199	311 (486)	461 (854)	174 (458)	678 (2,260)

*Potential AUMs is based on the key plant species with the highest. Authorized AUMs is equal to 456.

However, on the Sullivan Tank allotment the overall utilization for each key area for the evaluation period was key area #1, 17%; #2, 21%; #3, 15%, and #4, 18%.

4. Trend of frequency and cover data

The vegetation monitoring data is collected at different points in time on the same site (key area), reading and recording these studies every few years and then comparing these back to the original baseline data to detect any change (trend). (Analysis assumes the use of a binomial confidence limits table to evaluate significant differences frequency readings different years.)

Trend monitoring was conducted at seven key areas over the AMP area, using the pace-frequency method. Cover data is collected to determine the percent of bare ground, litter, rock, composition and live basal vegetation. 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 forage plant frequency at the key area which is toward or away from the stated.

Key Area #1 Imlay East Pasture (Shallow Loamy Upland 10-14" pz)					
Plant Species (Pace Frequency)	**Included in the EcoSite Guide**	**Present at the Key Area**	**Percent Frequency in 1982 Pre-fire**	**Percent Frequency in 2003 Post fire**	**Trend**
Grasses					
Orhy	Yes	Yes	2	T	Static
Sihy	Yes	Yes	11	1	down
Agsm	Yes	Yes	1		Static
Hija	Yes	Yes	14	12	Static
Spcr	Yes	Yes		1	Static
Forbs					
Sphae	Yes	Yes		5	
AAFF	Yes	Yes		81	
Eriog	No	Yes		92	
Penst	No	Yes		2	
PPFF	Yes	Yes	2	3	
Spurge	No	Yes		69	
Shrubs					
Gusa2	Yes	Yes	2		
Artr2	Yes	Yes	59		
Juos	Yes	Yes			
Ground Cover (Step Point)	**EcoSite potential**	**Reading in 1982**	**Reading in 2003**	**AMP objective for cover**	**Trend**
% Ground Cover	Not mentioned	33%	52%	N/A	Up
Live Basal Veg. cover.	Not mentioned	2%	1%	10%	Static

Key Area #2 Imlay East Pasture (Loamy Upland 10-14" pz)					
Plant Species (Pace Frequency)	**Included in the EcoSite Guide**	**Present at the Key Area**	**Percent Frequency in 1982**	**Percent Frequency in 2003**	**Trend**
Grasses					
Orhy	Yes	Yes	1		Static
Sihy	Yes	Yes	17	2	Down
Agsm	Yes	Yes	4		Down
Hija	Yes	Yes	7	T	Down
Spcr	Yes	Yes			Static
Forbs					
Sphae	Yes	Yes			
AAFF	Yes	Yes		66	
Shrubs					
Gusa2	No	Yes	1		
Artr2	Yes	Yes	74	63	
Opunt	No	Yes		T	
Eriog	No	Yes			
Juos	Yes	Yes	T	T	
Ground Cover (Step Point)	**EcoSite potential**	**Reading in 1982**	**Reading in 2003**	**AMP objective for cover**	**Trend**
% Ground Cover	Not mentioned	46%	82%	N/A	Up
Live Basal Veg. cover.	Not mentioned	5%	4%	10%	Static

Key Area #3 Imlay West Pasture (Shallow Loamy 10-14" pz)					
Plant Species (Pace-Frequency)	**Included in the EcoSite Guide**	**Present at the Key Area**	**Percent Frequency in 1982**	**Percent Frequency in 2003**	**Trend**
Grasses					
Orhy	Yes	Yes			Static
Sihy	Yes	Yes		10	Up
Hija	Yes	Yes		2	Static
Arist	Yes	Yes			
Forbs					
Sphae	Yes	Yes		2	
AAFF	Yes	Yes		52	
AAGG	No	Yes		43	
PPFF	Yes	Yes		12	
Spurge	No	Yes		6	
Aster	No	Yes			
Shrubs					
Epne	Yes	Yes			
Come	No	Yes			Static
Putr	No	Yes			
Gusa2	Yes	Yes	18	2	
Chiv8	No	Yes		2	
Cora	No	Yes	8	2	
Artr2	Yes	Yes	32	32	
Lycium	No	Yes		10	
Juos	Yes	Yes	14	12	
Befr	No	Yes		1	
Ground Cover (Step Point)	**EcoSite potential**	**Reading in 1982**	**Reading in 2003**	**AMP objective for cover**	**Trend**
% Ground Cover	Not mentioned	48%	73%	N/A	Up
Live Basal Veg. cover.	Not mentioned	4%	3%	10%	Static

Key Area #1 Sullivan Tank Pasture East end (Loamy Upland 10-14" pz)					
Plant Species (Pace Frequency)	**Included in the EcoSite Guide**	**Present at the Key Area**	**Percent Frequency in 1981 Pre-fire**	**Percent Frequency in 2004 Post fire**	**Trend**
Grasses					
Orhy	Yes	Yes			Static
Sihy	Yes	Yes		2	Static
Agcr	No	Yes		T	Static
Poa	Yes	Yes		T	Static
Hija	Yes	Yes	74	46	Down
Spcr	Yes	Yes		1	Static
Bogr	Yes	Yes			Static
Forbs					
Sphae	Yes	Yes	1	21	
AAFF	Yes	Yes		94	
Aster	No	Yes			
Shrubs					
Gusa2	No	Yes	1	2	
Artr2	Yes	Yes	21	11	
Opunt	No	Yes			
Ground Cover (Step Point)	**EcoSite potential**	**Reading in 1981**	**Reading in 2004**	**AMP objective for cover**	**Trend**
% Ground Cover	Not mentioned	39%	66%	N/A	Up
Live Basal Veg. cover.	Not mentioned	7%	4%	10%	Static

Key Area #2 Sullivan Tank Pasture northwest part (Loamy Upland 10-14" pz)					
Plant Species (Pace Frequency)	**Included in the EcoSite Guide**	**Present at the Key Area**	**Percent Frequency in 1981**	**Percent Frequency in 2004**	**Trend**
Grasses					
Orhy	Yes	Yes	P	1	Static
Sihy	Yes	Yes	6	9	Static
Agsm	Yes	Yes	P	1	Static
Seeded	No	Yes	P	P	Static
Hija	Yes	Yes	44	44	Static
Spcr	Yes	Yes	4	P	Down
Bogr	Yes	Yes	P	P	Static
Forbs					
Sphae	Yes	Yes	P	T	
AAFF	Yes	Yes	P	21	
Shrubs					
Cela	Yes	Yes	P	P	
Gusa2	No	Yes	1	T	
Artr2	Yes	Yes	67	59	
Ground Cover (Step Point)	**EcoSite potential**	**Reading in 1981**	**Reading in 2004**	**AMP objective for cover**	**Trend**
% Ground Cover	Not mentioned	38%	66%	N/A	Up
Live Basal Veg. cover.	Not mentioned	7%	6%	10%	Static

Key Area #3 Sullivan Tank Pasture northwest part (Loamy Upland 10-14" pz)					
Plant Species (Pace Frequency)	**Included in the EcoSite Guide**	**Present at the Key Area**	**Percent Frequency in 1981 Pre-fire**	**Percent Frequency in 2004 Post-fire**	**Trend**
Grasses					
Orhy	Yes	Yes	P	1	Static
Sihy	Yes	Yes	1	9	Up
Agsm	Yes	Yes	P	P	Static
Poa	Yes	Yes	3	2	Static
Hija	Yes	Yes	P	T	Static
Spcr	Yes	Yes	P	P	Static
Bogr	Yes	Yes	P	P	Static
Arist	Yes	Yes	P	P	
Forbs					
Sphae	Yes	Yes	P	4	
AAFF	Yes	Yes	P	5	
Eriog	No	Yes	P	5	
PPFF	Yes	Yes	P	T	
Aster	No	Yes	P	1	
Shrubs					
Epne	Yes	Yes	P	P	
Come	No	Yes	8	3	Static
Gusa2	No	Yes	16	22	
Artr2	Yes	Yes	27	9	
Opunt	No	Yes	P	2	
Eriog	No	Yes	P	1	
Yucca	Yes	Yes	P	P	
Juos	Yes	Yes	9	5	
Fapa	No	Yes	P	17	
Qutu	No	Yes	4	P	
Epvi	Yes	Yes	P	1	
Befr	No	Yes	P	2	
SSSS	No	Yes	7		
Ground Cover (Step Point)	**EcoSite potential**	**Reading in 1981**	**Reading in 2004**	**AMP objective for cover**	**Trend**
% Ground Cover	Not mentioned	92%	92%	N/A	Static
Live Basal Veg. cover.	Not mentioned	3% cover	3% cover	10%	Static

Key Area #4 Sullivan Tank Pasture northern mid part (Loamy Upland 10-14" pz)					
Plant Species (Pace Frequency)	**Included in the EcoSite Guide**	**Present at the Key Area**	**Percent Frequency in 1981 Pre-fire**	**Percent Frequency in 2004 Post-fire**	**Trend**
Grasses					
Orhy	Yes	Yes	1	8	Up
Sihy	Yes	Yes	6	26	Up
Stipa	Yes	Yes	P	1	
Poa	Yes	Yes	11	3	Down
Hija	Yes	Yes	43	58	Up
Spcr	Yes	Yes	P	P	Static
Bogr	Yes	Yes	1	P	Static
Forbs					
Sphae	Yes	Yes	P	11	
AAFF	Yes	Yes	P	17	
AAGG	No	Yes	P	1	
Eriog	No	Yes	P	T	
PPFF	Yes	Yes	P	10	
Astra	No	Yes	P	P	
Spurge	No	Yes	P	8	
Daisy	No	Yes	P	24	
Shrubs					
Epne	Yes	Yes			
Come	No	Yes			
Gusa2	No	Yes			
Artr2	Yes	Yes			
Opunt	No	Yes			
Eriog	No	Yes			
Yucca	Yes	Yes			
Juos	Yes	Yes			
FAPA	No	Yes			
Qutu	No	Yes			
Epvi	Yes	Yes			
Befr	No	Yes			
SSSS	No	Yes			
Ground Cover (Step Point)	**EcoSite potential**	**Reading in 1981**	**Reading in 2004**	**AMP objective for cover**	**Trend**
% Ground Cover	Not mentioned	70%	68%	N/A	Static
Live Basal Veg. cover.	Not mentioned	4% cover	9% cover	10%	Up

Monitoring data (1981 to 2004) of the Imlay/Sullivan Tank AMP indicates that drought and fires have had impacts on trends. Fire has been an influence on key area #1 (1995) in the Imlay Allotment, and key area #1 (1998), #3 (1998), and #4 (1995 & 1998). Drought (1999 to 2004) has been an influence on all key areas. Still on the 7 key areas, 5 key forage species showed improving trends, 30 remained static, and 7 were down. Ground cover showed an improving trend on 5 of the 7 key areas and remaining static on 2. Live vegetative cover trend improved on 1 key area and remained static on the remaining 6. Comparing this data to the

pre-drought monitoring summaries helps to illustrate what influence climatic has had on the seven key areas. Pre-drought summaries showed improving trend on 13 key forage species, 28 were static, with only 1 being in a downward trend.

Five to seven years of data even with the influence of fire suggest that current management has not precluded achievement of static to improving trends on key forage species, but that climatic change is a factor. The Interdisciplinary Assessment Team (IAT) determined during the assessment process, that resource conditions on the allotments are making significant progress toward meeting the applicable Standards for Rangeland Health

5. Species Composition and Ecological Status

The "Dry Weight Rank" vegetative sampling method is used to determine species composition. The present composition and the potential for each key species are used to set composition objectives. 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.

Key Area #1, Imlay Allotment, East Pasture (Shallow Loamy 10-14" pz)				
Plants Species	**Site Guide Allowable Percent Composition**	**1988 Percent Composition Pre-fire**	**2003 Percent Composition Post fire**	**Desired Percent Composition Objective**
Grasses	60-70	11	7	
Group-3				
Hija	5-15	7	6	10-15
Spcr	1-5	0	0	
Group-4				
Orhy	5-10	1	T	5-10
Agsm	5-20	0	0	1-5
Group-6				
Sihy	5-10	3	1	5-10
Forbs	1-5	0	93	1-5
Group-14				
Sphae	1-5		3	
Group-15				
PPFF	1-5			
Penst*		0	0	
Comand		0	0	
Group-18				
AAFF	1-5	0	0	
Eroig		0	42	
Euph		0	11	
Ment-1		0	37	
Nigl		0	0	
AAGG*		0	0	
Shrubs & Trees	5-30 5-10	89	0	
Group-24				
Gusa2	5-10	21	0	
Group-27				
Artr	5-30	61	0	0-10
Group-32				
Juos	5-10	7	0	0-5
	% Similar to PNC	58	15	

Key Area #2, Imlay Allotment, Middle Pasture (Loamy Upland 10-14" pz)				
Plants Species	**Site Guide Allowable Percent Composition**	**1988 Percent Composition was not read**	**2003 Percent Composition**	**Desired Percent Composition Objective**
Grasses	70-80		1	
Group-3				
Hija	5-15		1	5-15
Spcr	1-3		0	
Group-4				
Orhy	5-20		0	5-10
Agsm	20-30		0	10-20
Group-6				
Sihy	5-10		0	5-10
Forbs	5-10		33	5-10
Group-14				
Sphae	5-10		0	
Group-18				
AAFF	5-10		33	
Shrubs & Trees	15-20 0-5		67	
Group-24				
Gusa2	0-5		0	
Group-27				
Artr	5-15		63	1-15
Come*				
Eriog*			0	
Opunt*			2	
Group-32				
Juos	0-5		2	2-5
	% Similar		30	

Key Area #3, Imlay Allotment, West Pasture (Shallow Loamy 10-14" pz)				
Plants Species	**Site Guide Allowable Percent Composition**	**1988 Percent Composition**	**2003 Percent Composition**	**Desired Percent Composition Objective**
Grasses	60-70	8	12	
Group-3				
Hija	5-15	T	1	1-10
Group-4				
Orhy	5-10	3	0	1-5
Group-6				
Sihy	5-10	5	11	5-10
Forbs	1-5	8	39	1-5
Group-14				
Sphae (Spam*)	1-5	2	0	
Group-15				
PPFF	1-5	1		
Ascl*		2		
Aster*		3		
Phlox*			8	
Vicia*			2	
Group-18				
AAFF	1-5	0	12	
Videp*			2	
Astra*			2	
Ment-1*			2	
Brte*		0	10	
Shrubs & Trees	5-30 5-10	84	49	
Group-24				
Gusa2	5-10	18	0	
Group-27				
Artr	5-30	50	23	15-25
Befr	5-10	1	1	
Epne	1-5	0	0	
Chvi (Chgr6)	5-10	0	2	
Group-32				
Juos	5-10	8	19	15-20
Come*		3	0	
Lyciu*		2	2	
Putr*		3	0	
Cora*		0	2	
	% Similar	64	54	

Key Area #1, Sullivan Tank Allotment, east end (Loamy Upland 10-14" pz)				
Plants Species	**Site Guide Allowable Percent Composition**	**2000 Percent Composition**	**2004 Percent Composition**	**Desired Percent Composition Objective**
Grasses	70-80	65	46	
Group-3				
Hija	5-15	39	44	30-50
Spcr	1-3	9	1	1-3
Group-4				
Orhy	5-20	5	0	5-10
Poa	5-10	0	0	
Group-5				
Bogr2	15-30	1	0	1-5
Group-6				
Sihy	5-10	11	2	5-10
Agcr*		0	0	
Forbs	5-10	8	48	5-10
Group-14				
Sphae (Spam*)	5-10	7	16	
Group-15				
PPFF	5-10	1	0	
Group-18				
AAFF	5-10	0	32	
Shrubs & Trees	15-20 0-5	27	6	
Group-24				
Gusa2	0-5	2	3	
Group-27				
Artr	5-15	23	3	0-15
Opunt*		2	0	
	% Similar	61	33	

Key Area #2, Sullivan Tank Allotment, east end (Loamy Upland 10-14" pz)				
Plants Species	**Site Guide Allowable Percent Composition**	**1988 Percent Composition**	**2004 Percent Composition**	**Desired Percent Composition Objective**
Grasses	70-80	17	37	
Group-3				
Hija	5-15	13	31	40-50
Spcr	1-3	0	0	
Group-4				
Orhy	5-20	3	3	5-10
Agsm	20-30	0	0	
Group-5				
Bogr2	15-30	1	0	1-5
Group-6				
Sihy	5-10	0	3	5-10
Seeded*				
Forbs	5-10	0	4	5-10
Group-14				
Sphae (Spam*)	5-10	0	0	
Group-15				
PPFF	5-10	0	0	
Group-18				
AAFF	5-10	0	3	
Chen*			1	
Shrubs & Trees	15-20 0-5	83	58	
Group-24				
Gusa2	0-5	1	T	
Group-27				
Artr	5-15	83	58	5-10
Cela*		0	0	
	% Similar	32	41	

Key Area #3, Sullivan Tank Allotment, east end (Loamy Upland 10-14" pz)				
Plants Spp	**Site Guide Allowable Percent Composition**	**1988 Percent Composition Pre-fire**	**2004 Percent Composition Post-fire**	**Desired Percent Composition Objective**
Grasses	70-80	20	5	
Group-3				
Hija	5-15	3	T	3-7
Spcr	1-3	0	0	
Group-4				
Agsm	20-30	0	0	
Orhy	5-20	7	1	5-10
Pofe	5-10	3	T	3-7
Arist	0-5	0	T	
Group-6				
Sihy	5-10	8	3	5-10
Forbs	5-10	3	52	5-10
Group-14				
Sphae (Spam*)	5-10	1	1	
Group-15				
PPFF	5-10			
Anten*		5	0	
Aster*		0	2	
Ascl			1	
Group-18				
AAFF	5-10		4	
Mentz*			3	
Erci6*			5	
Eriog*			2	
Brte*			33	
Shrubs & Trees	15-20 0-5	76	43	
Group-24				
Gusa2	0-5	43	13	
Group-27				
Artr	5-15	17	8	5-15
Befr* (Matr3)	0-3	T	2	
Epvi (Ephed)	1-10	0	0	
Fapa*		0	10	
Come*		7	5	5-10
Opunt*		T	2	
Eriog*		0	T	
Group-31				
Yucca	0-10	0	T	
Group-32				
Juos	0-5	8	4	
	% Similar	54	45	

Key Area #4, Sullivan Tank Allotment, east end (Loamy Upland 10-14" pz)				
Plants Species	**Site Guide Allowable Percent Composition**	**Previous Percent Composition was not read**	**2004 Percent Composition Post-fire**	**Desired Percent Composition Objective**
Grasses	70-80		56	
Group-3				
Hija	5-15		47	40-50
Spcr	1-3		0	
Group-4				
Orhy	5-20		2	5-10
Pofe	5-10		0	1-5
Stipa	5-10		1	
Group-5				
Bogr2	15-30		0	
Group-6				
Sihy	5-10		6	5-10
Forbs	5-10		18	5-10
Group-14				
Sphae	5-10			
Spam*			7	
Group-15				
PPFF	5-10		0	
Daisy*			6	
Phlox*			1	
Group-18				
AAFF	5-10		2	
Mentz*			3	
Spurge*				
Saka*				
Shrubs & Trees	15-20 0-5		26	
Group-24				
Gusa2	0-5		24	
Group-27				
Artr	5-15		1	1-15
Epvi (Ephed)	1-10		0	
Opunt*			0	
Eriog			0	
Group-32				
Juos			1	1-3
	% Similar		46	

6. Special Status Species

a. Plant
None

b. Animal

There is no known data regarding bald eagles, California condors, or peregrine falcons in the AMP area.

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

Herpetological inventories have not been done for the allotments. No sensitive reptiles or amphibians are known or suspected to occur on these allotments.

7. Wildlife Habitat

Big Game:

Mule deer information is collected by AGFD on a Game Management Unit basis; the AMP area lies within Unit 13B. It is not possible to precisely determine what contribution this AMP area makes to the overall wildlife populations in the much larger and more diverse Unit 13B.

Unit 13B is well known for trophy mule deer hunting and mule deer are the most important big-game species in this AMP area. Other big game species in Unit 13B such as bighorn sheep, pronghorn, and wild turkey are unlikely to be found in the AMP area.

In general, the 13B mule deer population is believed to have increased over the past ten years. The ratio of fawns per 100 does has ranged from 20 to 67 fawns and averaged 47 fawns per 100 does. AGFD manages for 20 bucks per 100 does, but the buck ratio is believed to exceed this standard in Unit 13B. Appendix E provides recent AGFD mule deer data.

Non Game:

There is no known data regarding non game species in the AMP area.

8. Riparian/Fisheries Habitat – None

Not applicable – there is no riparian/fisheries habitat in the AMP area.

9. Wild Horse and Burro Habitat

Not applicable – area is not within or adjacent to a wild horse or burro management area.

10. Lithology and Soils

Lithology:

The Imlay Allotment consists of slopes from 2 to 70 percent. The east portion of Imlay is composed of limestone mesas. The extreme southwest is made up of basalt. The north and west parts are rock outcrops and consist of pinyon juniper forests.

The Sullivan Tank allotment consists of a plateau dissected by canyons and ravines in Kaibab limestone and shale

Soils (623) and ecological sites:

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

38 Hobog-Tidwell fam complex, 8 to 35 percent slopes, (plateau, mesa, ridge), limestone; Hobog and Tidwell-Limey Upland, 6" to 9"

45 Mellenthin-Rock outcrop-Torriorthents complex, 10 to 70 percent slopes (hills) Kaibab; 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"

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

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"

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

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)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. Noxious weeds, scotch thistle

A field check for the scotch thistle resulted in none being found, however, the Field Office has an aggressive weeds program and any occurrences of scotch thistle will be controlled.

b. Lack of herbaceous plants in old burns and juniper stands.

