Appendix B: Limestone Allotment Rangeland Health Evaluation

Rangeland Health Evaluation
Limestone Allotment
Lease #4508

June 2015

United States Department of the Interior
Bureau of Land Management
Tucson Field Office
Gila District Office

Table of Contents

1 Introduction 3

2 Allotment Profile 3

2.1 Climate, Temperature, Soils, Watershed, Water Quality 3

2.2 Biological Resources: 6

2.3 General Wildlife Resources 7

2.4 Special Management Areas 9

2.5 Recreational Resources 10

2.6 Cultural Resources 10

3 Grazing Management 11

3.1 Grazing History 11

3.2 Mandatory Terms and Conditions for Permitted Use 11

4 Objectives 12

4.1 Relevant Planning and Environmental Documents 12

4.2 Key Area Objectives 13

5 Plant List 16

6 Monitoring Protocols 16

7 Management Evaluation and Summary of Studies Data 18

7.1 Actual Use 18

7.2 Monitoring Study Analysis 18

8 Conclusions 21

Standard 1 21

Standard 2 21

Standard 3 21

9 Recommendations 22

10 References 23

1 Introduction

The purpose of this evaluation is to determine if existing multiple uses are meeting the Arizona Standards for Rangeland Health and Guidelines for grazing administration along with appropriate land use plan and activity plan objectives. Standards are goals for the desired condition of the biological and physical components and characteristics of rangelands. Guidelines are management approaches, methods, and practices.

2 Allotment Profile

The Limestone allotment is located on both sides of State Route 77 (SR 77) between the communities of Winkelman and Globe in Gila County.

Table 1 Physical Description

Land Ownership	Acreage
Public (BLM)	8,291
State Trust Lands	910
Private	250
Total	**9,451 acres**

2.1 Climate, Temperature, Soils, Watershed, Water Quality

2.1.1 Climate

Precipitation in this area ranges from 10-13 inches per year, with elevations from 2300-5100 feet. The average precipitation recorded at the Kearny station for the 30 year data is 13 inches. Approximately 40% of moisture comes as gentle rain or snow during the winter-spring (October – April) season, originates in the north Pacific and Gulf of California, and comes as frontal storms with long duration and low intensity. The remaining 60% falls in the summer season (May – September), originates in the Gulf of Mexico, and is convective, usually brief, and intense thunderstorms. Snow is uncommon from December – March, but rarely lasts more than a day. May and June are the driest months. The Southwest region has been in a severe drought since 1995, the southeastern portion of Arizona has been in a serious drought for 7 to 10 years, depending on the exact location. Most of the precipitation stations have experienced up to seven years of below average moisture. The last four years produced exceptionally limited amounts of precipitation at many stations. Precipitation data is collected from Bureau of Land Management (BLM), National Oceanic and Atmospheric Agency and rancher rain gauge stations on BLM land. The data presented below came from the Western Regional Climate Center rain gauge station which is nearest to the allotment. (Kearny, Arizona (024590)).

Western Regional Climate Center Rain Gauge Data for Winkelman 6 S, Arizona (029420)

Table 2 Period of Record Monthly Climate Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	64.2	68.2	73.3	81.0	89.5	99.2	99.3	96.7	93.6	84.4	72.6	64.1	82.2
Average Min. Temperature (F)	31.2	33.8	38.5	42.9	49.9	59.8	69.5	67.8	60.6	47.6	36.6	30.8	47.4
Average Total Precipitation (in.)	1.36	1.06	0.98	0.46	0.32	0.30	2.04	2.69	1.31	1.03	0.86	1.38	13.79
Average Total Snowfall (in.)	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Period of Record: 01/01/1893 to 05/31/1980

2.1.2 Soils/Vegetation

The Limestone allotment is located in the middle elevation of the Sonoran Basin and Range province in southeastern Arizona. The potential plant community is a diverse community of desert trees, shrubs, cacti, and perennial forbs and grasses. With continuous heavy grazing, herbaceous and suffrutescent forage species can be replaced by increases in shrubs, cacti and trees. Well-developed gravel cover helps protect the soil from erosion. This site has a cycle of dominance by saguaro, alternating with large shrubs and trees that act as nurse plants for the giant cacti. This cycle takes approximately 300 years and starts from exceptionally wet years (El Nino) where saguaro establishes in large numbers. Trees present in the current plant community on the allotment include Canotia (Canotia holacantha), Ironwood (Olneya spp.), foothill Palo Verde (Parkinsonia microphylla), and velvet mesquite (Prosopis velutina). Shrubs include whitethorn acacia (Acacia constricta), ocotillo (Fouquieria splendens), creosote bush (Larrea tridentate var. tridentate) with the dominant half shrubs being triangle bursage (Ambrosia deltoidea), white bursage (Ambrosia dumosa), white brittlebush (Encelia farinosa), rayless brittlebush (Encelia frutescens), and threadleaf snakeweed (Gutierrezia microcephala).

Native perennial grasses include black grama (Bouteloua eriopoda), bush muhly (Muhlenbergia porter), purple threeawn (Aristida purpurea), blue threeawn (Aristida purpurea var. nealleyi), red grama (Bouteloua trifida), and fluffgrass (Dasyochloa pulchella).

