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Land Health Evaluation
Arivaca Lease No. 6003
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Contents

1.	Executive Summary	Error! Bookmark not defined.
2.	Introduction	1
3.	Allotment profile	1
3.1	Location.....	1
3.2	Physical Description	3
3.2.1	Acreage	3
3.2.2	Watershed	5
3.2.3	Soils.....	7
3.3	Biological Resources.....	8
3.3.1	Major Land Resource Areas	8
3.3.2	Ecological Sites	9
3.3.3	Climate Data for Ecological Site.....	11
3.3.4	Vegetation Communities	12
3.3.5	General Wildlife Resources.....	15
3.3.6	Threatened & Endangered Species	15
3.3.7	BLM Sensitive Species	18
3.3.8	Migratory Birds	21
3.4	Special Management Areas	21
3.5	Recreation Resources.....	21
3.6	Heritage Resources & the Human Environment	21
3.6.1	Cultural Resources.....	21
3.6.2	Native American Concerns	24
4.	Grazing Management.....	24
4.1	Grazing History.....	24
4.2	Grazing System.....	25
4.2.1	Existing Range Improvements	25
4.3	Mandatory Terms and Conditions for Permitted Use.....	28
5.	Objectives	28
5.1	Relevant Planning and Environmental Documents.....	28
5.2	Allotment Specific Objectives.....	28
5.2.1	Land Health Standards	28
6.	Plant List	30
7.	Inventory and Monitoring Data.....	32
7.1	Evaluation Protocol	32

7.1.1	Indicators of Rangeland Health.....	32
7.2	Monitoring Protocols	33
7.2.1	Line Point Intercept (species composition and ground cover)	33
7.2.2	Pace Frequency	33
7.2.3	Fetch	34
7.2.4	Dry Weight Rank	34
7.2.5	Utilization	34
8.	Management Evaluation and Summary of Studies data.....	36
8.1	Actual Use	36
8.2	Precipitation.....	36
8.3	Key Area Data	37
8.3.1	Utilization.....	37
8.3.2	Rangeland Health Evaluations and Frequency/Cover, Composition, and Structure Data	37
9.	Conclusions.....	58
9.1	Determination of Land Health Standards	58
10.	Recommended Management Actions	60
10.1.1	Proposed Terms and Conditions:.....	60
11.	List of Preparers	62
12.	Authorized Officer Concurrence.....	63
13.	references	64

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1 INTRODUCTION

The purpose of this draft Land Health Evaluation (LHE) report for the Arivaca allotment is to evaluate whether the Arizona Standards for Rangeland Health (Standards) are being achieved on the allotment. In the case of non-achievement of Standards, the LHE would also seek to determine if livestock are the causal factor for either not achieving or not making significant progress towards achieving the Standards. An evaluation is not a decision document, but a stand-alone report that clearly records the analysis and interpretation of the available inventory and monitoring data. As part of the landhealth evaluation process, Desired Plant Community (DPC) objectives (also referred to as key area objectives in this document) were established for the biological resources within the allotment.

The Secretary of the Interior approved Bureau of Land Management (BLM) Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Standards and Guidelines) in April 1997. The Decision Record, signed by the Arizona BLM State Director (April 1997) provides for full implementation of the Standards and Guidelines in Arizona land use plans. Standards and guidelines are implemented by the BLM through terms and conditions of grazing permits, leases, and other authorizations, grazing related portions of activity plans, and through range improvement-related activities. Land health standards are measurable and attainable goals for the desired condition of the biological resources and physical components/characteristics of desert ecosystems found within the allotment.

This evaluation seeks to ascertain:

If Standards are being achieved or not achieved, and, if not, if significant progress is being made towards achievement of land health on the allotment.

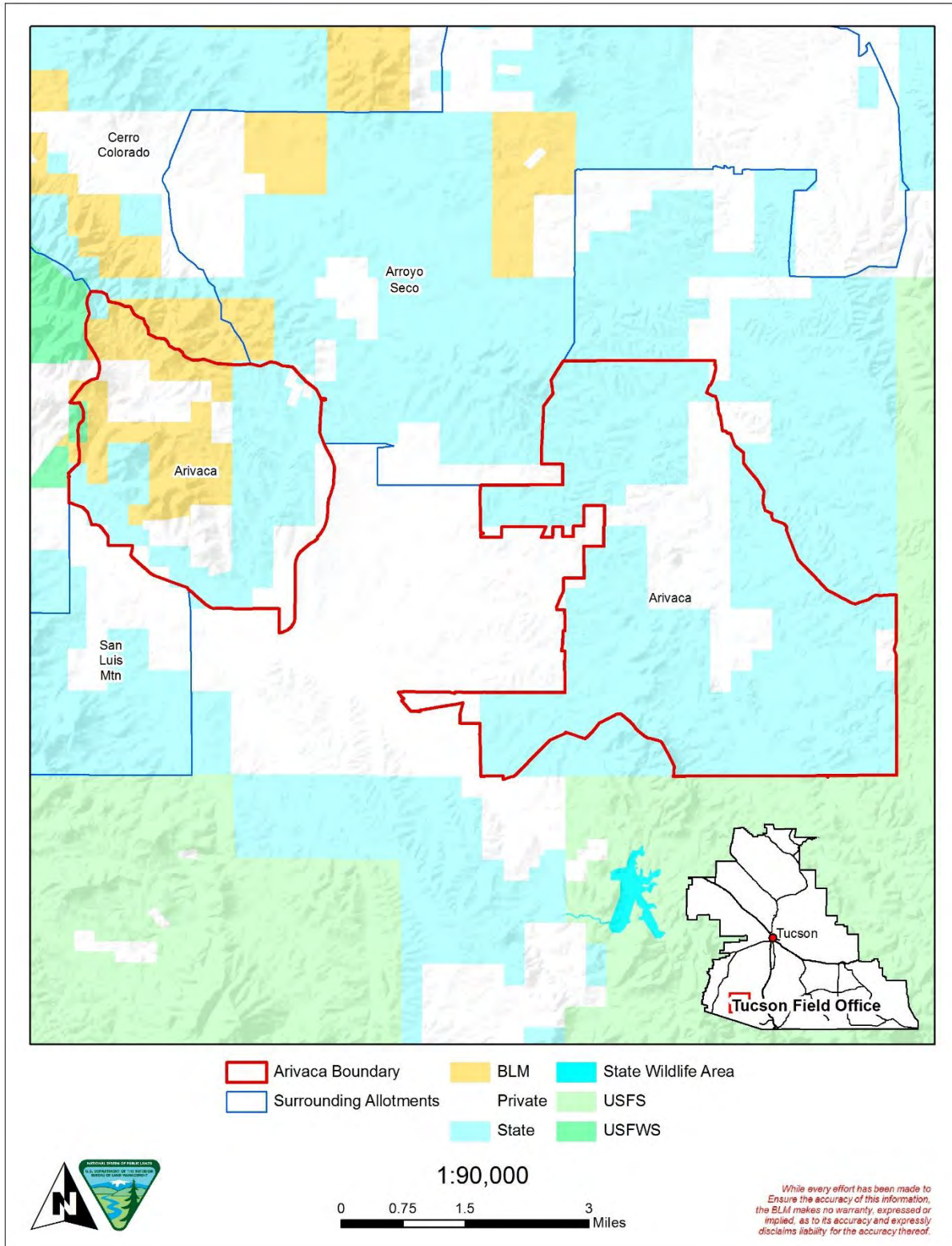
If it is ascertained that Standards are not being achieved, to determine whether livestock grazing is a significant factor causing that non-achievement.

2 ALLOTMENT PROFILE

2.1 Location

The BLM portion of the Arivaca allotment is located less than 1 mile north of the town of Arivaca, and 12 miles southwest of Amado in Pima County, Arizona. It is located 15 miles northeast and 15 miles west of the weather stations in Sasabe and Tumacacori, respectively. The allotment is geographically separated into two pieces. The BLM lands within the allotment are all located on the western piece and they comprise approximately 12 percent of the total livestock operation. The portion of the allotment with public lands is run as a single pasture. The ranch borders the Buenos Aires National Wildlife Refuge to the west, the Arroyo Seco allotment to the East, the Cerro Colorado allotment to the north, and the San Luis Mountain allotment to the south. Figure 1 below shows the Arivaca allotment location in relation to the Buenos Aires National Wildlife Refuge.

Figure 1. Vicinity Map of the Arivaca Allotment



2.2 Physical Description

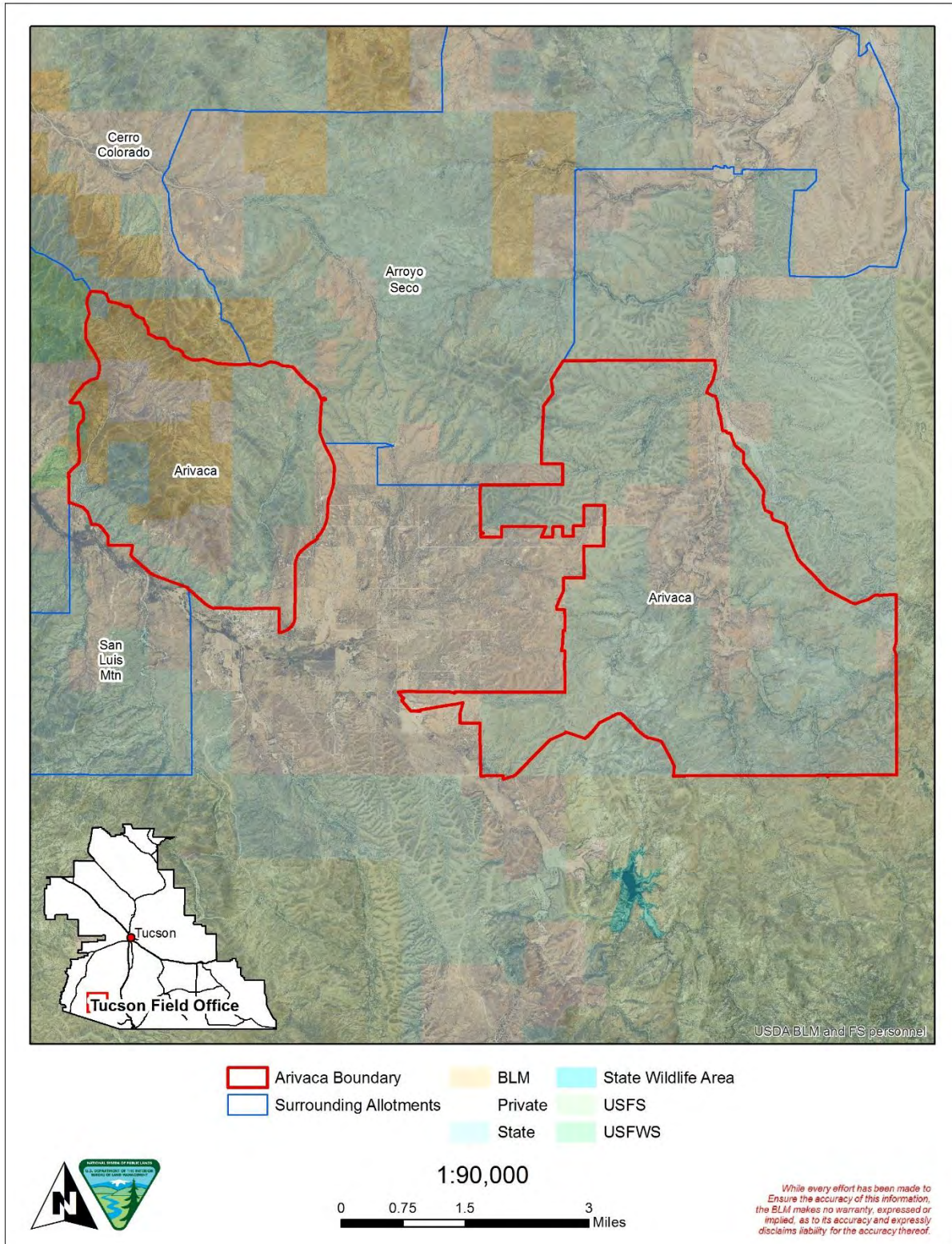
2.2.1 Acreage

The acreage of the Arivaca allotment is detailed below (Table 1). The allotment is geographically separated into two pieces and the BLM lands within the allotment are all located on the western piece. The portion of the allotment with public lands is run as a single pasture. Lands within the allotment are predominately State-owned, with lesser amounts of public and private lands. Public lands constitute about 12 percent of the allotment. Spatial distributions of land ownership are displayed in Figure 2.

Table 1. Acreage of Landownership

Land Classification	Arivaca Allotment
Public Acres	1,555
State Acres	10,633
Private Land Acres	575
Total Acres	12,793

Figure 2. Land Ownership of the Arivaca Allotment



2.2.2 Watershed

The allotment lies within the Lower Brawley Wash hydrologic unit (HUC 10), which is part of the Altar/Brawley wash system that drains from the US-Mexico border near Sasabe to the confluence with the Santa Cruz River at the north boundary of the allotment.

The Brawley Wash-Los Robles Wash Watershed is located in the south-central portion of the state of Arizona. The watershed lies west of I-19 and east of the Baboquivari Mountains, north of the U.S.-Mexico border and, south of Pinal County, except for a small section located in Pinal County.

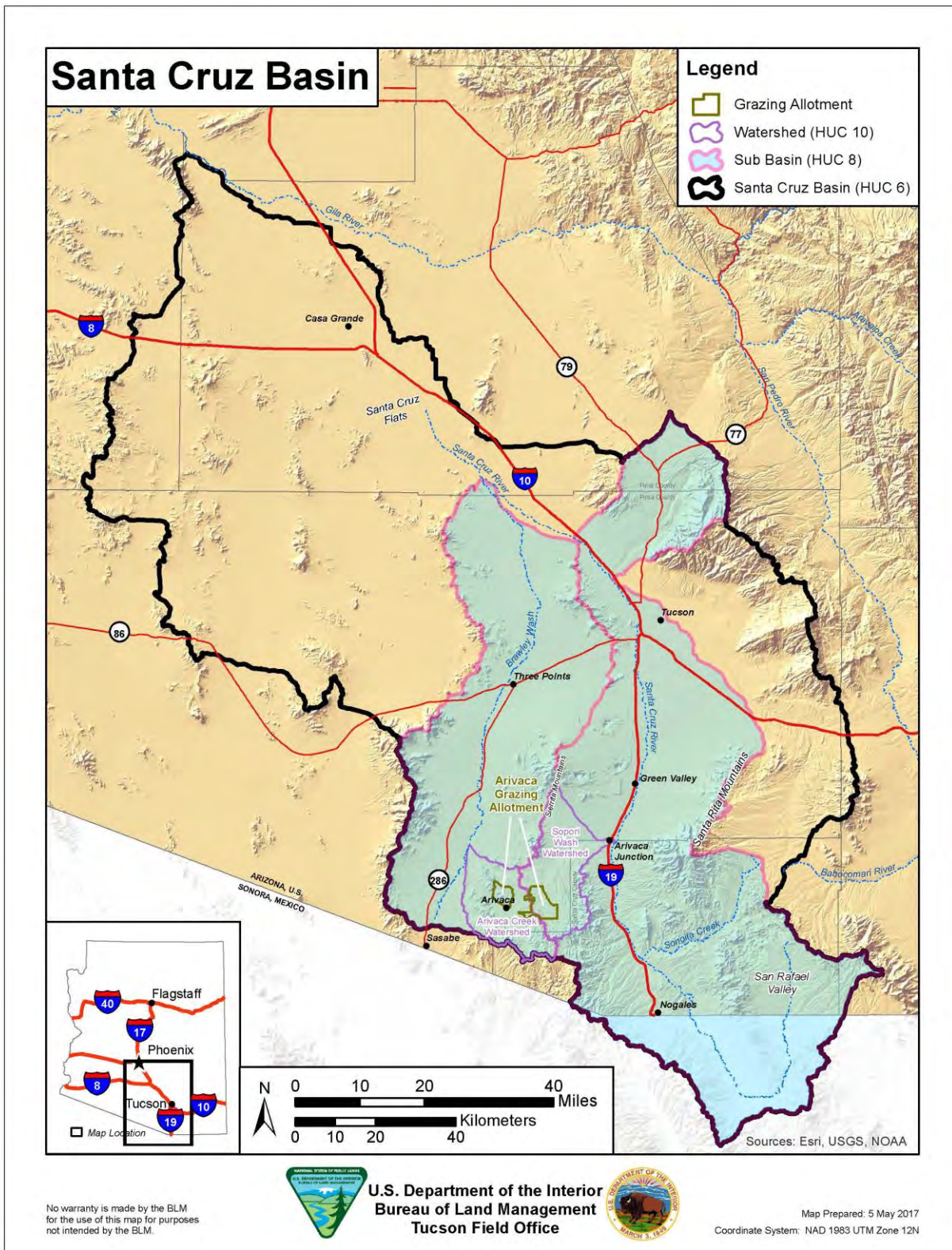
Within the United States, the watershed is composed of 900,480 acres (1,407 square miles), and represents about 1.2 percent of the State of Arizona. Approximately 97 percent of the watershed is in Pima County, about 2 percent in Santa Cruz County and 1 percent in Pinal County. About 41 percent of the land is state owned, 24 percent is privately owned, 11 percent is wildlife preserve, the Bureau of Land Management manages 10 percent, 8 percent is Tohono O'odham Indian Reservation, 3 percent is Forest Service, 2 percent is national parks and 1 percent is state parks.

