United States Department of the Interior

Bureau of Land Management

Land Health Evaluation

Indian Camp Lease No. 6042

September 2017

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BLM

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1 INTRODUCTION

The purpose of this draft Land Health Evaluation (LHE) report for the Indian Camp 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 land health 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.

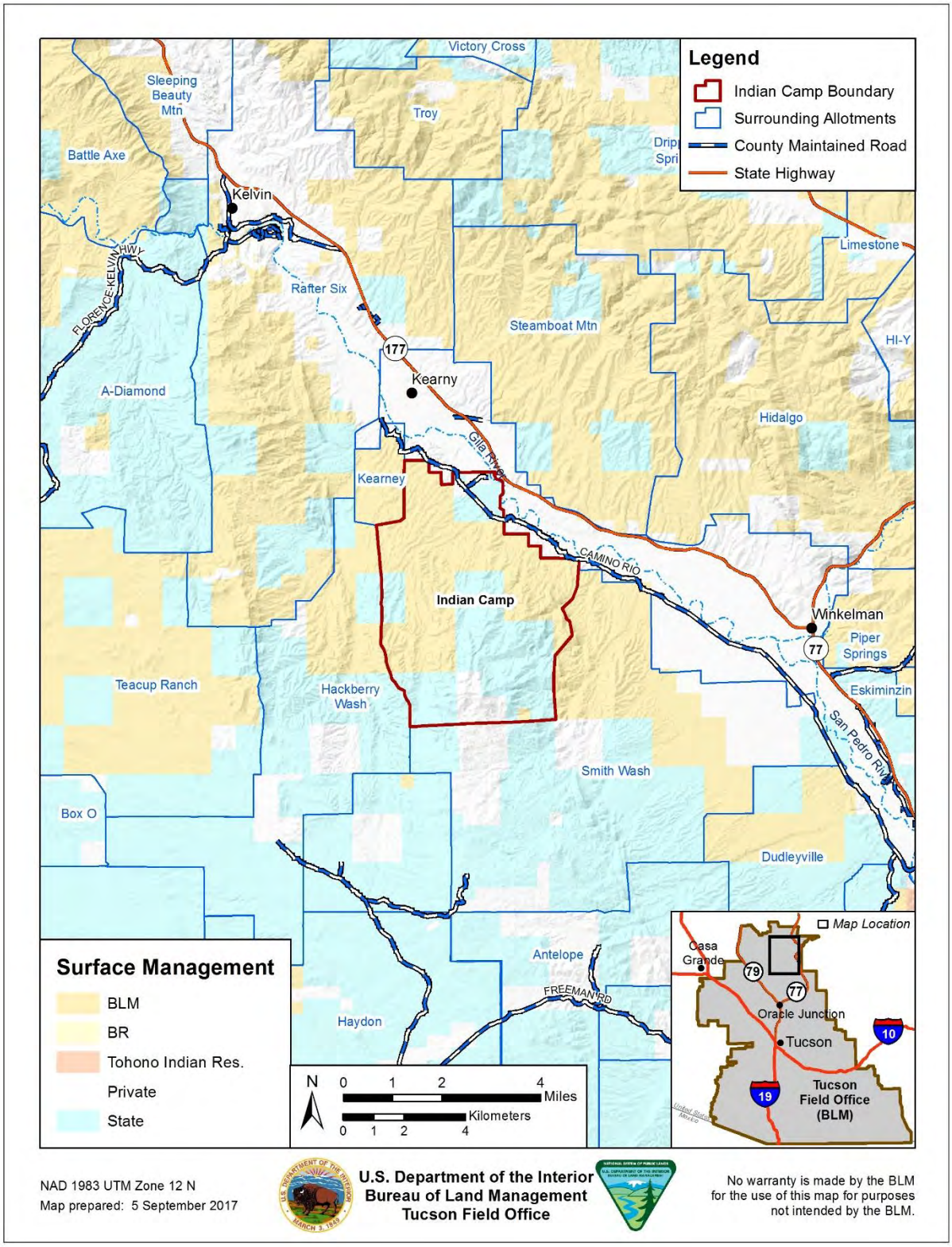
If it is ascertained that Standards are not being achieved, to determine whether livestock grazing is a significant factor causing that non-achievement.

2 ALLOTMENT PROFILE

2.1 Location

The BLM portion of the Indian Camp allotment is located about 2 miles south of the town of Kearny in Pinal County, Arizona. The BLM lands within the allotment comprise approximately 52 percent of the total acres used for the livestock operation. The ranch borders the Kearny allotment to the north, the Smith Wash allotment to the East and south, and the Hackberry Wash allotment to the south. Figure 1 below shows the Indian Camp allotment location.