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 area number one, 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.

c. Erosion in the bottoms

Some of the valley bottoms had excessive erosion particularly in areas where land treatment such as prescribed fire had taken place. Field examination and comparison of key area study indicated that there is now more ground cover present on these sites and washes are starting to heal. Positive ground cover improvement on these sites showed changes from base year ranging from 33 to 52% on key area #1 on the Imlay allotment, 39 to 66% on key area #1 on Sullivan Tank allotment. On other areas of the Sullivan Tank allotment that burn the ground cover remained static at 92% on key area #3 and 70 to 68% on key area #4.

V. Conclusions

A. Pertaining to Objectives

1. Land Use Plan Objectives

SHIVWITS RESOURCE AREA IMPLEMENTATION PLAN (SRAIP)

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

This objective is met by this analysis and the DPC objectives developed by this process 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 utilization is set at 45%.

This objective was met completely on all key areas since implementation started (1991) on the AMP.

RR02 - Evaluate requests for additional recreation permits through the National Environmental Policy Act process and for their consistency with management goals and objectives and process on a case-by-case basis.

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

RR04 - Recreation management direction includes:

1. Accommodate current uses, protect cultural values, and complement wilderness management plans where appropriate.
2. Provide visitor information.
3. Use various methods to acquire visitor use data on an annual basis.
4. Maintain a system of traffic counters, monitor results monthly, and field-verify results annually.
5. Conduct compliance patrols by district ranger.
6. Consider visual impacts on all proposed actions and protect scenic values by using mitigation measures where feasible, including alternative locations, camouflage, vegetation or topographic screening and other measures.

This objective is being met. Current impacts by recreational users on this AMP area have not been detrimental. Routine monitoring of resources are conducted by resource specialists in the area and by district rangers and visitor information is collected on use through a system of traffic counters spread across the district.

Impacts are routinely evaluated in NEPA documents related to any disturbing activities and mitigating measures recommended to protect the values in the area.

RR05 - Improve and increase road signs and develop a sign inventory system.

This objective is being met. Signs are monitored and replaced on a routine basis due to attrition and new information.

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.

RR07 - Maintain primary access roads, particularly Quail Hill Road on a year round basis.

This objective is routinely met as roads need grading from traffic use, repairs needed due to washouts during wet weather, or as other maintenance needs occur.

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.

VR04 - Consider designating backcountry byways as more information becomes available on environmental impacts and public need.

This objective has been met. No backcountry byways have been designated to date on this district but will be considered per this objective.

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

This has been met as cover has improved. Departure from soil and hydrologic site descriptions/function (rills, flow patterns, pedestals, bare ground, gullies, wind scour, litter movement and amount, resistance to erosion, soil loss, compaction and infiltration) are none to slight.

This has been accomplished by using prescribe fire and reseeding on portions of the AMP area. There is still additional work that could be accomplished as identified in the AMP.

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

The objective has been met. Departure from soil and hydrologic site descriptions/function (rills, flow patterns, pedestals, bare ground, gullies, wind scour, litter movement and amount, resistance to erosion, soil loss, compaction and infiltration) are none to slight.

Management has been successful in increasing or maintaining vegetative cover based on key area information, thus minimizing erosion over most of the AMP area.

This allotment (Sullivan Tank) was classified as a Category IV meaning that watershed units are currently in unsatisfactory erosion condition and the soils would be responsive to treatment.

Condition has improved enough to reclassify the allotment as a Category II which means that the watersheds are in satisfactory condition, but are susceptible to erosion if disturbed.

TE01 - Manage areas consistent with multiple use 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.

This objective is being met. No actions which might contribute to the need to list candidate species are known. 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.

WL04 - Conduct inventories to obtain information required to effectively manage habitat and incorporate wildlife habitat considerations into activities of other programs.

Not met. No habitat inventories have been conducted in the AMP area other than inventories of structural habitat improvements, such as water developments

WL07 - Manage wildlife habitat through the Habitat Management Plan process to achieve desired plant community objectives.

WL16 - 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 in order to prescribe management or improvement practices to achieve these objectives.

These objectives are being met through the Black Rock HMP, revised in 1994. Standards and Guidelines assessments provide a means for development of new desired plant community objectives which meet the needs of wildlife species. Ecological site inventories are being conducted as time and funding permit.

2. Specific Resource Objectives

California Condor Recovery Plan (April, 1996)

CC-1 Provide foraging habitat for California condors. Re-establish extirpated native ungulate populations.

This objective is being met. Foraging habitat is provided. Pronghorn have been re-introduced. They had been extirpated from this general area. Due to recent concerns raised about the condors eating contaminated food, leaving dead livestock on the range for the condors is not being encouraged. Condors are especially vulnerable to lead poisoning and carcasses possibly containing lead should be removed from the range. There is no evidence that the habitat is limiting or restricting condor population growth.

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.

While this objective has not yet been met, the condor population appears to be stable and is increasing. One condor chick fledged in 2003 and two nestlings have been produced in 2004, indicating that the birds are beginning to make progress towards self-sustaining populations. Most of the condors at the Vermilion Cliffs are still young birds, with many having just recently reached sexual maturity. It will be years before the population objective reaches 150 individuals and at least 15 breeding pairs. There is no evidence that rangeland health on this allotment would inhibit the condor population from reaching this objective.

Black Rock Habitat Management Plan (HMP) Objectives

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

This objective is being met through the Standards and Guidelines assessment process, through development of new desired plant community objectives and interdisciplinary activity plans for wildlife habitat management.

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.

This objective is being met. BLM and AGFD have identified probable factors. The deer herd in Game Management Unit 13B is not currently declining

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

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

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

This objective is being met. AGFD does this as that agency manages hunting. Objectively, AGFD is doing a good job in managing buck/doe ratios as GMU 13B is one of, if not, the most desirable mule deer hunting units in the intermountain West at the current time. The unit does have a low density of deer overall, but buck numbers relative to doe numbers and the overall trophy size for this unit are excellent.

Allotment Management Plan Objectives

The overall resource goals are to improve vegetative conditions, increase the available amount of forage for livestock and wildlife, and improve the watershed conditions.

Imlay Allotment:

Key Area No. 1, located in the East Pasture of the Imlay Allotment
The Ecological Site is Shallow Loamy 10-14" precipitation zone (pz)

- Increase Indian ricegrass from 2% to 10% frequency

  Objective not met do to 1995 fire and drought. This objective was progressing towards being met. Based on the 1992 studies data, it had increased in frequency to 6%. Then, as a result of the prescribed fire and the prolonged extreme drought, it decreased and is currently not being met. However, Indian ricegrass is present on the site and the potential exists for its frequency to increase.

- Increase Galleta from 13% to 25% frequency

  Objective not met do to 1995 fire and drought. This objective was progressing towards being met. Based on the 1992 studies data, it had increased in frequency to 20%. Then, as a result of the prescribed fire and the prolonged extreme drought, it decreased and is currently not being met For several years after the treatment there were no galleta plants present; however, as of 2003 that plant frequency was back to 12% with potential to improve.

- Increase Squirreltail from 11% to 15% frequency

  Objective not met do to 1995 fire and drought. This objective was slowly progressing towards being met. Based on the 1992 studies data, it had increased in frequency to 12%. As a result of the prescribed fire and the prolonged extreme drought, it decreased and is currently not being met. For several years after the treatment there were no Squirreltail plants present; however, as of 2003 that plant frequency was back to 1% with potential to improve.

- Live Vegetation Cover (basal cover) from 3% to 10%

  Objective not met do to 1995 fire and drought. This objective was slowly progressing towards being met. Based on the 1992 studies data, it had increased to 6%. Since the treatment , it decreased and is currently not

being met, but as of 2003 live vegetative cover was back to 1% with potential to improve as perennial grasses come back.

Summary for Key Area #1:

A determination at the site was made by the IAT that standard number one was 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 33% to 52%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 2, located in the Middle Pasture of the Imlay Allotment

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)

- Increase Galleta from 7% to 15% frequency

  Objective not met. This objective was being met based on the 1997 studies data, it had increased in frequency to 24%; but as a result of the prolonged extreme drought, it currently is not being met.

- Increase Squirreltail from 17% to 20% frequency

  Objective not met. This objective was slowly progressing towards being met. Based on the 1997 studies data, it had increased in frequency to 18%; but as a result of the prolonged extreme drought, it currently is not being met.

- Increase Intermediate wheatgrass from 4% to 45% frequency

  Objective not met. Intermediate wheatgrass was seeded, but due to drought the seeding didn't take. However Western wheatgrass is present. Based on the 1997 studies data, it had increased in frequency to 8%; but as a result of the prolonged extreme drought, it currently is present in plots.

- Live Vegetation Cover (basal cover) from 5% to 10%

  Objective not met. This objective is slowly progressing towards being met. Based on the 2003 studies data, it had increased to 9%. This too has been affected by the prolonged extreme drought and presently is at 4%.

Summary for Key Area #2:

A determination at the site was made by the IAT that standard number one was 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 46% to 65%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 3, located in the West Pasture of the Imlay Allotment

The Ecological Site is Shallow Loamy 10-14" precipitation zone (pz)

- Increase Indian ricegrass from 1% to 5% frequency

  Objective not met. This objective was being met, based on the 1997 studies data. Frequency had increased to 9%, but as a result of the prolonged extreme drought, it currently is not being met.

- Increase Galleta from 0% to 10% frequency

  Objective not met. This objective was making progress towards being met. Based on the 1997 studies data, it had increased in frequency to 6%, but as a result of the prolonged extreme drought, it currently is not being met.

- Increase Squirreltail from 6% to 15% frequency

  Objective not met. This objective was being met. Based on the 1997 studies data, it had increased in frequency to 17%, but as a result of the prolonged extreme drought, it currently is not meeting.

- Increase Cliffrose from 3% to 5% frequency

  Objective not met. This objective was not making progress towards being met. Based on the 1997 studies data, its frequency was still at 3%; and as a result of the prolonged extreme drought, it currently is not being met.

- Live Vegetation Cover (basal cover) from 4% to 10%

  Objective not met. This objective was making progress towards being met. Based on the 1997 studies data, it had increased to 6%. This too has been affected by the prolonged extreme drought and presently is at 3%.

Summary for Key Area #3

The IAT debated at this site because of evidence of water flows causing some soil movement. The IAT was split as to whether the site actually met standard number one because of that movement. Additional literature search of soil properties and qualities in the "Soil Survey of Shivwits Area, Arizona, Part of Mohave County" (Issued 2000) concerning the Childers-Rizno association indicated that water runoff

was medium to rapid and that the hazard of water erosion was slight. The IAT did conclude, though, that the livestock were not the cause and that current livestock grazing was not precluding attainment of standard number one. A greater factor contributing to water flows are the surrounding hills that had been burned in the recent past. That, coupled with the site's proximity to these hills being located essentially on a small low fan at the base of a fairly extensive draw, demonstrate the tendency to be flooded during the short duration high intensity summer storms. The hills are starting to re-vegetate and recover from the fires, and runoff should decrease over time. Based on the annual/perennial vegetation, litter or rock etc., there is adequate ground cover (ground cover had changed from 48% to 73%) to prevent accelerated erosion on the site provided the site is not inundated from high intensity rain events and runoff from the adjacent hills.

Sullivan Tank Allotment:

Key Area No. 1, located in the east end of Sullivan Tank

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)

- Increase Indian ricegrass from 1% to 5% frequency

  Objective not met do to 1998 fire and drought. This objective was progressing towards meeting objectives in spite of the fire. Based on the 2000 studies data, it had increased in frequency to 2%. Then, as a result of the prolonged extreme drought, it has not been met. However, Indian ricegrass is present on the site and the potential exists for its frequency to increase.

- Maintain or increase Galleta at 50% frequency

  Objective met. Galleta frequency is a 46% which is considered with in the range of 39 to 53, based on confidence intervals for binomial populations.

- Increase Squirreltail from 10% to 15% frequency

  Objective not met do to 1998 fire and drought. This objective was progressing towards meeting objectives in spite of the fire. Based on the 2000 studies data, it had increased in frequency to 16%. Then, as a result of the prolonged extreme drought, it has not been met. However, squirreltail is present on the site and the potential exists for its frequency to increase.

- Increase Sand dropseed from 6% to 10% frequency

  Objective not met do to 1998 fire and drought. This objective was progressing towards meeting objectives in spite of the fire. Based on the 2000 studies data, it had increased in frequency to 9%. Then, as a result of

the prolonged extreme drought, it has not been met. However, Sand dropseed is present on the site and the potential exists for its frequency to increase.

- Live Vegetation Cover (basal cover[2]) from 5% to 10%

  Objective not met do to 1998 fire and drought. This objective was slowly progressing towards being met. Based on the 1993 studies data, it had increased to 7%. Since the treatment it has not been met, but as of 2004 live vegetative cover was back to 4% with potential to improve as perennial grasses come back.

· Summary for Key Area #1:

A determination at the site was made that standard number one was 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 39% to 66%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 2, located in the south end of Sullivan Tank

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)

- Maintain or increase Galleta at 40% frequency

  Objective met. Frequency is at 44%

- Increase Squirreltail from 6% to 15% frequency.

  Objective not met.

- Increase Sand dropseed from 3% to 5% frequency

  This objective was progressing towards meeting objectives based on the 2000 studies data, it had increased in frequency to 6%. Then, as a result of the prolonged extreme drought, it has not been met. However, Sand dropseed is present on the site and the potential exists for its frequency to increase.

- Live Vegetation Cover (basal cover) from 6% to 10%

  Objective not met.

[2] Basal cover is the area of ground surface occupied by the basal portion of the plants. Basal cover as used in this document is one component of ground cover (i.e., plants, litter, rocks, and gravel on a site).

Summary for Key Area #2:

A determination at the site was made by the IAT that standard number one was 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 38% to 66%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 3, located in the northwest part of Sullivan Tank

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)

- Increase Mutton grass from 3% to 5% frequency

  Objective not met. Frequency is at 2%. See previous response regarding fire and drought.

- Increase Squirreltail from 5% to 15% frequency

  Objective not met. Frequency is at 9%. See previous response regarding fire and drought.

- Increase Cliffrose from 8% to 15% frequency

  Objective not met. It decreased to 3%. See previous response regarding fire and drought.

- Live Vegetation Cover (basal cover) from 3% to 10%

  Objective not met. It remained Static. See previous response regarding fire and drought.

Summary for Key Area #3:

A determination at the site was made by the IAT that standard number one was 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 remained static at 92%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Key Area No. 4, located in the northern mid part of Sullivan Tank

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)

- Increase Indian ricegrass from 1% to 5% frequency

  Objective met. Orhy increased to 8%.

- Maintain or increase Galleta at 40% frequency

  Objective met. It actually increased to 58%.

- Increase Squirreltail from 5% to 15% frequency

  Objective met. It actually increased to 26%.

- Live Vegetation Cover (basal cover) from 4% to 10%

  Objective met. It increased to 9% which is within the range based on the confidence intervals for Binomial populations.

Summary for Key Area #4:

A determination at the site was made by the IAT that standard number one was 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 remained static at 70% and 68%) to prevent accelerated erosion on the site, and signs of accelerated erosion were minimal.

Desired Plant Community Objectives:

DPC objectives that were developed during this process are as follows, though achievement is actually not expected until 2015 they would replace existing frequency objectives in AMP.

One key area is meeting DPC objectives, the other six key areas are not. Four of the six key areas are not meeting due to prescribed fires during the late 90's followed by extended drought. The other two of the six key areas not meeting are in sagebrush communities would require land treatment to achieve DPC objectives.

The IAT felt that, on the key areas not meeting due to prescribed fires, there is potential for continued improvement to the plant community as they recover from the treatments and establish DPC objectives accordingly. Based on the analysis of the monitoring data (i.e., precipitation, utilization, ecological status, and vegetative trend) and other rationale provided, livestock grazing is not impeding DPC

achievement; but progress to attainment was affected by the land treatments and drought.

On the other two key areas dominated by sagebrush, the composition of sagebrush would need to be reduced to achieve the DPC objectives. Based on the analysis of the monitoring data (i.e., precipitation, utilization, ecological status, and vegetative trend) and other rationale provided, livestock grazing is not impeding DPC achievement. However progress to attainment would require implementation of a vegetation treatment to reduce sagebrush CBW. Attainment could be adversely impacted by wildfire, and to a lesser extent, by drought...

Imlay Allotment:

Key Area No. 1, located in the East Pasture

The Ecological Site is Shallow Loamy 10-14" precipitation zone (pz)
Increase Sihy CBW to between the range of 5 to 10%, Currently at 1%
Increase Orhy CBW to between the range of 5 to 10%, Currently at 0%
Increase Hija CBW to between the range of 10 to 15%, Currently at 6%
Increase Agsm CBW to between the range of 1 to 5%, Currently at 0%
Objective not met.

Maintain Artr CBW to between the range of 0 to 10%, currently at 0%
Maintain Juos CBW to between the range of 0 to 5%, currently at 0%
Objective met.

Maintaining forb CBW to between the range of 1 to 5% or above, currently at 93%
Objective met.

Maintain ground cover above 50% currently at 52%
Objective met.

- Increase live vegetation cover (basal cover) to between 3 and 8% currently at 1%
- Increase canopy cover to between 10 and 30% on perennial vegetation
  Objective not met. Perennial basal vegetation cover has varied from 1 to 7% in the past, and canopy cover is presently at 3%.

Summary key area #1 Imlay allotment:

Overall this key area, as a result of the burn and prolonged drought, didn't meet Standard Number Three. However, four of the ten objectives, developed at the time of this assessment, are being met.

Key Area No. 2, located in the Middle Pasture

The Ecological Site is Loamy Upland 10-14" precipitation zone (pz)
Increase Sihy CBW to between the range of 5 to 10%, currently at 0%
Increase Orhy CBW to between the range of 5 to 10%, currently at 0%
Increase Hija CBW to between the range of 5 to 15%, currently at 1%
Increase Agsm CBW to between 1 the range of 0 to 20%, currently at 0%
Objectives not met.

Decrease Artr CBW to between the range of 1 to 15%, currently 63%
Objective not met. This DPC objective will not be met without some type of land treatment.

Maintain Juos CBW to between the range of 2 to 5%, currently at 2%
Maintaining the forb CBW to between the range of 5 and 10% or above, currently at 33%
Objectives met.

Maintain ground cover above 65%
Objective met. Ground cover has increased from 46 to 82% do to high spring precipitation (118% of average).

- Maintain live vegetation cover (basal cover) between 5 and 10%, currently at 9%
- Maintain canopy cover to between the range of 25 to 35% on perennial vegetation

Objectives met. Canopy cover is presently at 53%. This DPC objective will not be met without some type of land treatment.

Summary key area #2 Imlay:

Overall this key area, as a result of the prolonged drought and site potential, didn't meet Standard Number Three. However, five of the ten DPC objectives, developed at the time of this assessment, are being met.

Key Area No. 3, located in the West Pasture

The Ecological Site is Shallow Loamy 10"-14" precipitation zone (pz)
Maintain Sihy CBW to between the range of 5 to 10%, currently at 11%
Maintain Hija CBW to between the range of 1 to 10%, currently at 1%
Objectives met

Maintain Orhy CBW to between the range of 1 to 5%, currently at 0%
Objective not met

Maintaining Artr CBW to between the range of 15 to 25%, currently at 23%
Maintaining Juos CBW to between the range of 15 to 20%, currently at 19%

Objectives met

Maintaining the forb CBW to between the range of 1 to 5% or above, currently at 12%
Objective met

Maintain ground cover above 55%
Objective met. . *Ground cover has increased from 48 to 73% do to high spring precipitation (118% of average).*

- Maintain live vegetation cover (basal cover) to between the range of 3 and 8%, currently at 3%
- Maintain canopy cover to between the range of 25 to 35% on perennial vegetation currently at 28%.

Objectives met.

Summary key area #3 Imlay

Overall this key area is meeting Standard Number Three. All of the nine objectives are being met. Based on the analysis of the monitoring data (i.e., precipitation, utilization, ecological status, and vegetative trend) and other rationale provided, livestock grazing is not impeding objective achievement, but current drought has impacted the area.

Sullivan Tank Allotment:

Key Area No. 1, located in the east end of Sullivan Tank

Increase Sihy to between the range of 5 to 10% CBW, currently at 2%
Increase Orhy to between the range of 5 and 10% CBW, currently at 0%
Objectives not met.

Maintain Hija to between the range of 30 and 50% CBW, currently at 44%.
Maintain Spcr to between the range of 1 and 3% CBW, currently at 1%
Objectives met.

Maintain Artr CBW to between the range of 0 to 15%, currently at 3%
Objective Met.

Maintaining forbs to between the range of 1 to 10 percent CBW through 2015
Objective Met. Forbs are at 48%.

Maintain ground cover above 65%, currently at 66%
Objective met.

- Maintain basal cover to between the range of 5 and 10% on perennial vegetation, currently at 4%
  Objective not met.

- Increase canopy cover to between the range of 25 to 35% on perennial vegetation, currently at 20%
  Objective met.

Summary key area #1 Sullivan Tank:

Overall this key area, as a result of the burn and prolonged drought and site potential, didn't meet Standard Number Three. However, six of the nine objectives, developed at the time of this assessment, are being met.