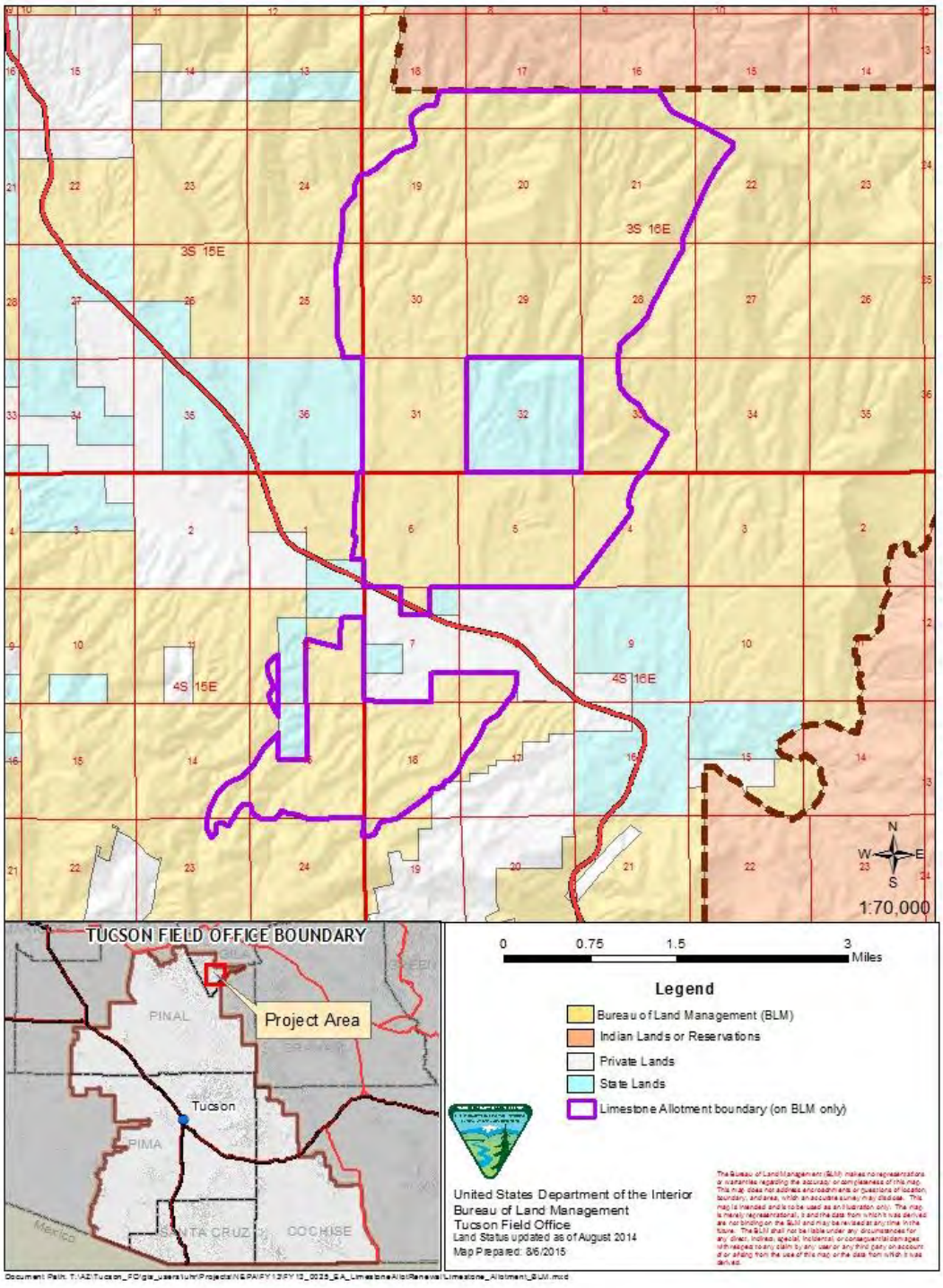

Figure 1 Limestone allotment land ownership

2.1.3 Watershed

The allotment is located in the Dripping Springs Wash watershed which is 25,000 acres. The Dripping Springs Wash is characterized by ponderosa pine, Arizona interior chaparral, and Sonoran desert grassland vegetation communities running from the top of the Pinal Mountains to the confluence of Dripping Springs Wash with the Gila River.

2.1.4 Water Quality

There is no Section 303d Water Quality Limited Stream Segment associated with the allotment. Based on current information, there are no other concerns about water quality that should be considered before lease issuance.

2.2 Biological Resources:

2.2.1 Major Land Resource Area

The Natural Resource Conservation Service (NRCS) characterizes land resource regions by particular patterns of soils, climate, water resources and land uses. These large regions are then grouped into Major Land Resource Areas (MLRAs). MLRAs are then broken down further into ecological sites, which are associated units of soil and vegetation with quantifiable characteristics. The BLM portion of the Limestone allotment encompasses several Ecological Sites. See Table 3 below.

2.2.2 Ecological Sites Descriptions

Table 3 Ecological Sites

Ecological Site	MLRA	Precipitation Zone	Acres
Limey Slopes	38-1	12-16”	888
Limestone Hills	38-1	12-16”	2990
Limey Gypsum Upland	38-1	12-16”	2484
Volcanic Hills	38-1	12-16”	450
Limestone Hills	38-1	16-20”	919

Ecological Site Guides were last updated in 2008 for the12-16” Precipitation Zone sites and 2014 for the 16-20” Precipitation Zone sites. Reference sites are on adjacent allotments.

2.2.3 Vegetation Communities

The historic native plant community is dominated by perennial warm season grasses with a mixture of desert shrubs, half shrubs, succulents and forbs. This includes a flora of native annual grasses and forbs of both the winter and summer seasons. Periodic wildfires occurred at moderate intervals (15 to 30 years) and helped to maintain a balance between grasses and shrubs. The interactions of drought, fire and continuous livestock grazing can, over time, result in the loss of palatable grasses, half shrubs and suffrutescent forbs on this site. The lack of fire for very long periods can lead to increases in large shrubs like creosotebush and whitethorn acacia. In some situations non-native annuals can dominate the site. These species can, over time, diminish

the soil seed-bank of native annual species. Non-native annuals can act to increase the fire frequency of areas of the site near roads and urban areas, where the incidence of man-made fires is high.

North slopes have a chaparral of evergreen shrubs like jojoba, turbinella oak, mountain mahogany, cliffrose, desert buckbrush and canotia. Southern exposures will have a higher percentage of desert shrubs, trees like palo verde and succulents in the plant community. More xeric grasses will dominate southern exposures (aristida, tridens). Grasses on cooler aspects include stipa species and sideoats grama.

2.3 General Wildlife Resources

Common wildlife species found in the area include Coues whitetail and mule deer, javelina, coyote, fox, jackrabbit, cottontail rabbit, small rodents, quail, mourning dove, and songbirds. The ecological site description states that the site provides excellent habitat for Mule deer and javelina, with natural water areas occurring infrequently as springs or seeps. Deer pellet groups were observed at the evaluation sites on March 6, 2013, as well as soil disturbance from rooting javelina. Gila woodpecker, cactus wren, and a Sonoran whipsnake were observed near the BLM lands on the allotment.

2.3.1 Special Status Species, Threatened & Endangered Species

A biological evaluation was completed which analyzes the effects on Threatened and Endangered (T&E) and Candidate species which are also BLM sensitive species. Grazing in the Gila District has been consulted on with the U.S. Fish and Wildlife Service (FWS) and a Biological Opinion (BO) was issued in May of 2012. Parts of the allotment are within 5 miles of occupied flycatcher habitat along the Gila River. The determination from the BO on the flycatcher is:

After reviewing the current status of southwestern willow flycatcher, the environmental baseline for the action area, the effects of the Gila District grazing program and the cumulative effects, it is the FWS's biological opinion that the grazing program, as proposed, is neither likely to jeopardize the continued existence of the southwestern willow flycatcher, nor likely to destroy or adversely modify critical habitat.