Figure 1. Vicinity Map of the Indian Camp Allotment



2.2 Physical Description

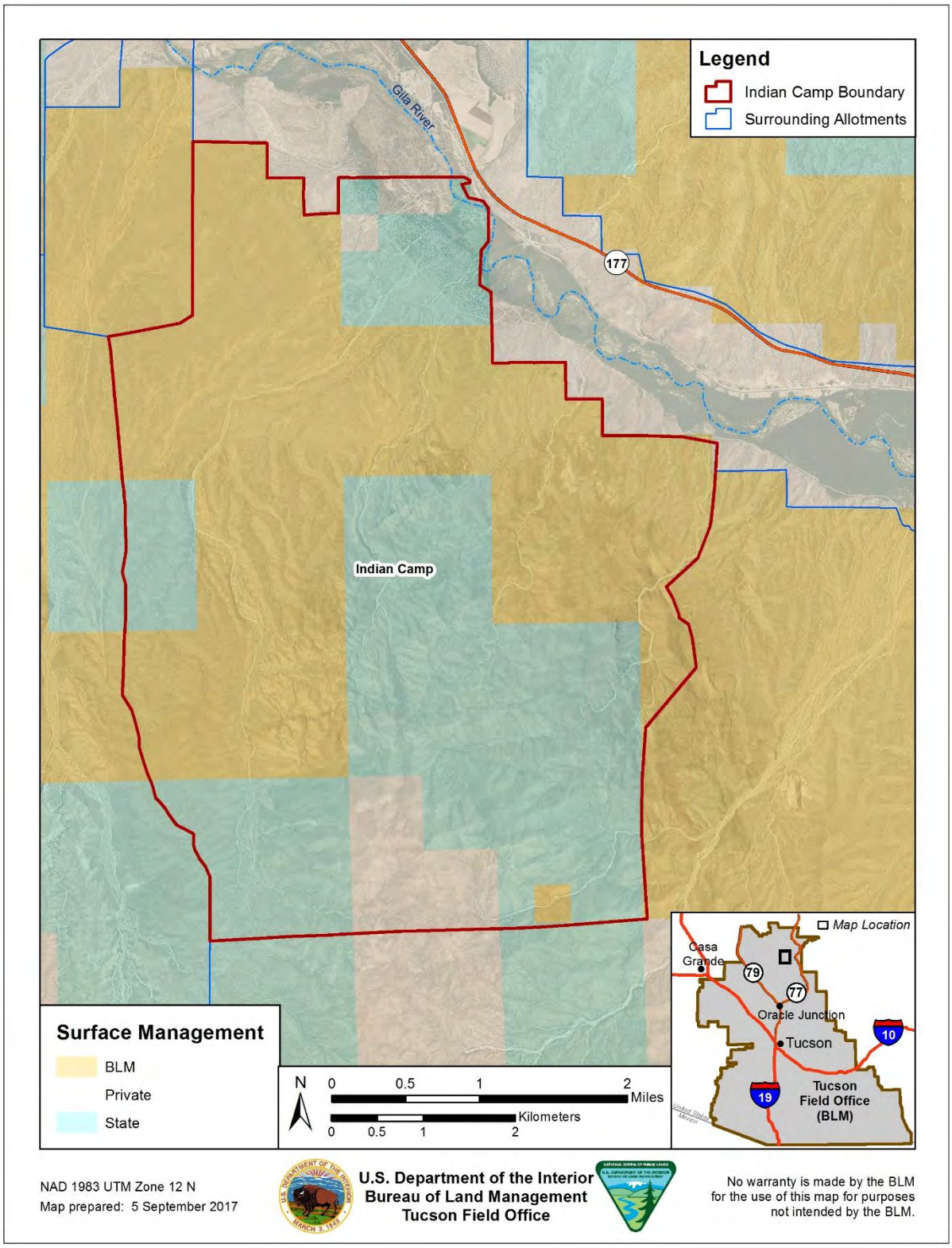
2.2.1 Acreage

The acreage of the Indian Camp allotment is detailed below (Table 1). The BLM lands comprise just over half of the allotment and State Land acres slightly less than half. The ownership pattern is mixed and the majority of the allotment is run as a single pasture with no fence lines separating between land ownership. Public lands constitute about 52 percent of the allotment. Spatial distributions of land ownership are displayed in Figure 2.

Table 1. Acreage of Landownership

Land Classification	Indian Camp Allotment
Public Acres	5,400
State Acres	4,249
Private Land Acres	638
Bureau of Reclamation	35
Total Acres	**10,323**