Key Area No. 2, located in the south end of Sullivan Tank

Increase Sihy to between the range of 5 to 10% CBW, currently at 3%
Increase Orhy to between the range of 5 to 10% CBW, currently at 3%
Increase Bogr to between the range of 1 to 5% CBW, currently at 0%
Objectives not met.

Maintain Hija to between the range of 25 to 35% CBW, currently at 31%
Objective met.

Reduce Artr2 to between the range of 5 to 10% CBW, currently at 58%
Objective not met. Outside of a lands treatment this objective is not attainable.

Maintaining forbs to between the range of 5 to 10 percent CBW through 2015
Objective not met. Forbs were at 4%

Maintain ground cover above 65%, currently at 66%
Objective met.

- Maintain basal cover to between the range of 5 and 10% on perennial vegetation, currently at 6%
- Maintain canopy cover to between the range of 25 to 35% on perennial vegetation, currently at 40%

Objectives met.

Summary key area #2 Sullivan Tank:

Overall this key area, as a result of the burn and prolonged drought, didn't meet Standard Number Three. However, four of the nine DPC objectives, developed at the time of this assessment, are being met.

Key Area No. 3, located in the northwest part of Sullivan Tank

Increase Sihy to between the range of 5 to 10% CBW
Increase Orhy to between the range of 5 to 10% CBW
Increase Pofe to between the range of 3 to 7% CBW

Increase Hija to between the range of 3 to 7% CBW
Objectives not met

Maintain Come to between the range of 5 to 10% CBW, currently at 5%
Maintain Artr2 to between the range of 5 to 15% CBW, currently at 8%
Objectives met.

Maintaining forbs to between the range of 5 to 10 percent CBW through 2015
Objective met. Forbs are a 52%.

Maintain ground cover above 80%, currently at 92%
Objective met.

- Maintain basal cover to between the range of 5 and 10% on perennial vegetation, currently at 3%
  Objective not met.

- Maintain canopy cover to between the range of 25 to 35% on perennial vegetation, currently at 25%

Objective met.

Summary key area #3 Sullivan Tank:

Overall this key area, as a result of the burn and prolonged drought, didn't meet Standard Number Three. However, five of the ten objectives, developed at the time of this assessment, are being met.

Key Area No. 4, located in the northern mid part of Sullivan Tank

Maintain Sihy to between the range of 5 to 10% CBW, currently at 6%
Maintain Hija to between the range of 40 to 50% CBW, currently at 47%
Objectives met.

Increase Orhy to between the range of 5 to 10% CBW, currently at 2%
Increase Pofe to between the range of 1 to 5% CBW, currently at 0%
Objective not met.

Maintain Artr2 to between the range of 1 to 15% CBW, currently at 1%
Maintain Juos to between the range of 1 to 3% CBW, currently at 1%
Objectives met.

Maintaining forbs to between the range of 5 to 10 percent CBW through 2015
Objective met. Forbs are at 18%.

Maintain ground cover above 65%, currently at 68%
Objective met. Ground cover is at 68%.

- Maintain basal cover to between the range of 5 and 10% on perennial vegetation, currently at 9%
- Maintain canopy cover to between the range of 35 to 45% on perennial vegetation, currently at 36%

Objectives met

Summary key area #4 Sullivan Tank:

Overall this key area, as a result of the burn's and prolonged drought, didn't meet the key area objectives. However, eight of the ten objectives, developed at the time of this assessment, are being met.

Conclusion:

In conclusion the amount and timing of precipitation have adversely affected the frequency of the key species and other vegetation attributes, and that livestock grazing has not been a significant influence. Comparing pre-drought monitoring data helps to illustrate what influence climatic has had on the vegetative communities. As precipitation was above average most of the time from the late 1970's through the late 1980's vegetation increased, then as average precipitation declined in the 1990's vegetation frequency began to decline. Vegetation treatments in the late 90's, followed by drought, has precluded establishment of seeded plant species, however native forage plants are reestablishing. The AMP frequency objectives were set prior to vegetative treatment, and the DPC objectives were established during this process. It is felt that though many DPC objectives are not currently being met (39%), significant progress is being made toward their achievement under current livestock management practices and are attainable in the timeframe specified.

B. Pertaining to Issues

1. Issues relating to Rangeland Health

a. Noxious weeds, scotch thistle

Scotch thistle was not found during this evaluation process. However, annual field checks for scotch thistle will be conducted, and if found the field office has an aggressive weeds program and any occurrences of scotch thistle will be eradicated.

b. Lack of herbaceous plants in old burns

The Imlay Allotment S&G field visit on August 27, 2003, determined that there was an almost continuous presence of forbs at key area #1 which had been burned approximately six years ago. Key areas 2 &3 contained 33% and 39% CBW for forbs in the 2003 monitoring studies, but were not old

burns. In previously burned non-key areas seen from the road, especially going in to key area #1, the grass coverage looked very good and appeared to be expanding. The recent fires have removed much of the overstory shrubs and pinyon/juniper.

Annual production is based on timing, frequency, and amount of precipitation. As shown in key area number one, which was burned, 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 for the rest of the AMP area on the field trip to the Sullivan Tank Allotment on June 30, 2004.

The IAT felt that these sites were meeting Standard Number One. The IAT did feel that do to land treatments, drought, sagebrush and pinyon-juniper encroachment that Standard Number 3 was not being met at 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 vegetation treatments and drought. Current livestock grazing wasn't precluding attainment.

c. Erosion in the bottoms

As a result of the field visits on August 27, 2003, and June 30, 2004, and examination of the monitoring data the IAT made the determination that erosion in the bottoms was decreasing. This decrease in erosion is do in part to vegetation treatments. The IAT also made the determination that these areas were meeting Standard Number One, but are not meeting Standard Number Three, based on the new DPC objectives established at the time of this assessment; but progression towards attainment was being made. Further, current livestock management is not precluding attainment, but the extended drought and other climatic influences are the major factors.

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 AMP area:

[ ] Meet all applicable standards for rangeland health

[XX] 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 10 year grazing permits for the Imlay/Sullivan Tank grazing allotments, based on the assessment findings that current management has allowed significant progress to be made toward meeting the applicable standards for rangeland health.

B. Continue to implement the AMP for the Imlay/Sullivan Tank Grazing Allotments. Incorporate the new DPC's objectives into the existing AMP and continue to monitor the vegetative response to grazing management in relationship to attainment of DPC'S.

C. Contingent on funding and staffing, encourage vegetative treatment projects in pinyon-juniper habitat to benefit mule deer using prescriptions developed in habitat management plans. Leave debris piles unburned for small mammals where practical. Leave as many snags as possible for raptor perches, cavity nesting birds, and bats.

D. In reference to soils and watershed, continue the current management practices.

AUTHORIZED OFFICER CONCURRENCE:

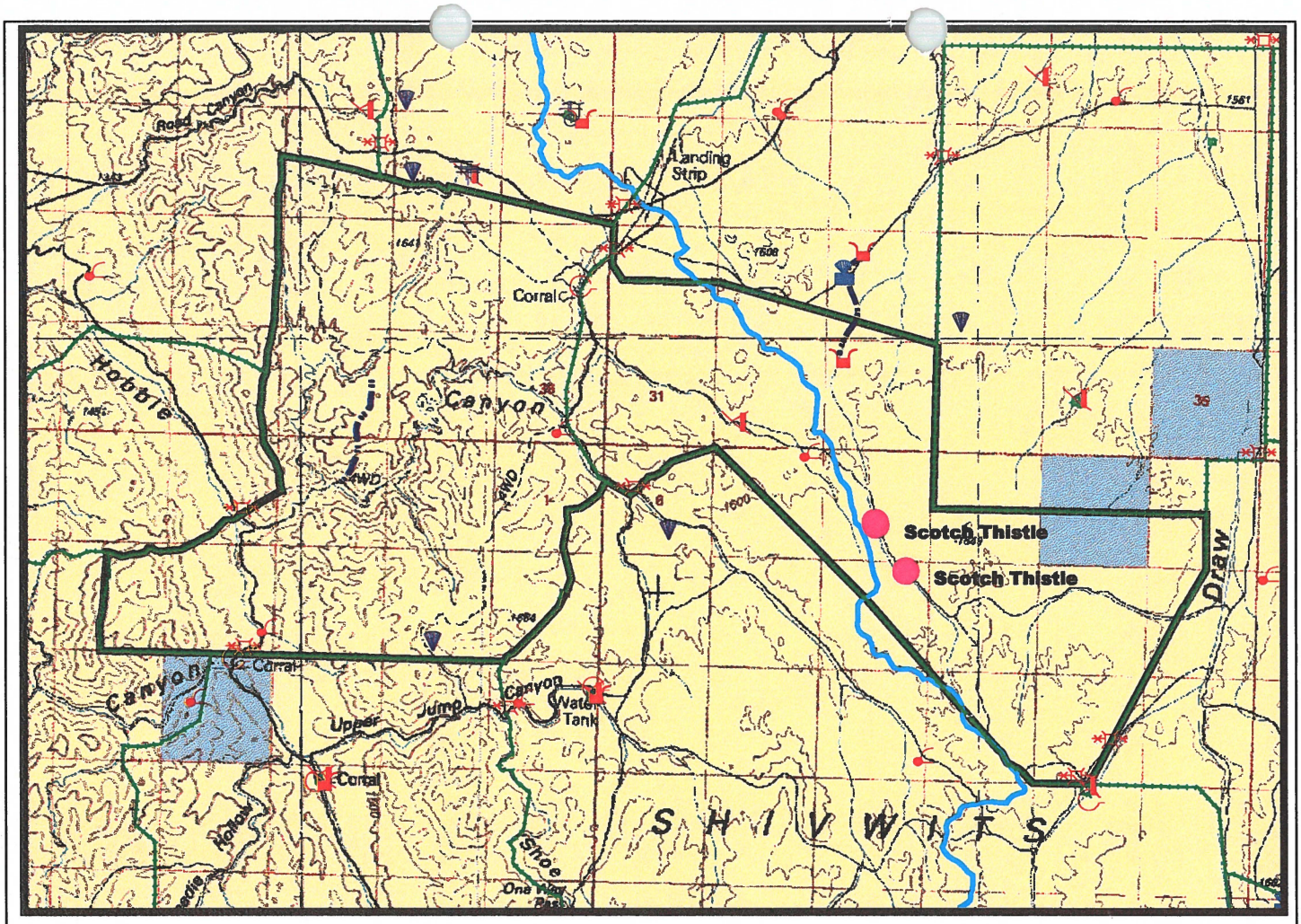
__X__ I concur with the conclusions and recommendations as written.

_____ I do not concur.

_____ I concur, with the following modifications:

Dennis Curtis
Manager
Grand Canyon – Parashant National Monument

8/15/05
Date



Imlay Allotment

Bureau of Land Management
Arizona Strip Field Office

1:100000

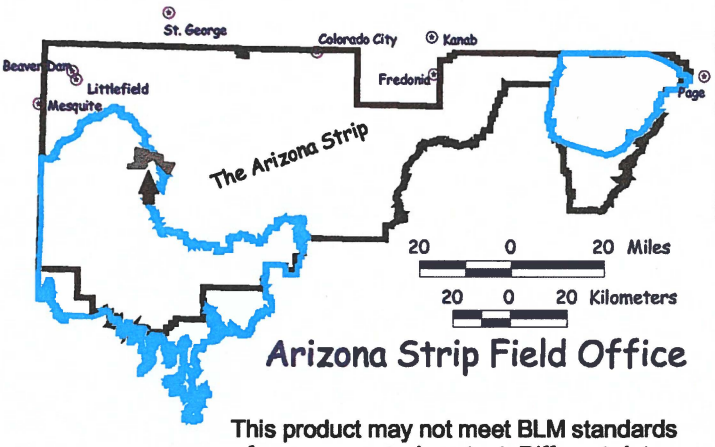
1 0 1 Miles

1 0 1 2 Kilometers

- Noxious Weeds
- Livestock Catchment
- Key Area
- Fence
- Pipeline
- Monument Boundary
- Allotment Boundary
- Wilderness Boundary

Ownership
- BLM
- Forest Service
- Indian Reservation
- National Park
- Private
- Recreation Area
- State

- Fenced Reservoir
- Trough
- Undeveloped Spring
- Unfenced Reservoir
- Water Storage Tank
- Well
- Wildlife Catchment
- Wildlife Drinker
- Windmill
- Cattleguard
- Corral
- Developed Spring



Arizona Strip Field Office

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

Produced by
Linda Price
January 6, 2003

Appendix A

ARIZONA STANDARDS FOR RANGELAND HEALTH AND
GUIDELINES FOR GRAZING ADMINISTRATION

ARIZONA STANDARDS FOR RANGELAND HEALTH AND
GUIDELINES FOR GRAZING ADMINISTRATION

INTRODUCTION

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

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

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

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

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

> "The guiding principles for standards and guidelines require that State or regional standards and guidelines address the basic components of healthy rangelands. The Department believes that by implementing grazing-related actions that are consistent with the fundamentals of §4180.1 and the guiding principles of §4180.2, the long-term health of public rangelands can be ensured.
>
> "Standards and guidelines will be implemented through terms and conditions of grazing permits, leases, and other authorizations, grazing-related portions of activity plans (including Allotment Management Plans), and through range improvement-related activities.

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

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

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

FUNDAMENTALS AND DEFINITION OF RANGELAND HEALTH

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

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

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

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

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

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This Committee defined Rangeland Health ". . .as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." This committee emphasized ". . .the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The Committee also recommended that "The determination of whether a

rangeland is healthy, at risk, or unhealthy should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

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

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

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

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

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

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

STANDARD AND GUIDELINE DEFINITIONS

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

(1) are measurable and attainable; and

(2) comply with various Federal and State statutes, policies, and directives applicable to BLM Rangelands.

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

(1) typically identify and prescribe methods of influencing or controlling specific public land uses;

(2) are developed and applied consistent with the desired condition and within site capability; and

(3) may be adjusted over time.

IMPLEMENTING STANDARDS AND GUIDELINES

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

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

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

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

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will

be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

ARIZONA STANDARDS AND GUIDELINES

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

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

Standard 1: Upland Sites

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

Criteria for meeting Standard 1:

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

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

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

As indicated by such factors as:

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

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

Exceptions and exemptions (where applicable):

none

Guidelines:

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

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

Standard 2: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

Criteria for meeting Standard 2:

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

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

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

As indicated by such factors as:

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

Exceptions and exemptions (where applicable):

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

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

Guidelines:

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

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

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

Standard 3: Desired Resource Conditions

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

Criteria for meeting Standard 3:

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

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

As indicated by such factors as:

Composition
Structure
Distribution

Exceptions and exemptions (where applicable):

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

Guidelines:

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

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

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

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

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

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

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

serviceable waters are capable of providing for proper grazing distribution;

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

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

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

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

Appendix B
Team Membership

Interdisciplinary Assessment Team

Linda Price	Project Coordinator (BLM)
Mike Small	Wildlife Biologist (BLM)
Larry Gearhart	Wilderness/Recreation Specialist (BLM)
Phil Seegmiller	Vegetation/Grazing Administration (BLM)
Robert Smith	Soils and Hazmat Watershed (BLM)
Luke Thompson	Wildlife Manager (Arizona Game and Fish Department)
Kyle Spencer	Soils and Vegetation (Natural Resource Conservation Service)
Rob Grumbles	Vegetation and Social Economics (Mohave County Extension Service)
Vernon Parent	Vegetation and Social Economics (Washington County Extension Service)

Rangeland Resource Team

Commodity Interests

Bill Gubler,
Grazing
Rancher, St. George, UT

Bill Howes
Off Road Vehicle Use
Wizards Motorcycle Club

Kent McComb,
Grazing
Retired, St. George, UT

Non-Commodity Interests

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

Spence Esplin,
Historical
Retired, St. George, UT

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

Local Area Interests

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

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

Dennis Becenti
Native American Interests
Hopi and Navajo Tribes, AZ

Alternates

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

Paul Weaver
Non-Commodity
St. George, UT

Appendix C

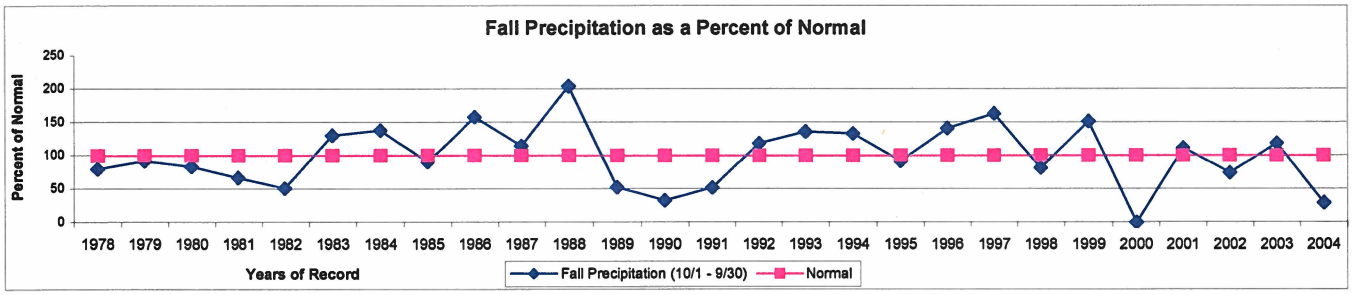
Precipitation Data

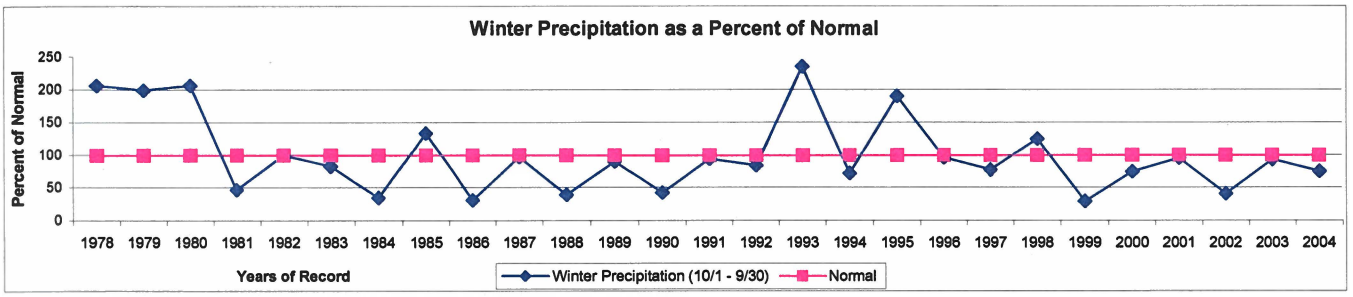
Historical Precipitation Report

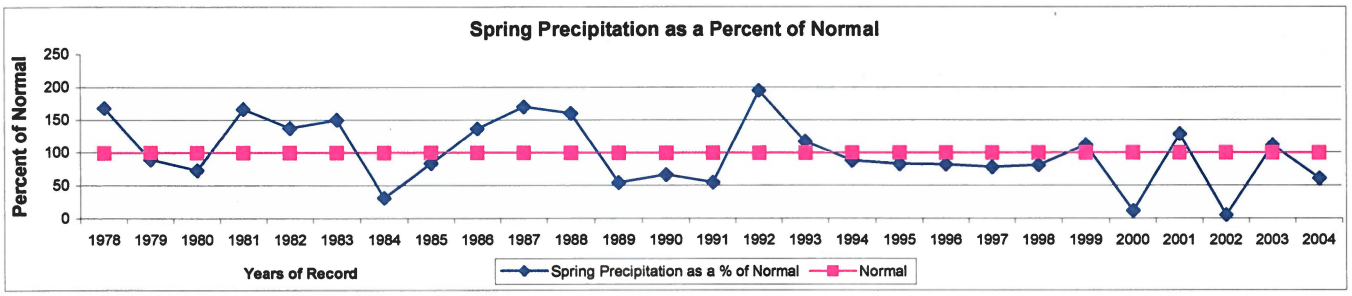
Field Office 010 **Rain Gauge Name:** Sullivan Tank **Rain Gauge Number:** 25