The watershed has a maximum width of about 25 miles east to west, and a maximum length of about 65 miles north to south. The high elevation point in the watershed is the Baboquivari Mountains near Baboquivari Peak at 7,257 feet, and the low elevation point is the confluence of Brawley Wash and the Santa Cruz River at 1,847 feet. Figure 3 below shows the Brawley Wash watershed.

Brawley Wash is an ephemeral stream, tributary to the Santa Cruz River, located in Pima County. Its source is in the Altar Valley between the Sierrita and Coyote Mountains at 31°58'20"N 111°23'29"W, at the confluence of the Altar and Alambre washes along Arizona State Route 286. It flows north-north east through the Altar Valley and turns north as it enters Avra Valley near Robles Junction (also known as Three Points) where Arizona State Route 86 crosses the streambed. The wash traverses the Avra Valley between the Roskrige Mountains and the Tucson Mountains. It joins the Santa Cruz east of the Samaniego Hills of the Silver Bell Mountains. The wash is known as the Los Robles Wash near its junction with the Santa Cruz approximately six miles west of Avra and Interstate 10. (From USDA NRCS & U of A WRRC, 2008).

The Brawley Wash-Los Robles Wash Watershed is an 8-digit Hydrologic Unit Category (HUC) of 15050304 and contains the following 10-digit HUCs: 1505030401 Arivaca Creek, 1505030402 Puertocito Wash, 1505030403 Altar Wash, 1505030404 Upper Brawley Wash, 1505030405 Lower Brawley Wash, 1505030406 Los Robles Wash.

Figure 3. Map of Altar/Brawley Wash Watershed



2.2.3 Soils

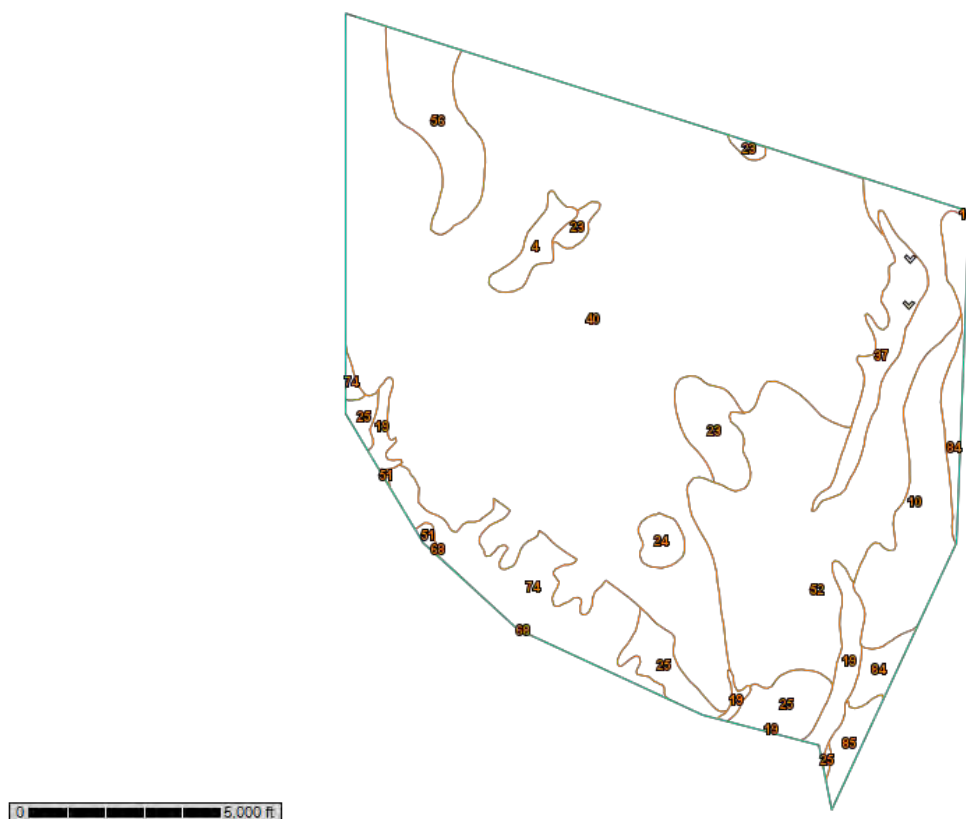
The soil composition on the Arivaca allotment is varied as presented in Table 2 and Figure 4. The dominant soil orders in this Major Land Resource Area (MLRA) (see section 3.3.1) are Aridisols, Entisols, Alfisols, and Mollisols. The soils in the area have a dominantly thermic soil temperature regime, an aridic or ustic soil moisture regime, mixed mineralogy, and are formed in alluvium. They are very shallow to very deep and are well drained to somewhat excessively drained. Ustic Torrfluvents (Ubik and Keysto series) formed on flood plains. Calcids (Blakeney series) formed on terraces. Argids (Eloma and Forrest series) and Aridic Haplustalfs (Gardencan and Crowbar series) formed on fan terraces. Shallow and very shallow Haplustolls (Far and Yarbam series) formed on hills and mountains.

The specific soils on the Arivaca allotment are shown in the table below. Soils are only mapped on the western portion of the allotment that includes the BLM lands. The dominant soils are Lampshire-Romero-Rock outcrop complex, 10 to 65 percent slopes and Oracle-Romero-Rock outcrop complex, 5 to 35 percent slopes. The acreages may not be accurate due to difficulty defining the area of interest in the web soil survey system.

Table 2. Soils on the Arivaca Allotment

Map Unit Symbol	Map Unit Name	Acre in Allotment	Percent of Allotment Acres
4	Arivaca very cobbly loam, 2 to 15 percent slopes	45.0	0.9%
10	Caralampi extremely gravelly sandy loam, 15 to 45 percent slopes	238.2	4.6%
19	Comoro sandy loam, 0 to 2 percent slopes	89.3	1.7%
23	Deloro-Andrada complex, 5 to 35 percent slopes	105.3	2.1%
24	Deloro-Rock outcrop complex, 15 to 60 percent slopes	30.7	0.6%
25	Deloro-Schrap association, 1 to 8 percent slopes	148.7	2.9%
37	Keysto extremely gravelly fine sandy loam, 2 to 8 percent slopes	104.9	2.0%
40	Lampshire-Romero-Rock outcrop complex, 10 to 65 percent slopes	3,038.7	59.3%
51	Nolam-Tombstone complex, 8 to 30 percent slopes	6.5	0.1%
52	Oracle-Romero-Rock outcrop complex, 5 to 35 percent slopes	758.8	14.8%
56	Pantak-Deloro complex, 8 to 35 percent slopes	163.5	3.2%
68	Riveroad and Comoro soils, 0 to 2 percent slopes	0.9	0.0%
74	Schrap very channery loam, 5 to 30 percent slopes	251.7	4.9%
84	White House-Caralampi complex, 5 to 25 percent slopes	106.7	2.1%
85	White House gravelly loam, 1 to 8 percent slopes	39.4	0.8%
Totals for Allotment		5,128.4	100.0%

Figure 4. Map of Soil Types Within the Western Half of the Arivaca Allotment



2.3 Biological Resources

2.3.1 Major Land Resource Areas

Major Land Resource Areas are geographically associated land resource units, usually encompassing several thousand acres. Natural Resource Conservation Service (NRCS) soil scientists in appropriate states wrote the descriptions of new MLRAs and MLRAs with changed boundaries. The National Soil Survey Center staff wrote the descriptions of MLRAs with no boundary changes since 1981. The information in the United States Department of Agriculture Handbook 296, issued 2006, is current as of October 2005. A unit may be one continuous area or several separate nearby areas. Major Land Resource Areas are characterized by particular patterns of soils, geology, climate, water resources and land use. The Arivaca allotment is located in MLRA 41—Southeastern Arizona Basin and Range. This area is in Arizona (89 percent) and New Mexico (11 percent). It makes up about 15,730 square miles.

Most of this area is in the Mexican Highland Section of the Basin and Range Province of the Intermontane Plateaus. The eastern one-fifth of the area is in the Sonoran Desert Section of that same province and division. This MLRA has mountain ranges that trend southeast to northwest and has relatively smooth valleys between the mountains. Examples of the many mountain ranges include the Chiricahua, Dagoon, Swisshelm, and Pedregosa Mountains. The southeast boundary of the part of this MLRA that is in New Mexico is the Continental Divide. Elevation ranges from 2,620 to 4,590 feet (800 to 1,400 meters) in most areas. It generally ranges from 4,920 to 5,900 feet (1,500 to 1,800 meters) in the mountains of this MLRA. On some peaks, however, it can reach almost 8,900 feet (2,715 meters). The

Gila River runs through the northern end of this area. The San Francisco, San Simon, and San Pedro Rivers are tributaries to the Gila River in this MLRA.

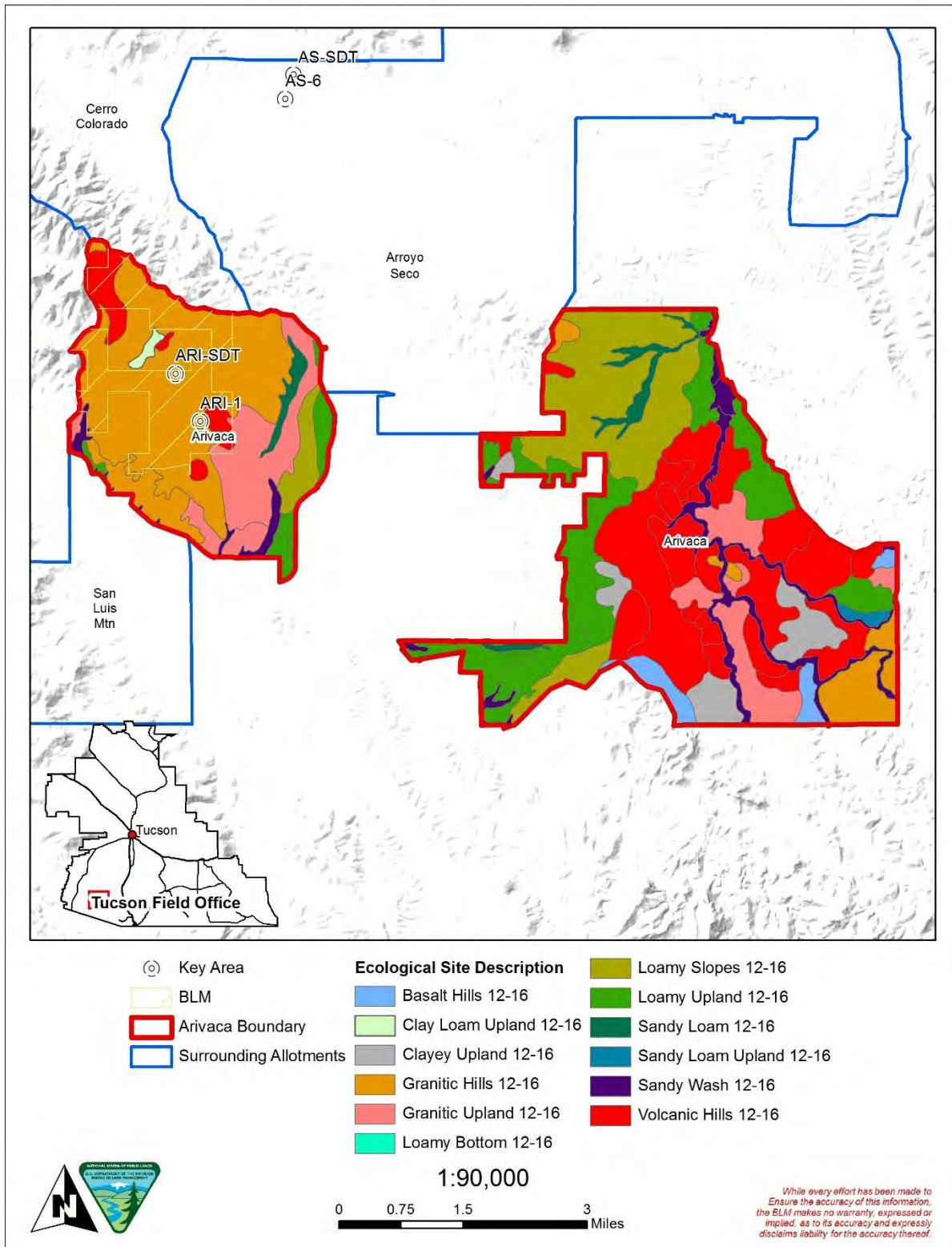
Major Land Resource Areas are broken down further into ecological sites, which are associated units of soil and vegetation with quantifiable characteristics.

2.3.2 Ecological Sites

An ecological site is a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. It is the product of all the environmental factors responsible for its development, and it has a set of key characteristics (soils, hydrology, and vegetation) that are included in the Ecological Site Description. Development of the soils, hydrology, and vegetation are all interrelated (TR 1734-07, Ecological Site Inventory). Ecological sites are named and classified based on soil parent material or soil texture and precipitation. Ecological sites provide a consistent framework for classifying and describing rangeland soils and vegetation thereby delineating land units that share similar capabilities to respond to management activities or disturbance. NRCS provides Ecological Site Descriptions online at <https://esis.sc.egov.usda.gov/>.

A total of 12 ecological sites exist within the entire Arivaca allotment. Two key areas, ARI-1 and ARI-SDT, have been established on BLM public lands within the Shallow Hills 12-16" precipitation zone (p.z), ecological site, which is the primary ecological site within the BLM lands in the allotment (Figure 5). The Key Areas were each established for different purposes. Key Area ARI-1 was established by the BLM and University of Arizona Extension, and pace frequency data is collected to be able to track any changes in long-term trend of vegetation and ground cover. Key Area ARI-1 is also the location where the U.S. Forest Service Strike Team, referred to as TEAMS documented the 2014 LHE and collected line-point intercept data. Key Area ARI-SDT was established in 2016 within Sonoran Desert Tortoise habitat to be able to track any changes in long-term trend of vegetation and ground cover. TEAMS also conducted a LHE in 2016 at ARI-SDT.

Figure 5. Ecological Sites within Arivaca Allotment



The ecological site for key areas ARI-1 and ARI-SDT is Shallow Hills 12-16" precipitation zone (R041XC306AZ). Key vegetative species for this site include: shrubby buckwheat (*eriogonum wrightii*), fairyduster (*calliandra eriophylla*), sideoats grama (*bouteloua curtipendula*) and Louisiana sagewort (*artemisia ludoviciana*).

This site is in the middle elevations of the Southeastern Arizona Basin and Range province and occurs on hill-slopes and ridge-tops. Slope aspect is site differentiating at elevations near the MLRA boundaries. The plant communities found on the ecological site are naturally variable. Composition and production will fluctuate with yearly conditions, location, aspect, and the natural variability of the soils.

The Historical Climax Plant Community represents the natural potential for plant communities found on relict or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as fire, grazing, or drought.

The potential plant community on this site is dominated by warm season perennial grasses. Several species of low shrubs are well represented on the site, but the aspect is grassland dotted with shrubs and cacti. Larger species of shrubs are concentrated at the edges of rock outcrop areas and in canyon bottoms. Most of the grass and low shrub species are well dispersed throughout the plant community.

Cool season plants start growth in early spring and mature in early summer. Warm season plants take advantage of summer rains and are growing and nutritious in July-September. Warm season grasses may remain green throughout the year.

2.3.3 Climate Data for Ecological Site

Climate data comes from the Shallow Hills 12-16" precipitation zone (p.z.) Ecological Site Description (ESD). Precipitation in this common resource area ranges from 12-16 inches yearly in the eastern part with elevations from 3600-5000 feet, and 13-17 inches in the western part where elevations are 3300-4500 feet. Winter-Summer rainfall ratios are 40-60 percent in the west and 30-70 percent in the east. Summer rains fall July-September, originate in the Gulf of Mexico and are convective, usually brief, intense thunderstorms. Cool season moisture tends to be frontal, originates in the Pacific and Gulf of California, and falls in widespread storms with long duration and low intensity. Snow rarely lasts more than one day. May and June are the driest months of the year. Humidity is generally very low. Temperatures are mild. Freezing temperatures are common at night from December-April; however temperatures during the day are frequently above 50 °F. Occasionally in December-February, brief 0 °F temperatures may be experienced on some nights. During June, July and August, some days may exceed 100 °F. Cool season plants start growth in early spring and mature in early summer. Warm season plants take advantage of summer rains, and are growing and nutritious July-September. Warm season grasses may remain green throughout the year. Climate stations for the average precipitation and temperature tables below are: 020309, Apache Powder Co. Period of record 1923-1990, 022659 Douglas Period of Record 1948-2004, 027530 San Manuel Period of Record 1954-2004 and 028619 Tombstone Period of Record 1893-2004.