This determination was reached based on the following conservation measures proposed by the BLM for the grazing program that are pertinent to livestock grazing on the Limestone allotment.

Southwestern willow flycatcher

1. Mapping: The BLM will maintain maps that convey information about flycatcher habitat. These maps will be reassessed as conditions change, (example; fire and floods). Maps will include the following information:

a. Location, size, shape, and spacing of habitat areas.

b. Habitat stage with respect to flycatchers according to the following classification: suitable occupied, suitable-unoccupied, suitable un-surveyed, potential in the short-term (1 to 3 years), and potential in the long-term (greater than 3 years).

c. Status of flycatcher surveys for each area of suitable habitat: either the date(s) surveyed or indication that the area has not been surveyed.

2. Habitat Management Guidelines: The BLM will implement the following guidelines:

a. Livestock grazing will be excluded within occupied and un-surveyed, suitable habitat during the breeding season (April 1-September 1).

b. Manage suitable flycatcher habitat so that suitable characteristics are not eliminated or degraded.

c. Manage riparian areas to allow natural regeneration and, therefore, allow those sites with potential to progress into suitable habitat.

3. Range Improvements: The BLM will locate range improvement projects outside of flycatcher occupied areas, except for fences, cattle guards, and gates needed to exclude or better manage livestock. Within breeding habitat, implement construction, maintenance, or management activities outside of the flycatcher breeding season. Any range improvement project within two miles of occupied, suitable or critical habitat, including those proposed to improve flycatcher habitat, will be reviewed by the FWS for compliance with the Biological Opinion.

4. Cowbird Control: To reduce the likelihood of nest abandonment and loss of flycatcher productivity owing to cowbird parasitism associated with BLM-authorized grazing activities in or near occupied habitats, BLM will implement the following:

a. Investigate, identify, and assess livestock concentration areas on BLM lands in the action areas that are likely foraging areas for cowbirds. This will be done within a 5-mile radius of occupied or un-surveyed suitable southwestern willow flycatcher habitat. The BLM will evaluate ways to reduce any concentration areas found. The BLM will pay special attention to those facilities within two miles of breeding habitat, since this is the range in which alteration of concentration areas are most effective.

b. The BLM will ensure that willow flycatcher surveys and nest monitoring take place at least every three years in the areas where the BLM controls significant breeding habitat and public land grazing is a predominate use on adjacent lands. This will be initiated along the Gila River between Winkelman and the Dripping Spring Wash confluence and between Kelvin Bridge and the Buttes. If jointly determined, other areas may be added.

Monitoring protocols will be updated as necessary and nest monitoring may use surrogate species.

c. If cowbird parasitism in monitored areas is determined to be ten percent of nests or greater, the BLM and the FWS will meet and discuss reasons for the parasitism and possible management actions.

There is only one range improvement within two miles of flycatcher habitat, and that is the allotment boundary fence between the Limestone allotment and the Christmas allotment. Mine and Seep spring developments are about 2.5 miles from the Gila River, but are small spring developments and water troughs on steep slopes with low shrubs in the area. During the rangeland health evaluation field visit, no livestock concentration areas were identified on BLM lands within the allotment within 5 miles of occupied habitat (see Figure 11 Cowbird Analysis for the Limestone allotment).

Special Management Areas

There is one special area or designation that occurs within the allotment.

Table 4 Special Management Area

	Yes	Name	Date Established	No
Wild & Scenic Rivers				X
Wilderness				X
Unique Waters				X
Area of Critical Environmental Concern (ACEC)	XX	Desert Grasslands (Mescal Ridge unit)	1991 Safford RMP	
Other				X

The Desert Grasslands Area of Critical Environmental Concern (ACEC) was established on several parcels through the adoption of the Safford District Resource Management Plan (RMP), one of which is located on the north end of the Limestone allotment. The Mescal Ridge part of the ACEC is about 360 acres in size, with about 240 acres of the ACEC being on the Limestone allotment. The ACEC was established with the following prescriptions:

- Mineral withdrawal (All of Mescal Ridge parcel)
- Closed to off highway vehicles (OHV)
- Acquire state/private lands if available
- No livestock
- Prescribed fire plan

The management prescription for the exclusion of livestock from the Desert Grasslands ACEC affects only BLM lands not currently accessible to livestock, including the parcel on the Limestone allotment. Livestock do not use the area of the ACEC on the Limestone allotment due to the distance to water and the presence of steep, rocky slopes and cliffs. The portion of the Desert Grasslands ACEC that is on the allotment is located on the crest of steep, rocky slopes that are between 50-150% slopes. Cattle do not utilize slopes greater than 50% that are more than

600 yards from a water source. The closest water source is 3 miles away from the ACEC. There are no key areas for monitoring in the ACEC. Utilization studies in 1989 and 1988 indicated there were not any areas utilized by livestock within 2 miles of the ACEC. The other prescriptions will be as stated in the Safford District Resource Management Plan and Final Environmental Impact Statement, Partial ROD II. Page 5. II

2.4 Recreational Resources

There are no developed recreation sites on the allotment. Recreation use is limited and consists primarily of off-highway vehicle driving and small game hunting. Access to public land is difficult due to surrounding private property and rough terrain.

2.5 Cultural Resources

Issuance of the permit constitutes a Federal Undertaking under Section 106 of the National Historic Preservation Act (NHPA). The Area of Potential Effect (APE) has been determined to be the BLM public lands within the grazing allotment.

In compliance with the BLM Cultural Resources Programmatic Agreement, the Arizona BLM-SHPO Protocol, the 1980 Programmatic Memorandum of Agreement between the BLM, Advisory Council on Historic Preservation (ACHP), and the National Conference of State Historic Preservation Officers Regarding the Livestock Grazing and Range Improvement Program, and the BLM 8100 Manual series, the following actions have been taken to identify cultural resources located in the APE, evaluate the eligibility of cultural resources for listing in the National Register of Historic Places (NRHP), determine the effect of the undertaking on eligible cultural resources, and design mitigation measures or alternatives where appropriate.

The State Historic Preservation Officer (SHPO), the ACHP, and Indian tribes having historical ties to Arizona public lands were consulted during the preparations of the Upper Gila-San Simon Grazing Environmental Impact Statement (UG-EIS) (1978) and the Safford District Resource Management Plan (1992). Indian tribes were consulted at the beginning of the permit renewal process. There were no areas of Native American concern, Traditional Cultural Properties (TCP), or Sacred Sites identified during consultations.