Figure 2. Land Ownership of the Indian Camp Allotment



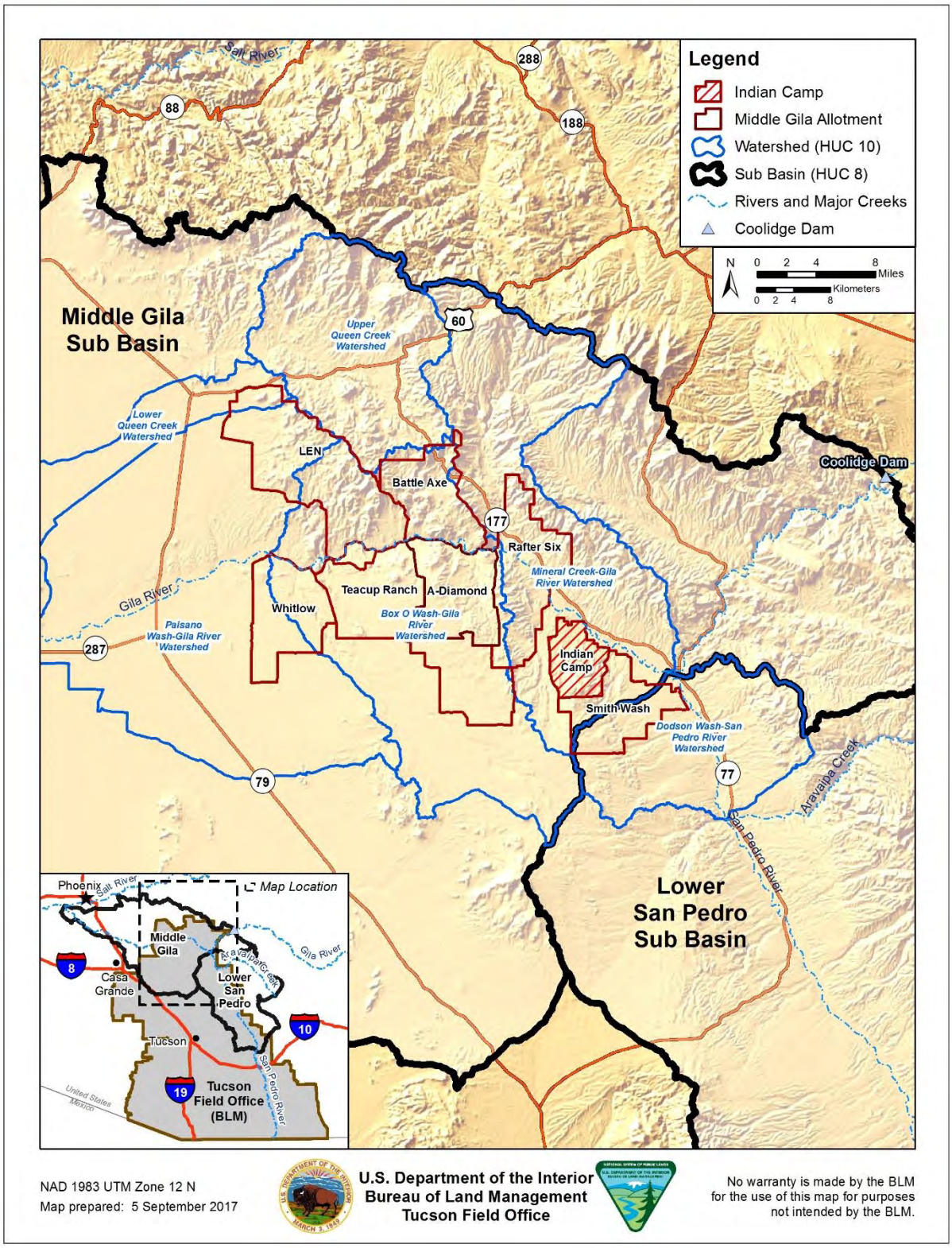
2.2.2 Watershed

The Indian Camp allotment is located just west of the confluence of the Gila River and the San Pedro River and lies within the Middle Gila HUC-8 Sub Basins (Figure 3).

The Middle Gila Sub basin encompasses an area of over 2 million acres surrounding the Gila River from below Coolidge Dam to the Salt River confluence, including the confluence with the San Pedro River to the South. Within this sub basin, the Indian Camp allotment is included in the smaller Mineral Creek – Gila River Watershed (HUC-10), which has a drainage area of approximately 165,710 acres.

According to the USGS National Elevation Dataset, the Indian Camp allotment ranges in elevation from 1,800 to 4,200 feet, with an average elevation of 2,750 feet. Its slope varies from 0 to 73%, with an average slope of 34%. Additional information about watershed characteristics is located in Section 2.3.1.