Table 3. Precipitation and Temperature for Ecological Site

Averaged	
Frost-free period (days):	195
Freeze-free period (days):	0
Mean annual precipitation (inches):	16.00

Monthly Precipitation (Inches):												
	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<i>High</i>	1.10	0.97	0.50	0.30	0.24	0.52	3.86	3.46	1.72	0.88	0.74	1.08
<i>Low</i>	0.76	0.67	0.50	0.29	0.17	0.50	2.44	2.61	1.63	0.90	0.53	0.87

Monthly Temperature (°F):													
	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Dec</u>
<i>High</i>	46.8	49.7	54.6	61.7	68.1	77.1	80.7	78.6	73.9	65.1	54.1	48.3	48.3
<i>Low</i>	46.3	48.8	54.0	60.0	67.5	76.8	77.3	75.2	72.1	64.1	53.5	47.1	47.1

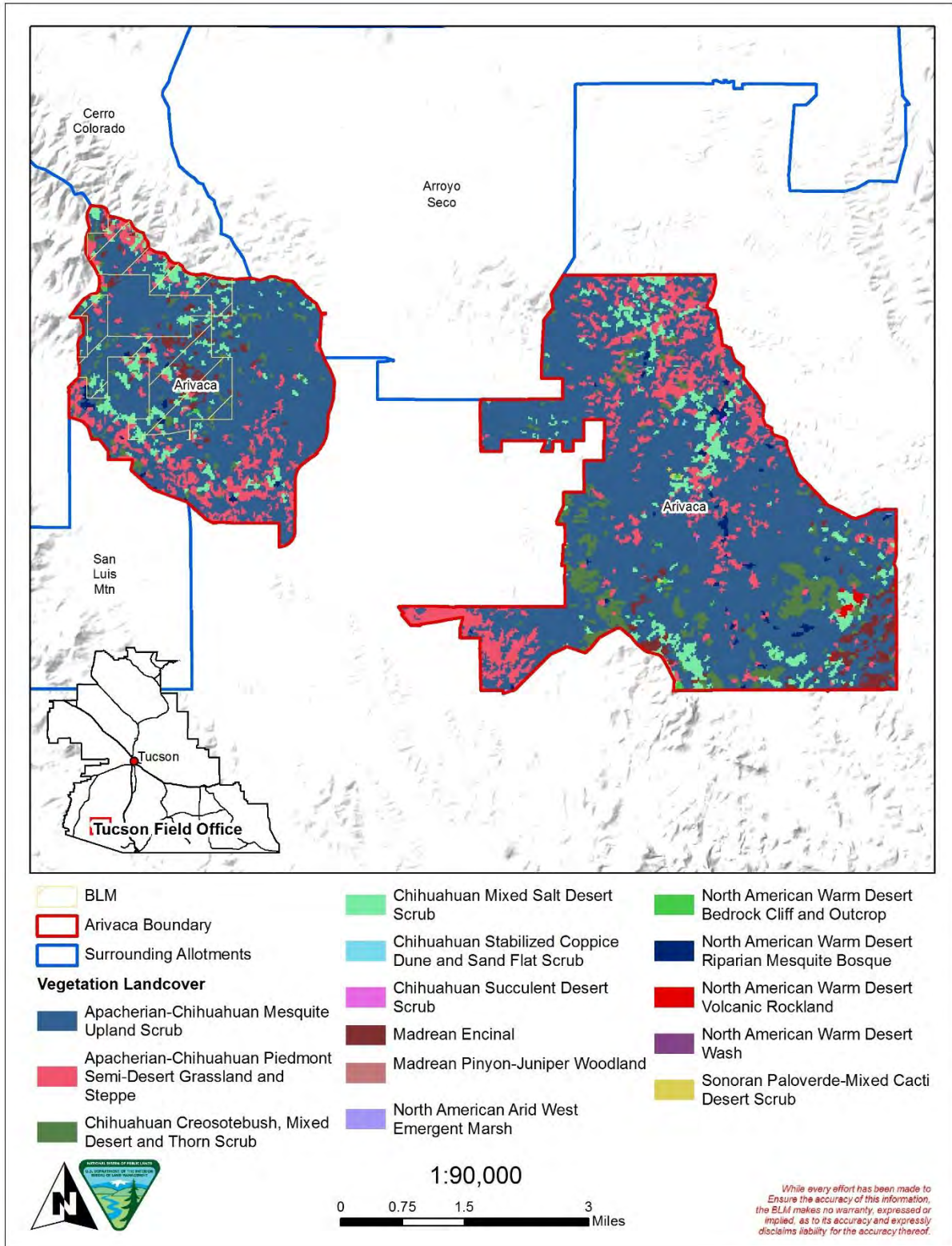
2.3.4 Vegetation Communities

The MLRA supports forest, savanna, and desert shrub vegetation. Pine-oak woodlands are at the higher elevations, where ponderosa pine, Douglas-fir, live oak, New Mexico locust, Mexican pinyon, buckbrush, and manzanita grow along with an understory of muhly, bluegrass, sedge, pine dropseed, and squirreltail. Evergreen woodland savannas are at intermediate elevations. Mexican blue oak, Emory oak, and turbinella oak are the dominant species and cane beardgrass, sideoats grama, blue grama, Texas bluestem, plains lovegrass, sprucetop grama, threeawns, and needlegrass characterize the understory. Whitethorn, soaptree yucca, fourwing saltbush, mesquite, and ocotillo grow in the drier soils at the lower elevations. The understory on these sites consists of Rothrock grama, black grama, alkali sacaton, curly mesquite, plains bristlegrass, bush muhly, and lemongrass. Figure 6 below shows the vegetation community types within the Arivaca allotment.

Table 4. Vegetation Communities Found Within the Arivaca Allotment

Vegetation Type	Acres on Allotment	Acres on Allotment within BLM
Apacherian-Chihuahuan Mesquite Upland Scrub	11162.22557	974.124616
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	1951.9523	145.178744
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	897.328736	65.353059
Chihuahuan Mixed Salt Desert Scrub	1049.713908	222.672649
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	1.556764	-
Chihuahuan Succulent Desert Scrub	3.558317	-
Madrean Encinal	438.261708	126.498916
Madrean Pinyon-Juniper Woodland	1.236615	-
North American Arid West Emergent Marsh	2.746472	-
North American Warm Desert Bedrock Cliff and Outcrop	29.371158	7.131978
North American Warm Desert Riparian Mesquite Bosque	131.697917	14.406887
North American Warm Desert Volcanic Rockland	24.685828	-
North American Warm Desert Wash	3.558317	-
Sonoran Paloverde-Mixed Cacti Desert Scrub	8.14098	-

Figure 6. Vegetation Communities within Arivaca Allotment



2.3.5 General Wildlife Resources

Wildlife species that are expected to occur on this allotment are: mule deer, occasional white-tailed deer, mountain lion, coyote, bobcat, raccoon, skunk, white-throated woodrat, white-footed mouse, gopher snake, king snake, western diamondback rattlesnake, prairie rattlesnake, coachwhip, patch-nosed snake, western whiptail lizard, side-blotched lizard, tree lizard, canyon tree frog, red-tailed hawk, Cooper’s hawk, golden eagle, prairie falcon, raven, turkey vulture, meadowlark, ladder-back woodpecker, ash-throated flycatcher, canyon wren, and rough-winged swallow.

2.3.6 Threatened & Endangered (T&E) Species

A query conducted on the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (iPaC; USDI 2016) website showed that the following threatened, endangered and proposed (TEP) species may occur within the allotment:

- Lesser long-nosed bat (LLNB)
- Jaguar
- Ocelot
- Sonoran pronghorn
- Chiricahua leopard frog
- California least tern
- Mexican spotted owl
- Yellow-billed cuckoo
- Northern Mexican garter snake
- Pima pineapple cactus (PPC)

Review of habitat requirements for each species was conducted by the TEAMs and BLM biologists to determine each species potential to occur on the allotment and to inform the Effects Determination for each species (Table 5). No designated or proposed critical habitats overlap with this allotment.

Table 5. T&E Species for the Arivaca Allotment as Indicated by 2016 USDI iPAC Analysis

Species	Habitat	Potential for Occurrence on Arivaca Allotment and Effects Determination
California Least Tern	Forms nesting colonies on barren to sparsely vegetated areas. Nests in shallow depressions on open sandy beaches, sandbars, gravel pits, or exposed flats along shorelines of inland rivers, lakes, reservoirs, and drainage systems. Primarily in California, may occur in different parts of Arizona where habitat components are adequate for nesting or feeding such as large lakes, recharge basins, or wetland areas. Breeding documented in Maricopa County. Transient migrants occur more frequently and have recently been documented in Mohave and Pima counties. ¹	Habitat does not exist for California Least Tern on Arivaca allotment. No effect

Species	Habitat	Potential for Occurrence on Arivaca Allotment and Effects Determination
Chiricahua leopard frog	The Chiricahua leopard frog historically occurred in cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 1,000 to 2,710 m (3,281 to 8,890 ft). It is now often restricted to springs, livestock tanks, and streams in the upper portions of watersheds where non-native predators either have yet to invade or habitats are marginal for them. ²	No known habitat for the species occurs on the allotment. No Effect
Jaguar	In the northern portion of the range, found in thornscrub, desertscrub, and grasslands. Vegetation communities used in Arizona range from Sonoran desertscrub at lower elevations to sub-alpine mixed conifer in the mountain ranges. ³	The allotment is located within the potential range of jaguar and may be used by the species for foraging or travel between mountain ranges. Consultation with USFWS concerning effects of livestock grazing to jaguar within the Gila District was completed in 2012 (USDI 2012). USFWS concurred with the determination that livestock grazing within the allotment may affect, but is not likely to adversely affect jaguars.
Ocelot	Desert scrub communities in Arizona ⁴	Several confirmed sightings of ocelots have been made in Arizona in recent years, with confirmed sightings of live ocelots made in 2009 and 2011 in Cochise County. ⁴ No sightings are known from Arivaca allotment area. USFWS concurred with the determination in 2012 that livestock grazing within the allotment may affect, but is not likely to adversely affect ocelot.
Lesser Long-nosed Bat	Mainly desert scrub habitat in the U.S. portion of its range. In Mexico, the species occurs up into high elevation pine-oak and ponderosa pine forests. Altitudinal range is from 480-3,450 m (1,600-11,500 ft). Roosting is in caves, abandoned mines, and unoccupied buildings at the base of mountains where agave, saguaro, and organ pipe cacti are	Forage species for LLNB may occur on the Arivaca allotment; however, forage availability to LLNB in the area will not be significantly reduced as a result of livestock grazing on the allotment as LLNB are a mobile species, foraging up to 50 miles

Species	Habitat	Potential for Occurrence on Arivaca Allotment and Effects Determination
	present. Forages at night on nectar, pollen, and fruit of paniculate agaves and columnar cacti. ⁵	from roost sites. No effect to LLNB.
Sonoran Pronghorn	Lower Sonoran Desert habitat ⁶	Historic range of the species included nearby Altar Valley, however Sonoran Pronghorn have not occupied this area since probably the 1920-1940's. Populations of the species in the US occur only on the Cabeza Prieta National Wildlife Refuge and the Organ Pipe Cactus National Monument near Ajo AZ approximately 80-100 miles west of the Arivaca allotment. Sonoran Pronghorn do not occupy the Arivaca allotment Area. No Effect
Mexican spotted owl	Spotted owls are residents of old-growth or mature forests that possess complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). Canyons with riparian or conifer communities are also important components. In southern Arizona and New Mexico, the mixed conifer, Madrean pine-oak, Arizona cypress, encinal oak woodlands, and associated riparian forests provide habitat in the small mountain ranges (Sky Islands) distributed across the landscape ⁷	Habitat for this species does not occur on or near the allotment. No Effect
Pima Pineapple Cactus	This cactus grows in alluvial basins or on hillsides in semi-desert grassland and Sonoran desertscrub in southern Arizona and northern Mexico. Soils range from shallow to deep, and silty to rocky, with a preference for silty to gravely deep alluvial soils. The plant occurs most commonly in open areas on flat ridge tops or areas with less than 10-15% slope. ⁸	Some potential for occurrence on allotment, though surveys have not been conducted. The May 2012 Gila District Grazing Biological Opinion on the Gila District Livestock Grazing Program concluded that ongoing livestock grazing activities were not likely to adversely affect the species.
Yellow Billed Cuckoo	Nests in willows along streams and rivers, with nearby cottonwoods serving as foraging sites. Critical habitat designated but no designation on Arivaca allotment. ⁹	Yellow-billed Cuckoo habitat not on Arivaca allotment. No effect

Species	Habitat	Potential for Occurrence on Arivaca Allotment and Effects Determination
Northern Mexican Garter Snake	This species occurs up to about 8,500 feet in elevation, but is most frequently found between 3,000 and 5,000 feet in the United States. The northern Mexican gartersnake is found in both lotic and lentic habitats that include cienegas and stock tanks (in southern Arizona), as well as river habitat that includes pools and backwaters. It forages along the banks of waterbodies feeding primarily upon native fish and adult and larval leopard frogs. ¹⁰	Habitat for northern Mexican garter snake does not occur on the Arivaca allotment. No Effect
<p>¹https://www.fws.gov/southwest/es/arizona/Documents/Redbook/California%20Least%20Tern%20RB.pdf</p> <p>² https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Chiricahua%20Leopard%20Frog%20RB.pdf</p> <p>³ https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Jaguar%20RB.pdf</p> <p>⁴ https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Ocelot%20RB.pdf</p> <p>⁵ https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Lesser%20Long-nosed%20bat%20RB.pdf</p> <p>⁶ https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Sonoran%20Pronghorn%20RB.pdf</p> <p>⁷ http://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B074</p> <p>⁸https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Pima%20Pineapple%20cactus%20RB.pdf</p> <p>⁹ http://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B06R</p> <p>¹⁰ https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Northern%20Mexican%20gartersnake%20RB.pdf</p>		

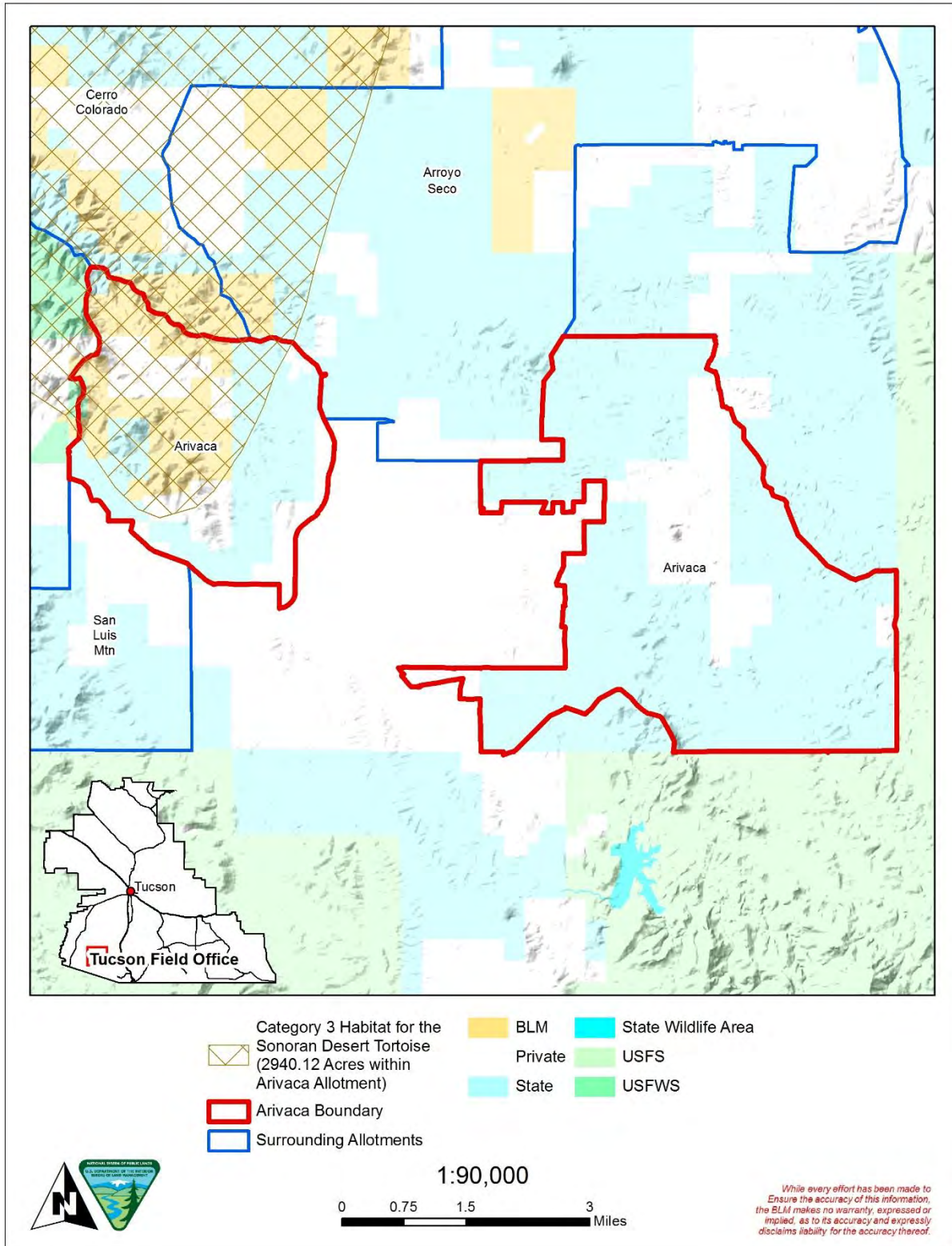
2.3.7 BLM Sensitive Species

The BLM sensitive species, which have suitable habitat present and are known or have the potential to exist within this allotment are the Sonoran desert tortoise, western narrow-mouthed toad, Sonoran green toad, American peregrine falcon, bald eagle (wintering), Botteri’s sparrow, cactus ferruginous pygmy-owl, desert purple martin, gilded flicker, golden eagle, spotted bat, Townsend’s big-eared bat, Mexican long-tongued bat, California leaf-nosed bat, cave myotis, greater western mastiff bat, desert ornate box turtle, and Bartram Stonecrop (possibly). The allotment has 2,940 total acres of Category 3 habitat for the Sonoran desert tortoise of which 1,542 acres of category 3 habitat overlaps federal lands as shown in Figure 7 below. The tortoise utilizes rugged uplands such as rocky bajadas, hillsides, mountain slopes, and canyons. The bird species utilize the grassland, open shrub, and cliff habitat for nesting and foraging. The aquatic species are associated with any perennial native or man-made spring/water source that possesses water year-round, none provide riparian habitat. They utilize grasslands, rocky and wooded hills, and areas along the edge of marshes and inhabit rain pools, wash bottoms, and areas near water in semi-arid mesquite-grassland, creosote bush desert, and upland saguaro-paloverde desert scrub. In central and southern Arizona, the pygmy-owl is currently found primarily in Sonoran desert scrub vegetation, with some locations in riparian drainages and woodlands within semi-desert grassland vegetation communities.