Allotment case files, Allotment Management Plans (AMP) files, range project files, water source inventory files, and/or Cultural resource files were reviewed to determine areas of livestock congregation and whether these areas have been previously inventoried for cultural resources. Because no historic properties were identified in areas of livestock congregation, no mitigation is recommended as a BLM responsibility or as a term or condition of the permit, to protect cultural values identified above.

As required by the Native American Graves Protection and Repatriation Act regulations at 43 CFR 10.4(g), the following should be added to the grazing lease/permit as a term and condition:

If in connection with allotment operations under this authorization, any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001) are discovered, the permittee shall stop operations in the immediate area of the discovery, protect the remains

and objects, and immediately notify the Authorized Officer of the discovery. The permittee shall continue to protect the immediate area of the discovery until notified by the Authorized Officer that operations may resume.

* Properties refer to archaeological sites, Traditional Cultural Properties, and Sacred Sites.

3 Grazing Management

3.1 Grazing History

The allotment and surrounding area was grazed starting in the early 1900's when miners first settled the area. In the 1930's raising goats for the mohair industry was popular in Arizona and the area surrounding the allotment was reported to have an excess of 35,000 goats on the ranches surrounding Winkelman.

The last division fence defining this allotment was completed in 1962. Although an allotment management plan was completed in 1984 for this allotment, it is out of date, and there is not a current activity plan for this allotment. The allotment is divided into two pastures by the private lands in the valley bottom and SR 77. Grazing occurs mainly on the pasture on the north side of the allotment as it is the larger pasture. The pasture on the south side of the allotment has steeper hillsides because of the Dripping Springs Mountains.

3.2 Mandatory Terms and Conditions for Permitted Use

Number, Kind, and Class of Livestock use	54 Cattle
Period/Season of Use:	3/1 – 2/28 (yearlong)
Percent Public Lands	92%
Percent Public Land (Billing):	92%

Attachment A contains the mandatory terms and conditions of the current lease.

The management category given to the allotment is Maintain (M). By definition, M category allotments do not have serious resource conflicts and range condition and present management is satisfactory.

- Allotments have moderate or high resource production potential and are producing near their potential (or are trending in that direction).
- No serious resource use conflict/controversy exists.
- Opportunities may exist for positive economic return from public investments.
- Present management appears satisfactory.

Authorized range improvements on BLM public land are the allotment boundary fences and three spring developments. The springs are Tub Spring at the north end of the allotment and Mine and Seep springs on the south end of the allotment near the San Bernardino Mine. These spring developments are in disrepair because they have not been used for livestock within the last 5 years. Primary water sources for livestock are located on State and Private Land.

4 Objectives

4.1 Relevant Planning and Environmental Documents

The Taylor Grazing Act of 1934 provides for two types of authorized use: (1) A *grazing permit*, which is a document authorizing use of the public lands within an established grazing district, and is administered in accordance with Section 3 of the Taylor Grazing Act; and (2) a *grazing lease*, which is a document authorizing use of the public lands outside an established grazing district, and is administered in accordance with Section 15 of the Taylor Grazing Act. The Limestone allotment is a Section 15 grazing lease.

The BLM is responsible for establishing the appropriate levels and management strategies for livestock grazing in this allotment. Grazing leases issued must be in compliance with the multiple use and sustained yield concepts of FLPMA and the Fundamentals of Rangeland Health (43 CFR 4180), and be in accordance with the Guidelines for Grazing Administration while continuing to achieve Arizona Standards for Rangeland Health.

Land Health Standards

On April 28, 1997, the Secretary of Interior approved the implementation of the *Arizona Standards for Rangeland Health and Guidelines for Grazing Administration* for all Land Use Plans in Arizona. The purpose of the Standards and Guidelines is to maintain or improve the health of the public rangelands. Standards and guidelines are intended to help the Bureau, rangeland users and others focus on a common understanding of acceptable resource conditions and work together to achieve that vision. Standards and Guidelines were incorporated into the *Safford District RMP* in 1997.

As defined by the Arizona Resource Advisory Council, "Standards" are goals for the desired condition of the biological and physical components and characteristics of rangelands. "Guidelines" are management approaches, methods, and practices that are intended to achieve a standard. Guidelines are developed and applied consistent with the desired condition and within the site's capability and specific public land uses, and may be adjusted over time. Arizona S&Gs are defined as the following:

Standard 1 - Upland Sites
Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).

Standard 2 - Riparian - Wetland Site
Riparian-wetland areas are in proper functioning condition.
There is no riparian on the allotment, therefore Standard 2 is not applicable.

Standard 3 - Desired Resource Conditions
Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

Land Use Plan Objectives

The *Upper Gila San Simon Grazing Environmental Impact Statement* (UG-EIS) (BLM 1978) allocated lands within the Limestone Allotment as available for livestock grazing. The *Safford District RMP* (1992 and 1994) incorporated the decisions from the UG-EIS by reference. The *Safford District RMP* contains additional objectives applicable to the resources on the Limestone allotment:

- The objective for management of upland vegetation is to restore and maintain plant communities for wildlife, watershed condition and livestock.
- The desired plant communities will be determined in the preparation of activity plans (allotment management plans, habitat management plans, etc.).
- An ecological site inventory will be completed as new allotment management plans are prepared or existing plans revised (page 45).

4.1.1 Activity Level Plan Objectives

An allotment management plan was prepared for this allotment in 1984 and several activity level plan objectives were developed for vegetation on the two key areas. For Key area 1, the objectives were 1) Increase cover of Jojoba from 8.75 to 11 %, and 2) Increase total vegetation cover from 11.9 to 16 %. For Key area 2, the objectives were 1) Increase cover of Jojoba from 7.25 to 10 %, and 2) Increase total vegetation cover from 12.45 to 17 %. These were based on an evaluation of the allotment conducted between 1980 and 1984 that included vegetation, utilization and actual use monitoring.

Allotment specific resource objectives 1, 2, and 3 for the Limestone allotment from the UG-EIS (page A-31) were:

1. Support present wildlife populations of 25 deer, 30 javelina, and 120 quail.
2. Over 15 years, increase plant density from 14% to 18% and reduce SSF (soil surface factor) from 31 to 25.
3. Increase forage available to livestock from 30 CYLs to 35 CYLs over 15 years.
4. Key species are Jojoba and Side-oats grama.