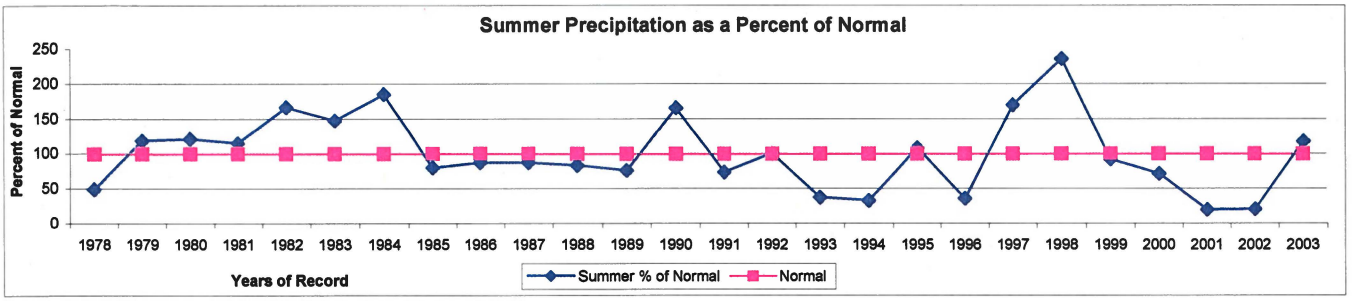
	Seasonal Precipitation Amounts					Annual Average					Percent of Normal				
Year	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.35	10.00	3.78	1.88	17.01	1.69	4.84	2.24	3.82	12.59	80%	207%	169%	49%	135%
1979	1.56	9.64	2.01	4.54	17.75	1.69	4.84	2.24	3.82	12.59	92%	199%	90%	119%	141%
1980	1.41	10.00	1.64	4.63	17.68	1.69	4.84	2.24	3.82	12.59	84%	207%	73%	121%	140%
1981	1.13	2.28	3.74	4.39	11.54	1.69	4.84	2.24	3.82	12.59	67%	47%	167%	115%	92%
1982	0.86	4.83	3.08	6.37	15.14	1.69	4.84	2.24	3.82	12.59	51%	100%	137%	167%	120%
1983	2.20	4.00	3.36	5.65	15.21	1.69	4.84	2.24	3.82	12.59	130%	83%	150%	148%	121%
1984	2.33	1.69	0.70	7.08	11.80	1.69	4.84	2.24	3.82	12.59	138%	35%	31%	185%	94%
1985	1.53	6.49	1.88	3.06	12.96	1.69	4.84	2.24	3.82	12.59	91%	134%	84%	80%	103%
1986	2.67	1.51	3.06	3.33	10.57	1.69	4.84	2.24	3.82	12.59	158%	31%	137%	87%	84%
1987	1.94	4.71	3.82	3.33	13.80	1.69	4.84	2.24	3.82	12.59	115%	97%	170%	87%	110%
1988	3.45	1.93	3.59	3.19	12.16	1.69	4.84	2.24	3.82	12.59	204%	40%	160%	83%	97%
1989	0.89	4.37	1.22	2.91	9.39	1.69	4.84	2.24	3.82	12.59	53%	90%	54%	76%	75%
1990	0.56	2.07	1.50	6.35	10.48	1.69	4.84	2.24	3.82	12.59	33%	43%	67%	166%	83%
1991	0.88	4.57	1.24	2.82	9.51	1.69	4.84	2.24	3.82	12.59	52%	94%	55%	74%	76%
1992	2.00	4.10	4.38	3.86	14.34	1.69	4.84	2.24	3.82	12.59	119%	85%	195%	101%	114%
1993	2.30	11.39	2.63	1.43	17.75	1.69	4.84	2.24	3.82	12.59	136%	235%	117%	37%	141%
1994	2.25	3.52	1.98	1.25	9.00	1.69	4.84	2.24	3.82	12.59	133%	73%	88%	33%	72%
1995	1.55	9.20	1.86	4.14	16.75	1.69	4.84	2.24	3.82	12.59	92%	190%	83%	108%	133%
1996	2.38	4.66	1.84	1.37	10.25	1.69	4.84	2.24	3.82	12.59	141%	96%	82%	36%	81%
1997	2.75	3.75	1.75	6.50	14.75	1.69	4.84	2.24	3.82	12.59	163%	78%	78%	170%	117%
1998	1.38	6.05	1.82	9.00	18.25	1.69	4.84	2.24	3.82	12.59	82%	125%	81%	236%	145%
1999	2.56	1.44	2.50	3.50	10.00	1.69	4.84	2.24	3.82	12.59	152%	30%	112%	92%	79%
2000	0.00	3.62	0.26	2.72	6.60	1.69	4.84	2.24	3.82	12.59	0%	75%	12%	71%	52%
2001	1.88	4.62	2.88	0.75	10.13	1.69	4.84	2.24	3.82	12.59	111%	96%	129%	20%	80%
2002	1.25	2.00	0.12	0.78	4.15	1.69	4.84	2.24	3.82	12.59	74%	41%	5%	20%	33%
2003	2.00	4.50	2.50	4.50	13.50	1.69	4.84	2.24	3.82	12.59	119%	93%	112%	118%	107%
2004	0.50	3.65	1.37	1.69			4.84	2.24	3.82	12.59	30%	75%	61%		

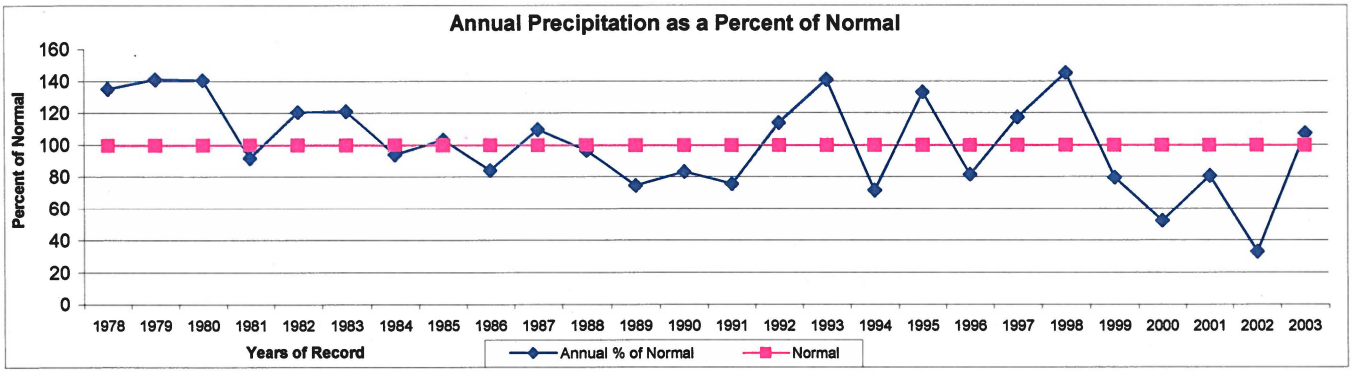
Sullivan Tank Precipitation rain gauge number 25



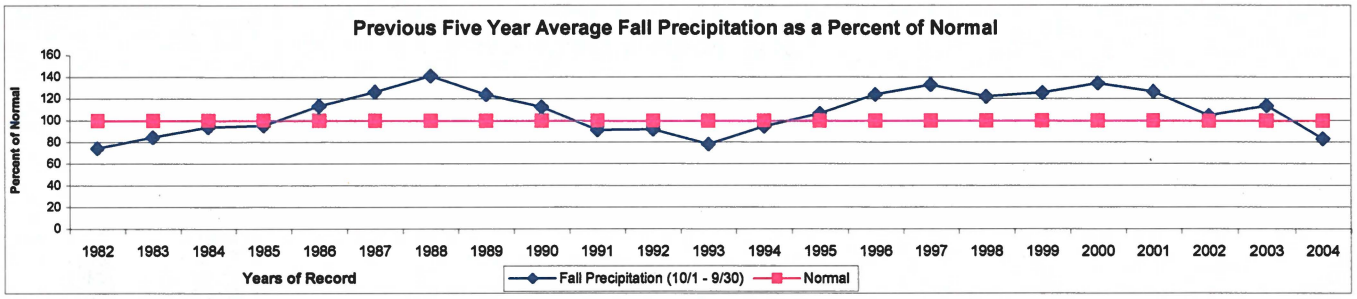


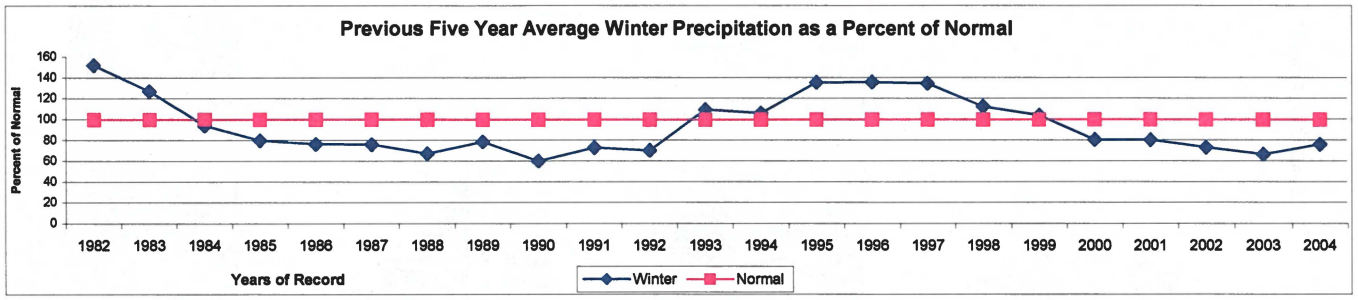


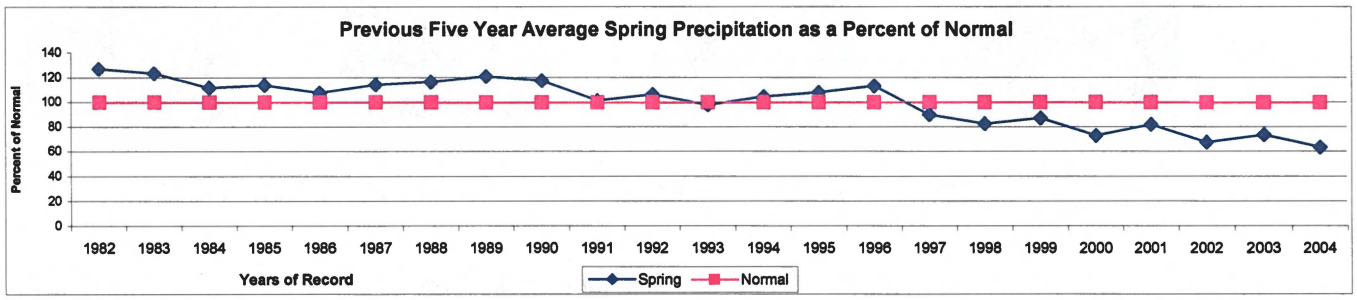


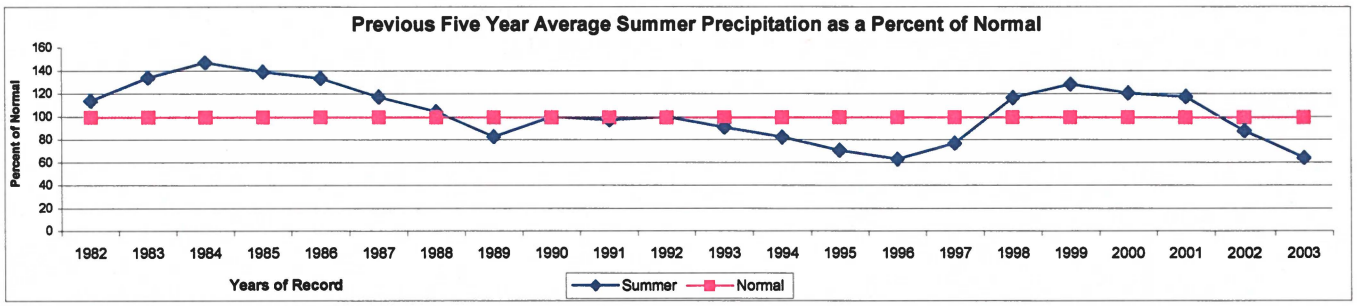


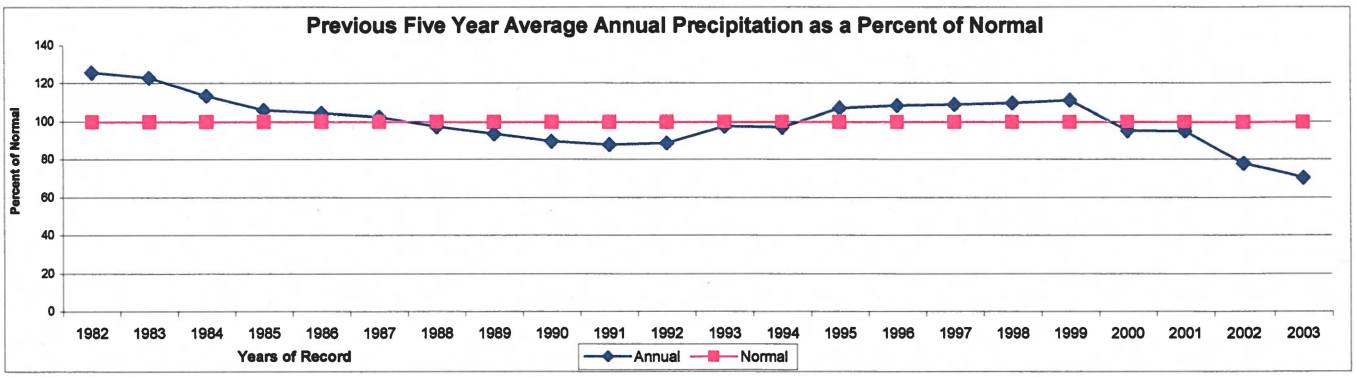
Sullivan Tank Precipitation Rain Gauge Number 25



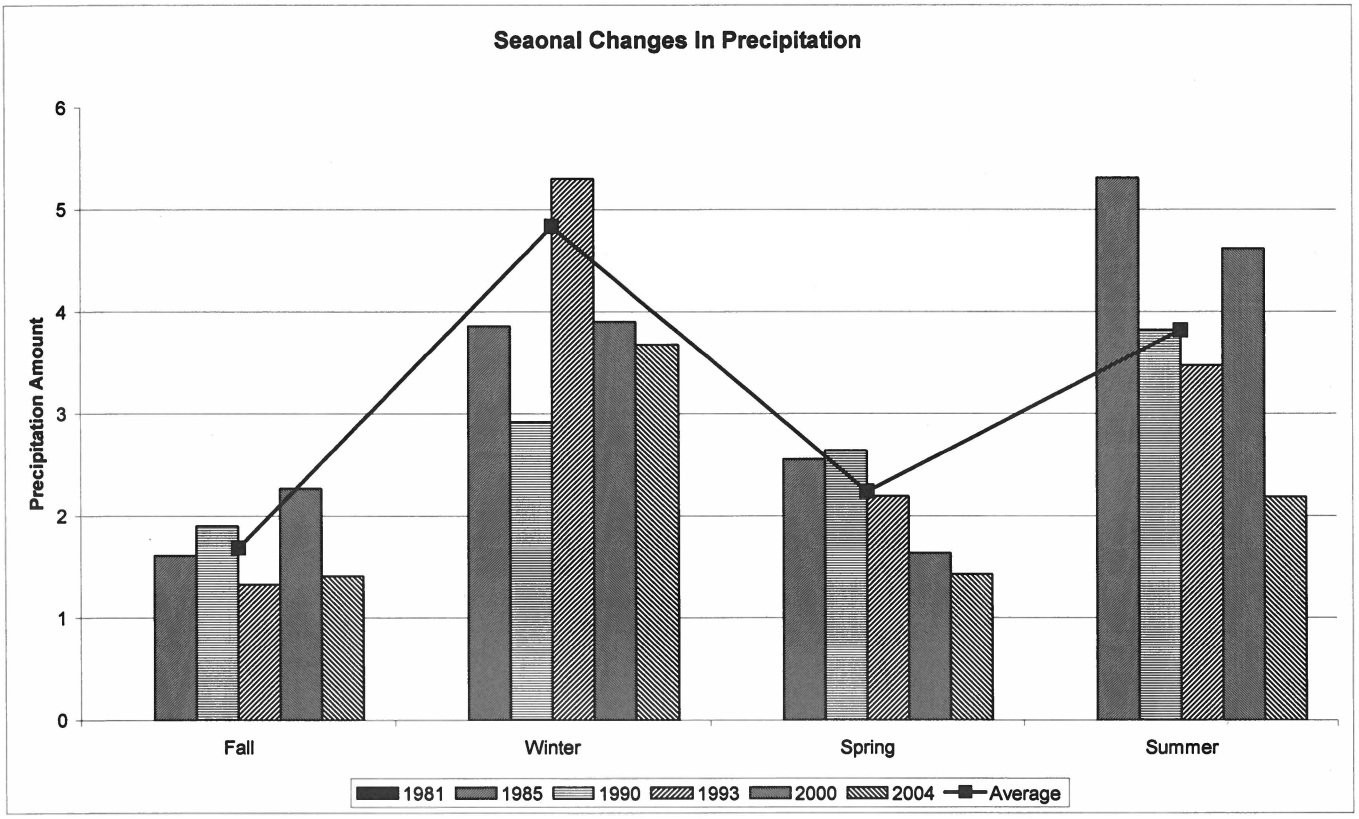








Sullivan Tank PRECIPITATION RAIN GAUGE NUMBER: 25



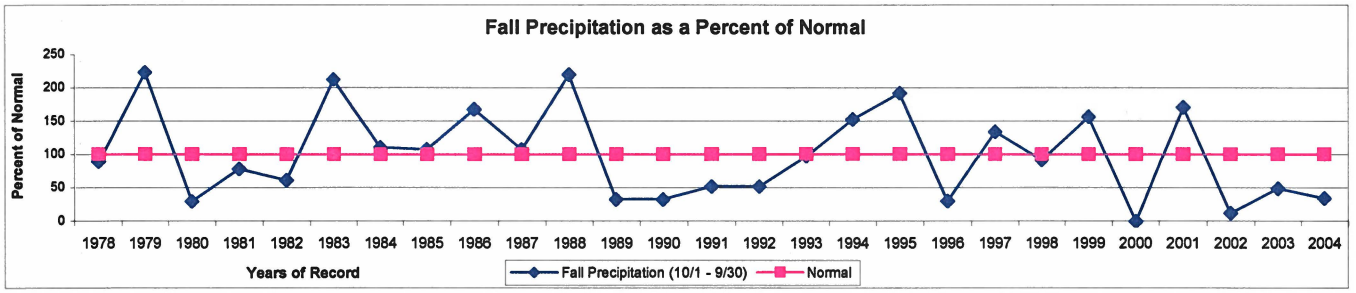
Percent of Normal Precipitation for each season.

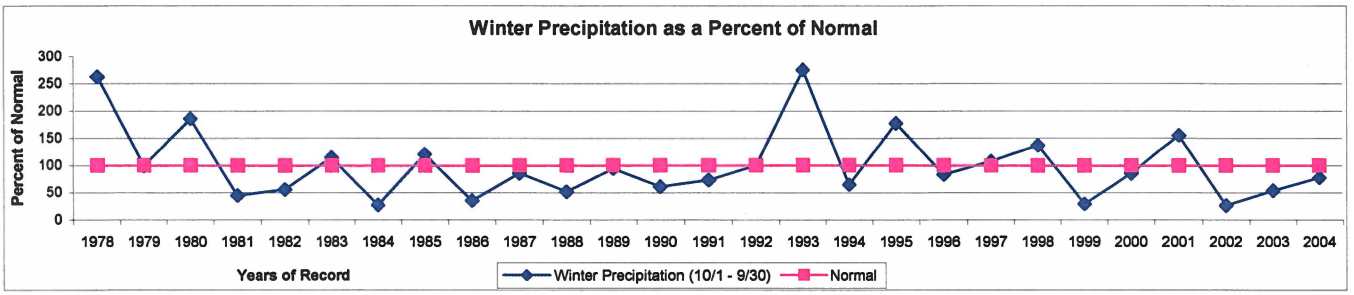
Fall	Winter	Spring	Summer
13%	38%	18%	30%

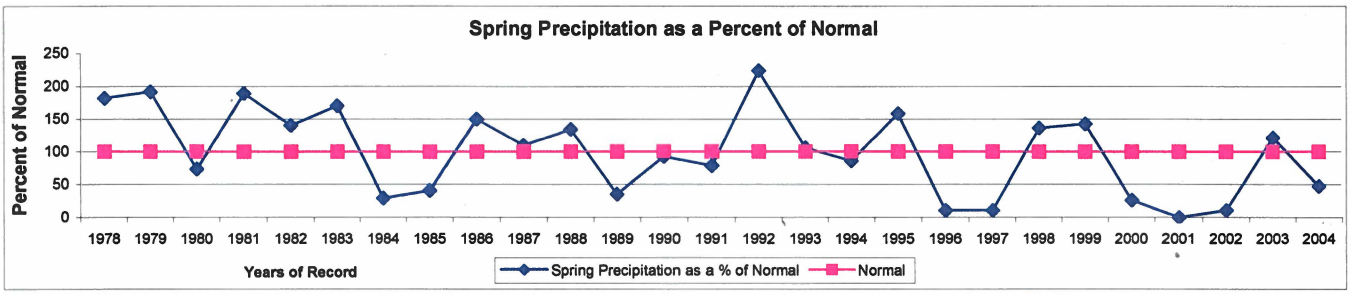
Field Office 100 Rain Gauge Name: Mud Mountain Rain Gauge Number: 06