The bat species may occur on the allotment if roosting habitat is available in cliffs, caves, or mines. The bat species utilize the desert habitats for foraging for nectar, pollen, insects or fruits. The desert ornate

box turtle utilizes low valleys, plains and gentle bajadas of the semi-desert grasslands and Chihuahuan desert scrub communities and is most abundant between 3,000 and 6,500 feet. The box turtle feeds on insects and plant materials. Bartram stonecrop is found in rock crevices, ledges, and gravelly slopes from 1,113 to 2,042 meters (m) (3,652 to 6,700 feet (ft.)) in elevation in southern Arizona and Mexico.

Figure 7. Category 3 Habitat for the Sonoran Desert Tortoise within the Arivaca Allotment



2.3.8 Migratory Birds

The Arivaca allotment, which includes public, private, and state lands offers diverse habitats for migratory birds, providing valuable food, water, and cover. Migratory species that utilize the area include but are not limited to: Arizona woodpecker, Bendire's thrasher, canyon towhee, five-striped sparrow, golden eagle, red-tailed hawk, raven, turkey vulture, meadowlark, ladder-back woodpecker, ash-throated flycatcher, canyon wren, varied bunting, Costa's hummingbird, gilded flicker, phainopepla, and rufous-winged sparrow. No surveys have been conducted specifically within this allotment for this project to determine presence but these species have the potential of occurring within the vegetation communities located on this allotment (Figure 7).

2.4 Special Management Areas

There are no Special Management Areas within the Arivaca allotment boundary. Wilderness inventory was conducted between 1978 and 1980. No lands were found to contain wilderness character.

2.5 Recreation Resources

The BLM lands in the area provide opportunities for dispersed recreation primarily related to hunting and recreational off highway vehicle driving for pleasure and sightseeing. There are no developed recreation sites on the allotment. Overall, recreational use is low in volume.

2.6 Heritage Resources & the Human Environment

The BLM's evaluation of rangeland health standards includes considerations for the protection of cultural resources—such as prehistoric and historic-age sites, buildings, and structures—and plants that may be of traditional and/or cultural significance to Native Americans. Should impacts to sites or traditional-use plants be identified, revised lease terms and conditions may be warranted and/or rangeland management directives could be modified to achieve desired resource conditions. The following sections describe BLM TFO's assessment efforts regarding applicable heritage resources management and compliance criteria.

2.6.1 Cultural Resources

The BLM's authorization of grazing leases is considered an undertaking subject to compliance with Section 106 of the National Historic Preservation Act (NHPA; 54 U.S.C. 306108 et seq.). The BLM has the legal responsibility to consider the effects of its actions on *historic properties* located on public lands. BLM Manual 8100 Series and the Arizona BLM Protocol (the Statewide Protocol) provide Section 106 compliance requirements to meet appropriate cultural resources management standards. Additionally, cultural resources evaluations for proposed grazing permits and leases generally follow the procedures and guidance provided in BLM Instructional Memoranda.

Section 106 of NHPA requires federal agencies to 1) identify historic properties within Areas of Potential Effects (APEs) for a federal undertaking, 2) evaluate the significance of cultural resources by determining National Register of Historic Places (NRHP) eligibility, and 3) consult with applicable federal, state, and tribal entities regarding assessment results, NRHP eligibility determinations, and proposed methods to avoid or mitigate potential impacts to historic properties. In Arizona, the BLM's NHPA responsibilities are carried out in accordance with the Statewide Protocol—a Programmatic Agreement (PA) among the BLM and the Arizona State Historic Preservation Officer (SHPO; executed December 14, 2014). Should a routine undertaking be determined to have “no historic properties affected” or “no adverse effect” by a qualified BLM archaeologist, the undertaking may proceed under the terms and conditions of the Statewide Protocol. If the undertaking is determined to have “adverse effects,” or otherwise meets the stipulated consultation thresholds, project-specific consultation is then initiated with the SHPO.

A small number of controlled studies have been performed to examine potential grazing impacts on historic properties (c.f., Osborn and Hartley 1991, Osborn et al. 1987, Roney 1977, and Van Vuren 1982). For example, Alan Osborn and his colleagues examined the effects of domestic livestock grazing on the archaeological resources of Capitol Reef National Park in southern Utah. The study included reconnaissance and observations at recorded sites, and the creation of experimental and control plots containing several types of newly manufactured lithic and ceramic artifacts that were measured, weighed, placed, and mapped. Several study plots were located close to water sources. The study plots and artifacts were reexamined after six months of grazing use. Osborn found that 93 percent of the artifacts remained intact, and 84 percent remained visible. Pottery fragments were more prone to breakage. Mapping revealed that 23 percent of artifacts were displaced, but that 75 percent of the displaced artifacts had moved less than 15 centimeters.

The results varied by study plot location with the greatest impacts recorded near water sources, which received higher concentrations of livestock use. Osborn and Hartley (1991) concluded that “the degree of effect is a direct reflection of grazing intensity and dependence on limited water sources in this cold desert environment.” This conclusion is also reflected in a study that examined lithic artifact breakage in areas of variable livestock use along the Central Arizona Project aqueduct in the western Arizona desert (Brown and Stone 1982) where collections of lithic artifacts from six archaeological sites were found to exhibit breakage rates between 13 and 17 percent. In comparison, 52 percent of the artifacts from a seventh site located near a cattle-accessed reservoir were found broken. In sum, these studies have demonstrated that grazing impacts to cultural resources are primarily of concern in areas of concentrated livestock use such as around water sources and corrals.

Direct impacts to historic properties where livestock concentrate may include trampling, chiseling, and churning of site soils, cultural features and artifacts, artifact breakage, and impacts from standing, leaning, or rubbing against historic structures, above-ground cultural features and/or rock art (Broadhead 2001; Osborn et al. 1987). Indirect impacts from livestock concentrations may include accelerated soil erosion and gulying, in addition to increased potential for unlawful artifact collection and/or vandalism of cultural resources. Other indirect impacts may include degradation of the historic setting, thereby detracting from the view-shed and historic feeling of nearby cultural resource sites. However, cultural resources are constantly subject to site formation processes or events after creation (Binford 1981; Schiffer 1987). These processes can be both cultural and natural, and may occur instantly or over thousands of years. Cultural formation processes include activities directly or indirectly caused by humans. Natural processes include chemical, physical, and biological processes of the natural environment that impinge upon and/or modify cultural materials. Determining the cause of impacts to historic properties may be difficult, in some cases, because activities such as camping and off-highway vehicle use may also result in the same kinds of effects as described above.

A BLM cultural resources specialist completed a comprehensive Class 1 (existing information) assessment of the Arivaca grazing allotment between November 28, 2016 and January 15, 2017. Data reviewed were obtained from BLM TFO cultural program project files, site reports, and atlases, in addition to BLM-maintained General Land Office (GLO) plats and patent records. Electronic files also were reviewed using online cultural resource databases including *AZSite*, Arizona’s statewide cultural resource inventory system (administered by the Arizona State Museum), and the *National Register of Historic Places Focus Database & NPGallery Digital Asset Search* (maintained by the National Park Service). Archival information was compared with livestock grazing and range improvement data (see section 4.2.1) to determine the potential for resource conflicts, particularly in livestock concentration areas such as around water sources, at chutes/corrals, and near supplemental feeding locations. The results of archival research are summarized as follows; data provided are applicable to BLM administered lands

within the subject allotment (i.e., the jurisdictional APE) and based on currently available information from the aforementioned sources.

Background data indicates no prior surveys or documented sites on the BLM administered portion of the allotment; however, topographic maps and a historic-age GLO plat (no. 2426, dated 1907) show mining and grazing-related features throughout the area. Noted features on BLM lands include prospect pits, mine shafts, roads, and the Backbone Mine workings that were operated between 1932 and 1942 (Keith 1974). With exception for pasture/allotment fencing, no range improvements are located on BLM administered lands within the Arivaca allotment and, therefore, cultural or historic features—mapped or otherwise—are not likely to be impacted by dispersed livestock grazing.

Statement of Effect Determination

As a result of this cultural resources assessment, no historic properties or areas likely to contain historic properties were identified *that also coincide with areas of potential impacts from concentrated livestock use on the BLM administered portion of the Arivaca allotment*. A light-to-moderate level of dispersed livestock use is proposed under the proposed lease terms, with no identified range improvements and/or concentrated use-areas on the BLM administered portion of the allotment. Additionally, no new range improvement projects are currently proposed as a component of land-health evaluation or lease issuance.

As a routine undertaking with no identified impacts to historic properties within the BLM administered portion of the allotment, lease issuance for continued livestock use of the Arivaca allotment is appropriate under a finding of “no adverse effect,” with the following Conditions of Approval (COAs) applied as lease stipulations. Any subsequent cultural resources inventory should focus on identified areas of livestock concentration within the BLM administered portion of the allotment, as appropriate. Proposed range improvements would be subject to individual project review and assessment for compliance with Section 106 and the Statewide Protocol. If, as a result of any new assessment or monitoring, historic properties are identified and found to exhibit potential for or actively occurring grazing impacts, mitigation measures would be developed in coordination with the SHPO and any other applicable consulting parties.

Cultural Resources Stipulations / Standard Conditions of Approval (COAs)

The operator is responsible for informing all persons who are associated with the allotment operations that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. Any cultural (historic/prehistoric site or object) or paleontological resource (fossil remains of plants or animals) discovered during operations shall be immediately reported to the Authorized Officer (AO) or his/her designee. All operations in the immediate area of the discovery shall be suspended until written authorization to proceed is issued. An evaluation of the discovery shall be made by a qualified archaeologist or paleontologist to determine appropriate actions to prevent the loss of significant cultural or scientifically important values.

If in connection with this work 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, operations in the immediate area of the discovery shall cease, the remains and objects shall be protected, and the operator shall immediately notify the BLM Tucson Field Manager. The immediate area of the discovery shall be protected until notified by the BLM Tucson Field Manager that operations may resume.

2.6.2 Native American Concerns

Native American religious concerns are legislatively considered under several acts and Executive Orders including the American Indian Religious Freedom Act (AIRFA; 42 U.S.C. 1996), the Native American Graves Protection and Repatriation Act (NAGPRA; 25 U.S.C. 3001), and Executive Order 13007 (Indian Sacred Sites). In sum, and in concert with other provisions such as those found in the NHPA and Archaeological Resources Protection Act (ARPA; 16 U.S.C. 470aa-470mm), these acts and orders require the federal government to carefully and proactively consider the traditional and religious values of Native American culture and lifeways to ensure, to the greatest degree possible, that access to sacred sites, treatment of human remains, the possession of sacred items, conduct of traditional religious practices, and the preservation of important cultural properties are not unduly infringed upon. In some cases, these concerns are directly related to *historic properties* and/or archaeological resources, such as those considered under Section 106 of the NHPA. Likewise, elements of the landscape without archaeological or human material remains also may be involved.

The BLM initiated government-to-government consultation with four Native American tribes who claim cultural affiliation to and/or traditional use of the area by sending letters summarizing the results of the Class 1 cultural resources assessment and rangeland monitoring data for the Arivaca allotment. Tribes consulted include the Hopi Tribe, Pascua Yaqui Tribe, Tohono O'odham Nation, and the White Mountain Apache Tribe. Plant species with potential cultural significance are noted to occur within the Arivaca allotment such as broom snakeweed (*Gutierrezia sarothrae*) and velvet mesquite (*Prosopis velutina*; USDA-NRCS 2017).

Currently, there are no known adverse impacts to any culturally significant plants, items, sites, or landscapes (see prior Cultural Resources section). Additionally, because lease issuance does not include authorization for new construction, ground disturbance, or the direct sale/exchange of federally managed lands, the undertaking will not prevent access to any known sacred sites, prevent the possession of sacred objects, or otherwise interfere with the performance of traditional ceremonies and/or rituals.

If new information is provided by consulting tribes, additional or edited terms and conditions of land-use and/or mitigation may be required to protect or restore resource values. Future assessment and/or consultations would occur during the BLM's review of any additional proposed actions within the subject allotment such as range improvement projects. Should the BLM identify adverse impacts, additional consultations regarding potentially significant sites and possible protection or mitigation strategies would be warranted.

3 GRAZING MANAGEMENT

3.1 Grazing History

Historic and recent grazing use has been by cattle on the Arivaca allotment. The allotment is geographically separated into two pieces. The BLM lands within the allotment are all located on the western piece and they comprise approximately 12 percent of the total livestock operation. There are 27 head of cattle run on the BLM lease. The portion of the allotment with public lands is run as a single pasture. Between it and the other leased and private lands, there is a rotational grazing system. The 324 Animal Unit Months (AUMs) under the BLM grazing lease are included in the total head of cattle (total of

6,484 AUMs) on the private land, State lease, Forest Service lease and are managed together on the entire allotment.

The management category given to the Arivaca allotment is custodial (C). Custodial grazing management is applied to areas having acceptable range condition and a stable or improving trend. Under custodial management, the BLM management actions are limited to licensing livestock use based on the AUMs available on the public lands. The individual ranch operator determines the grazing system (if any) to be used. The BLM checks these grazing units to insure that the utilization on public lands is not excessive, that range condition and trend are being maintained, and that applicable regulations are being followed. The BLM will work with the operator to adjust livestock numbers on the total grazing unit if utilization is found to be excessive or the range trend to be downward. Grazing units managed custodially include areas where the effects of livestock use on the public land resources are anticipated to be minimal. Selection of public land areas for custodial management is based on the following criteria:

1. Present range condition is not a factor.
2. Allotments have low resource production potential and are producing near their potential.
3. Limited resource-use conflict/controversy may exist.
4. Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors.
5. Present management appears satisfactory or is the only logical practice under existing resource conditions.

3.2 Grazing System

The allotment is 12,793 total acres, of which 1,555 acres is administered by the BLM. There is currently one lease issued for 324 Animal Unit Months (AUMs) on the BLM public lands for the Arivaca allotment. An AUM is the amount of forage required by one animal unit for a period of 30 days or one month. Within the allotment, yearlong grazing from March 1 to February 28 is allowed under the terms and conditions of the lease. The BLM lands associated with this allotment are used in conjunction with the private, state and Forest Service lands in a rotational grazing system. The BLM land, however, is not fenced off completely. An Animal Unit (AU) is considered to be one mature cow of about 1,000 pounds either with or without a calf up to six months of age or one bull, consuming about 20 pounds of forage per day. AUMs totals for the Arivaca allotment leases are in Table 6.