Resource Objectives 1, 2, and 3 for the Limestone allotment from the UG-EIS (page A-31) are no longer valid. For Objective 1, BLM does not manage wildlife populations, only habitat for wildlife. For Objectives 2 and 3, state and transition modeling of vegetative communities demonstrates a natural range of variability and that certain degraded sites do not change easily due to a variety of factors.

For Objective 4, key forage species at the range health evaluation sites were selected based on ecological site descriptions and species present. These species were jojoba, ephedra, and range rataney.

4.2 Key Area Objectives

Two Key Areas (Table 4) for monitoring were established on the Limestone Allotment. During the RHE, BLM found that one of the Key Areas is no longer accessible due to private land

Table 5 Key Area Ecological Sites

Allotment	Key Area	Ecological Site
Limestone	KA1	Limy Slopes Pz 10-13”
	KA2	Limy Upland (Deep) 10-13”

access issues. A new Key Area will be established to replace Key Area 2 on the same ecological site. Because of these issues and to better represent existing rangeland conditions, RHEs were completed at three locations on the same ecological sites as the Key Areas.

4.2.1 Standard 1- Upland Sites, applies to both ecological sites

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

Soil erosion on the RHE evaluation area is appropriate to the ecological site on which it is located. Factors indicating conformance to Standard 1 include ground cover, litter, vegetative foliar cover, flow patterns, rills, and plant pedestalling in accordance to developed NRCS Ecological Site Guides and/or Reference Sheets. Deviations that are “slight” or “slight to moderate” from the appropriate site guide or reference are considered meeting the Standard. Departures of Moderate or greater will not meet the Standard except in cases where the departure is documented as showing an improvement of land health over what is expected on a reference site.

4.2.2 Standard 3- Desired Resource Condition Objectives

Objective: Productive, diverse upland and riparian-wetland plant communities exist and are maintained.

DPC objectives 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. Because DPC objectives are site-specific, Rangeland Health evaluation areas located on similar stratum may have difference DPC objectives. This is due to differences in slope, elevation, aspect and rainfall factors, as well as other site potential limiting factors such as prior disturbance, rock outcroppings, or heavy gravel cover. The recommended palatable shrub and grass compositions will provide for adequate wildlife forage on the site for species such as Sonoran desert tortoise, mule deer, quail, and other non-game wildlife species. The foliar cover and bare ground cover class objectives will provide thermal and hiding cover for wildlife species and will prevent accelerated erosion on the sites.

Since the allotment specific objectives from the UG-EIS (described above) are no longer valid, BLM set Desired Plant Community (DPC) objectives for the Limestone allotment for important biological resources and to measure Standard 3.

4.2.2.1 Ecological Site specific DPC objectives:

Limy Slopes Pz 10-13" (Key Area 1)

- Maintain basal cover at greater than or equal ≥ 5%
- Maintain perennial grass cover at greater or equal ≥ 1%
- Maintain a palatable shrub composition of ≥10% (Fairy duster and Jojoba)
- Maintain vegetative foliar cover of ≥15%
- Sufficient annual vegetation will remain on site to satisfy other resource concerns such as the desert tortoise (Arizona Standards and Guidelines 3-5.4)

Rationale:
The reference sheet used for this site is the Limy Slope 10-13"pz. Maintaining a perennial grass composition of 1% on this site works toward Sonoran desert tortoise habitat requirements and is appropriate for the site based on its aspect, elevation, and its current state based on the NRCS state and transition modelling. Palatable shrub composition of 10% or greater is appropriate for the site based on its aspect and elevation and complies with the expected ranges of shrub production in the Ecological Site Guide in its current state based on the NRCS state and transition modelling. Foliar cover is expected to be between 15% and 20% as per the reference sheet. A vegetative foliar cover of 15% or greater should serve to prevent accelerated erosion beyond what is expected in the reference state. The range of basal ground cover class on the site ranges from 0% to 8% based on the reference sheet. Maintaining a basal ground cover class of 5% or more will ensure that soil erosion on the site is consistent with the expected erosion rate of the reference state.

Limy Upland (Deep) 10-13" (Key Area 2)

- Maintain basal cover at greater than or equal ≥ 5%
- Maintain perennial grass cover at greater or equal ≥ 1%
- Maintain a palatable shrub composition of ≥10%
- Maintain vegetative foliar cover of ≥15%
- Sufficient annual vegetation will remain on site to satisfy other resource concerns such as the desert tortoise (Arizona Standards and Guidelines 3-5.4)

Rationale:
This site is located in the Stagecoach-Haplogypsids-Delnorte soil complex. The majority of the complex is located in the Limy Upland (Deep) site and therefore we used the Limy Upland (Deep) 10-13" pz reference sheet. Maintaining a perennial grass composition of 1% on this site works toward Sonoran desert tortoise habitat requirements and is appropriate for the site based on its aspect, elevation, and its current state based on the NRCS state and transition modelling. Palatable shrub composition of 10% or greater is appropriate for the site based on its aspect and elevation and complies with the expected ranges of shrub production in the Ecological Site Guide in its current state based on the NRCS state and transition modelling. Foliar cover is expected to be between 15% and 20% as per the reference sheet. A vegetative foliar cover of 15% or greater should serve to prevent accelerated erosion beyond what is expected in the reference state. The range of basal ground cover class on the site ranges from 0% to 8% based on the reference sheet. Maintaining a basal ground cover class of 5% or more will ensure that soil erosion on the site is consistent with the expected erosion rate of the reference state.

5 Plant List

Table 6 Plant List

Common Name	Scientific Name
Jojoba	*Simmondsia chinensis*
Palo Verde	*Cercidium microphyllum*
Yucca	*Yucca sp.*
Prickly Pear	*Opuntia*
Snake Weed	*Gutierrezia sarothrae*
Burro Weed	*Ambrosia dumosa*
Brittle Bush	*Encelia farinosa*
White Thorn	*Acacia constricta*
Catclaw Mimosa	*Mimosa aculeteaticarpa*
Velvet Mesquite	*Prosopis velutina*
Fairy Duster	*Calliandra eriophylla*
Ocotillo	*Fouquieria splendens*
Desert Christmas Cactus	*Opuntia leptocaulis*
Staghorn Cholla	*Opuntia versicolor*
Saguaro	*Carnegiea gigantea*
Paper Flower	*Psilotrophe tagentina*
Blue Dick	*Dichelostemma capitatum*
Mormon Tea	*Ephedra*
Creosote bush	*Larrea tridentate*
Rat Eared Coldinea	*Tiquilia canescens*
Crucifixion Thorn	*Canotia holacantha*
Lycium	*Lycium pallidum*
Blue Dicks	*Covena*
Filaree	*Erodium cicutarium*
Patota	*Monolepis nuttlliana*
Indian Wheat	*Plantago patagonica*
Schismus	*Schismus barbatus*
Desert Zinnia	*Zinnia acerosa*

6 Monitoring Protocols

Monitoring protocols used at the upland Key Areas on the allotment include a variety of study methods. Compliance with Standard One is completed using the Interpreting Indicators of Rangeland Health study method, as described in BLM Technical Reference 1734-6 Version 4 (2005).