Figure 3. Map of watersheds associated with Indian Camp



2.2.3 Soils

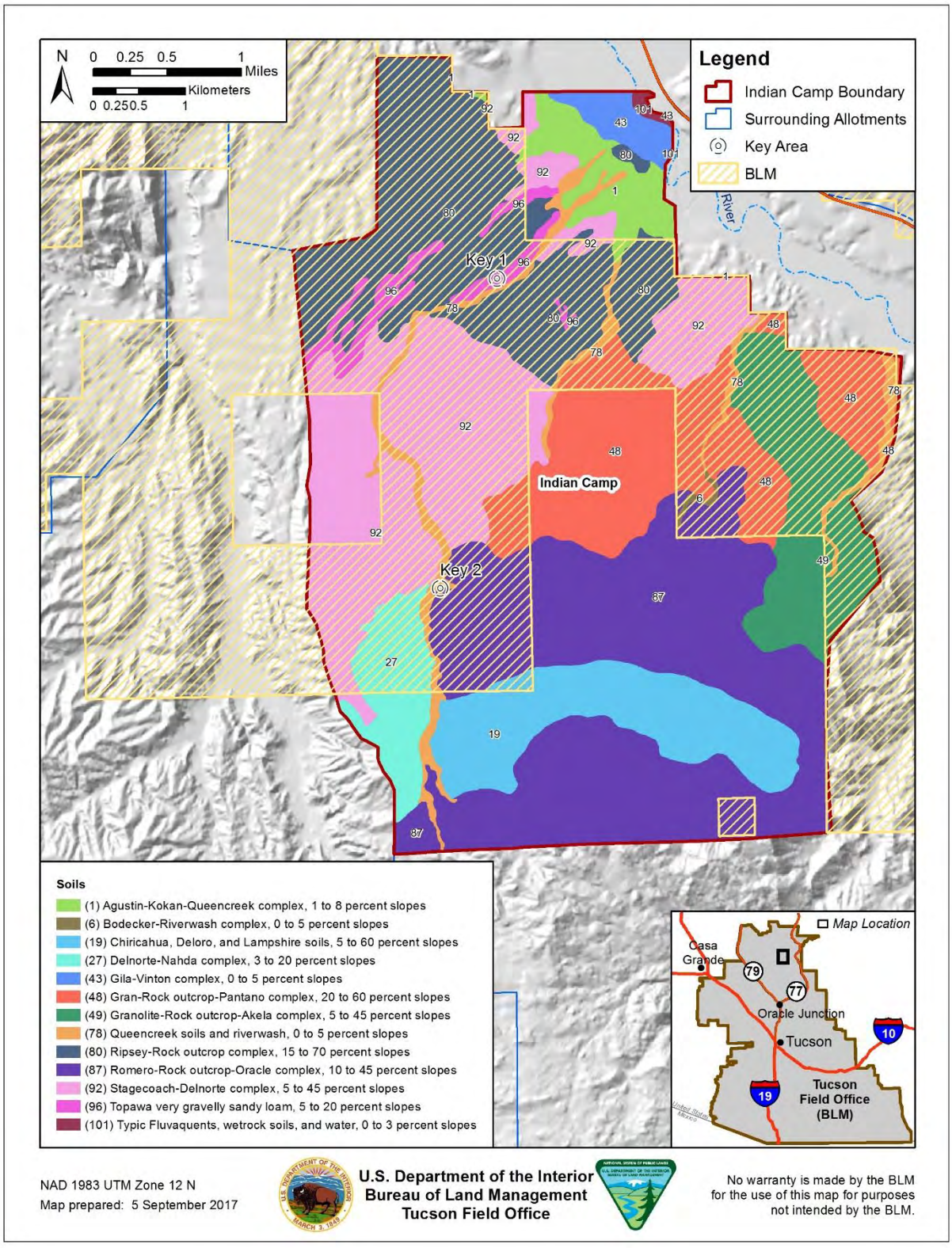
The soil composition on the Indian Camp allotment is varied as presented in Table 2 and Figure 4. The dominant soil orders in this Major Land Resource Area (MLRA) (see section 3.3.1) are Aridisols and Entisols. The soils in the area have a dominantly thermic or hyperthermic soil temperature regime, an aridic 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. Haplocambids (Denure and Hayhook series), Haplocalcids (Gunsight and Stagecoach series), Calciargids (Mohall and Pinaleno series), and Natrargids (Casa Grande series) formed on fan terraces and relict basin floors. Torrifluvents (Antho and Comoro series) formed on alluvial fans and flood plains. Shallow or very shallow Torriorthents (Cellar and Quilotosa series) formed on hills and mountains.

The specific soils on the Indian Camp allotment are shown in the table below. The dominant soils are Romero-Rock outcrop-Oracle complex, 10 to 45 percent slopes and Tubac-Rillino complex, 3 to 25 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 Indian Camp Allotment

Map Unit Symbol	Map Unit Name	Acres in Allotment	Percent of Allotment Acres
1	Agustin-Kokan-Queencreek complex, 1 to 8 percent slopes	38.5	0.2%
6	Bodecker-Riverwash complex, 0 to 5 percent slopes	225.7	1.5%
8	Brunkcow-Chiricahua complex, 10 to 60 percent slopes	455.1	2.9%
19	Chiricahua, Deloro, and Lampshire soils, 5 to 60 percent slopes	793.7	5.1%
27	Delnorte-Nahda complex, 3 to 20 percent slopes	613.7	4.0%
40	Fig family-Topock complex, 5 to 50 percent slopes	228.0	1.5%
48	Gran-Rock outcrop-Pantano complex, 20 to 60 percent slopes	2,805.5	18.1%
49	Granolite-Rock outcrop-Akela complex, 5 to 45 percent slopes	714.0	4.6%
78	Queencreek soils and riverwash, 0 to 5 percent slopes	515.7	2.8%
80	Ripsey-Rock outcrop complex, 15 to 70 percent slopes	2,512.0	16.2%
81	Rock outcrop-Garzona family complex, 15 to 70 percent slopes	471.1	3.0%
87	Romero-Rock outcrop-Oracle complex, 10 to 45 percent slopes	2,288.5	14.8%
92	Stagecoach-Delnorte complex, 5 to 45 percent slopes	2,269.2	14.6%
96	Topawa very gravelly sandy loam, 5 to 20 percent slopes	1,248.9	8.1%
Totals for Allotment		15,493.5	100.0%

Figure 4. Map of Soil Types within the Indian Camp 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 Indian Camp allotment is located in MLRA 40—Sonoran Basin and Range. This area is almost entirely in Arizona, but it includes a very small part of California. It makes up about 31,765 square miles.

Most of this area is in the Sonoran Desert Section of the Basin and Range Province of the Intermontane Plateaus. Many short, fault-block mountain ranges trending southeast to northwest rise abruptly from the smooth or gently sloping desert valley floors. These include the Painted Rock, Gila Bend, Big Horn, Copper, Granite, and Santa Rosa Mountains. Elevation ranges from 980 to 3,600 feet (300 to 1,100 meters) in most of this area. The Gila River then flows west across the southern part of the MLRA to the Colorado River.