Table 6. Arivaca Leases and AUMs

Ownership	Animal Unit Months (AUMs)	Animal Units (AU)
AZ State Trust Land- P&P Ranch LLC	2,984 AUMs	350 AU Yearlong
BLM - Arivaca #6003	324 AUMs	27 AU Yearlong
Coronado National Forest - Sardina	3,176 AUMs	350 AU Yearlong
Total	6,484 AUMs	727 AU Yearlong

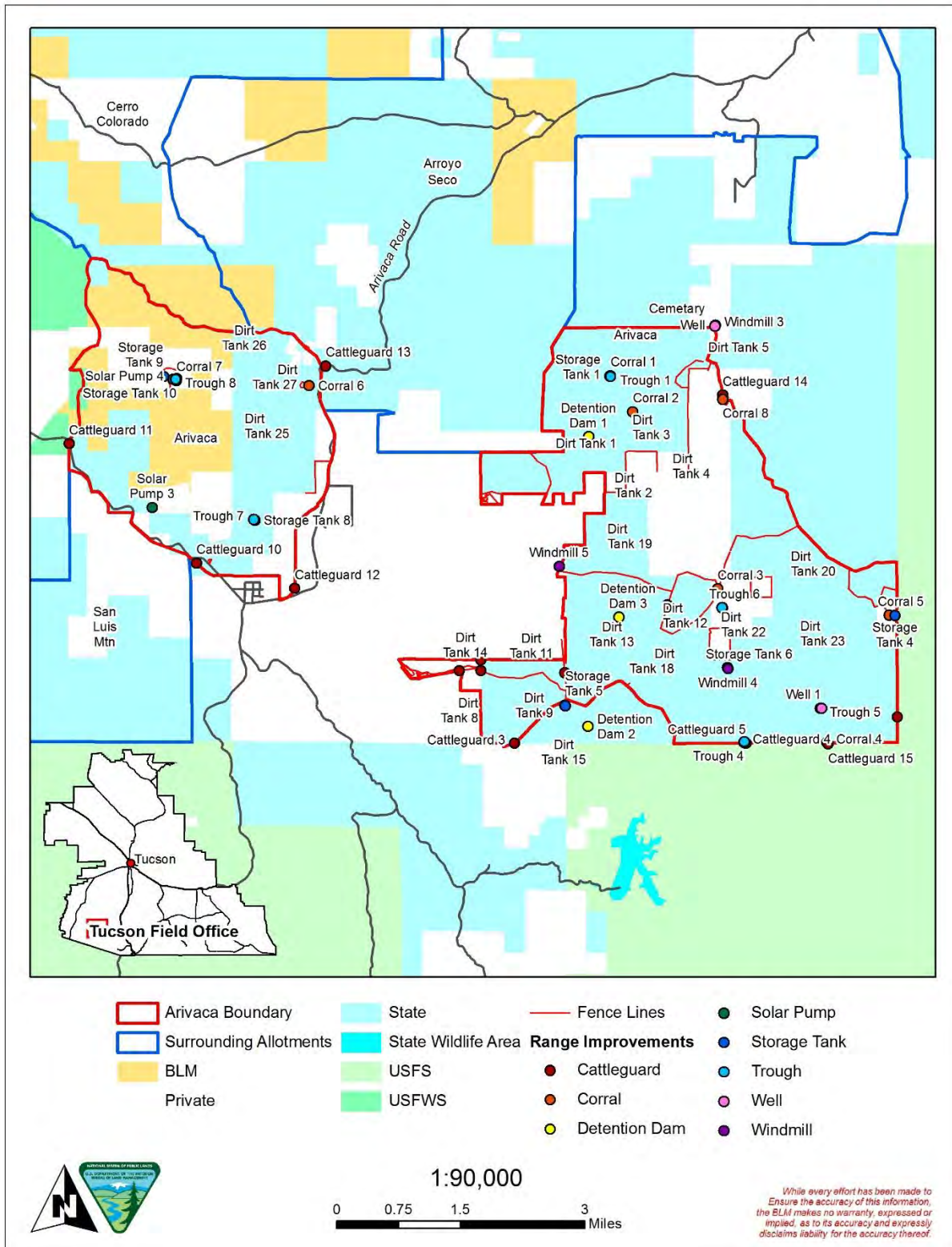
The Arivaca allotment, combining all land ownership and leases, has a capacity of 6,484 AUMs.

3.2.1 Existing Range Improvements

After a review of the range improvement record for this allotment, there was one record of a fence line that was installed. In addition, it has been verified that no water sources are located on the BLM land or where livestock might congregate. The pasture on the north side of Arivaca Road that has the BLM lands has not been used in recent years due to fencing concerns. Repairs along Arivaca Road are planned in the next 1-2 years in order to utilize this pasture. When repairs secure the pasture, a rest rotation grazing

system will be utilized. Figure 8 is a map of the existing range improvements throughout the entire allotment. This mapping exercise was completed using areal imagery as well as verification from the lease holder.

Figure 8. Existing Range Improvements on the Arivaca Allotment



3.3 Mandatory Terms and Conditions for Permitted Use

There is currently one lease issued for 324 AUMs on public lands. The Mandatory Terms and Conditions of the lease are listed below:

Table 7. Mandatory Terms and Conditions of the Lease

Total Livestock on the BLM acres of the Allotment	Livestock Kind	Grazing Period of Use	Percent Public Land*	Type Use	AUMs on Public Land
27	Cattle	3/1 to 2/28	100	Active	324

* Percent Public Land is used for calculating AUMs on the BLM acreage. This is not stating the percent of public land within the total allotment.

4 OBJECTIVES

4.1 Relevant Planning and Environmental Documents

Eastern Arizona Grazing Environmental Impact Statement (1987)

Phoenix District Resource Management Plan (1989)

Gila District Livestock Grazing Program Biological Opinion, 2012

4.2 Allotment Specific Objectives

4.2.1 Land Health Standards

Standard 1: Upland Sites

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

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, 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

Standard 2: Riparian-Wetland Sites

“Riparian-wetland areas are in proper functioning condition.”

Standard 2 is **not applicable** because no riparian-wetland sites exist within the Arivaca allotment.

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 were 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 are used as an indicator of ecosystem function and rangeland health.

As indicated by such factors as:

- Composition
- Structure
- Distribution

Desired Plant Community Objective

As part of the land health evaluation process, Desired Plant Community (DPC) objectives were established for important biological resources. DPC objectives address the desired resource conditions based on vegetation attributes, such as composition, structure, and cover that are desired within the allotment. These include establishing vegetative characteristics necessary for soil protection, providing forage and habitat for both livestock and wildlife.

Perennial grass components of the DPCs provide important forage resources for Sonoran desert tortoise by providing protein for nutrition and to help tortoises excrete excess potassium. Shrub components provide forage for grazing wildlife such as mule deer, as well as foliar cover for smaller animals such as rabbits, quail and tortoise.

Key Areas ARI-1 and ARI-SDT Desired Plant Community Objectives for Shallow hills 12-16” precipitation zone ecological site

Maintain plant species diversity such that the potential plant community on this site is dominated by warm season perennial grasses. Several species of low shrubs are well represented on the site, but the aspect is grassland dotted with shrubs and cacti. Larger species of shrubs are concentrated at the edges of rock outcrop areas and in canyon bottoms. Most of the grass and low shrub species are well dispersed throughout the plant community.

- Maintain perennial grasses/grasslike plants composition of ≥50%
- Maintain a palatable shrub composition of ≥20%
- Maintain vegetative foliar cover at ≥20%

Rationale: The rationale for the DPCs listed above is taken from the NRCS Reference Sheet. The reference sheet used for these key areas is the Shallow Hills 12-16" p.z.

Maintaining a perennial grass composition of 50 percent on this site complies with Sonoran desert tortoise habitat requirements and is appropriate for the site based on its aspect and elevation. Palatable shrub composition of 10 percent 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. Foliar cover is expected to be greater than 20 percent as per the reference sheet. A vegetative foliar cover of 20 percent or greater should serve to prevent accelerated erosion beyond what is expected in the reference state. The bare ground cover class on the site ranges from 5-40 percent based on the NRCS reference sheet. Maintaining a bare ground cover class of 20 percent or less will ensure that soil erosion on the site is consistent with the expected erosion rate of the reference state.

5 PLANT LIST

This section includes the list of plant species present or potentially present within the Shallow Hills 12-16” precipitation zone (p.z.) ecological site located on the public lands within the Arivaca allotment. These plant species provide key forage and cover for wildlife species and livestock.

Table 8 presents a list of plant species from the Shallow Hills 12-16” p.z. ecological site description located on the Arivaca allotment.

Table 8. Key Plant Species from the Shallow Hills 12 -16” p.z. ecological site description

Common name	Scientific name
cane beardgrass	<i>Bothriochloa barbinodis</i>
sprucetop grama	<i>Bouteloua chondrosioides</i>
sideoats grama	<i>Bouteloua curtipendula</i>
blue grama	<i>Bouteloua gracilis</i>
hairy grama	<i>Bouteloua hirsuta</i>
slender grama	<i>Bouteloua repens</i>
false mesquite	<i>Calliandra eriophylla</i>
plains lovegrass	<i>Eragrostis intermedia</i>
shrubby buckwheat	<i>Eriogonum wrightii</i>
kidneywood	<i>Eysenhardtia polystachya</i>

Common name	Scientific name
desert-honeysuckle	<i>Anisacanthus thurberi</i>
false mesquite	<i>Calliandra eriophylla</i>
fishhook barrel cactus	<i>Ferocactus wislizeni</i>
ocotillo	<i>Fouquieria splendens</i>
range ratany	<i>Krameria erecta</i>
Lycium	<i>Lycium</i>
velvetpod mimosa	<i>Mimosa dysocarpa</i>
sacahuista	<i>Nolina microcarpa</i>
Engelmann pricklypear	<i>Opuntia engelmannii</i>
staghorn cholla	<i>Opuntia versicolor</i>
desert globemallow	<i>Sphaeralcea ambigua</i>
Palmer agave	<i>Agave palmeri</i>
wait-a-bit	<i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>
Graham's mimosa	<i>Mimosa grahamii</i>
staghorn cholla	<i>Opuntia versicolor</i>
Wright's cudweed	<i>Pseudognaphalium canescens</i> subsp. <i>canescens</i>

During the March 2014 data collection these species in table 9 were found on key area ARI-1.

Table 9. Species List from Arivaca ARI-1 Key Area in August 2016.

Common Name	Scientific Name
Perennial Grasses	
Perennial three-awn	<i>Aristida</i> spp.
Sprucetop grama	<i>Bouteloua chondrosioides</i>
Sideoats grama	<i>Bouteloua curtipendula</i>
Hairy grama	<i>Bouteloua hirsuta</i>
Slender grama	<i>Bouteloua repens</i>
Arizona cottontop	<i>Digitaria californica</i>
Plains lovegrass	<i>Eragrostis intermedia</i>
Lehmann lovegrass	<i>Eragrostis lehmanniana</i>
Common wolfstail	<i>Lycurus phleoides</i>
Arizona muhly	<i>Muhlenbergia arizonica</i>
Plains bristlegrass	<i>Setaria macrostachya</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
Perennial Forbs	
Arizona blue eyes	<i>Evolvulus arizonica</i>
Ragged nettlespurge	<i>Jatropha macrorhiza</i>
Sida	<i>Sida abutifolia</i>
Orange flameflower	<i>Talinum</i>
Trees and Shrubs	
False mesquite (Fairyduster)	<i>Calliandra eriophylla</i>
Cane cholla	<i>Cylindropuntia spinosior</i>

Common Name	Scientific Name
Ocotillo	<i>Fouquieria splendens</i>
Broom snakeweed	<i>Gutierrezia sarothrae</i>
Range ratany	<i>Krameria erecta</i>
Slender janusia	<i>Janusia gracilis</i>
Velvetpod mimosa	<i>Mimosa dysocarpa</i>
Mesquite	<i>Prosopis spp.</i>
Turbinella oak	<i>Quercus turbinella</i>

6 INVENTORY AND MONITORING DATA

The following sections describe the inventory and monitoring protocols that were used on the Arivaca allotment in 2014.

6.1 Evaluation Protocol

6.1.1 Indicators of Rangeland Health

A rangeland health evaluation provides information on the function of ecological processes (water cycle, energy flow, and nutrient cycle) relative to the reference state for the ecological site or other functionally similar unit for that land area. This evaluation provides information that is not available with other methods of evaluation. It gives an indication of the status of the three attributes chosen to represent the health of the “evaluation area” (i.e., the area where the evaluation of the rangeland health attributes occurs). The three attributes are:

1. Soil/Site Stability (S)
2. Hydrologic (H)
3. Biotic Integrity (B)

The following are the 17 indicators of rangeland health that are evaluated during an evaluation and the attribute(s) they measure:

1. Rills: S, H
2. Water Flow Patterns: S, H
3. Pedestals and/or Terracettes: S, H
4. Bare Ground: S, H
5. Gullies: S, H
6. Wind-scoured, Blowout, and/or Depositional Areas: S
7. Litter Movement: S
8. Soil Surface Resistance to Erosion: S, H, B
9. Soil Surface Loss or Degradation: S, H, B
10. Plant Community Composition and Distribution Relative to Infiltration and Runoff: H
11. Compaction Layer: S, H, B
12. Functional/Structural Groups: B
13. Plant Mortality/Decadence: B
14. Litter Amount: H, B
15. Annual Production: B
16. Invasive Plants: B
17. Reproductive Capability of Perennial Plants: B

The three attributes of rangeland health (soil/site stability, hydrologic function, and biotic integrity) are evaluated and assigned rating categories for each of the 17 attributes (Technical Reference 1734-6).

Attribute ratings reflect the degree of departure from expected levels for each indicator per the Reference Sheet. The degree of departure may be categorized as:

- Extreme to Total
- Moderate to Extreme
- Moderate
- Slight to Moderate
- None to Slight

6.2 Monitoring Protocols

The standards were assessed for the Arivaca allotment by a contracted U.S. Forest Service interdisciplinary team consisting of rangeland management specialists and wildlife biologists (both with additional resource backgrounds in soils and botany) and by the BLM staff on 3/18/ 2009. TEAMS (Talent, Expertise, Agility, Mobility and Simplicity) Enterprise mission is to provide convenient and cost effective environmental planning, field services, and policy development through an exemplary workforce of dedicated, creative, and experienced natural resource specialists. Additional information is on their website: <https://www.fs.fed.us/teams/>.

The interdisciplinary team used rangeland monitoring data, professional observations, and photographs to assess achievement of the Standards and conformance with the Guidelines. All study sites were recorded with a GPS using projection of NAD 83.

Quantitative cover, and species composition, collected along each transect (Line Point Intercept [LPI]) was used in conjunction with qualitative indicators of soil quality, hydrologic function, and biological health (Indicators of Rangeland Health) in order to assess existing condition of ecological sites at the key area within the Arivaca allotment. Existing condition was compared to site-specific reference conditions (thought to represent relatively undisturbed states within a given soil--plant community type) in order to determine the level of departure from the potential natural community. Other data collected at key areas ARI-1 and ARI-SDT was the 17 indicators of rangeland health (NRCS 2005) and utilization.

6.2.1 *Line Point Intercept (species composition and ground cover)*

The method used to obtain transect data pertaining to species composition, and soil cover is the LPI. This method consists of a horizontal, linear measurement of plant intercepts along the course of a line (tape) 100 foot in Arivaca. It is designed for measuring grass or grass-like plants, forbs, shrubs, and trees. This method is a rapid, accurate method for quantifying soil cover, including vegetation, litter, rocks and biotic crusts. These measurements are related to wind and water erosion, water infiltration and the ability of the site to resist and recover from degradation. The LPI method measures vegetation cover along a given distance and from that, composition is extrapolated.

6.2.2 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 m²) quadrat is used for pace frequency applied as follows:

1. Species present within the bounds of the sample quadrat are recorded with a single tally.
2. If no species are present, no frequency data are recorded.
3. Perennial or annual grasses and forbs must be rooted within the quadrat to be counted.
4. A grass or forb plant base present under the quadrat frame is considered "in."
5. Annual plants, grasses and forbs, are counted whether green or dried.
6. 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).
7. A canopy hit is any part of the tree or shrub that overhangs the quadrat (enters an imaginary vertical projection of the plot frame).
8. 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).

6.2.3 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.

6.2.4 Dry Weight Rank

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.

6.2.5 Utilization

Utilization is the proportion or degree of the current year's forage production that is consumed or destroyed by animals (including insects). Utilization may refer to either a single plant species, a group of species, or the vegetation as a whole. Utilization is a comparison of the amount of vegetation left compared with the amount of vegetation produced during the year (USDA, NRCS, and USDO, 1996).

Table 10. Herbaceous (grasses and forbs) utilization classes

Rating	Description
0-5%	The rangeland shows no evidence of grazing use or negligible use.
6-20%	The key species has the appearance of very light grazing. Plants may be topped or slightly used. Current seedstalks and young plants are little disturbed.

Rating	Description
21-40%	The key species may be topped, skimmed, or grazed in patches. Between 60 and 80 percent of current seedstalks remain intact. Most young plants are undamaged.
41-60%	Half of the available forage (by weight) on key species appears to have been utilized. Fifteen to 25 percent of current seedstalks remain intact.
61-80%	More than half of the available forage on key species appears to have been utilized. Less than 10 percent of the current seedstalks remain. Shoots of rhizomatous grasses are missing.
81-94%	The key species appears to have been heavily utilized and there are indications of repeated use. There is no evidence of reproduction or current seedstalks.
95-100%	The key species appears to have been completely utilized. The remaining stubble is utilized to the soil surface.

Source: Interagency Technical Reference, *Utilization Studies and Residual Measurements*, 1996.