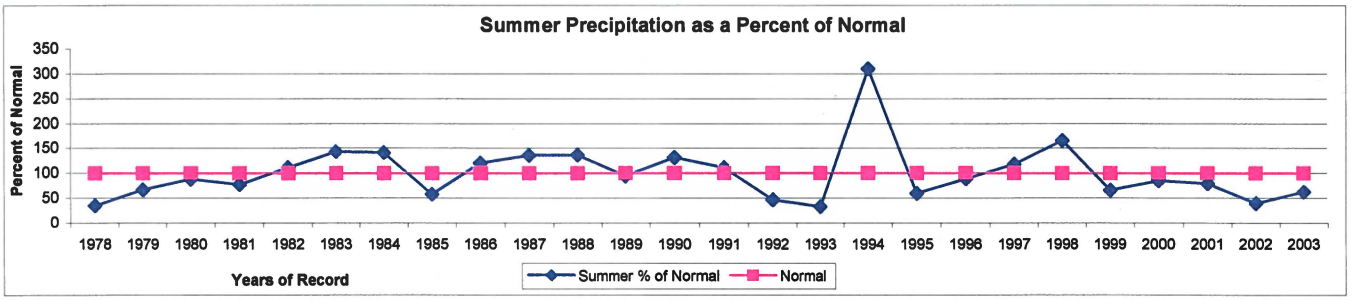
	Seasonal Precipitation Amounts					Annual Average					Percent of Normal				
Year	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.83	14.52	4.30	1.32	21.97	2.05	5.57	2.41	3.79	13.83	89%	260%	178%	35%	159%
1979	4.57	5.50	4.54	2.52	17.13	2.05	5.57	2.41	3.79	13.83	223%	99%	188%	66%	124%
1980	0.61	10.32	1.74	3.32	15.99	2.05	5.57	2.41	3.79	13.83	30%	185%	72%	88%	116%
1981	1.60	2.50	4.48	2.93	11.51	2.05	5.57	2.41	3.79	13.83	78%	45%	186%	77%	83%
1982	1.26	3.12	3.33	4.23	11.94	2.05	5.57	2.41	3.79	13.83	62%	56%	138%	112%	86%
1983	4.35	6.40	4.04	5.42	20.21	2.05	5.57	2.41	3.79	13.83	212%	115%	167%	143%	146%
1984	2.28	1.56	0.70	5.36	9.90	2.05	5.57	2.41	3.79	13.83	111%	28%	29%	141%	72%
1985	2.21	6.70	0.98	2.19	12.08	2.05	5.57	2.41	3.79	13.83	108%	120%	41%	58%	87%
1986	3.44	1.98	3.55	4.56	13.53	2.05	5.57	2.41	3.79	13.83	168%	36%	147%	120%	98%
1987	2.20	4.75	2.60	5.13	14.68	2.05	5.57	2.41	3.79	13.83	107%	85%	108%	135%	106%
1988	4.50	2.89	3.18	5.16	15.73	2.05	5.57	2.41	3.79	13.83	220%	52%	132%	136%	114%
1989	0.67	5.24	0.84	3.57	10.32	2.05	5.57	2.41	3.79	13.83	33%	94%	35%	94%	75%
1990	0.67	3.39	2.18	4.97	11.21	2.05	5.57	2.41	3.79	13.83	33%	61%	90%	131%	81%
1991	1.06	4.08	1.85	4.20	11.19	2.05	5.57	2.41	3.79	13.83	52%	73%	77%	111%	81%
1992	1.06	5.55	5.30	1.76	13.67	2.05	5.57	2.41	3.79	13.83	52%	100%	220%	46%	99%
1993	2.00	15.25	2.50	1.25	21.00	2.05	5.57	2.41	3.79	13.83	98%	274%	104%	33%	152%
1994	3.13	3.59	2.03	11.75	20.50	2.05	5.57	2.41	3.79	13.83	153%	64%	84%	310%	148%
1995	3.93	9.83	3.75	2.25	19.76	2.05	5.57	2.41	3.79	13.83	192%	176%	155%	59%	143%
1996	0.62	4.63	0.25	3.37	8.87	2.05	5.57	2.41	3.79	13.83	30%	83%	10%	89%	64%
1997	2.75	6.00	0.25	4.50	13.50	2.05	5.57	2.41	3.79	13.83	134%	108%	10%	119%	98%
1998	1.88	7.62	3.23	6.27	19.00	2.05	5.57	2.41	3.79	13.83	92%	137%	134%	165%	137%
1999	3.21	1.66	3.38	2.50	10.75	2.05	5.57	2.41	3.79	13.83	157%	30%	140%	66%	78%
2000	0.00	4.75	0.63	3.21	8.59	2.05	5.57	2.41	3.79	13.83	0%	85%	26%	85%	62%
2001	3.50	8.61	0.00	3.00	15.11	2.05	5.57	2.41	3.79	13.83	171%	154%	0%	79%	109%
2002	0.25	1.50	0.25	1.50	3.50	2.05	5.57	2.41	3.79	13.83	12%	27%	10%	40%	25%
2003	1.00	3.00	2.88	2.38	9.25	2.05	5.57	2.41	3.79	13.83	49%	54%	119%	63%	67%
2004	0.70	2.05					5.57	2.41	3.79	13.83	34%				

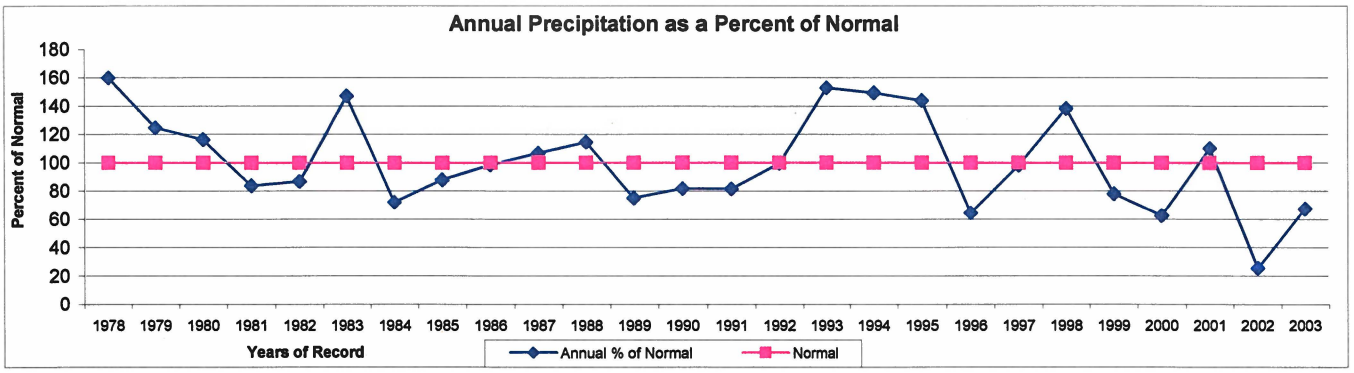
Mud Mountain Precipitation rain gauge number 06



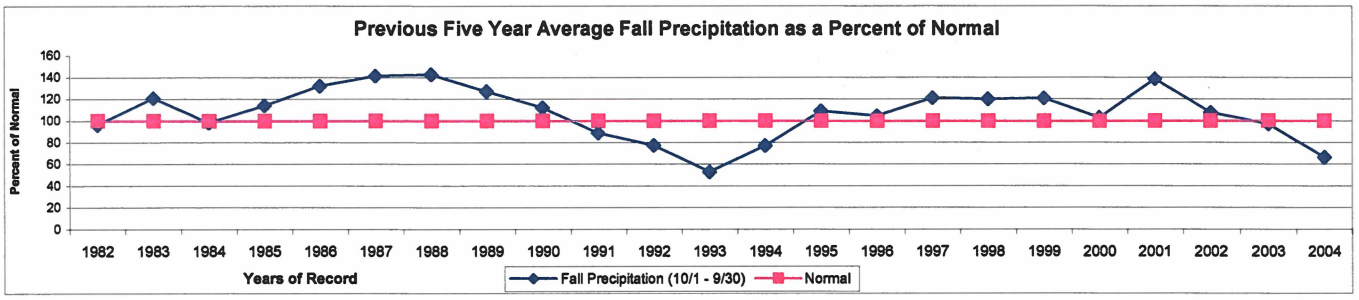


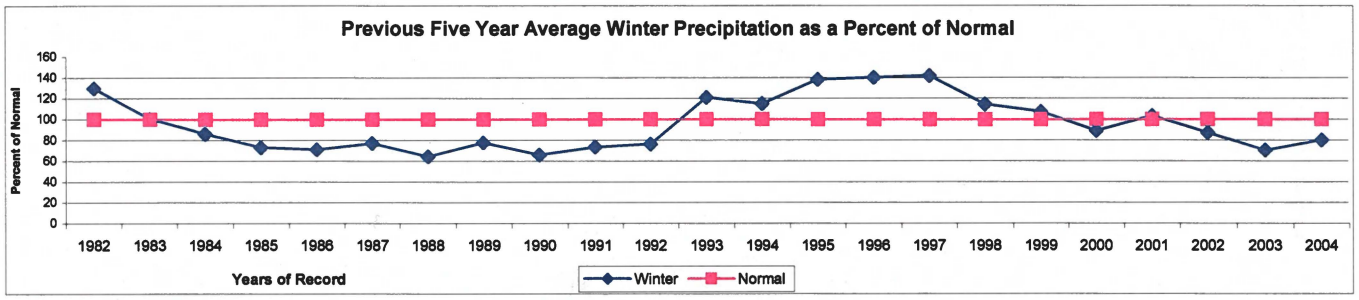


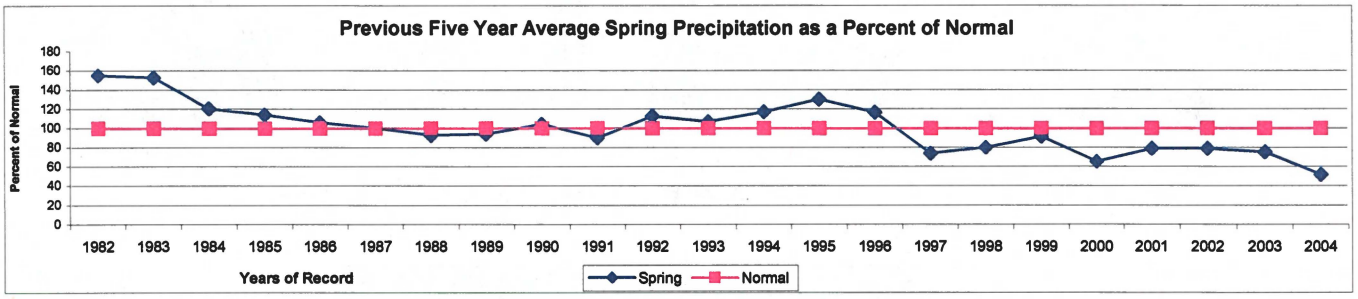


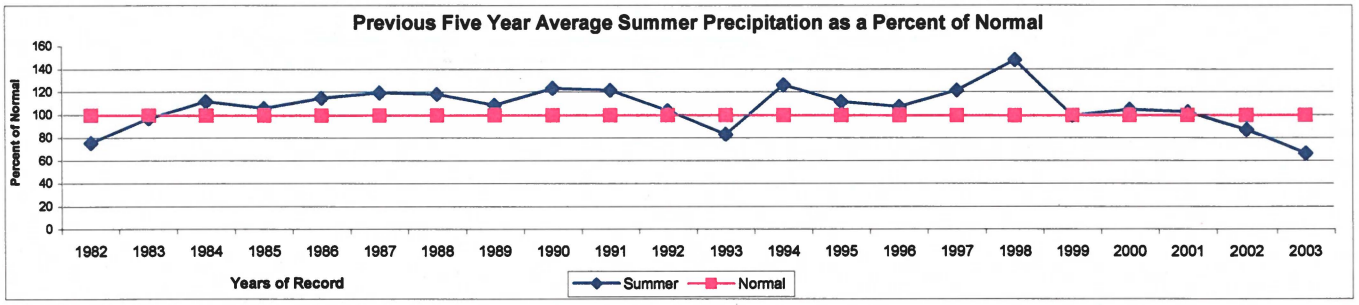


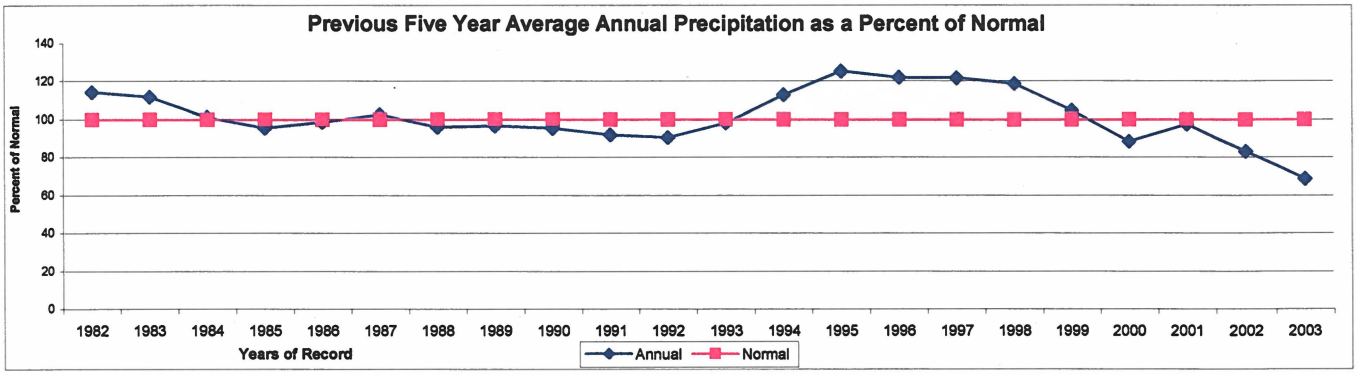
Mud Mountain Precipitation Rain Gauge Number 06



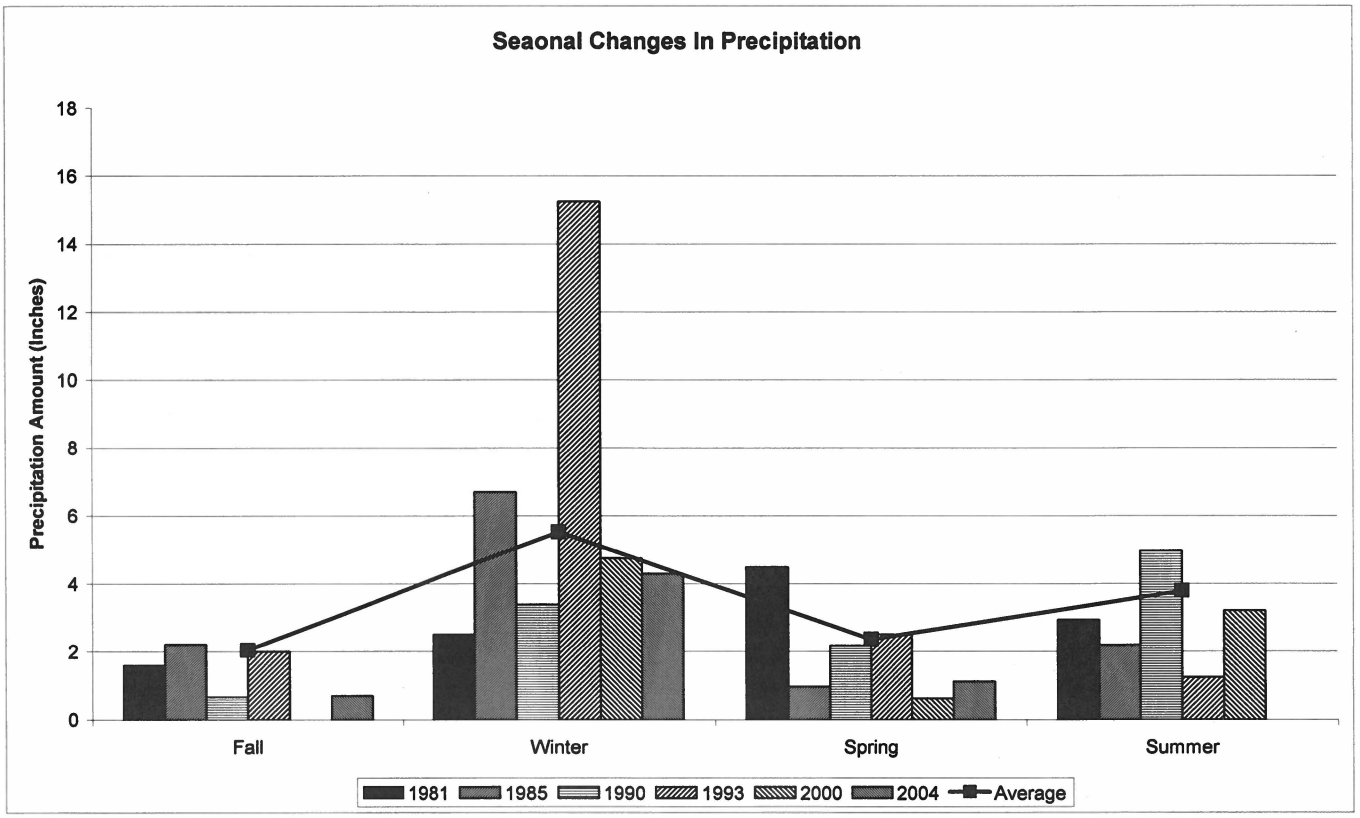








Mud Mountain PRECIPITATION RAIN GAUGE NUMBER: 06



Precipitation Average by Percent for each Season.			
Fall	Winter	Spring	Summer
15%	40%	17%	28%

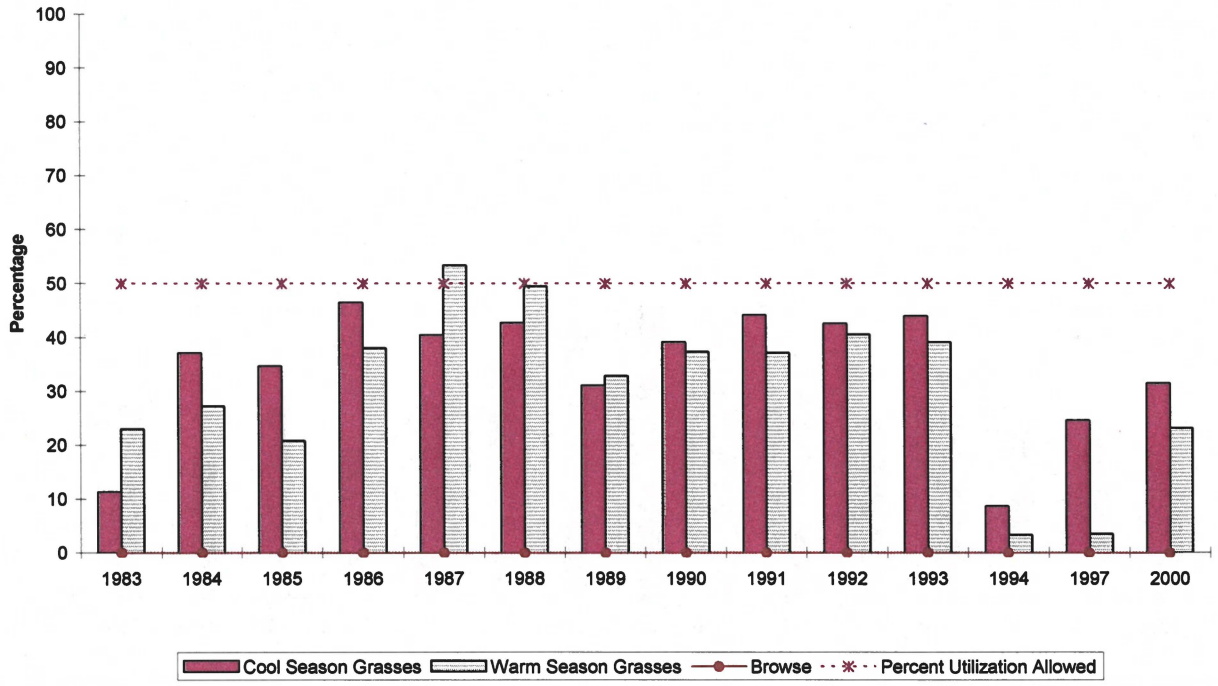
Appendix D

Vegetation Data

ARIZONA STRIP					UTILIZATION STUDY SUMMARY											09/14/04
ALLOTMENT = IMLAY					PASTURE = EAST							KEY AREA NUMBER =		1		
Utilization expressed as a percent use for each species as of the particular year read.																
Cool Season Grasses																
	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1997	2000		
ORHY	12	41	40	50	53	46	26	37	42	41	41	10	21	32		
SIHY	11	33	30	41	30	39	36	41	47	45	45	6	30	31		
WARM SEASON GRASSES																
HIJA	23	27	19	34	46	53	34	38	41	34	38	3	4	20		
SPCR			28	68	72	34	27	37	29	47	40	3	3	28		