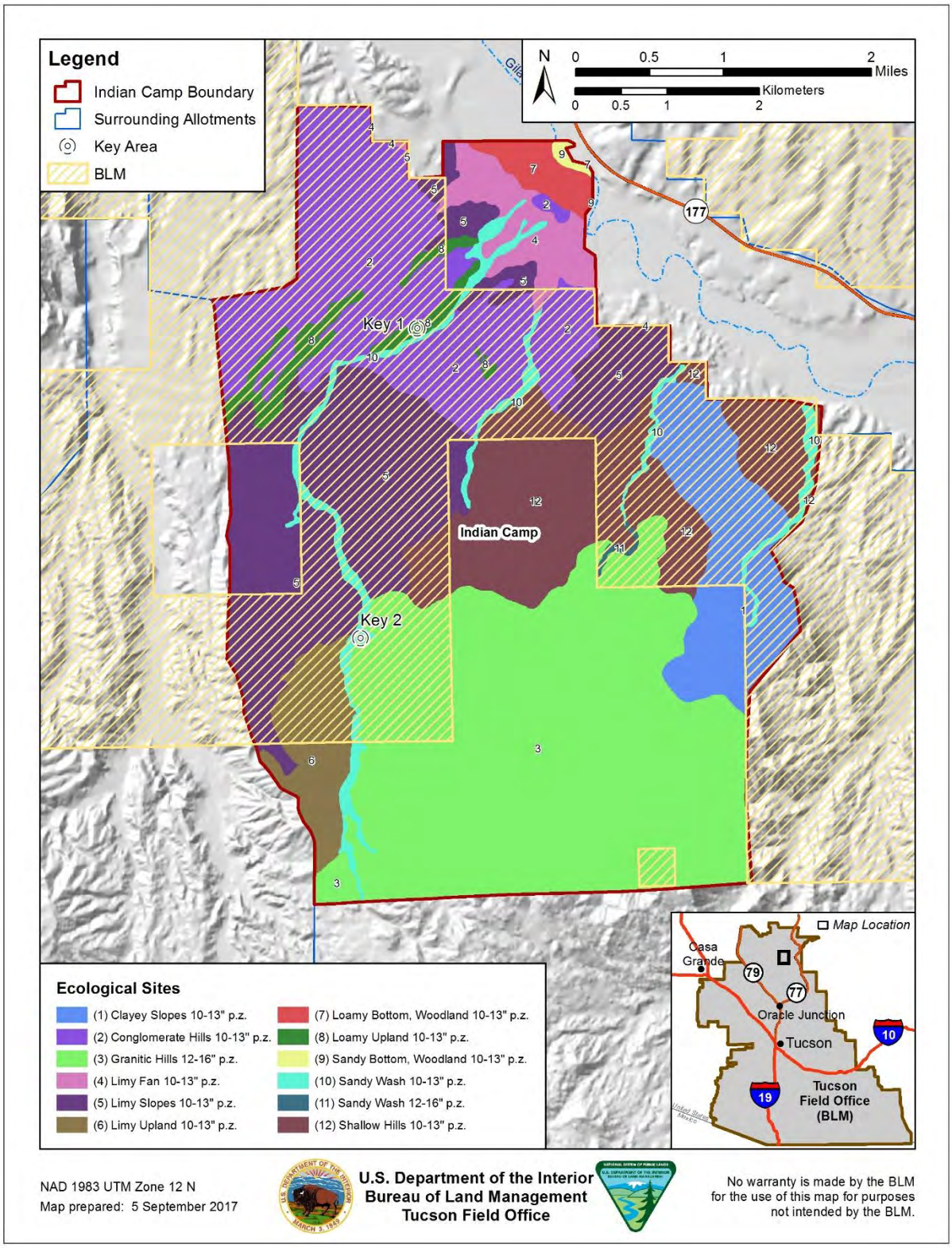
Major Land Resource Areas are broken down further into ecological sites, which are associated units of soil and vegetation with quantifiable characteristics.

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 Indian Camp allotment. Two key areas, Key-1 and Key-2, have been established on BLM public lands. Key-1 is within Conglomerate Hills 10-13" precipitation zone (p.z) and Key-2 is within the Sandy Wash 10-13" p.z. ecological site, which are the primary ecological sites within the BLM lands in the allotment (Figure 5). Key Area Key-1 and Key-2 were established by the BLM and University of Arizona Extension, and line intercept data is collected to be able to track any changes in long-term trend of vegetation and ground cover. Key-1 is also the location where the U.S. Forest Service Strike Team, referred to as TEAMs documented the 2013 LHE and collected line-point intercept data.

Figure 5. Ecological Sites within Indian Camp Allotment



The ecological site for key area Key-1 is Conglomerate Hills 10-13" precipitation zone (R040XA128AZ). Key vegetative species for this site include: foothill palo verde (P*arkinsonia microphylla*), whitethorn acacia (*Acacia constricta*), creosote bush *(Larrea tridentate*) and purple three awn (A*ristida purpurea*). This site occurs in the upper elevations of the Sonoran Desert in southern Arizona. Slope aspect is site differentiating at elevations near common resource area boundaries. It occurs on steep hill-slopes and ridge-tops. 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 is a diverse mixture of desert shrubs, trees, cacti, and perennial grasses and forbs. The aspect is shrubland. Cool and warm season annual forbs and grasses can be common in their respective seasons with above average rainfall. Perennial forage species can remain green throughout the year with available moisture.