Seven utilization classes show relative degrees of use of available current year's growth (leaders) of key browse plants (shrubs, half shrubs, woody vines, and trees). Each class represents a numerical range of percent utilization. Utilization classes are as follows:

Table 11. Browse (shrubs, half shrubs, woody vines, and trees) utilization classes

Rating	Description
0-5%	The key browse plants show no evidence of grazing use or only negligible use.
6-20%	The key browse plants have the appearance of very light use. The available leaders are little disturbed.
21-40%	There is obvious evidence of leader use. The available leaders appear cropped or browsed in patches and 60 to 80% of the available leader growth remains intact.
41-60%	Key browse plants appear rather uniformly utilized and 40 to 60% of the available leader growth remains intact.
61-80%	The key browse plants are hedged and some plant clumps may be slightly broken. Nearly all available leaders are used and few terminal buds remain. Between 20 and 40% of the available leader growth remains intact.
81-94%	There are indications the key browse species have been utilized repeatedly. There is no evidence of terminal buds and usually less than 20% of available leader growth remains intact. Some, and often much, of the second and third years' growth has been utilized. Hedging (the appearance of browse plants that have been browsed so as to appear artificially clipped or consistent browsing of terminal buds of browse species that results in excessive lateral branching and a reduction in upward and outward growth) is readily apparent. Key browse plants frequently have broken branches.
95-100%	Less than 5% of the available leader growth on the key browse plants remain intact. Most of the second and third years' growth have been utilized. All key browse plants have major portions broken.

Source: Interagency Technical Reference, *Utilization Studies and Residual Measurements*, 1996.

7 MANAGEMENT EVALUATION AND SUMMARY OF STUDIES DATA

7.1 Actual Use

Actual use information will be submitted within 15 days of the end of the grazing year in accordance with 43 CFR 4130.3-2(d). Actual use reports will identify the amount of livestock use and period of use for each water source/pasture. According to billed use the lease has paid for the full 324 AUMs on the lease from 2008-2016.

7.2 Precipitation

The nearest local climate recording station is the Arivaca 1 E station. The station is located about 1000 feet southwest of the town of Arivaca off Fragutta Road. Figure 9 below is an average total monthly precipitation summary from the Western Regional Climate Center - Arivaca 1 E station. Table 11 is the climate data for the station.

Figure 9. Arivaca 1E station precipitation data

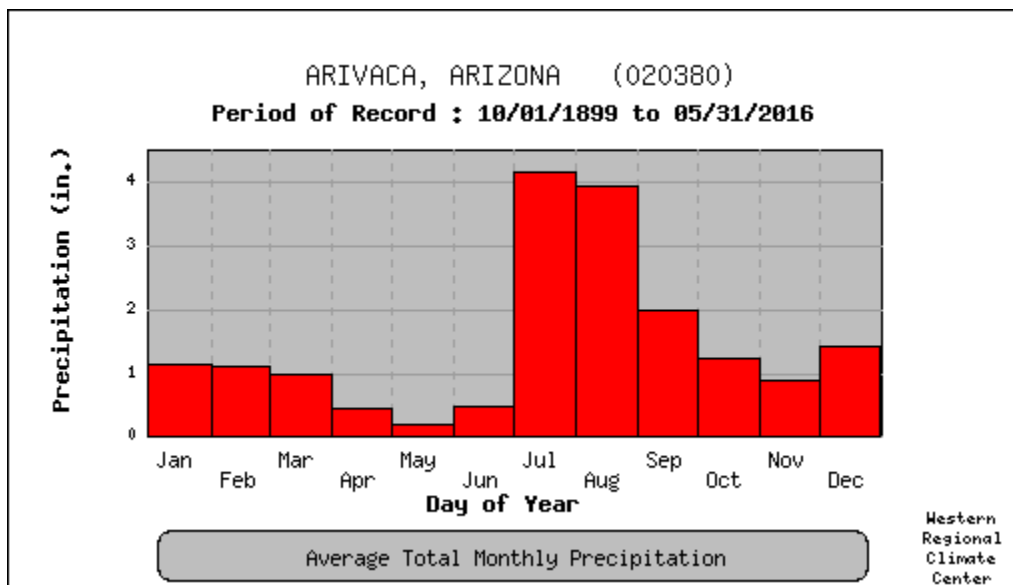


Table 12. Climate data from ARIVACA, ARIZONA (020380). Period of Record Monthly Climate Summary. Period of Record: 10/01/1899 to 05/31/2016

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	60.9	68.0	72.7	76.0	81.3	99.8	97.9	93.7	89.3	83.2	76.0	71.9	80.9
Average Min. Temperature (°F)	32.8	35.6	40.6	40.1	45.3	61.0	64.8	61.6	57.4	47.1	38.9	30.0	46.3
Average Total Precipitation (in.)	1.12	1.15	0.99	0.44	0.19	0.45	4.09	3.93	1.85	1.21	0.88	1.44	17.74
Average Total Snowfall (in.)	0.3	0.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	2.6
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Temperatures are typically mild. Freezing temperatures are common at night from January-April; however, temperatures during the day are frequently above 50° F. Occasionally in January-February, brief 0° F temperatures may be experienced some nights. During June, July and August, some days may exceed 100° F.

7.3 Key Area Data

Vegetation monitoring was conducted by the University of Arizona Extension and the BLM range specialists at the key area, which is called ARI-1, in 2011, 2013 and again in 2016. Upland range health was evaluated on ARI-1 in 2014 by TEAMS. In 2016 TEAMS established a second key area with the purpose of monitoring perennial grass availability relative to Sonoran Desert Tortoise (SDT) forage needs. This additional key area is called ARI-SDT. TEAMS also evaluated upland range health at the ARI-SDT in 2016.

These key areas were selected for consistency with average livestock use within the allotment. A quantitative and qualitative evaluation of rangeland health indicators was conducted in order to determine if any gaps existed between existing condition and the ecological reference condition. Using these evaluations, it was determined whether applicable resource standards were being met within the allotment and whether adequate perennial grass resources were available relative to Sonoran desert tortoise forage needs. Key areas ARI-1 and ARI-SDT are located in the Shallow Hills 12-16" p.z. These are shallow soils formed on acid igneous rocks (granite and rhyolite) and related metamorphic rocks like gneiss, schist and quartzite. They are non-calcareous, sandy loam to loamy textured with well-developed covers of gravels and cobbles. They are dark colored in the surface. Numerous areas of rock outcrop occur intermingled with soil areas. Plant-soil moisture relationships are fair. Warm season perennial grasses dominate the potential plant community on this site. Several species of low shrubs are well represented on the site, but the aspect is grassland dotted with shrubs and cacti. Larger species of shrubs are concentrated at the edges of rock outcrop areas and in canyon bottoms. Most of the grass and low shrub species are well dispersed throughout the plant community.

7.3.1 Utilization

Utilization measured at ARI-1 at the time of the study was 0 percent. Utilization data on key area ARI-SDT shows 0 to 10 percent use.

7.3.2 Rangeland Health Evaluations and Frequency/Cover, Composition, and Structure Data

Tables 13 and 14 below show the results from the land health evaluation completed in January 2014 on the Arivaca allotment. Summary results are shown from the Rangeland Health Evaluation at key area ARI-1. All but two attributes ranked none to slight from departure of the Shallow Hills 12-16" p.z. reference sheet.

Table 13. January 12, 2014 Summary Results from Rangeland Health Evaluation at Key Area ARI-1.

Rangeland Health Attribute	Departure From Ecological Site Description				
	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Soil/Site Stability	0	0	0	0	10
Hydrologic Function	0	0	0	0	10
Biotic Integrity	0	0	2	0	7

Table 14. Summary of 17 Indicators for Shallow Hills 12-16” p.z. Ecological Site on Key Area ARI-1.

17 Indicators Reference Sheet	Rational from January 2014
1. Number and extent of rills: None present on this site.	None to slight. None observed.
2. Presence of water flow patterns: Occupy < 5% of area, broken by rock and gravel cover, <1 foot in length, highly discontinuous.	None to slight. None observed.
3. Number and height of erosional pedestals or terracettes: Erosional pedestals are very uncommon (1 per 20 plants observed); Terracettes are fairly uncommon, 10-20 feet apart with a 3-4 inch elevation difference from above to below the terracette	None to slight. None observed.
4. Bare ground from Ecological Site Description or other studies (rock, litter, standing dead, lichen, moss, plant canopy are not bare ground): 5%	None to slight. 0% bare ground was recorded. Within ESD parameters.
5. Number of gullies and erosion associated with gullies: None present on this site.	None to slight. None observed.
6. Extent of wind scoured, blowouts and/or depositional areas: None present on this site.	None to slight. None observed.
7. Amount of litter movement (describe size and distance expected to travel): All litter size classes are staying in place.	None to slight. Litter observed at plant bases and interspaces.
8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values): Expect ratings of 1-3 in plant, rock and gravel interspaces.	None to slight. Observed good vegetation cover of soils.
9. Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness): Weak granular; Color is 10YR6/2 Dry, 10YR4/2 Moist; thickness to 3 inches.	None to slight. None observed.
10. Effect on plant community composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Cover estimated in 9.6ft2 frames as: Canopy 30%, Basal 6%, Litter 10%; 60-70% of canopy cover is perennial mid	None to slight. Observed vegetative cover near 100% with high infiltration rates.

17 Indicators Reference Sheet	Rational from January 2014
<p>grasses, 20-30% sub shrubs, 5% is perennial forbs , 5-10% is annual forbs & grasses, and <1% trees & shrubs. Cover is well dispersed throughout site.</p>	
<p>11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): None present on this site.</p>	<p>None to slight. None observed</p>
<p>12. Functional/Structural Groups (list in order of descending dominance by above-ground weight using symbols: >>, >, = to indicate much greater than, greater than, and equal to) with dominants and sub-dominants and "others" on separate lines: Dominant: perennial grass = sub shrubs Sub-dominant: annual forbs & grasses > perennial forbs > trees & shrubs > succulents</p>	<p>Moderate. Observed slight departure at site high composition and cover of these groups is generally similar to ESD.</p>
<p>13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Very low; most basal area loss is masked by litter decomposition</p>	<p>None to slight. Observed even age class distribution.</p>
<p>14. Average percent litter cover (10%) and depth (0.25inches):</p>	<p>None to slight. Litter amount was within the parameters of the site.</p>
<p>15. Expected annual production (this is TOTAL above-ground production, not just forage production): 600 lbs/acre unfavorable precipitation; 900 lbs/acre normal precipitation; 1,600 lbs/acre favorable precipitation.</p>	<p>None to slight. Within site parameters.</p>
<p>16. Potential invasive (including noxious) species (native and non-native). List Species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicator, we are</p>	<p>Moderate. 76% Lehmann's lovegrass (<i>Eragrostis lehmanniana</i>) on site.</p>

17 Indicators Reference Sheet	Rational from January 2014
describing what is NOT expected in the reference state for the ecological site: Lehmann lovegrass	
17. Perennial plant reproductive capability: Not affected even following several years of prolonged drought period for region.	None to slight. Within ESD parameters.

Tables 15 and 16 below show the results from the land health evaluation completed in March 2016 on the Arivaca allotment at key area ARI-SDT. Summary results are from Land Health Evaluation at ARI-SDT. All but two attributes ranked none to slight from the departure of the Shallow Hills 12-16" p.z. reference sheet.

Table 15. March 29, 2016 summary results from Rangeland Health Evaluation.

Rangeland Health Attribute	Departure From Ecological Site Description				
	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
Soil/Site Stability	0	0	0	0	10
Hydrologic Function	0	0	0	0	10
Biotic Integrity	0	0	0	2	7

Table 16. Summary of 17 Indicators for Shallow Hills 12-16" p.z. Ecological Site on Key Area ARI-SDT.

17 Indicators Reference Sheet	Rational from March 2016
1. Number and extent of rills: None present on this site.	None to slight. Rock armored and well vegetated.
2. Presence of water flow patterns: Occupy < 5% of area, broken by rock and gravel cover, <1 foot in length, highly discontinuous.	None to slight. Only at the road itself but no issues at the site.
3. Number and height of erosional pedestals or terracettes: Erosional pedestals are very uncommon (1 per 20 plants observed); Terracettes are fairly uncommon, 10-20 feet apart with a 3-4 inch elevation difference from above to below the terracette	None to slight. None observed.
4. Bare ground from Ecological Site Description or other studies (rock, litter, standing dead, lichen, moss, plant canopy are not bare ground): 5%	None to slight. 0-5% bare ground. High rock, gravel and vegetation cover.
5. Number of gullies and erosion associated with gullies: None present on this site.	None to slight. None observed. No active
6. Extent of wind scoured, blowouts and/or depositional areas: None present on this site.	None to slight. None observed.

17 Indicators Reference Sheet	Rational from March 2016
<p>7. Amount of litter movement (describe size and distance expected to travel): All litter size classes are staying in place.</p>	<p>None to slight. High vegetative cover.</p>
<p>8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values): Expect ratings of 1-3 in plant, rock and gravel interspaces.</p>	<p>None to slight. High rock and gravel cover.</p>
<p>9. Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness): Weak granular; Color is 10YR6/2 Dry, 10YR4/2 Moist; thickness to 3 inches.</p>	<p>None to slight. None observed even in recent burn area off site.</p>
<p>10. Effect on plant community composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Cover estimated in 9.6ft² frames as: Canopy 30%, Basal 6%, Litter 10%; 60-70% of canopy cover is perennial mid grasses, 20-30% sub shrubs, 5% is perennial forbs , 5-10% is annual forbs & grasses, and <1% trees & shrubs. Cover is well dispersed throughout site.</p>	<p>None to slight. Observed normal for shallow hill site.</p>
<p>11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): None present on this site.</p>	<p>None to slight. None observed</p>
<p>12. Functional/Structural Groups (list in order of descending dominance by above-ground weight using symbols: >>, >, = to indicate much greater than, greater than, and equal to) with dominants and sub-dominants and "others" on separate lines: Dominant: perennial grass = sub shrubs Sub-dominant: annual forbs & grasses > perennial forbs > trees & shrubs > succulents</p>	<p>None to slight. Expected for the site.</p>
<p>13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Very low; most basal</p>	<p>Slight to moderate. Observed in burn area not on evaluation site.</p>

17 Indicators Reference Sheet	Rational from March 2016
area loss is masked by litter decomposition	
14. Average percent litter cover (10%) and depth (0.25inches):	None to slight. Expected for the site with high percent cover.
15. Expected annual production (this is TOTAL above-ground production, not just forage production): 600 lbs/acre unfavorable precipitation; 900 lbs/acre normal precipitation; 1,600 lbs/acre favorable precipitation.	None to slight. Within site parameters. Estimated 800-1000 lbs/acre.
16. Potential invasive (including noxious) species (native and non-native). List Species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicator, we are describing what is NOT expected in the reference state for the ecological site: Lehmann lovegrass	Slight to moderate. Mesquite and Lehmanns scattered throughout site.
17. Perennial plant reproductive capability: Not affected even following several years of prolonged drought period for region.	None to slight. Within ESD parameters. Even in burned area new growth is starting with no issues.

Key Areas ARI-1 and ARI-SDT on Shallow hills 12-16” precipitation zone

7.3.2.1 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, 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.

The below indicators were applied to the potential of the ecological site.

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

The ecological site for key areas ARI-1 and ARI-SDT is Shallow Hills 12-16" p.z. ecological site. Vegetative cover collected at ARI-1 is adequate to ensure soil stabilization, and appropriate permeability rates within the ecological system. There were no rills/gullies present at either site, pedestals and/or terracettes were none to slight. Wind-scouring and litter movement were none to slight (Figure 10).

Figure 10. Key Area ARI-1 looking North in January 2014



The approximate potential ground cover (surface, basal, and foliar) is described in Tables 17 and 18 below. Table 17 specifically provides a comparison between the desired conditions as described by the ESD reference sheet for Shallow Hills 12-16", and the current conditions of ARI-1 in January 2014. Table 18 address the kind and amount (by cover) of vegetation at the sites. Litter should be in the range of 25 to 45 percent, with 25 to 50 percent surface fragments. A tolerable range of bare ground would be between 5 and 40 percent. Foliar cover collected at ARI-1 was 92 percent with 18 percent basal cover of perennial grasses and shrubs. Total litter at ARI-1 was measured at 97 percent, with bare ground measuring 0 percent. Rock and rock fragments covered 81 percent of the soil surface.

Foliar cover collected at a second key area ARI-SDT was 70 percent with 19 percent basal cover of perennial grasses and shrubs. Total litter at ARI-SDT-1 was measured at 59 percent, with bare ground measuring 2 percent. Rock and rock fragments covered 40 percent of the soil surface.

Table 17. A comparison between conditions described in the ESD (R041XC306AZ – NRCS 2013) and current conditions of key areas ARI-1 and ARI-SDT. Soil cover components include: plants (including basal cover), biological crusts, litter, and surface fragment.

	<u>Basal Cover</u>				<u>Biological Crust</u>	<u>Non-Vascular Plants</u>	<u>Litter</u>	<u>Surface Fragments > ¼" & <= 3"</u>	<u>Surface Fragments > 3"</u>	<u>Bedrock</u>	<u>Bare Ground</u>
	<u>Grass/Grass like</u>	<u>Forb</u>	<u>Shrub / Vine</u>	<u>Tree</u>							
ESD	3-7%	0-1%	2-4%	0%	0-1%	0-1%	25-45%	25-50%	0-10%	0-10%	5-40%
ARI-1 (2014)	16%	0%	2%	0%	0%	0%	97%	65%	16%	0%	0%
ARI-SDT	18%		1%	0%	0%	0%	59.4%	39.6%	0%	0%	2%
ARI-1(2016)	4%				0%	0%	63%	25%	5%	0%	2%

Table 18. Foliar cover of species recorded in the LPI plot for key areas ARI-1 and ARI-SDT.