Compliance with Standard Three is completed using a variety of upland study methods described below.

Ground Cover

Ground cover is the amount of surface area comprised of bare ground, perennial plant bases, litter, gravel or rocks. Ground cover data, each soil protection category expressed as a percentage of total hits, reflect the amount of litter, vegetative root bases, gravel and rocks available to intercept raindrop impact before reaching the soil and of bare ground exposed to climatic elements. Cover data were collected with each quadrat placement. A single point from the quadrat was consistently the focal point for cover category classification.

Ground cover ground rules established prior to data collection were:

- One ground cover hit is recorded per quadrat placement. The total number of ground cover hits equals the total number of quadrat placements.
- Litter is dead plant material directly covering the ground, dead perennial vegetative bases, or animal material. If a small stem or piece of litter is not considered large enough to intercept raindrop impact, the hit is the ground covering below it.
- Bare ground is soil with particles up to 1/4"; gravel are particles 1/4"-3" in size; rocks are $\geq$3".
- Annual forbs are considered litter cover when in contact with the ground and large enough to intercept raindrop impact.

Pace Frequency

Pace frequency is the number of times a plant species is present within a given number of uniformly sized sample quadrats (plot frames placed repeatedly across a stand of vegetation). Plant frequency is expressed as percent presence for each species encountered within total number of quadrat placements, therefore, frequency reflects the probability of encountering a particular plant species within a specifically sized area (quadrat size) at any location within the key area. The total number of frequency hits among all species will not equal the total number of quadrat placements and frequency is insensitive to the size or number of individual plants. Frequency is a very useful monitoring method but does not express species composition, only species presence. Frequency is an index that integrates species' density and spatial patterns.

A 40 x 40 cm. (0.16 m^2) quadrat is used for pace frequency. Ground rules are:

- Species present within the bounds of the sample quadrat are recorded with a single tally.
- If no species are present, no frequency data are recorded.
- Perennial or annual grasses and forbs must be rooted within the quadrat to be counted.
- A grass or forb plant base present under the quadrat frame is considered "in."
- Annual plants, grasses and forbs, are counted whether green or dried.
- Tree/shrub canopy and basal hits are recorded separately. Over time, these parameters can indicate changes in tree/shrub size (canopy) or plant numbers (basal).
- A canopy hit is any part of the tree or shrub that overhangs the quadrat (enters an imaginary vertical projection of the plot frame).
- Quadrat placements are placed at one-pace intervals (2-steps), patterned in transects (straight lines) and are run parallel to each other, generally contouring slope, within the area of one ecological site (vegetation and soil type).

Fetch

Fetch is the distance from the nearest perennial plant base within 360 degrees of the quadrat's ground cover point. Fetch, reported with descriptive statistics, relates to plant distribution and watershed characteristics. Perennial plant cover can reduce soil erosion by creating an obstruction, slowing the rate of overland flow. A shorter distance between perennial plant bases lessens the opportunity for flowing water to acquire the necessary energy to remove soil and litter from a site. Overtime, fetch data can be used to assess changes in the spatial distribution and connectivity of vegetation patches plus document trends in the fragmentation of plant cover for rangeland health evaluation. One-hundred distances were measured in conjunction with pace frequency as baseline data for future monitoring.

Dry Weight Rank (DWR)

Dry weight rank estimates plant composition on a dry weight production basis. This data collection was made using a 40cm x 40cm plot frame and 100 placements. The three perennial species within a vertical projection of quadrats placed repeatedly (100 times) comprising the most annual biomass production on a dry weight basis are ranked (1st, 2nd, and 3rd most biomass). Multiple ranks are given when less than 3 species are present. For example, if species A and species B are the two species present, ranks of 1 and 3, 1 and 2, or 2 and 3 are given to species A; if only species B is present, it receives a tally for each rank. No tally was recorded at quadrat placements void of perennial species.

Utilization data was collected at Key Area 1 and at the Rangeland Health evaluation sites using the Key Species method. This method is described in BLM Technical Reference 1734-3, "Utilization Studies and Residual Measurements".

7 Management Evaluation and Summary of Studies Data

7.1 Actual Use

Actual Use reporting is required for the Limestone allotment. The current grazing lessee has turned in Actual Use reports yearly, beginning in 2010. Prior to this, there are only records on billed use.

Number of Active Livestock	Kind	Grazing Begin	Period End	%PL	AUMs
0	Cattle	3/1/2010	2/28/2011	92%	0
0	Cattle	3/1/2011	2/28/2012	92%	0
0	Cattle	3/1/2012	2/28/2013	92%	0

7.2 Monitoring Study Analysis

The USDA Natural Resources Conservation Service (NRCS) State General Soil Map for this

area was completed in 2009. The reference sheet for the Limy Slopes 10-13" p.z. was created in 2003, and for Limy Upland in 2002. Rangeland health evaluations were conducted on March 6, 2013. In addition, species composition and utilization monitoring was conducted March 6, 2013. Monitoring data from the rangeland health evaluation is available at the Tucson Field Office.

Table 7 Data Types, Methods, and Frequency of Collection

Method	Yes	Date	No
Rangeland Health Evaluation	X	3/6/2013	
Pace Frequency	X	2/5/2015	
Dry Weight Rank	X	2/5/2015	
Point Cover	X	1980, 1987, 2015	
Line Intercept	X	1977, 1980, 1987,	
Photos	X	1977, 1980, 1984, 3/6/2013, 2/5/2015	
Utilization	X	1980, 3/6/2013	
Actual Use	X	2010, 2011	
Climate	X	6/ 1/1984 to 2/21/2013	

Rangeland Health Evaluations were completed on three ecological sites on the allotment on March 6, 2013. One ecological site contained Key Area 1, but the evaluation area did not include the key area transect. The evaluations' preponderance of evidence indicated that there was a "none to slight" rating for departure from the ecological site description and ecological reference area for soil/site stability and hydrologic functions. Rills, water flow patterns, pedestals and/or terracettes, bare ground, gullies, and litter movement were "none to slight" for departure from expected reference conditions. Rocky outcroppings and ground cover contributed to the absence of rills, gullies, and water-flow patterns. Plant community composition and distribution relative to infiltration was also "slight to moderate" for departure from expected reference conditions. Biotic integrity was rated "moderate to slight to moderate" for the three evaluations, because of the loss of plants and production on all sites due to drought conditions on the allotment.