The ecological site for key area Key-2 is Sandy Wash 10-13” precipitation zone (R040XA115AZ). Key vegetative species for this site include: blue palo verde (P*arkinsonia florida*), velvet mesquite (*Prosopis velutina*), canyon ragweed (*Ambrosia ambrosioides*), bush muhly (*Muhlenbergia porter*) and desert globemallow (*Sphaeralcea ambigua*). This site occurs in the upper elevations of the Sonoran Desert in southern Arizona. This site benefits on a regular basis from extra moisture received as over bank flooding and/or runoff from adjacent upland sites. It occurs on flood plains and low stream terraces. The potential plant community is a diverse mixture of desert trees, shrubs, vines, grasses, and forbs. Major species are well dispersed throughout the plant community. The aspect is shrubland. Cool and warm season annual forbs and grasses can be common in their respective seasons with above average rainfall. Perennial forage species can remain green throughout the year with available moisture.

2.3.3 Climate Data for Ecological Site

Climate data comes from the Conglomerate Hills 10-13” precipitation zone (p.z.) Ecological Site Description (ESD). Precipitation in this common resource area ranges from 10 to 13 inches yearly in the southern part, along the Mexican border with elevations from about 1900 to 3200 feet, and 11-14 inches in the northern part with elevations from about 1700 to 3500 feet. Winter-summer rainfall ratios range from 40-60 percent in the southern portions, 50 percent in the central portions and 40-60 percent in the northern part. 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. This winter precipitation falls in widespread storms with long duration and low intensity. Snow is rare and seldom lasts more than an hour or two. May and June are the driest months of the year. Humidity is generally very low. Winter temperatures are mild, with very few days recording freezing temperatures in the morning. Summer temperatures are warm to hot, with several days in June and July exceeding 105 °F. Both the spring and the summer growing seasons are equally important for perennial grass, forb and shrub growth. Cool and warm season annual forbs and grasses can be common in their respective seasons with above average rainfall. Perennial forage species can remain green throughout the year with available moisture. Climate stations for the average precipitation and temperature tables below are: 020287, Anvil Ranch, Period of record 1948-2005, 021282 Carefree, Period of Record 1962-2005, 025700 Mormon Flat, Period of Record 1923-2005, 028214 Stewart Mtn., Period of Record 1948-2005, 028815 Tucson, Univ. of Arizona, Period of Record 1894-2005.

Table 3. Precipitation and Temperature for Ecological Site

Averaged	
Frost-free period (days):	227
Freeze-free period (days):	0
Mean annual precipitation (inches):	13.00

Monthly Precipitation (Inches):												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High	1.60	1.34	1.55	0.51	0.21	0.27	2.02	2.16	1.16	1.02	1.04	1.42
Low	0.89	0.85	0.76	0.39	0.18	0.15	1.23	1.65	0.95	0.75	0.77	0.97

Monthly Temperature (°F):													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Dec
High	63.5	66.6	71.6	79.6	90.0	98.3	101.7	99.9	94.7	84.1	71.1	62.8	48.3
Low	37.6	40.1	44.0	49.8	57.5	66.8	73.9	72.4	66.9	54.8	43.8	38.1	47.1