Allotment: IMLAY **Pasture: EAST** **Key Area: 1**

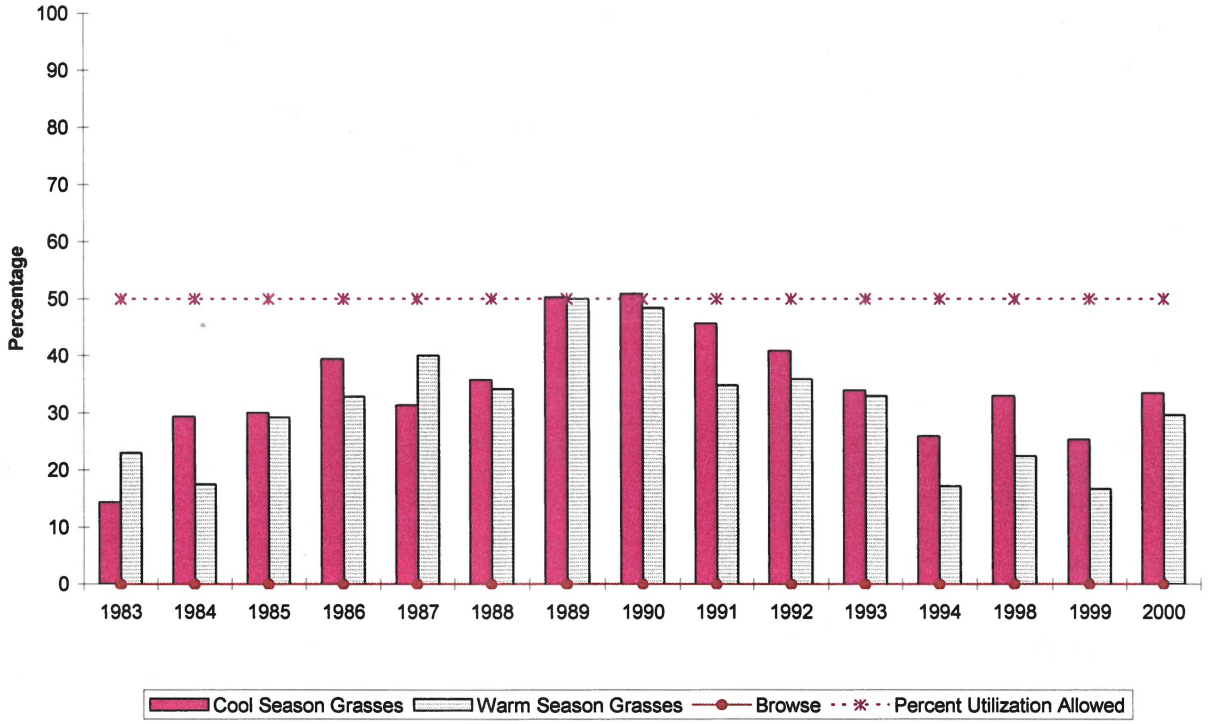
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY										09/14/04
ALLOTMENT = IMLAY					PASTURE = MIDDLE							KEY AREA NUMBER = 2			
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	1998	1999	2000
ORHY	14	32	54	58	47	35	51	53	42	36	43	32	30	27	30
SIHY	15	28	16	27	15	36	50	49	46	43	30	23	35	25	36
AGROPY							50	53	50	44	25	19			
WARM SEASON GRASSES															
HIJA	23	18	24	28	36	34	50	48	35	36	33	17	21	18	24
SPCR			43	58	66								28	13	43

Allotment: IMLAY **Pasture: MIDDLE** **Key Area: 2**

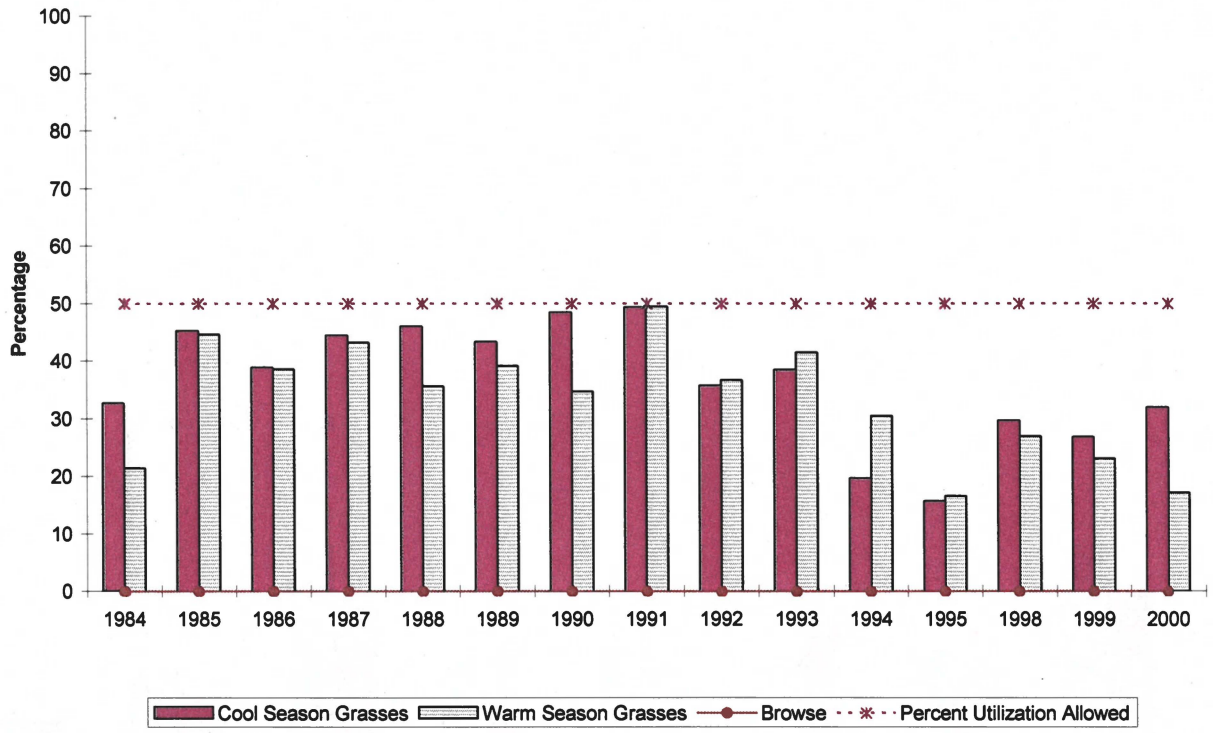
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY										09/14/04
ALLOTMENT = IMLAY					PASTURE = WEST						KEY AREA NUMBER = 3				
Utilization expressed as a percent use for each species as of the particular year read.															
Cool Season Grasses															
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1998	1999	2000
ORHY	52	63	55	48	50	42	47	50	33	39	18	13	30	25	35
SIHY	27	39	26	43	42	45	49	48	38	38	21	17	29	29	28
WARM SEASON GRASSES															
HIJA	21	45	39	43	36	39	35	49	37	41	30	17	27	23	17

Allotment: IMLAY **Pasture: WEST** **Key Area: 3**

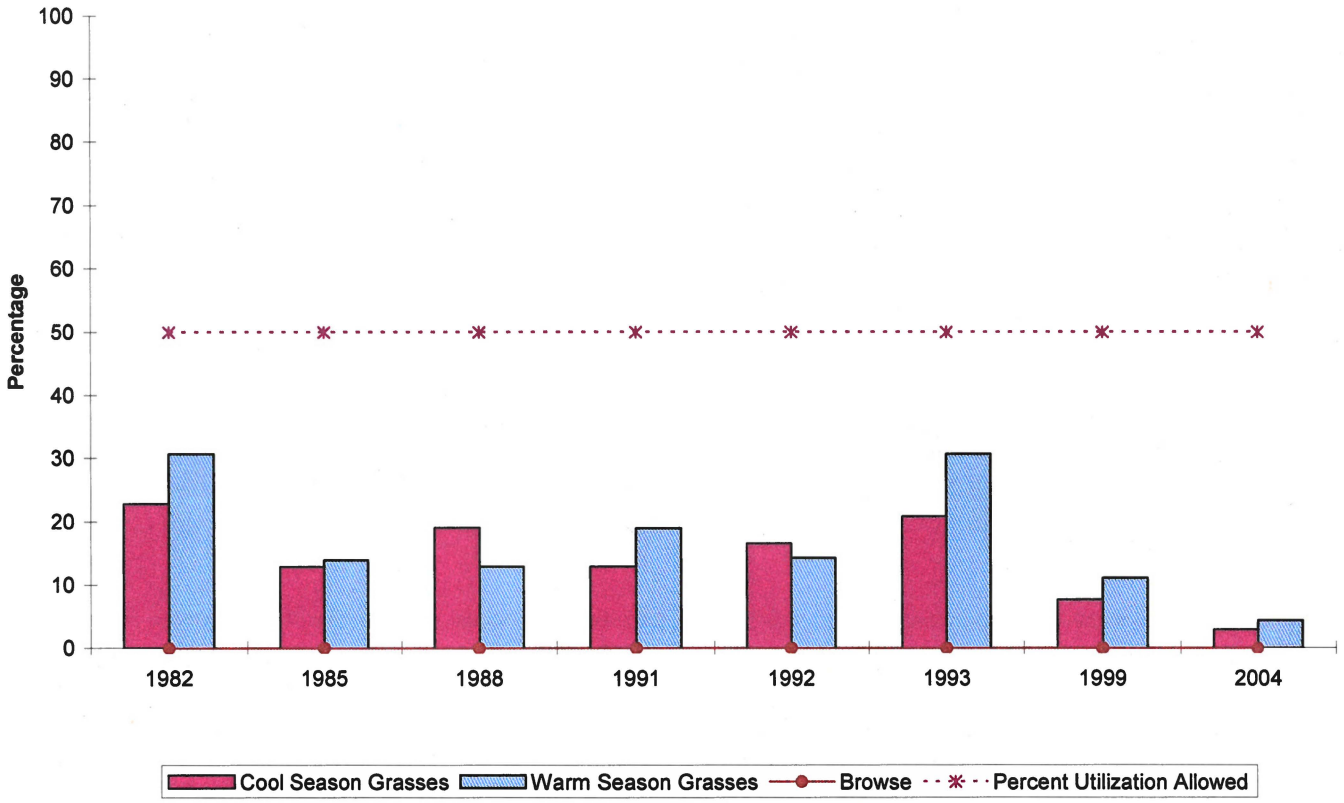
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY			06/17/04							
ALLOTMENT = SULLIVAN TANK					PASTURE =			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	1985	1988	1991	1992	1993	1999	2004							
ORHY	38	12	19	11	18	21	8	10							
SIHY	19	13	19	15	15	21	7	2							
WARM SEASON GRASSES															
HIJA	31	11	11	14	13	34	14	4							
SPCR		27	16	24	16	28	8	5							

Allotment: SULLIVAN TANK **Pasture:** _____ **Key Area: 1**

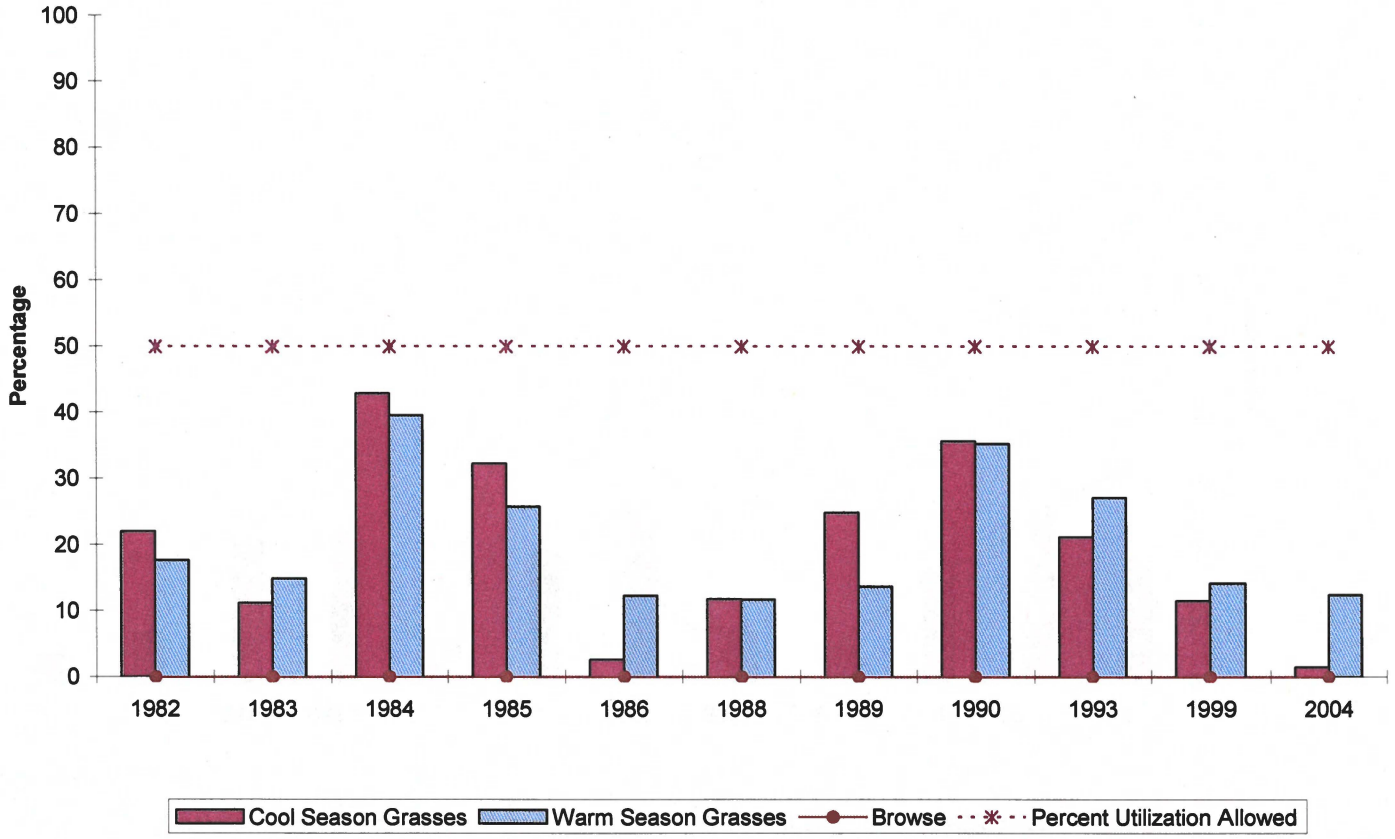
Utilization by Plant Category



ARIZONA STRIP					UTILIZATION STUDY SUMMARY				06/17/04						
ALLOTMENT = SULLIVAN TANK					PASTURE =				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	1983	1984	1985	1986	1988	1989	1990	1993	1999	2004				
ORHY	38		36	39	6	13	25	36	24	12	3				
SIHY	14	12	51	33	2	14	35	43	17	11					
AGSM		10	38	22		7	13	26							
WARM SEASON GRASSES															
HIJA	18	15	40	17	7	11	16	34	27	13	12				
SPCR				38	31	14	11	36	27	15					

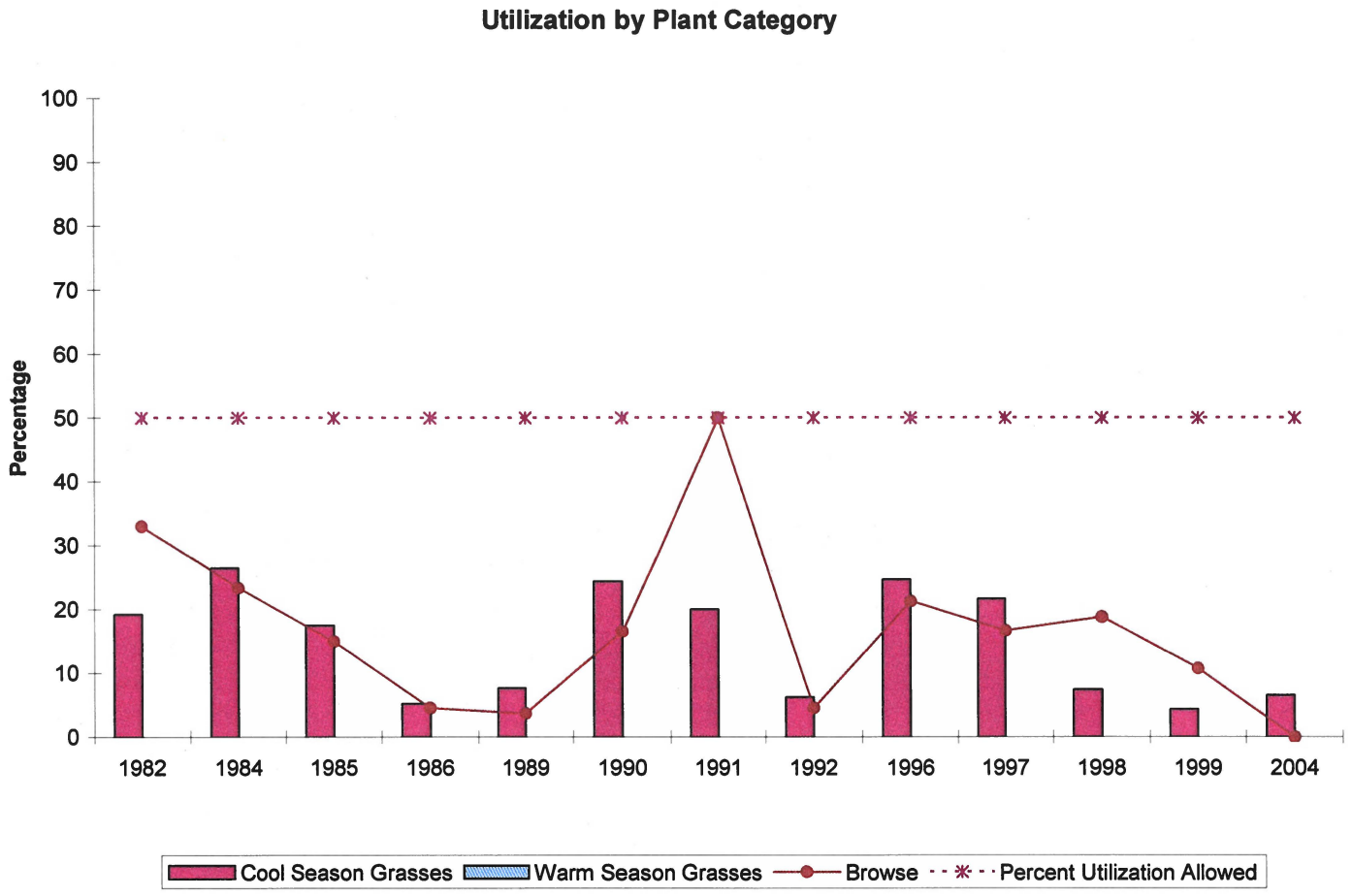
Allotment: SULLIVAN TANK **Pasture:** _____ **Key Area: 2**

Utilization by Plant Category



ARIZONA STRIP						UTILIZATION STUDY SUMMARY			06/17/04						
ALLOTMENT = SULLIVAN TANK					PASTURE =				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	1984	1985	1986	1989	1990	1991	1992	1996	1997	1998	1999	2004		
ORHY		26	16	4	9	21	20	9	32	24	4	3	7		
SIHY	17	22	12	7	4	18	20	7	25	22	7	5	8		
POA	22	34	26	3	9	30	20	3	14	19	13	5	3		
BROWSE															
EPNE	36														
COME	30	23	15	5	4	17	50	5	21	17	19	11			

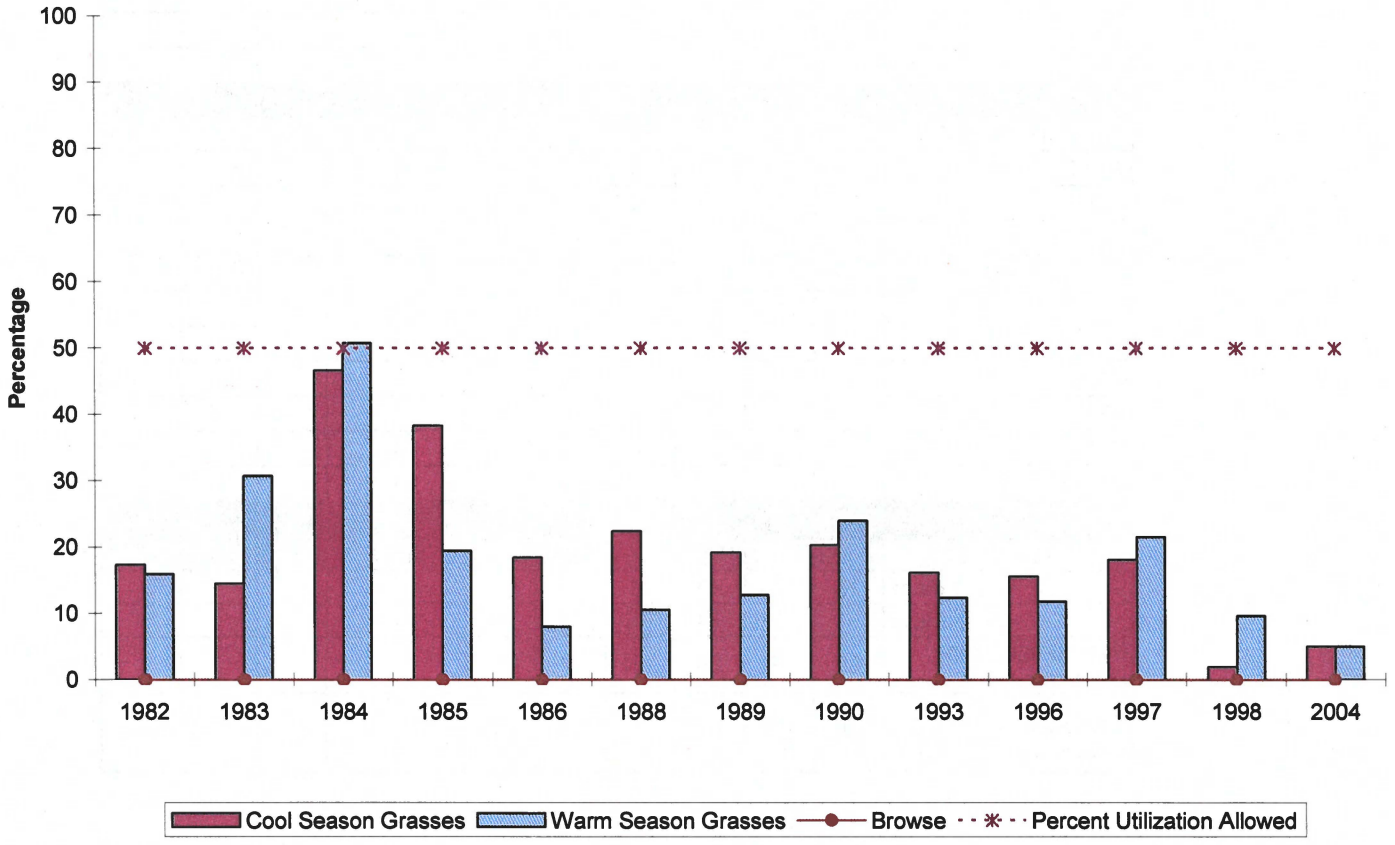
Allotment: SULLIVAN TANK **Pasture:** _____ **Key Area: 3**