Limey Slopes 3/6/2013

Rangeland Health Attribute	**Departure From Ecological Site Description**				
	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Soil/Site Stability			1	2	7
Hydrologic Function			2	4	5
Biotic Integrity			2	2	3

Clay Loam Upland 3/6/2013

Rangeland Health Attribute	Departure From Ecological Site Description				
	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Soil/Site Stability				3	7
Hydrologic Function				5	5
Biotic Integrity			4	4	1

Limey Upland 3/6/2013

Rangeland Health Attribute	Departure From Ecological Site Description				
	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Soil/Site Stability				2	8
Hydrologic Function				3	7
Biotic Integrity			1	3	5

Utilization monitoring was conducted on March 6, 2013. Species chosen for monitoring were listed in the ecological site description as plant preferences for livestock cattle. Jojoba, ephedra, and rataney were chosen as the three species for monitoring because the other listed species either were not present at the BLM evaluation site, or had no utilization (e.g. Mesquite). A total of 22 jojoba, 10 ephedra, and 15 rataney plants were monitored for utilization. Average utilization for Jojoba, ephedra, and rataney is given in the following table. Utilization was below 10% for all species. Utilization on jojoba and rataney was probably from deer (pellet groups were observed), as no sign of cattle was observed on the slope.

Species	Utilization (%)
Jojoba	1.8
Ephedra	0.0
Rataney	4.0

Dry Weight Rank monitoring was completed on Key Area 1, which was established in 1977, on 2/5/2015. Key area 2 is no longer accessible because of locked gates on private lands leading to the monitoring site, and is no longer a viable monitoring location. One of the rangeland health evaluations is on the same ecological site as key area 2. A new Key Area will be established on the allotment as time and funding permit.

8 Conclusions

Arizona Standards and Guidelines:

Standard 1: Upland Sites – There are no concerns about soils that should be considered before lease issuance. Upland soils exhibit infiltration, permeability, and erosion rates typical for this soil type, climate and landform. According to the rangeland health evaluation, soil/site stability, hydrologic, and biotic functions meet expectations for reference conditions. The only exception is due to the loss of grass species due to drought on the site. However, native perennial shrubs and forbs are present and their composition is what is expected for the site. Therefore, Standard 1 is being met for the allotment.

Standard 2: Riparian – There are no riparian areas on the allotment. Therefore, Standard 2 is not applicable.

Standard 3: Desired Resource Condition

Key Area 1

Table 8 Key Area Objectives

Desired Plant Community Objectives			
	Desired	**Actual**	**Meeting objective or not**
Basal cover	≥ 5%	3%	Not Achieved
Perennial Grass Composition	≥1%	5%	Achieved
Palatable Shrub Composition	≥10 %	18.9%	Achieved
Foliar cover	≥ 15%	38.0%	Achieved
Sufficient annual Vegetation		Annual Forbs 92% Annual grasses 50%	Achieved

Dry Weight Rank monitoring was completed on Key Area 1, which was established in 1977, on 2/5/2015. Current monitoring showed basal cover of perennial vegetation of 3%, perennial grasses were 1.5% of the total composition, palatable shrubs were 18.9% and vegetative foliar cover was estimated from the combination of litter and live vegetation at 38%. Annual forbs occurred in 92% of the quadrats and annual grasses were in 50% of the quadrats.
The 1980 monitoring showed a basal cover of 1%, no perennial grasses present, palatable shrubs were 5%, and vegetative foliar cover was 20%. Although the Basal Cover objective is not being achieved, the basal cover data is showing an upward trend, along with all of the other objectives.

For desert tortoise, the perennial grass species present at the site are known to be palatable and important to desert tortoise (Van Devender, et al. 2002) (Oftedal 2002) and the perennial grass composition objective is being met at this Key Area. Palatable shrub composition on the site is met for Sonoran desert tortoise with a palatable browse (Van Devender, et al. 2002) (Oftedal

2002) of slightly less than 19% of the plant community.

Key Area 2 could not be accessed on 2/5/2015 because of locked gates on private lands leading to the monitoring site. Key area 2 is no longer a viable monitoring location. In response, one of the rangeland health evaluations is on the same ecological site as Key Area 2. A new Key Area will be established on the allotment as time and funding permit.

There are no vegetative resource concerns that should be considered before lease issuance for the allotment. The rangeland health evaluation indicates the soil/site stability, hydrologic, and biotic integrity functions are meeting expectations for the site. There are losses of native perennial grass species due to drought and the allotment is currently in non-use for drought, which has been prevalent in this part of the state for the last 8 years. Shrubs and forbs are present and their composition is what is expected for the site. The shrub and forb composition and density is sufficient to provide forage and shelter for the desert tortoise, therefore, Standard 3 is being met for the allotment.

9 Recommendations

The 10-year grazing lease may be renewed with the following terms and conditions:

Terms

Allotment Number	Allotment Name	Pasture Type	Number of Livestock	Type of Livestock	Year Begin	Year End	% Public Land	Type of Use	AUMs
4508	Limestone	Upland	54	CATTLE	3/1	2/28 (year-long)	92	ACTIVE	596

Conditions

1. Standard conditions (see Attachment B).

2. If in connection with allotment operations under this authorization, any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001) are discovered, the lessee/permittee shall stop operations in the immediate area of the discovery, protect the remains and objects, and immediately notify the Authorized Officer of the discovery. The lessee/permittee shall continue to protect the immediate area of the discovery until notified by the Authorized Officer that operations may resume.

3. Maximum allowable use levels will be as follows:
    - 40% of the current year's growth on key forage species (Upper Gila-San Simon Grazing Environmental Impact Statement UG-EIS p. 1-9, GM36)

10 References

U.S. Department of Agriculture, Natural Resource Conservation Service. 1991. Major land resource area (MLRA): 038-Mogollon Transition, Limestone Hills 12-16" p.z. 2009.

U.S. Department of Agriculture, Natural Resource Conservation Service. 1991. Major land resource area (MLRA): 038-Mogollon Transition, Limy Upland 12-16" p.z. 2009.

U.S. Department of the Interior, Bureau of Land Management. 1978. Upper Gila-San Simon Grazing EIS. Bureau of Land Management Arizona State Office, Phoenix, AZ.