2.3.4 Vegetation Communities

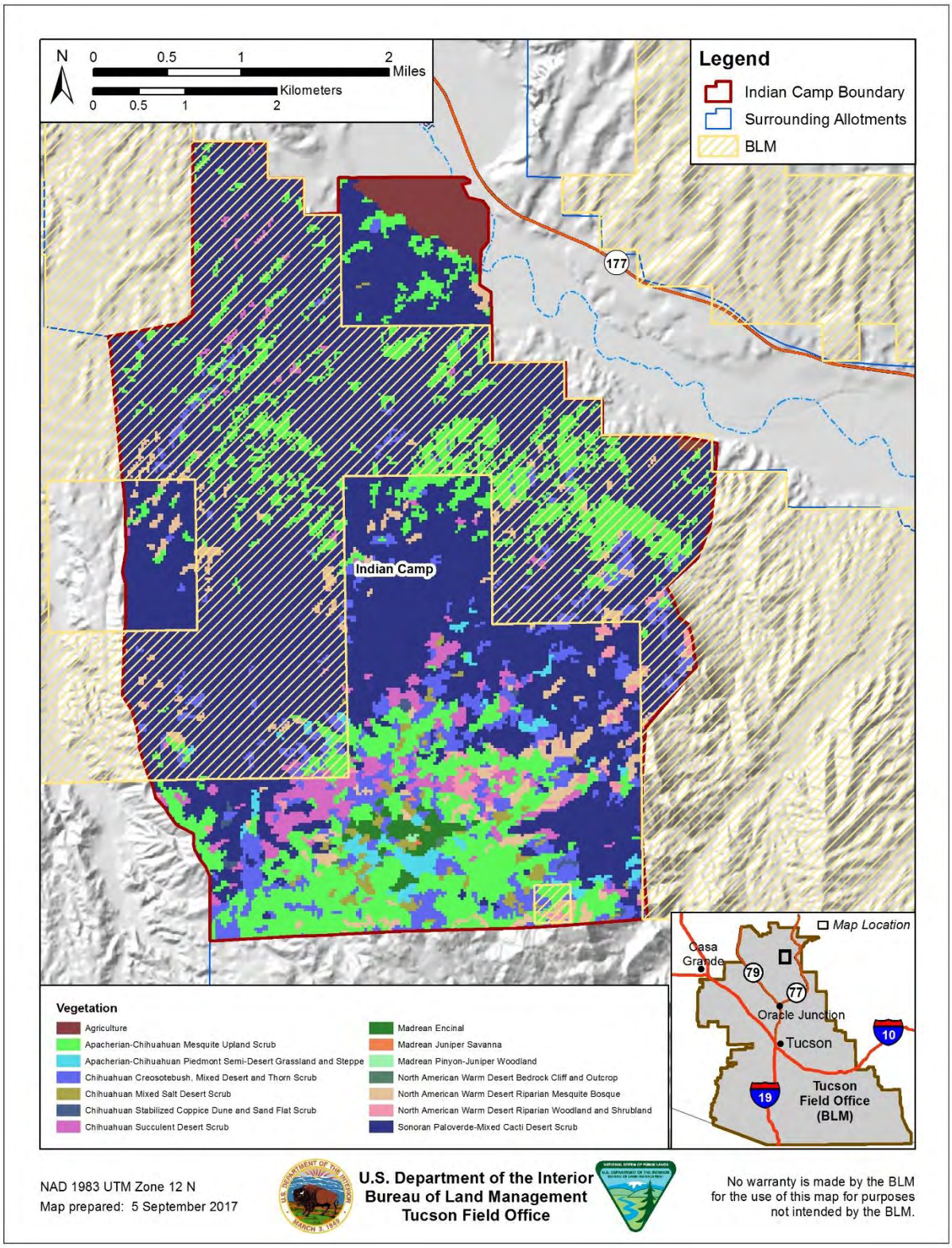
The MLRA supports desert shrub vegetation. The giant saguaro cactus is a dominant species. Bursage, desert wolfberry, ocotillo, cholla, desert saltbush, mesquite, brittlebush, burroweed, prickly pear, desert broom, and creosote bush are the dominant desert shrubs. Bush muhly, Arizona cottontop, three awns, and fluffgrass are the main understory plants. Winter annuals can grow in some areas, depending on the amount of winter precipitation. Joshua-tree and little leaf palo verde mixed with some honey mesquite are on stony or rocky sites. These sites have an understory of Mormon tea, prickly pear, cholla, ocotillo, desert saltbush, and grasses, such as tridens, bush muhly, tobosa, Arizona cottontop, and desert needle grass. At the lower elevations, creosote bush, ironwood, mesquite, burroweed, and catclaw are associated with an understory of three awns and annuals, such as red fescue, bluegrasses, fiddleneck, Indian wheat, globe mallow, and filaree. Figure 6 below shows the vegetation community types within the Indian Camp allotment.

Table 4. Vegetation Communities Found Within the Indian Camp Allotment

Vegetation Type	Acres on Allotment	Percent of Acres
Apacherian-Chihuahuan Mesquite Upland Scrub	1,823.93	17.66%
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	118.98	1.15%
Chihuahuan Creosote bush, Mixed Desert and Thorn Scrub	726.79	7.04%
Chihuahuan Mixed Salt Desert Scrub	102.75	1.00%

Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	16.90	0.16%
Chihuahuan Succulent Desert Scrub	297.34	2.88%
Madrean Encinal	77.84	0.75%
Madrean Juniper Savanna	2.00	0.02%
Madrean Pinyon-Juniper Woodland	2.22	0.02%
North American Warm Desert Bedrock Cliff and Outcrop	4.89	0.05%
North American Warm Desert Riparian Mesquite Bosque	342.27	3.32%
North American Warm Desert Riparian Woodland and Shrubland	73.39	0.71%
Sonoran Paloverde-Mixed Cacti Desert Scrub	6,539.74	63.34
Agriculture	195.93	1.90%
Total	10,324.68	-

Figure 6. Vegetation Communities within Indian Camp Allotment



2.3.5 General Wildlife Resources

Wildlife species composition expected to occur on this allotment is characteristic of the Sonoran Desert Section of the Basin and Range Province of the Intermontane Plateaus in Southeastern Arizona. Wildlife species expected to occur on this allotment include the following:

Mammals

- mule deer (Odocoileus hemionus),
- mountain lion (Puma concolur),
- javelina (Tayassu tajacu),
- coyote (Canis latrans),
- bobcat (Lynx rufus),
- raccoon (Procyon lotor),
- Stripped skunk (Mephitis mephitis),
- white-throated woodrat (Neotoma albigula),
- white-footed mouse(Peromyscus leucopus);

Birds

- Red-tailed hawk (Buteo jamaicensis),
- Cooper's hawk (Accipiter cooperii),
- Golden eagle (Aquila chrysaetos),
- Prairie falcon (Falco mexicanus),
- Raven (Corvus corax),
- Turkey vulture (Cathartes aura),
- Meadowlark (Sturnella neglecta),
- Ladder-back woodpecker (Dryobates scalaris),
- Ash-throated flycatcher (Myiarchus cinerascens),
- Canyon wren (Catherpes mexicanus),
- Rough-winged swallow (Stelgidopteryx serripennis);

Reptiles

- gopher snake(Pituophis catenifer),
- king snake (Lampropeltis getula),

- western diamondback rattlesnake (Crotalus atrox),
- prairie rattlesnake (Crotalus viridis) ,
- coachwhip (Coluber flagellum),
- patch-nosed snake (Salvadora hexalepis),
- tiger whiptail lizard (Aspidoscelis tigris),
- desert spiny lizard (Sceloporus magister),
- ornate tree lizard (Urosaurus ornatus),

Amphibians

- Mexican spadefoot (Spea multiplicata).