ARIZONA STRIP						UTILIZATION STUDY SUMMARY			06/17/04						
ALLOTMENT = SULLIVAN TANK					PASTURE =				KEY AREA NUMBER =			4		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	1988	1989	1990	1993	1996	1997	1998	2004		
ORHY	31		53	40	28	27	21	19	13	19	17	1	5		
SIHY	11	14	46	37	14	16	18	21	19	12	19	2	5		
AVERAGE	17	14	47	38	18	22	19	20	16	15	18	2	5		
WARM SEASON GRASSES															
HIJA	16	31	51	20	5	11	12	22	12	9	16	6	5		
SPCR				19	30	8	14	27	14	15	27	12			

Allotment: SULLIVAN TANK **Pasture:** _____ **Key Area: 4**

Utilization by Plant Category

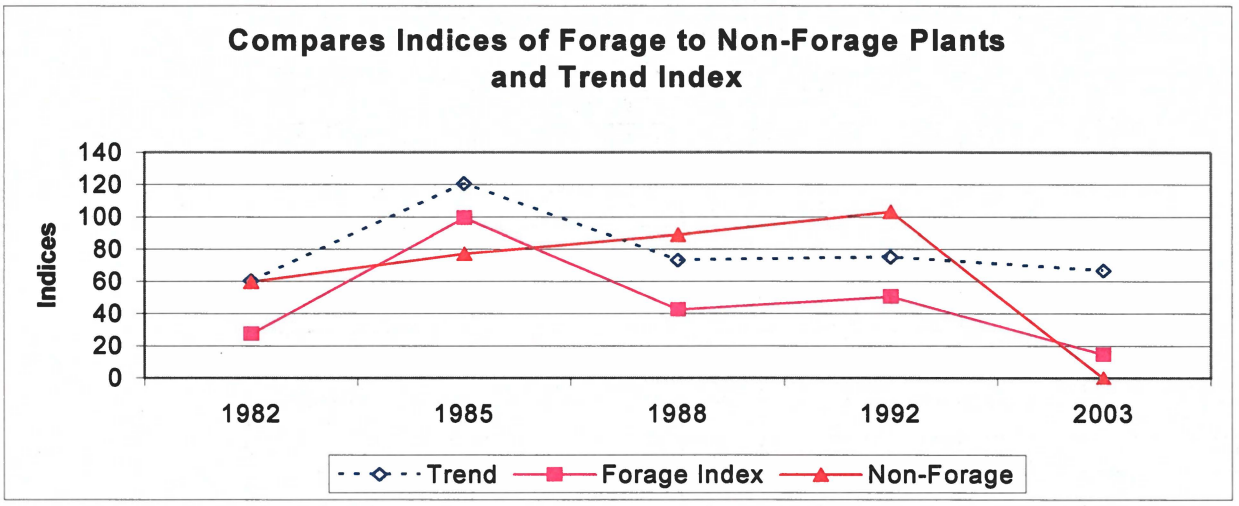


PACE FREQUENCY TREND ANALYSIS											9/14/2004
ALLOTMENT: IMLAY				PASTURE: EAST						KEY AREA: 1	
	KEY AREA										
COVER CATEGORIES	YEARS PLOT WERE READ										
	1982	1985	1988	1992	2003	2006	2009	2012	2015	2018	2021
Bare Ground	67	79	62	69	48						
Pers Litter	4	1	9	7	51						
Litter	27	18	15	13							
Rock			7	7							
Basal Cover	2	3	7	6	1						
% Ground Cover	33	22	38	32	52						
DESIRABLE GRASSES											
Cool Season											
ORHY	2	17	6	6	0						
SIHY	11	36	11	12	1						
AGSM	1	3	2	3							
Warm Season											
HIJA	14	27	15	20	12						
SPCR		18	10	11	1						
OTHER SHRUBS											
GUSA2	2	3	25	26							
ARTR2	59	74	62	76							
JUOS		1	2	2							
FORBS											
SPHAE		18	5	5	5						
AAFF					81						
ERIOG					92						
PENST			4	5	2						
PPFF	2		1		3						
SPURGE					69						
Year read	1982	1985	1988	1992	2003	2006	2009	2012	2015	2018	2021
Forage Index	28	100	43	51	15						
Trend Index	61	121	74	76	67						
Non-Forage Index (Grasses and Shrubs)	60	78	89	104							
Total species index (Doesn't include forbs or annual grasses)	88	177	132	155	15						

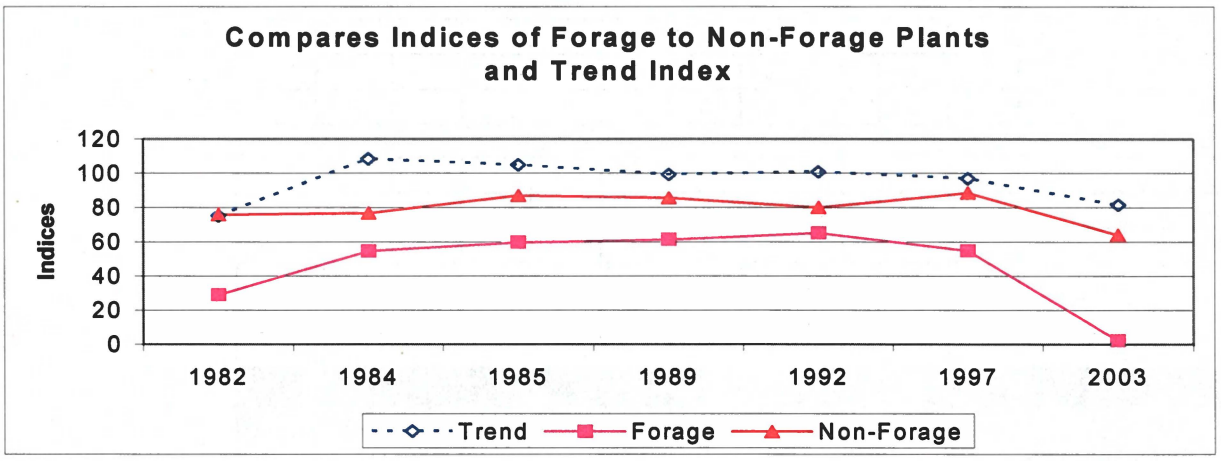
PACE FREQUENCY TREND ANALYSIS											9/15/2004
ALLOTMENT: IMLAY				PASTURE: MIDDLE					KEY AREA: 2		
	KEY AREA										
COVER CATEGORIES	YEARS PLOT WERE READ										
	1982	1984	1985	1989	1992	1997	2003	2006	2009	2012	2015
Bare Ground	54	45	55	58	59	54	18				
Pers Litter	4	13	5	7	8	10	75				
Litter	37	36	36	27	25	27					
Rock		1	1	4	6	4	3				
Basal Cover	5	4	5	3	4	6	4				
% Ground Cover	46	55	46	42	41	46	82				
DESIRABLE GRASSES											
Cool Season											
ORHY	1	3	9	6	6	6					
SIHY	17	31	34	29	30	18	2				
AGSM	4	9	8	9	10	8					
Warm Season											
HIJA	7	11	10	18	20	24	0				
SPCR			1								
OTHER SHRUBS											
GUSA2	1	4	1	5	6	8					
ARTR2	74	71	87	80	73	78	63				
OPUNT							0				
ERIOG_SHRB		0		1	2	4					
JUOS	0	1		0	1		0				
FORBS											
SPHAE		2		3	6	9					
AAFF						2	66				
Year read	1982	1984	1985	1989	1992	1997	2003	2006	2009	2012	2015
Forage Index	29	55	60	62	66	55	2				
Trend Index	75	108	105	100	101	97	82				
Non-Forage Index (Grasses and Shrubs)	76	77	88	86	81	89	64				
Total species index (Doesn't include forbs or annual grasses)	105	132	148	148	146	144	67				

PACE FREQUENCY TREND ANALYSIS											9/14/2004
ALLOTMENT: IMLAY				PASTURE: WEST					KEY AREA: 3		
	KEY AREA										
COVER CATEGORIES	YEARS PLOT WERE READ										
	1982	1985	1988	1992	1997	2003	2006	2009	2012	2015	2018
Bare Ground	52	42	48	52	52	28					
Pers Litter	3	16	18	17	21	61					
Litter	28	30	20	19	20						
Rock	13	9	10	10	2	9					
Basal Cover	4	2	4	4	6	3					
% Ground Cover	48	58	52	49	49	73					
BROWSE											
EPNE			1	2	3						
COME	1	1	1	2	3						
PUTR			2	2							
DESIRABLE GRASSES											
Cool Season											
ORHY		4	6	7	9						
SIHY		19	14	15	17	10					
Warm Season											
HIJA		2	3	4	6	2					
OTHER SHRUBS											
GUSA2	18	43	30	27	31	2					
CHVI8						2					
CORA	8					2					
ARTR2	32	60	51	52	63	32					
LYAN		4	2								
LYCIU				3	2	10					
JUOS	14	7	3	3	2	12					
BERBERIS		1	1	2	2	1					
OTHER GRASSES											
ARIST						1					
FORBS											
ASTRA						2					
SPHAE		3	2	4	8	1					
AAFF		8	3		3	52					
AAGG						43					
PPFF		10	2	2		12					
SPURGE						6					
ASTER			2	2	3						
Year read	1982	1985	1988	1992	1997	2003	2006	2009	2012	2015	2018
Forage Index	1	27	29	32	36	12					
Trend Index	36	76	71	71	83	75					
Non-Forage Index (Grasses and Shrubs)	72	116	87	86	100	61					
Total species index (Doesn't include forbs or annual grasses)	73	143	116	118	136	72					

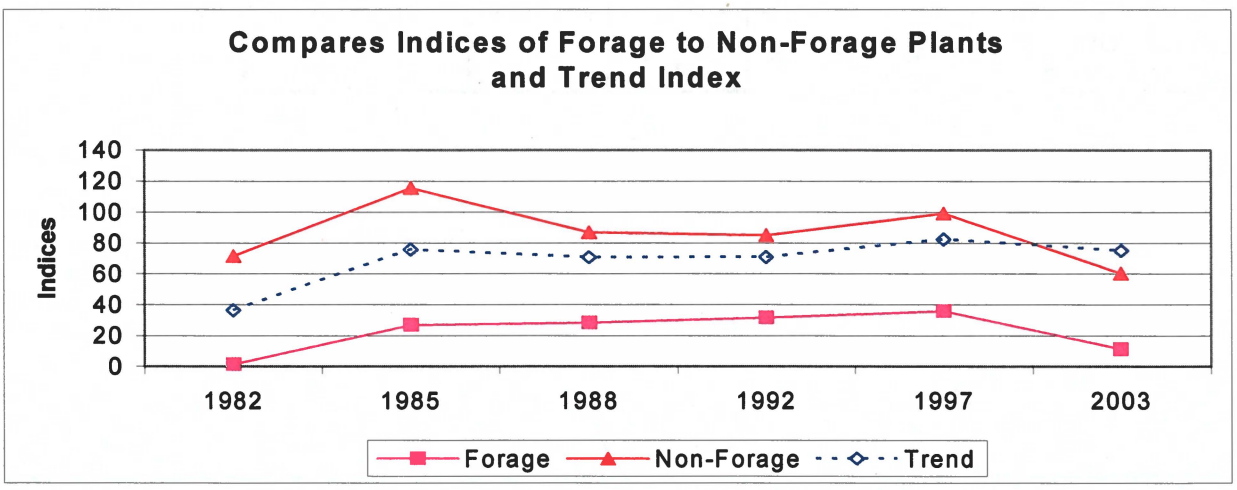
Allotment: IMLAY **Pasture: EAST** **Key Area: 1**



Allotment: IMLAY **Pasture: MIDDLE** **Key Area: 2**



Allotment: IMLAY **Pasture: WEST** **Key Area: 3**



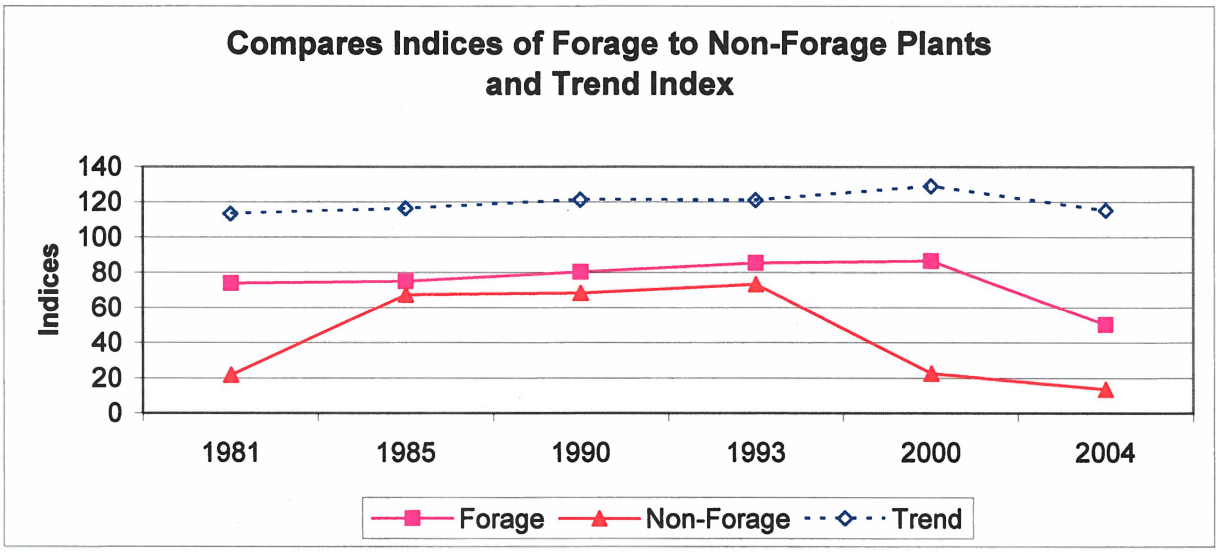
PACE FREQUENCY TREND ANALYSIS											9/15/2004
ALLOTMENT: SULLIVAN TANK				PASTURE:					KEY AREA: 1		
	KEY AREA										
COVER CATEGORIES	YEARS PLOT WERE READ										
	1981	1985	1990	1993	2000	2004	2007	2010	2013	2016	2019
Bare Ground	61	57	58	57	52	34					
Pers Litter	8	3	3	3	3	61					
Litter	25	30	31	25	36						
Rock		2	1	7	5	1					
Basal Cover	7	9	8	7	3	4					
% Ground Cover	39	43	42	43	48	66					
DESIRABLE GRASSES											
Cool Season											
ORHY			1	1	2						
SIHY		11	14	13	16	2					
AGCR						0					
POA						0					
Warm Season											
HIJA	74	54	52	56	56	46					
SPCR		8	9	10	9	1					
BOGR		3	5	4	3						
OTHER SHRUBS											
GUSA2	1	5	7	8	2	2					
ARTR2	21	62	61	64	19	11					
OPUNT		1	1	1	1						
SPHAE	1	14	15	12	13	21					
AAFF				2	2	94					
ASTER			1	1							
Year read	1981	1985	1990	1993	2000	2004	2007	2010	2013	2016	2019
Forage Index	74	75	81	86	87	50					
Trend Index	113	117	122	121	129	115					
Non-Forage Index (Grasses and Shrubs)	22	68	69	74	23	14					
Total species index (Doesn't include forbs or annual grasses)	96	143	149	159	109	64					

PACE FREQUENCY TREND ANALYSIS										9/15/2004
ALLOTMENT: SULLIVAN TANK			PASTURE:					KEY AREA: 2		
	KEY AREA									
COVER CATEGORIES	YEARS PLOT WERE READ									
	1981	1984	1985	1988	1993	2000	2004	2007	2010	2013	2016
Bare Ground	63	51	57	50	52	51	34				
Pers Litter	16	12	2	23	22	23	60				
Litter	15	29	34	19	20	19					
Rock	1			1	2	2					
Basal Cover	7	9	8	7	6	6	6				
% Ground Cover	38	50	43	50	49	49	66				
BROWSE											
CELA		1				1					
DESIRABLE GRASSES											
Cool Season											
ORHY		1	4	4	4	2	1				
SIHY	6	21	16		8	22	9				
AGSM				2			1				
SEEDED		11	6	7	3	10					
Warm Season											
HIJA	44	40	53	40	44	48	44				
SPCR	2	8		3	3	6					
BOGR		1		3	4	2					
OTHER SHRUBS											
GUSA2	1	2		2	4	2	0				
ARTR2	67	71	77	26	27	66	59				
FORBS											
SPHAE		4	1	1	2	5	0				
AAFF					2	2	21				
Year read	1981	1984	1985	1988	1993	2000	2004	2007	2010	2013	2016
Forage Index	52	81	78	60	65	90	55				
Trend Index	89	130	121	109	112	137	121				
Non-Forage Index (Grasses and Shrubs)	68	73	77	28	31	68	60				
Total species index (Doesn't include forbs or annual grasses)	120	154	155	88	96	157	115				

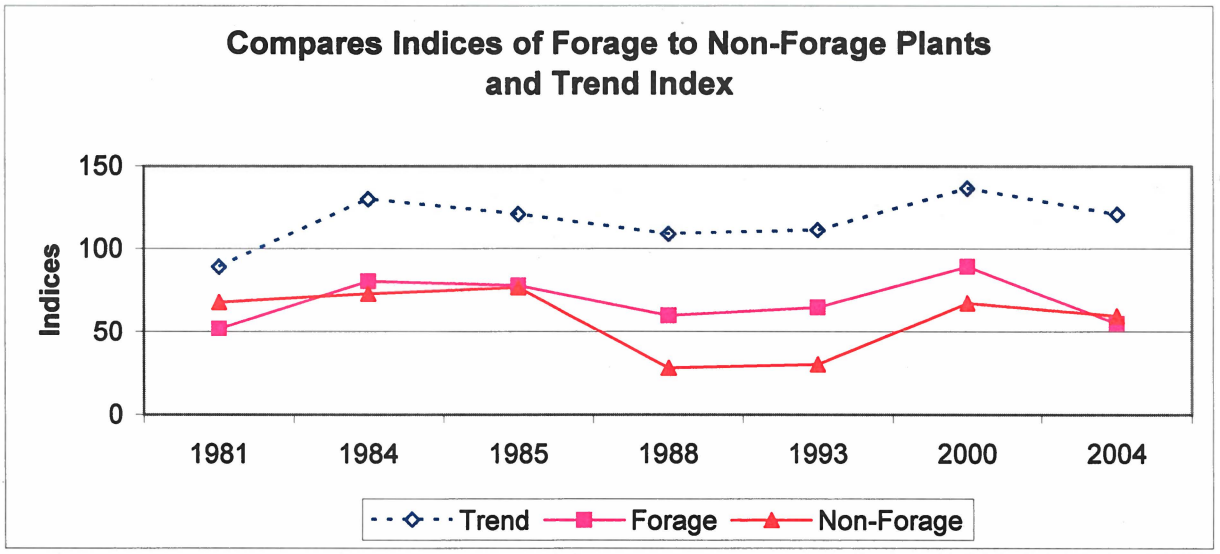
PACE FREQUENCY TREND ANALYSIS											9/15/2004
ALLOTMENT: SULLIVAN TANK				PASTURE:					KEY AREA: 3		
	KEY AREA										
COVER CATEGORIES	YEARS PLOT WERE READ										
	1981	1985	1988	1993	2000	2004	2007	2010	2013	2016	2019
Bare Ground	8	18	16	18	29	8					
Pers Litter	21	20	24	29	23	55					
Litter	7	11	7	7	15						
Rock	62	48	47	38	26	34					
Basal Cover	3	3	7	8	8	3					
% Ground Cover	92	82	84	82	71	92					
BROWSE											
EPNE					2						
COME	8	8	9	11	7	3					
DESIRABLE GRASSES											
Cool Season											
ORHY		2	5	6	4	1					
SIHY	1	20	18	20	23	9					
AGSM		0									
POA	3	4	5	5	6	2					
Warm Season											
HIJA			2	4	2	0					
SPCR		3									
OTHER SHRUBS											
GUSA2	16	33	32	37	9	22					
ARTR2	27	42	30	28	14	9					
OPUNT		2	3	3	2	2					
ERIOG_SHRB						1					
YUCCA			0	1	1						
JUOS	9	12	6	5	2	5					
FAPA						17					
QUTU	4										
EPVI		3	2	3	2	1					
BERBERIS		4	1	2	2	2					
OTHERSHRUB	7										
OTHER GRASSES											
ARIST						0					
FORBS											
SPHAE		1	2	3	9	4					
AAFF			0	1	2	5					
ERIOG						5					
PPFF						0					
ASTER		1	0	1	1	1					
Year read	1981	1985	1988	1993	2000	2004	2007	2010	2013	2016	2019
Forage Index	12	38	39	45	43	17					
Trend Index	42	72	77	89	88	75					
Non-Forage Index (Grasses and Shrubs)	62	98	75	79	31	61					
Total species index (Doesn't include forbs or annual grasses)	73	136	114	123	74	78					