U.S. Department of the Interior, Bureau of Land Management. 1991. Safford District Resource Management Plan. Bureau of Land Management Arizona State Office, Phoenix, AZ.

U.S. Department of the Interior, Bureau of Land Management. 1992. Safford District Resource Management Plan, Partial Record of Decision I. Bureau of Land Management Arizona State Office, Phoenix, AZ.

U.S. Department of the Interior, Bureau of Land Management. 1994. Safford District Resource Management Plan, Partial Record of Decision II. Bureau of Land Management Arizona State Office, Phoenix, AZ.

U.S. Department of the Interior, Fish and Wildlife Service. 2012. Gila District Grazing Biological Opinion. Ecological Services, Phoenix, AZ.

11 Attachment A: Conditions of the Current Grazing Lease

1. Grazing permit or lease terms and conditions and the fees charged for grazing use are established in accordance with the provisions of the grazing regulations now or hereafter approved by the Secretary of the Interior.
2. They are subject to cancellation, in whole or in part, at any time because of:
    a. Noncompliance by the permittee/lessee with rules and regulations.
    b. Loss of control by the permittee/lessee of all or a part of the property upon which it is based.
    c. A transfer of grazing preference by the permittee/lessee to another party.
    d. A decrease in the lands administered by the Bureau of Land Management within the allotment(s) described.
    e. Loss of qualifications to hold a permit or lease.
3. They are subject to the terms and conditions of allotment management plans if such plans have been prepared. Allotment management plans MUST be incorporated in permits or leases when completed.
4. Those holding permits or leases MUST own or control and be responsible for the management of livestock authorized to graze.
5. The authorized officer may require counting and/or additional or special marking or tagging of the livestock authorized to graze.
6. The permittees/lessee's grazing case file is available for public inspection as required by the Freedom of Information Act.
7. Grazing permits or leases are subject to the nondiscrimination clauses set forth in Executive Order 11246 of September 24, 1964, as amended. A copy of this order may be obtained from the authorized officer.
8. Livestock grazing use that is different from that authorized by a permit or lease MUST be applied for prior to the grazing period and MUST be filed with and approved by the authorized officer before grazing use can be made.
9. Billing notices are issued which specify fees due. Billing notices, when paid, become part of the grazing permit or lease. Grazing use cannot be authorized during any period of delinquency in the payment of amounts dues, including settlement for unauthorized use.
10. Grazing fee payments are due on the date specified on the billing notice and MUST be paid in full within 15 days of the due date, except as otherwise provided in the grazing permit or lease. If payment is not made within that time frame, a late fee (the greater of $25 or 10 percent of the amount owed but not more than $250) will be assessed.
11. No Member of, or Delegate to, Congress or Resident Commissioner, after his/her election of appointment, or either before or after he/she has qualified, and during his/her continuance in office, and no officer, agent, or employee of the Department of the Interior, other than members of Advisory committees appointed in accordance with the Federal Advisory Committee Act (5 U.S.C. App. 1) and Sections 309 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.) shall be admitted to any share or part in a permit or lease, or derive any benefit to arise therefrom; and the provision of Section 3741 Revised Statute (41 U.S.C. 22), 18 U.S.C. Sections 431-433, and 43 CFR Part 7, enter into and form a part of a grazing permit or lease, so far as the same may be applicable**.**

12 Attachment B: Conditions of the Proposed Grazing Lease

1. Any changes in grazing use must be applied for prior to the grazing period.
2. Each year billing notices are issued which specify, for the current year, the allotment(s), number and kind of livestock, period(s) of use, animal unit months of use, and the grazing fees due. These billing notices, when paid, become a part of this grazing permit/lease.
3. Grazing fees are due upon issuance of a billing notice and must be paid in full prior to making any grazing use under this grazing permit/lease, unless otherwise provided for in the terms and conditions of this grazing permit/lease.
4. This grazing permit/lease is subject to the terms and conditions of an allotment management plan if such plan has been prepared. If an allotment management plan has not been prepared, it must be incorporated in this permit/lease when completed.
5. No grazing use can be authorized under this grazing permit/lease during any period of delinquency in the payment of amounts due in settlement for unauthorized grazing use.
6. Grazing use authorized under this grazing permit/lessee may be suspended, in whole or in part, for violation by the permittee/lessee of any of the provisions of the rules or regulations now or hereafter approved by the Secretary of the Interior.
7. This grazing permit/lease is subject to cancellation, in whole or in part, at any time because of:
    a. Noncompliance by the permittee/lessee with rules and regulations now or hereafter approved by the Secretary of the Interior.
    b. Loss of control by the permittee/lessee of all or a part of the property upon which it is based.
    c. A transfer of grazing preference by the permittee/lessee to another party.
    d. A decrease in the lands administered by the Bureau of Land Management within the allotment(s) described herein.
    e. Repeated willful unauthorized grazing use.
8. This grazing permit/lease is subject to the provisions of executive Order No. 11246 of September 24, 1965, as amended, which sets forth nondiscrimination clauses. A copy of this order may be obtained from the authorized officer.
9. The permittee/lessee must own or control and be responsible for the management of the livestock authorized to graze under this grazing permit/lease.
10. The authorized officer may require counting and/or additional or special marking or tagging of the livestock authorized to graze under this grazing permit/lease.
11. The permittees/lessee's grazing case file is available for public inspection as required by the Freedom of Information Act.
12. Actual Use information, for each use area, will be submitted to the authorized officer within 15 days of completing grazing use as specified on the grazing lease and/or grazing billings in accordance with 43 CFR 4130.3-2(d).
13. In order to improve livestock distribution on the public lands, all salt blocks and/or mineral supplements will not be placed within a 1/4 mile of any riparian area, wet meadow, or watering facility (either permanent or temporary) unless stipulated though a written agreement or decision in accordance with 43 CFR 4130.3-2(c).
14. In Accordance with 43 CFR 4130.8-1(F): Failure to pay grazing bills within 15 days of the due date specified in the bill shall result in a late fee assessment of $25.00 or 10 percent of the grazing bill, whichever is greater, but not to exceed $250.00. Payment

made later than 15 days after the due date, shall include the appropriate late fee assessment. Failure to make payment within 30 days may be a violation of 43 CFR Sec. 4140.1(b) (1) and shall result in action by the authorized officer under 43 CFR Secs. 4150.1 And 4160.1-2.

15. Grazing in this allotment shall strictly adhere to the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration, the Safford Upland Livestock Utilization and Drought Policies.