Key area information	Species	Line point intercept cover at ARI-1	
		Foliar Cover	Basal Cover
Trend Plot 1 Arivaca Allotment	Annual forbs	1%	
Range site: R041XC306AZ	Sideoats grama (<i>Bouteloua curtipendula</i>)	2%	
	Fairyduster (<i>Calliandra eriophylla</i>)	14%	1%
	Three Awn (<i>Aristida sp.</i>)	4%	
	Catclaw acacia (<i>Acacia greggii</i>)	1%	

Key area information		Species	Line point intercept cover at ARI-1	
			Foliar Cover	Basal Cover
		Lehmann's lovegrass (<i>Eragrostis lehmanniana</i>)	76%	16%
		Sprucetop grama (<i>Bouteloua chondrosioides</i>)	1%	
		<i>Chloris virgata</i>	1%	
		Ocotillo (<i>Fouquieria splendens</i>)	4%	1%
		Bush muhly (<i>Muhlenbergia porterii</i>)	3%	
Cover/Litter/Bare Ground				
Foliar Cover	97%			
Basal Cover	18%			
Bare Ground	0%			
Key area information		Species	Line point intercept cover at ARI-1	
			Foliar Cover	Basal Cover
Trend Plot 2 SDT Arivaca Allotment		Three Awn (<i>Aristida ternipes</i> Cav.)	10%	1%
Range site: R041XC306AZ		Sprucetop grama (<i>Bouteloua chondrosioides</i>)	3%	1%
		Sideoats grama (<i>Bouteloua curtipendula</i>)	42%	11%
		Black grama <i>Bouteloua eriopoda</i>	10%	5%
		Fairyduster (<i>Calliandra eriophylla</i>)	10%	
		Arizona cottontop (<i>Digitaria californica</i>)	1%	1%
		Range ratany (<i>Krameria erecta</i>)	3%	
		Velvet mesquite (<i>Prosopis velutina</i>)	2%	
		Unknown forb2	1%	
		Unknown forb3	1%	
Cover/Litter/Bare Ground				
Foliar Cover	70%			
Basal Cover	18.8%			
Bare Ground	2%			

Figure 11 shows the data summary from 8-22-16 on key area ARI-1. Figure 12 is the percent frequency data collected by U of A, using pace frequency, on the Arivaca allotment. Some differences from the 3 years of data can be attributed to the different time of year collected, for example, annual forbs were high in July 2013. False mesquite has slowly been increasing over the last 5 years from 40 to 63 percent frequency. Lehmann lovegrass has also been shown to increase from 60 to 85 percent frequency but

again this is a factor of when the data was collected during different times of the year and plant growth cycle. Mesquite canopy has also been reduced from 14 to 5 percent frequency. Litter is higher than expected for the site (25-40 percent) and bare ground is lower than expected for the site (5-40 percent). Figure 13 is the percent ground cover for 3 years of data collection. Figure 14 is the most recent photo of transect ARI-1 from 8-22-16. Production data was also collected to determine how many pounds per acre the site produced. Three tables below show the grass production, the browse production and the total production available at ARI-1.

Figure 11. Data Summary From University of Arizona Extension on Key Area ARI-1

Data Summary

Site Class: BLM || Tucson || Arivaca
 Site ID: A-1

Date: 8/22/2016
 Examiner(s): Mike McIntire

% Ground Cover						
Species	Transect (#Hits)					% Cover*
	1	2	3	4	Total	
Bare Ground	3	2	1		6	2.01
Gravel (1/4" - 3")	18	17	26	16	77	25.75
Litter	45	50	39	55	189	63.21
Rock > 3"	6	4	3	2	15	5.02
Live Basal Veg.	3	2	6	1	12	4.01

Fetch			
n	100	Minimum	0
Maximum	17	Median**	4.25
Mean	4.86	SE	0.7
Asymmetry	2.47		

% Frequency								40x40 cm			DWR Wt. Composition			Sample Size = 100	
Species		Transect (#Hits)						% Freq*	Rank (#Hits)			Wtd. Sum	% Comp.*		
		1	2	3	4					1	2			3	
Woody Species															
false mesquite	CAER	20	16	13	14		63	63.00	4	33	30	124	12.40		
false mesquite-canopy	CAER	2	3	5	3		13	13.00							
cane cholla-canopy	CYSP8		1	1			2	2.00							
cane cholla	CYSP8									1	1	0.10			
ocotillo	FOSP2	1	1	1			3	3.00		7	11	25	2.50		
ocotillo-canopy	FOSP2	7	5	1	2		15	15.00							
broom snakeweed-canopy	GUSA2				1		1	1.00							
broom snakeweed	GUSA2									1	1	3	0.30		
slender janusia	JAGR	1					1	1.00			1	1	0.10		
range ratany	KRER	1					1	1.00	1			7	0.70		
velvetpod mimosa	MIDY				1		1	1.00	4	2		32	3.20		
velvetpod mimosa-canopy	MIDY	3	1				4	4.00							
Grasses - Perennial															
threeawn	ARIST			6	5		11	11.00	2	2	5	23	2.30		
sprucetop grama	BOCH	1	2	6			9	9.00	2	2	4	22	2.20		
sideoats grama	BOCU	1	1	1	4		7	7.00	4	2	1	33	3.30		
hairy grama	BOH2			3	3		6	6.00		1	3	5	0.50		
slender grama	BORE2	3	3	10	4		20	20.00	3	11	6	49	4.90		
Arizona cottontop	DICA8				1		1	1.00	1			7	0.70		
plains lovegrass	ERIN	1			4		5	5.00	3		2	23	2.30		
Lehmann lovegrass	ERLE	23	25	23	14		85	85.00	74	27	7	579	57.90		
common wolfstail	LYPH	3		1			4	4.00		3	1	7	0.70		
Arizona muhly	MUAR3	3	2	6	1		12	12.00		4	7	15	1.50		
Forbs - Perennial/Biennial															
AZ blue eyes	EVAR	4		3	7		14	14.00			5	5	0.50		
Annuals															
Annual forb(s)	AAFF	2	3	4	4		13	13.00							
Unclassified															
mesquite-canopy	PROSO				5		5	5.00							
mesquite	PROSO								2	1	2	18	1.80		
sida	SIAB	5	10	8	9		32	32.00		4	13	21	2.10		
fameflower	TALIN2	2					2	2.00							

* Number of decimal places does not imply level of precision

** Plot median = average transect median not the median of all plot data

Figure 12. Percent Frequency on Key Area ARI-1

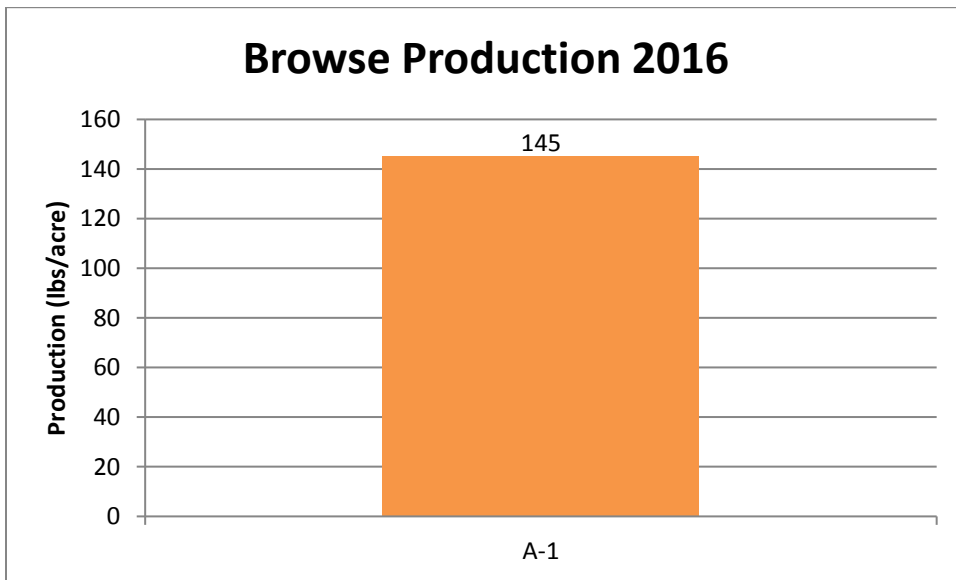
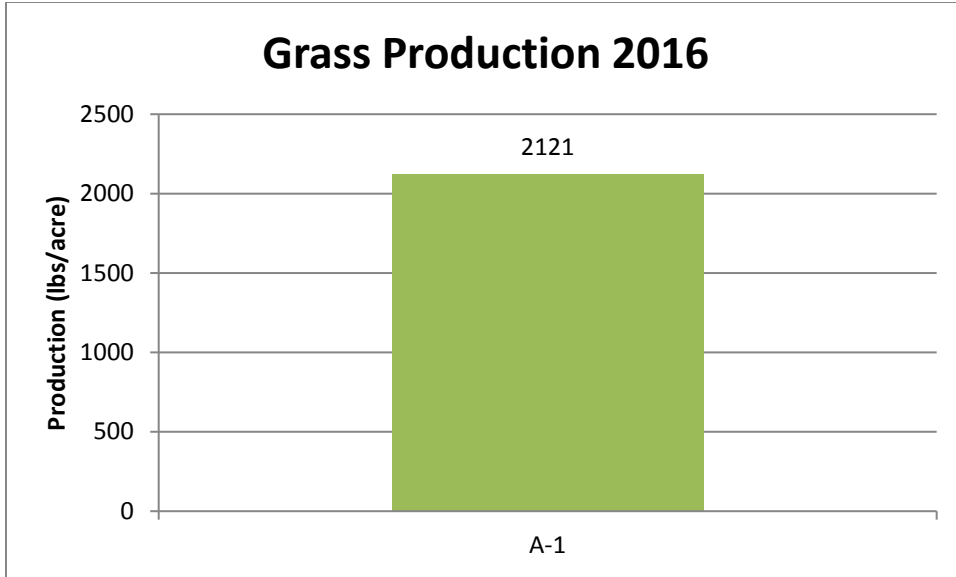
% Frequency		Quadrat Size: 40x40 cm		
Species	Transect			
	05/25/11	07/18/13	08/22/16	
Woody Species				
false mesquite	40	56	63	
false mesquite-canopy	16	3	13	
cane cholla-canopy			2	
ocotillo	3	3	3	
ocotillo-canopy	10	14	15	
broom snakeweed-canopy			1	
slender janusia		1	1	
range ratany	3		1	
velvetpod mimosa	4	3	1	
velvetpod mimosa-canopy	3	7	4	
turbinella oak-canopy	3			
Grasses - Perennial				
threeawn	14		11	
sprucetop grama	1	28	9	
sideoats grama	1	2	7	
hairy grama	46	4	6	
slender grama			20	
Arizona cottontop	1		1	
plains lovegrass	6	7	5	
Lehmann lovegrass	60	55	85	
common wolfstail			4	
Arizona muhly	5		12	
sand dropseed	3			
Forbs - Perennial/Biennial				
AZ blue eyes		2	14	
Annuals				
Annual forb(s)	6	55	13	
Annual grass(es)	3	14		
Unclassified				
nettlespurge		1		
mesquite	3	1		
mesquite-canopy	14	6	5	
plains bristlegrass	7			
sida		7	32	
fameflower		24	2	

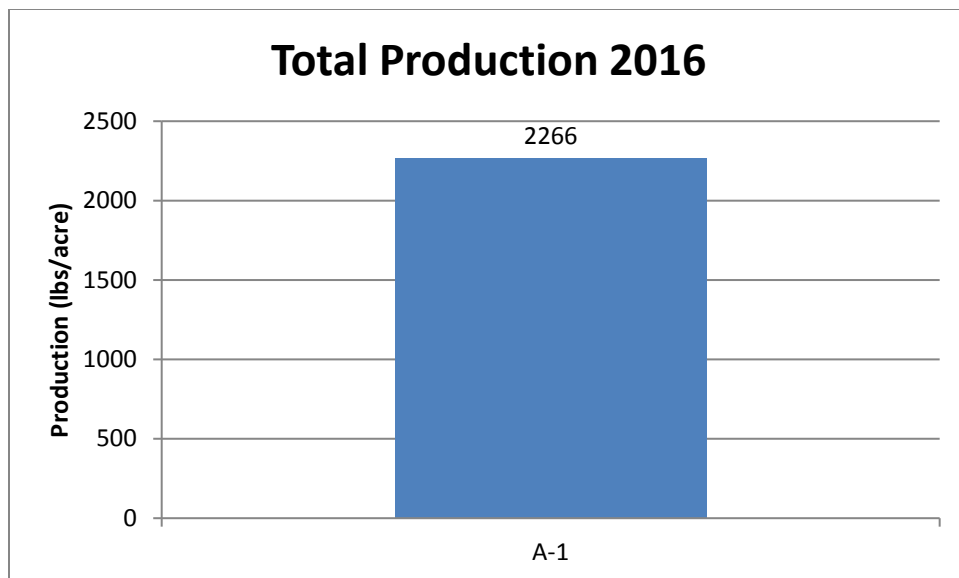
Figure 13. Percent ground cover for 3 years of data

% Ground Cover Category	Quadrat Size:		
	Transect		
	05/25/11	07/18/13	08/22/16
Bare Ground	3	5	2
Gravel (1/4" - 3")	8	7	26
Litter	71	75	63
Live Basal Veg.	12	7	4
Rock > 3"	6	5	5

Figure 14. ARI-1 Key Area on 8/22/2016





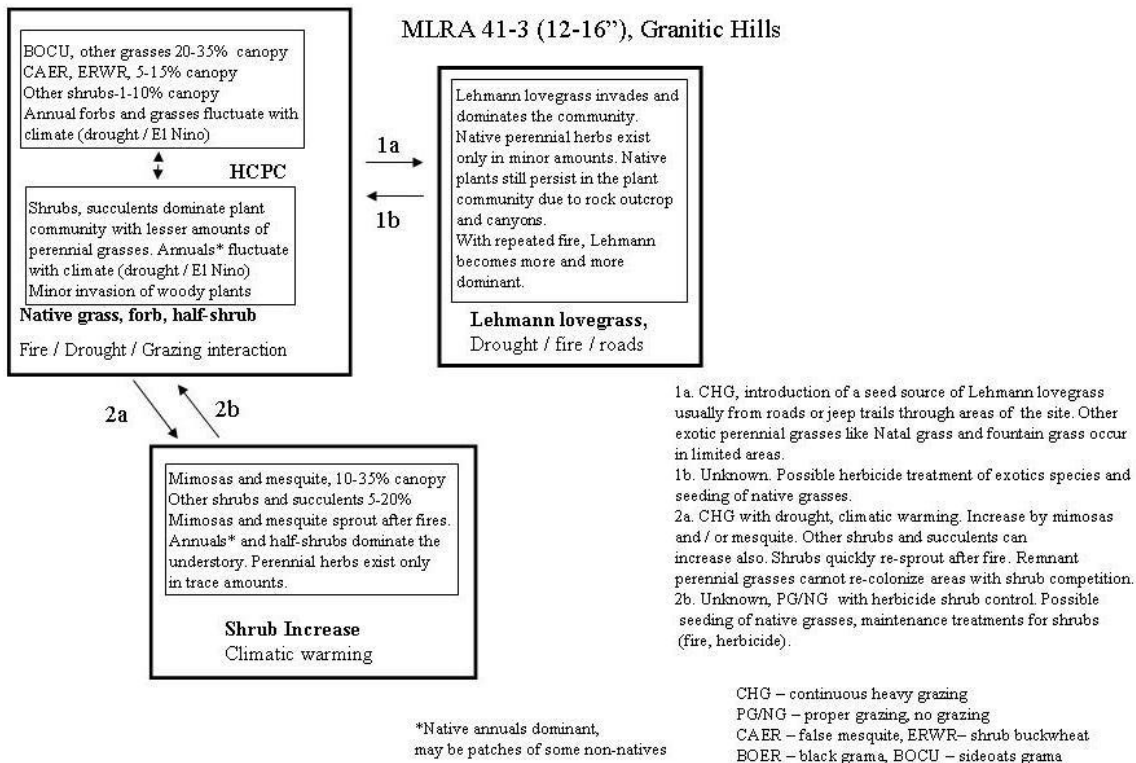


Conclusion:

The data at the trend plots show that cover and litter is adequate to ensure soil stabilization and appropriate permeability rates within the ecological site. The ESDs describe the ecological dynamics of the Sites on the allotment as plant communities that are “naturally variable” (NRCS 2013). These variations occur due to site aspect, soils, and other natural conditions. The ESD for ARI-1 describes the state and transition model of the vegetative community as a Lehmann invaded state: “Lehmann lovegrass has invaded, usually from a seed source associated with roads and jeep trails running though the site. The invasion is slow until the area burns; then Lehmann lovegrass can rapidly assume dominance of the plant community...” The key area reflects this description of the ecological site. In absence of invasive Lehmann’s lovegrass (as is the case at ARI-SDT), the ESD describes the Historic Climax Plant Community (HCPC) as follows: “The potential plant community on this site is dominated by warm season perennial grasses. Several species of low shrubs are well represented on the site, but the aspect is grassland dotted with shrubs and cacti. Larger species of shrubs are concentrated at the edges of rock outcrop areas and in canyon bottoms. Most of the grass and low shrub species are well dispersed throughout the plant community.” The state and transition model shows abundance of sideoats grama (*Bouteloua curtipendula*), other grasses, fairyduster (*Calliandra eriophylla*), shrubby buckwheat (*Eriogonum wrightii*), other shrubs, annual grasses, and annual forbs fluctuating with shrub and succulent dominance according to wildfire, drought, and grazing interaction.