PACE FREQUENCY TREND ANALYSIS											9/15/2004
ALLOTMENT: SULLIVAN TANK				PASTURE:					KEY AREA: 4		
	KEY AREA										
COVER CATEGORIES	YEARS PLOT WERE READ										
	1981	1984	1987	1993	2000	2004	2007	2010	2013	2016	2019
Bare Ground	30	40	43	47	43	32					
Pers Litter	13	11	10	7	14	46					
Litter	10	22	31	30	28						
Rock	43	18	9	9	9	13					
Basal Cover	4	9	7	8	7	9					
% Ground Cover	70	60	57	54	57	68					
DESIRABLE GRASSES											
Cool Season											
ORHY	1	5	8	10	12	8					
SIHY	6	34	49	52	49	26					
STIPA		0		1	1	1					
POA	11	16	15	17	16	3					
Warm Season											
HIJA	43	42	33	37	33	58					
SPCR		2	1	2	2						
BOGR	1	0		1	2						
OTHER SHRUBS											
GUSA2	30	17	40	42	7	46					
ARTR2	41	22	59	66	24	4					
OPUNT			0	1	2						
ERIOG_SHRB						1					
JUOS	4	0	0	1		1					
EPVI						1					
FORBS											
ASTRA		1	2	3	3						
SPHAE		6	9	9	10	11					
AAFF		5	13			17					
AAGG						1					
ERIOG						0					
PPFF						10					
SPURGE						8					
ASTER		1	5	4	4						
DAISY						24					
Year read	1981	1984	1987	1993	2000	2004	2007	2010	2013	2016	2019
Forage Index	62	101	105	119	113	96					
Trend Index	89	144	154	163	162	151					
Non-Forage Index (Grasses and Shrubs)	74	39	100	110	32	53					
Total species index (Doesn't include forbs or annual grasses)	136	141	206	229	145	149					

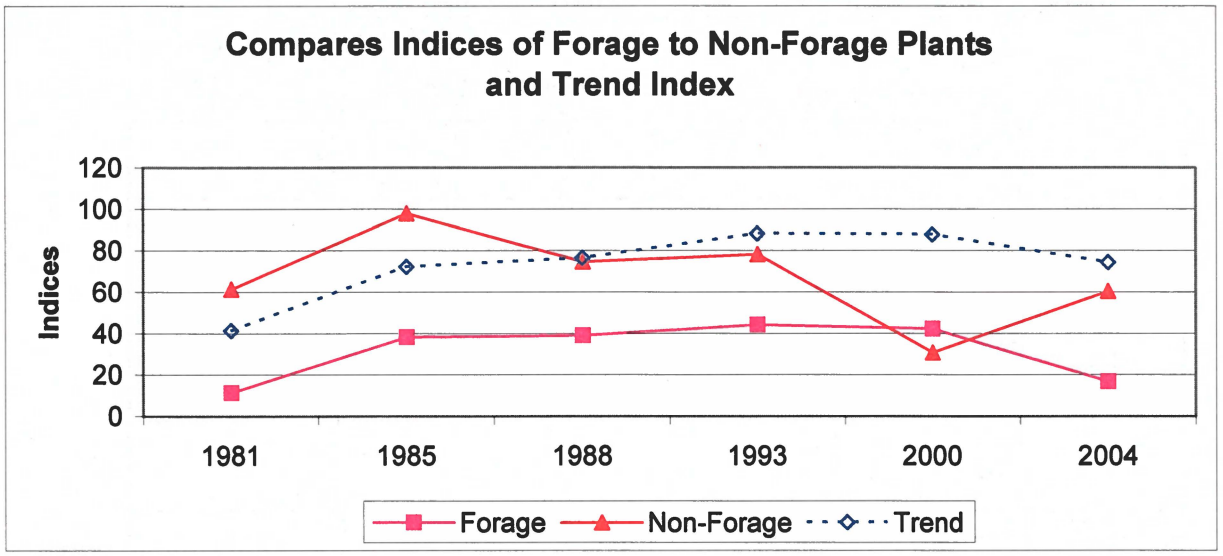
Allotment: SULLIVAN TANK **Pasture: 0** **Key Area: 1**



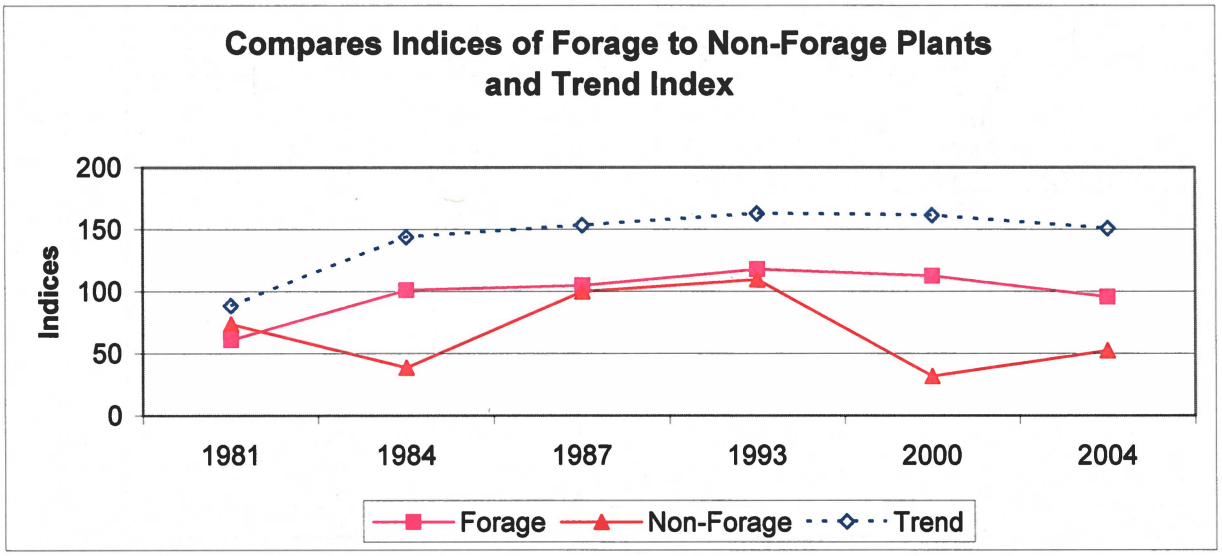
Allotment: SULLIVAN TANK **Pasture: 0** **Key Area: 2**



Allotment: SULLIVAN TANK **Pasture: 0** **Key Area: 3**



Allotment: SULLIVAN TANK **Pasture: 0** **Key Area: 4**



Allotment:	Imlay					Pasture:	East		
DWR	Key Area #:	1				Year Read:	1988		
Ecological Site:	Shallow Loamy 10-14					RATING:	Late		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	22	19	20	212	89%	40%	40%	47%
	Gusa	5	5	5	50	21%	10%	10%	
	Artr	15	13	14	145	61%	30%	30%	
	Juos	2	1	1	17	7%	10%	7%	
GRASSES	Totals	2	5	2	26	11%	75%	11%	11%
	Sihy		3	1	7	3%	10%	3%	
	Orhy		1		2	1%	10%	1%	
	Hija	2	1	1	17	7%	15%	7%	
	Spcr				0	0%		0%	
	Agsm				0	0%		0%	
FORBS	Totals	0	0	0	0	0%	5%	0%	0%
	AAFF				0	0%		0%	
	AAGG				0	0%		0%	
	Penst				0	0%		0%	
	Comand				0	0%		0%	
					0	0%		0%	
TOTALS					238	100%	85%	58%	

Allotment:	Imlay					Pasture:	East		
DWR	Key Area #:	1				Year Read:	2003		
Ecological Site:	Shallow Loamy 10-14 pz					RATING:	Early		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	0	0	0	0	0%	40%	0%	0%
	Gusa				0	0%	10%	0%	
	Artr				0	0%	30%	0%	
	Juos				0	0%	10%	0%	
GRASSES	Totals	7	7	8	71	7%	75%	7%	7%
	Sihy	1	1		9	1%	10%	1%	
	Orhy				0	0%	10%	0%	
	Hija	6	6	7	61	6%	15%	6%	
	Spcr			1	1	0%	5%	0%	
	Agsm				0	0%		0%	
FORBS	Totals	90	89	91	899	93%	5%	5%	8%
	Eriog	42	38	35	405	42%	5%	5%	
	Spam	3	2	4	29	3%	5%	3%	
	Euph	9	10	22	105	11%		0%	
	Ment-1	36	39	29	359	37%		0%	
	Nigl			1	1	0%		0%	
TOTALS					970	100%	100%	15%	

Allotment:	Imlay					Pasture:	East		
DWR	Key Area #:	2				Year Read:	2003		
Ecological Site:	Loamy Upland 10-14					RATING:	Mid		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	34	32	31	333	67%	25%	25%	19%
	Artr	32	30	29	313	63%	15%	15%	
	Opunt	1	1	1	10	2%	10%	2%	
	Juos	1	1	1	10	2%	5%	2%	
GRASSES	Totals	0	1	1	3	1%	80%	1%	1%
	Hija		1	1	3	1%	15%	1%	
FORBS	Totals	16	17	18	164	33%	10%	10%	10%
	AAFF	16	17	18	164	33%	10%	10%	
TOTALS					500	100%	55%	30%	

Allotment:	Imlay					Pasture:	West		
DWR	Key Area #:	3				Year Read:	1988		
Ecological Site:	Shallow Loamy 10-14					RATING:	Late		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	30	28	25	291	84%	40%	40%	48%
	Artr	18	17	14	174	50%	30%	30%	
	Gusa	6	6	7	61	18%	10%	10%	
	Come	1	1	1	10	3%	0%	0%	
	Juos	3	2	1	26	8%	10%	8%	
	Lypa	1			7	2%	0%	0%	
	Befr		1	1	3	1%	10%	1%	
	Putr	1	1	1	10	3%	0%	0%	
	Epne				0	0%		0%	
GRASSES	Totals	3	1	5	28	8%	75%	8%	8%
	Sihy	2		2	16	5%	10%	5%	
	Orhy	1	1	2	11	3%	10%	3%	
	Hija			1	1	0%	15%	0%	
FORBS	Totals	3	2	2	27	8%	5%	5%	7%
	AAFF				0	0%		0%	
	AAGG				0	0%		0%	
	Spam	1		1	8	2%	5%	2%	
	Milkweed	1			7	2%	2%	2%	
	Aster	1	1	1	10	3%	3%	3%	
	PPFF		1		2	1%	0%	0%	
					0	0%		0%	
					0	0%		0%	
TOTALS					346	100%	105%	64%	

Allotment:	Imlay					Pasture:	West		
DWR	Key Area #:			3		Year Read:		2003	
Ecological Site:	Shallow Loamy 10-14					RATING:	Late		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	**Totals**	**24**	**22**	**23**	**235**	**49%**	**40%**	**40%**	**36%**
	Artr	12	9	9	111	23%	30%	23%	
	Gusa			1	1	0%	10%	0%	
	Come				0	0%	0%	0%	
	Juos	9	9	9	90	19%	10%	10%	
	Lypa	1	1	1	10	2%	0%	0%	
	Befr		1	1	3	1%	10%	1%	
	Chvi	1	1	1	10	2%	10%	2%	
	Cora	1	1	1	10	2%	0%	0%	
GRASSES	**Totals**	**5**	**7**	**7**	**56**	**12%**	**75%**	**12%**	**11%**
	Sihy	5	6	6	53	11%	10%	10%	
	Orhy				0	0%	10%	0%	
	Hija		1	1	3	1%	15%	1%	
FORBS	**Totals**	**19**	**18**	**17**	**186**	**39%**	**5%**	**5%**	**7%**
	AAFF	6	5	7	59	12%	5%	5%	
	Euph				0	0%		0%	
	Brte	5	5	5	50	10%	0%	0%	
	Vicia	1	1	1	10	2%	0%	0%	
	Videp	1	1	1	10	2%	0%	0%	
	Astra	1	1		9	2%	5%	2%	
	Ment-1	1	1	1	10	2%	0%	0%	
	Phlox	4	4	2	38	8%	0%	0%	
TOTALS					**477**	**100%**	**115%**	**54%**	

Allotment:	Sullivan Tank					Pasture:			
DWR	Key Area #:	1				Year Read:	2000		
Ecological Site:	Loamy Upland 10-14					RATING:	Late		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	16	12	11	147	27%	20%	20%	19%
	Artr	14	11	6	126	23%	15%	15%	
	Gusa	1	1	3	12	2%	5%	2%	
	Opunt	1		2	9	2%	5%	2%	
GRASSES	Totals	36	36	32	356	65%	80%	65%	34%
	Hija	24	19	8	214	39%	15%	15%	
	Spcr	4	6	8	48	9%	3%	3%	
	Orhy	2	4	8	30	5%	20%	5%	
	Sihy	6	5	7	59	11%	10%	10%	
	Bogr		2	1	5	1%	15%	1%	
FORBS	Totals	4	5	8	46	8%	10%	8%	8%
	Spam	4	4	4	40	7%	7%	7%	
	PPFF		1	4	6	1%	1%	1%	
	AAFF				0	0%		0%	
TOTALS					549	100%	96%	61%	

Allotment:	Sullivan Tank					Pasture:			
DWR	Key Area #:	1				Year Read:	2004		
Ecological Site:	Loamy Upland 10-14					RATING:	Mid		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	3	3	3	30	6%	20%	6%	6%
	Artr	1	2	2	13	3%	15%	3%	
	Gusa	2	1	1	17	3%	5%	3%	
					0	0%		0%	
GRASSES	Totals	26	20	13	235	46%	80%	46%	18%
	Hija	25	18	11	222	44%	15%	15%	
	Spcr		1	1	3	1%	3%	1%	
	Orhy				0	0%		0%	
	Sihy	1	1	1	10	2%	10%	2%	
					0	0%		0%	
FORBS	Totals	22	28	35	245	48%	10%	10%	10%
	Spam	9	7	4	81	16%	10%	10%	
	AAFF	13	21	31	164	32%		0%	
					0	0%		0%	
TOTALS					510	100%	58%	33%	

Allotment:	Sullivan Tank					Pasture:			
DWR	Key Area #:	2				Year Read:	1988		
Ecological Site:	Loamy Upland 10-14					RATING:	Mid		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	31	30	24	301	83%	20%	20%	16%
	Artr	31	30	22	299	83%	15%	15%	
	Gusa			2	2	1%	10%	1%	
GRASSES	Totals	5	8	10	61	17%	80%	17%	17%
	Hija	4	5	8	46	13%	15%	13%	
	Orhy	1	1	1	10	3%	20%	3%	
	Bogr		2	1	5	1%	30%	1%	
					0	0%		0%	
FORBS	Totals	0	0	0	0	0%	10%	0%	0%
	Spam				0	0%	10%	0%	
					0	0%		0%	
					0	0%		0%	
TOTALS					362	100%	100%	32%	

Allotment:	Sullivan Tank					Pasture:			
DWR	Key Area #:	2				Year Read:	2004		
Ecological Site:	Loamy Upland 10-14					RATING:	Mid		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	57	54	45	552	58%	20%	20%	15%
	Artr	57	53	44	549	58%	15%	15%	
	Gusa		1	1	3	0%	10%	0%	
GRASSES	Totals	34	37	43	355	37%	80%	37%	21%
	Hija	29	30	33	296	31%	15%	15%	
	Orhy	3	2	2	27	3%	20%	3%	
	Bogr				0	0%	30%	0%	
	Sihy	2	5	8	32	3%	10%	3%	
FORBS	Totals	4	4	5	41	4%	10%	4%	4%
	Spam				0	0%		0%	
	Chen	1	1	1	10	1%	5%	1%	
	AAFF	3	3	4	31	3%	5%	3%	
TOTALS					948	100%	110%	41%	

Allotment:	Sullivan Tank					Pasture:			
DWR	Key Area #:	3				Year Read:	1988		
Ecological Site:	Loamy Upland 10-14					RATING:	Late		Allowed
		TALLY					Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	Totals	29	27	28	285	76%	20%	20%	31%
	Gusa	17	15	12	161	43%	10%	10%	
	Artr	6	7	9	65	17%	15%	15%	
	Fapa				0	0%		0%	
	Come	3	2	2	27	7%		0%	
	Befr			1	1	0%	3%	0%	
	Juos	3	3	3	30	8%	5%	5%	
	Epvi				0	0%	10%	0%	
	Opunt			1	1	0%	10%	0%	
	Erog				0	0%		0%	
	Yucca				0	0%		0%	
GRASSES	Totals	7	9	9	76	20%	80%	20%	20%
	Sihy	3	3	2	29	8%	10%	8%	
	Orhy	2	4	3	25	7%	20%	7%	
	Pofe	1	1	2	11	3%	10%	3%	
	Hija	1	1	2	11	3%	15%	3%	
	Arist				0	0%	5%	0%	
FORBS	Totals	1	2	2	13	3%	10%	3%	3%
	Spam		1	1	3	1%	1%	1%	
	Aster				0	0%		0%	
	Anten	1	1	1	10	3%	5%	3%	
					0	0%		0%	
					0	0%		0%	
					0	0%		0%	
					0	0%		0%	
					0	0%		0%	
TOTALS					374	100%	119%	54%	

Allotment:	Sullivan Tank				Pasture:			
DWR	Key Area #:	3			Year Read:	2004		
Ecological Site:	Loamy Upland 10-14				RATING:	Mid		Allowed
		TALLY				Climax	Allowable	Composition
SPECIES		1	2	3	WTD	% Comp	Comp	%	Total
BROWSE	**Totals**	**43**	**43**	**43**	**430**	**43%**	**20%**	**20%**	**30%**
	Gusa	12	14	15	127	13%	10%	10%	
	Artr	8	7	7	77	8%	15%	8%	
	Fapa	10	10	10	100	10%		0%	
	Come	5	4	3	46	5%	5%	5%	
	Befr	2	1	1	17	2%	3%	2%	
	Juos	4	4	2	38	4%	5%	4%	
	Epvi				0	0%	10%	0%	
	Opunt	2	2	2	20	2%	5%	2%	
	Erio-1			2	2	0%		0%	
	Yucca		1	1	3	0%	5%	0%	
GRASSES	**Totals**	**4**	**9**	**5**	**51**	**5%**	**80%**	**5%**	**5%**
	Sihy	3	5	2	33	3%	10%	3%	
	Orhy	1	1	2	11	1%	20%	1%	
	Pofe		1		2	0%	10%	0%	
	Hija		1	1	3	0%	15%	0%	
	Arist		1		2	0%	5%	0%	
FORBS	**Totals**	**53**	**46**	**50**	**513**	**52%**	**10%**	**10%**	**10%**
	Spam	2			14	1%	1%	1%	
	Aster	2	2	2	20	2%	2%	2%	
	Ascl	1	1	1	10	1%	1%	1%	
	Ment	2	4	3	25	3%	2%	2%	
	Brte	35	28	31	332	33%		0%	
	Erci-1	4	7	6	48	5%	4%	4%	
	AAFF	5	3	3	44	4%		0%	
	Erio-1	2	1	4	20	2%		0%	
TOTALS					**994**	**100%**	**128%**	**45%**	

Allotment:	Sullivan Tank					Pasture:			
DWR	Key Area #: 4					Year Read: 2004			
Ecological Site:	Loamy Upland 10-14					RATING: Mid			Allowed Composition Total
SPECIES		TALLY 1	TALLY 2	TALLY 3	WTD	% Comp	Climax Comp	Allowable %	
BROWSE	**Totals**	**27**	**23**	**19**	**254**	**26%**	**20%**	**20%**	**12%**
	Gusa	25	21	16	233	24%	10%	10%	
	Artr	1	1	2	11	1%	15%	1%	
	Opunt				0	0%		0%	
	Juos	1	1	1	10	1%	5%	1%	
	Epvi				0	0%	10%	0%	
	Erio-1				0	0%		0%	
GRASSES	**Totals**	**54**	**58**	**47**	**541**	**56%**	**80%**	**56%**	**23%**
	Hija	49	43	31	460	47%	15%	15%	
	Sihy	3	10	14	55	6%	10%	6%	
	Orhy	1	4	2	17	2%	20%	2%	
	Pofe				0	0%	10%	0%	
	Stipa	1	1		9	1%	10%	1%	
FORBS	**Totals**	**17**	**13**	**30**	**175**	**18%**	**10%**	**10%**	**10%**
	Spam	8	4	3	67	7%	7.00%	7%	
	Phlox		2	3	7	1%	1.00%	1%	
	AAFF	1		8	15	2%	2.00%	2%	
	Daisy	6	4	11	61	6%	1.00%	1%	
	Ment	2	3	5	25	3%		0%	
TOTALS					**970**	**100%**	**116%**	**46%**	

Appendix E

Wildlife Data

AGFD MULE DEER DATA FOR GMU 13B

YEAR	# SURVEYED	BUCKS/100DOES	FAWNS/100DOES	POPULATION ESTIMATE
1985	108	30	50	1000-1500
1986	41	29	18	1000-1500
1987	63	31	44	1163
1988	No data	No data	No data	No data
1989	112	71	31	900
1990	63	68	32	900
1991	85	27	37	900
1992	31	24	59	<1000
1993	117	126	52	800-1000
1994	143	69	52	No estimate
1995	88	183	79	No estimate
1996	154	87	33	No estimate
1997	64	77	29	No estimate
1998	156	43	45	No estimate
1999	145	51	35	No estimate
2000	155	49	36	No estimate
2001	275	34	67	No estimate
2002	118	46	20	No estimate
2003	Unknown	29	46	No estimate

AGFD RECENT MULE DEER HUNT DATA FOR GMU 13B

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