Overall throughout the allotment the soils are productive, stable and in a sustainable condition. There were no rills/gullies present at the ecological site, pedestals and/or terracettes were not observed. Wind-scouring and litter movement were none to slight. The allotment is within the variability of the state and transition models as delineated in the ecological site descriptions. (Figure 15).

Figure 15. State and transition model for Granitic Hills



7.3.2.2 Standard 2: Riparian-Wetland Sites

Not Applicable to Arivaca allotment

7.3.2.3 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

Evaluation: In general, the composition, structure and distributions of plant communities are present as described within the ESDs for a state and transition of “Lehmann Invaded State” throughout a majority of the allotment. The current vegetative composition of both perennial and annual native and non-native species within the allotment is acceptable for the range site and is conducive to meet the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and other applicable laws, regulations, and policies. The standard and guideline has an exception for this standard which states that “Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical.” This exception applies to key area ARI-1.

ARI-1

The vegetative community at ARI-1 represents the composition, structure, and distribution of the state called “Lehmann invaded state” (Table 18). The ESD describes this transition model as “This state occurs where Lehmann lovegrass has invaded, usually from a seed source associated with roads and jeep trails running though the site. The invasion is slow until the area burns; then Lehmann lovegrass can rapidly assume dominance of the plant community.” The data collected at the site reflects what is described within the community of the ESD. Figure 16 shows the species composition on ARI-1 and the dominance of Lehman Lovegrass. Table 17 specifically list the species that occurred within each transect. Table 19 is an ocular inventory of the study area with professional estimations of plant dominance within the population. The data indicates that the allotment has a moderate deviation from a HCPC community but is within the ESD framework of maintaining a functional, viable ecosystem for multiple users.

Table 19. A comparison between the state and transition model in the ESD and the LPI data collected in January 2013 at ARI-1.

State in Transition of Lehmann lovegrass invaded Site as described by the ESD	LPI Data ARI-1 Canopy Cover
Lehmann lovegrass invades and dominates the community. Native perennial herbs exist only on minor amounts. Native only in minor amounts. Native plants still persist in the plant community due to rock outcrop and canyons. With repeated fires, Lehmann lovegrass becomes more and more dominant.	Lehman’s lovegrass – 76%
Native grasses	Sideoats grama– 2% Sprucetop grama – 1% Bush muhly – 3%
Native shrubs	Fairyduster – 14% Catclaw acacia – 1% Ocotillo – 4%
Annual forbs and grasses fluctuate with climate	Annual forbs – 1%

State in Transition of Lehmann lovegrass invaded Site as described by the ESD	LPI Data ARI-1 Canopy Cover
(Drought/El Nino)	

Figure 16. Species Composition at Key Area ARI-1

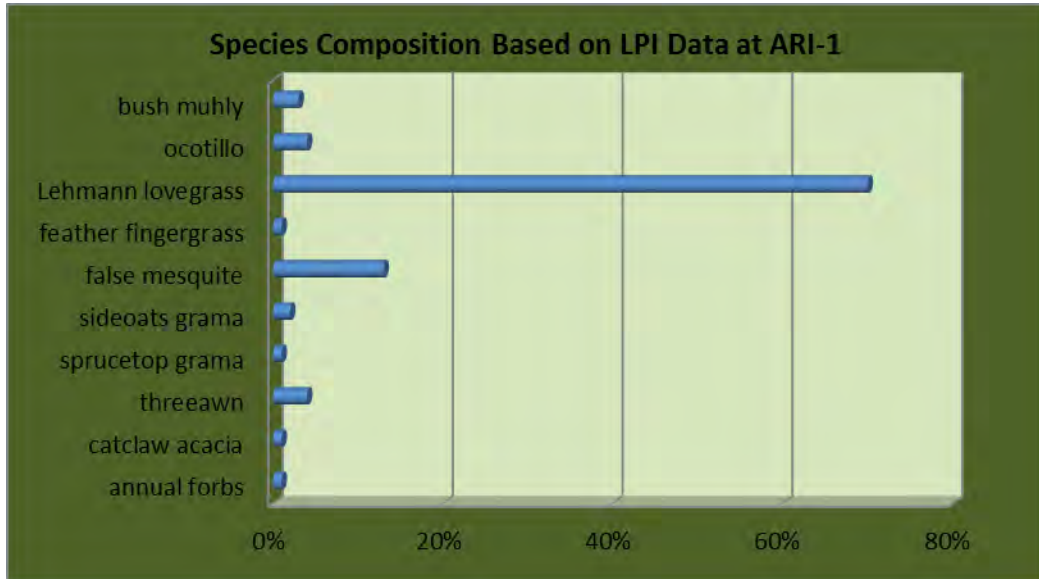


Table 19. Functional/structural plant groups at ARI-1

Ranking	Species List for Functional/Structural Groups at ARI-1
D	Lehmann’s Lovegrass (<i>Eragrostis lehmanniana</i>)
S	Velvet Mesquite (<i>Prosopis velutina</i>)
S	Ocotillo (<i>Fouquieria splendens</i>)
M	Three awn (<i>Aristida sp.</i>)
M	Fairyduster (<i>Calliandra eriophylla</i>)
M	Bush muhly (<i>Muhlenbergia porter</i>)
M	Feather fingergrass (<i>Chloris virgate</i>)
T	Arizona Passion Flower (<i>Passiflora arizonica</i>)
T	Catclaw Acacia (<i>Acacia greggii</i>)
T	Sideoats grama (<i>Bouteloua curtipendula</i>)
T	Sprucetop grama (<i>Bouteloua chondrosioides</i>)
M	Annual Forbs
	Dominant (D) roughly 40-100% composition, Sub-dominant (S) roughly 10-40% composition, Minor Composition (M) roughly 2-5% composition, or Trace (T) roughly <2% composition.

ARI-SDT

The vegetative community at ARI-SDT represents the composition, structure (Table 20), and distribution of the state called HCPC, where “The potential plant community on this site is dominated by warm season perennial grasses. Several species of low shrubs are well represented on the site, but the aspect is grassland dotted with shrubs and cacti. Larger species of shrubs are concentrated at the edges of rock outcrop areas and in canyon bottoms. Most of the grass and low shrub species are well dispersed throughout the plant community.” The data collected at the site reflects what is described within the community of the ESD. Figure 16 specifically list the species that occurred within key area ARI-SDT. Figure 17 shows the species composition and the dominance of sideoats gramma. Table 21 is an ocular inventory of the study area with professional estimations of plant dominance within the population. The data indicates that the allotment is functioning within the parameters of a HCPC community.

Table 21. A comparison between the state and transition model in the ESD and the LPI data collected in March 2015 at Key Area ARI-SDT

State in Transition of a Native grass, forb, half shrub community	LPI Data ARI-SDT Canopy Cover
Sideoats grama, other grasses 20-35% canopy	Sideoats grama – 42% Sprucetop – 3% Black grama - 10% Arizona cottontop – 1% Spidergrass-10%
Fairyduster, Shrubby buckwheat 5-15% canopy	Fairyduster –10%
Other shrubs 1-10% canopy	Range Ratany – 3% Velvet mesquite – 2%
Annual forbs and grasses fluctuate with climate (Drought/EI Nino)	Annual/perennial forbs – 2%

Figure 17. Species Composition at Key Area for Sonoran Desert Tortoise (SDT).

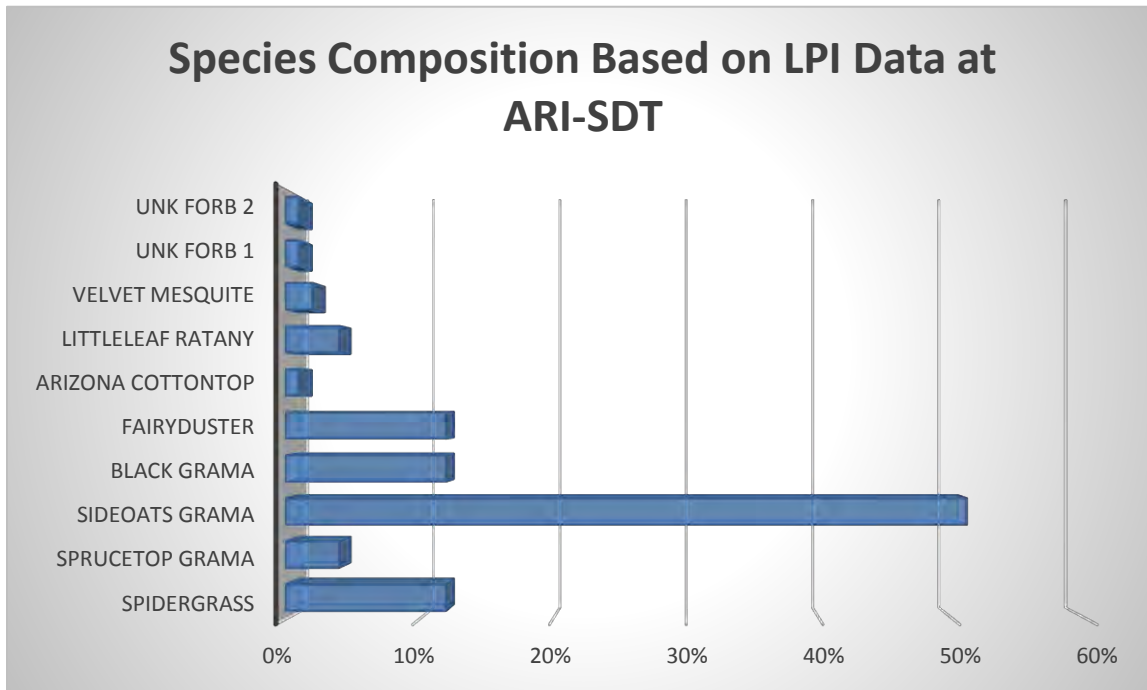


Table 22. Functional/structural plant groups at ARI-SDT

Ranking	Species List for Functional/Structural Groups at ARI-SDT
D	Lehmann's lovegrass (<i>Eragrostis lehmanniana</i>)
S	Velvet mesquite (<i>Prosopis velutina</i>)
S	Ocotillo (<i>Fouquieria splendens</i>)
M	Three Awn (<i>Aristida</i> sp.)
M	Fairyduster (<i>Calliandra eriophylla</i>)
M	Bush muhly (<i>Muhlenbergia porter</i>)
M	Feather fingergrass (<i>Chloris virgate</i>)
T	Arizona passion flower (<i>Passiflora arizonica</i>)
T	Catclaw acacia (<i>Acacia greggii</i>)
T	Sideoats grama (<i>Bouteloua curtipendula</i>)
T	Sprucetop grama (<i>Bouteloua chondrosioides</i>)
M	Annual Forbs

Conclusions:

Key Area ARI-1

- Maintain Grasses/Grasslike plants composition of $\geq 50\%$ ACHIEVED
- Maintain a palatable shrub composition of $\geq 10\%$ ACHIEVED
- Maintain vegetative foliar cover at $\geq 20\%$ ACHIEVED

Rationale: The grass composition objective is being met at ARI-1. The most current long-term monitoring data shows composition of grasses palatable to Sonoran desert tortoise (Van Devender, et al. 2002) (Ofstedal 2002) is 87 percent. Palatable shrub composition on the site is met for Sonoran desert tortoise with palatable browse (Van Devender, et al. 2002; Ofstedal 2002) comprising 14 percent of the plant community. Palatable shrub (Krausman et al. 1997, Heffelfinger et.al. 2006) availability is above the DPC objectives for mule deer, comprising 19 percent of the plant community (Table 3: Fairyduster, Catclaw acacia). The vegetative foliar cover objective is being met at this site, with foliar cover of 97 percent. Utilization data on ARI-1 shows no (0 percent) livestock use.

Key Area ARI-SDT

- Maintain Grasses/Grasslike plants composition of $\geq 50\%$ ACHIEVED
- Maintain a palatable shrub composition of $\geq 10\%$ ACHIEVED
- Maintain vegetative foliar cover at $\geq 20\%$ ACHIEVED

Rationale: The grass composition objective is being met at this ARI-SDT. The most current long-term monitoring data shows a perennial grass composition of 56 percent, dominated by palatable native species. Palatable shrub composition on the site is met with palatable browse for both Sonoran desert tortoise and mule deer (Van Devender, et al. 2002; Ofstedal 2002; Krausman et al. 1997; Heffelfinger et al. 2006) comprising 13 percent of the plant community (Table 7: Fairyduster (*Calliandra eriophylla*), Range ratany (*Krameria erecta*). The vegetative foliar cover objective is being met at this site, with foliar cover of 70 percent. Utilization data on ARI-SDT shows 0 to 10 percent use.

8 CONCLUSIONS

8.1 Determination of Land Health Standards

8.1.1.1.1 Standard 1: Upland Sites

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

Determination:

- Meeting the Standard
- Not Meeting the Standard, but making significant progress towards standard
- Not Meeting the Standard, not making significant progress toward standard

Conclusion: (Standard Achieved)

Rationale: Overall, the soil on the allotment is stable. The allotment exhibits biotic integrity, and it is in a productive and sustainable condition. Currently, soil loss or degradation is not occurring. Perennial, native grasses and shrubs are very effective at holding soil cover due to their basal area and their fine fibrous root systems. These grasses and shrubs contribute organic matter directly into the soil and help build stable soil aggregates. In addition the plant and litter cover provide protection against wind erosion, and it increases infiltration and decreases runoff.

8.1.1.1.2 Standard 2: Riparian-Wetland Sites

Objective: Riparian-wetland areas are in proper functioning condition.

Determination:

- Meeting the Standard
- Not Meeting the Standard; Making Significant Progress Toward Standard
- Not Meeting the Standard; Not Making Significant Progress Toward Standard
- Standard Does Not Apply

Rationale: There are no wetland-riparian sites within the Arivaca allotment.

8.1.1.1.3 Standard 3: Desired Resource Condition

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

Determination:

- Meeting the Standard
- Not Meeting the Standard, but making significant progress towards standard

Not Meeting the Standard, not making significant progress toward standard

Conclusion: (Standard Achieved)

Rationale: The current vegetative composition of species within the allotment is in an invaded Lehmann lovegrass state and transition. This state within the allotment falls under the exemption granted under the standard and guideline which reads "Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical." This describes the current condition for which this allotment falls under. However, even though the allotment is being dominated by an invasive perennial grass it is still conducive to meet the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and other applicable laws, regulations, and policies that support a productive and a diverse biotic community. The frequency of desirable native primary grammanoids is less than what is recommended in the ESD for a HCPC state. The desired native species occur within the allotment and occurred within the transects though at a reduced frequency.

9 RECOMMENDED MANAGEMENT ACTIONS

Based on existing information there are no resource concerns related to current livestock use that should be considered before lease issuance. Therefore, the 10-year grazing lease may be renewed with the following existing terms and conditions:

9.1.1 Proposed Terms and Conditions:

Terms:

Allotment	Livestock # and Kind	Grazing Period of Use	Percent Public Land	AUMs	Type Use
Arivaca	27 Cattle	3/1 to 2/28	100	324	Active

Conditions:

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. Repeated willful unauthorized grazing use.
 - f. 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 permittee's/lessees 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 a part of the grazing permit or lease. Grazing use cannot be authorized during any period of delinquency in the payment of amounts due, 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 there from; 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. The operator is responsible for informing all persons who are associated with the allotment operations that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. Any cultural (historic/prehistoric site or object) or paleontological resource (fossil remains of plants or animals) discovered during operations shall be immediately reported to the Authorized Officer (AO) or his/her designee. All operations in the immediate area of the discovery shall be suspended until written authorization to proceed is issued. An evaluation of the discovery shall be made by a qualified archaeologist or paleontologist to determine appropriate actions to prevent the loss of significant cultural or scientifically important values.

If in connection with this work 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, operations in the immediate area of the discovery shall cease, the remains and objects shall be protected, and the operator shall immediately notify the BLMTFO. The immediate area of the discovery shall be protected until notified by the BLMTFO Manager that operations may resume.

10 LIST OF PREPARERS

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11 AUTHORIZED OFFICER CONCURRENCE

I have reviewed the determinations presented in Section 8 Determinations of Land Health Standards and the grazing and other management actions identified in Section 9 Recommended Management Actions.

I concur with the determinations and recommendations as written.

I do not concur.

I concur, but with the following modifications:

 /s/

Melissa Warren

Field Office Manager

BLM Tucson Field Office

 5/25/17

Date

12 REFERENCES

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