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 2017) website identified threatened, endangered and proposed (TEP) species that may occur within the allotment. Review of habitat requirements for each species was conducted to determine its potential to occur on the allotment. This review included looking at the characteristics of proposed and designated critical habitat for yellow-billed cuckoo and southwestern willow flycatcher. Critical habitat for yellow-billed cuckoo and southwestern willow flycatcher is not present on BLM lands within the Indian Camp allotment. A summary of the potential of occurrence for each species on the Indian Camp allotment is shown in Table 5 below.

Table 5. T&E Species for the Indian Camp Allotment as Indicated by 2017 USDI iPAC Analysis

Species	Habitat	Potential for Occurrence on Indian Camp allotments and Effects Determination
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 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 present. Forages at night on nectar, pollen, and fruit of paniculate agaves and columnar cacti. [5]	Forage species for Lesser Long Nosed Bat may occur on Indian Camp Allotment; however, forage availability to LLNB in the area will not be significantly reduced because of livestock grazing on the allotment, as LLNB are a mobile species, foraging up to 50 miles from roost sites. The nearest known maternity roost is more than 50 miles away.
Ocelot	Desert scrub communities in Arizona	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. One sightings was known from 30

Species	Habitat	Potential for Occurrence on Indian Camp allotments and Effects Determination
		miles away from the Indian Camp Allotment area.
Southwestern willow flycatcher	Nests in willows along streams and rivers, with nearby cottonwoods serving as foraging sites. Critical habitat designated on Gila River adjacent to public lands on Indian Camp allotment.	There is Southwestern willow flycatcher habitat on Gila River in vicinity of public lands of Indian Camp Allotment.
Yellow Billed Cuckoo	Nests in willows along streams and rivers, with nearby cottonwoods serving as foraging sites. Critical habitat designated on Gila River adjacent to public lands of Indian Camp allotment.	There is Yellow-billed Cuckoo habitat on Gila River in vicinity of public lands on Indian Camp Allotment.
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 ft. 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]	The northern Mexican gartersnake has likely been extirpated in the San Pedro River and middle Gila river, but the status of this gartersnake remains uncertain (USFWS 2013c). The Gila River and San Pedro River in the vicinity of the allotment support a large and widespread bullfrog population. In addition, the aquatic habitat is occupied by green sunfish, channels catfish, largemouth bass, and northern crayfish that prey on small snakes. As a result, this species either is extirpated from the area or survives at very low population levels.
Gila chub	Gila chub commonly inhabit pools in smaller streams, cienegas, and artificial impoundments ranging in elevation from 2,000 to 5,500 ft. Gila chub are highly secretive, preferring quiet deeper waters, especially pools, or remaining near cover including terrestrial vegetation, boulders, and fallen logs.	The Gila chub has likely been extirpated in the middle Gila river, but critical habitat is designated on Mineral Creek, which is a tributary to the Gila River approximately 10 miles upstream. The Gila River and San Pedro River in the vicinity of the allotment a large and supports a widespread bullfrog population. In addition, green sunfish, channels catfish, largemouth bass, and northern crayfish that prey on small fish occupy the aquatic habitat. As a result, this species either is extirpated from the area or survives at very low population levels.
Acuña Cactus	This species is found in valleys and on small knolls and gravel ridges of up to 30 percent slope in the Palo	Some potential for occurrence on allotment, though surveys have not been conducted. Nearest known population is about 12 miles away.

Species	Habitat	Potential for Occurrence on Indian Camp allotments and Effects Determination
	Verde-Saguaro Association of the Arizona Upland subdivision of the Sonoran Desert scrub at 365 to 1,150 m (1,198 to 3,773 ft.) in elevation.	

2.3.7 BLM Sensitive Species

The BLM sensitive species that have suitable habitat present and are known or have the potential to exist within this allotment are:

- Pima Indian Mallow (Abutilon parishii)
- Monarch Butterfly (Danaus plexippus plexippus)
- Sonoran Talussnail (Sonorella magdalenensis)
- Sonoran desert tortoise (Gopherus morafkai),
- Allen's Big-eared Bat (Idionycteris phyllotis)
- Arizona Myotis (Myotis occultus)
- spotted bat (Euderma maculatum),
- Townsend's big-eared bat (Corynorhinus townsendii),
- California leaf-nosed bat (Macrotus californicus),
- cave myotis (Myotis velifer),
- Greater western mastiff bat (Eumops perotis californicus),
- Mexican Long-tongued Bat (Choeronycteris mexicana)
- American peregrine falcon (Falco peregrinus),
- bald eagle (wintering) (Haliaeetus leucocephalus),
- desert purple martin (Progne subis hesperia),
- gilded flicker (Colaptes chrysoides),
- golden eagle (Aquila chrysaetos),

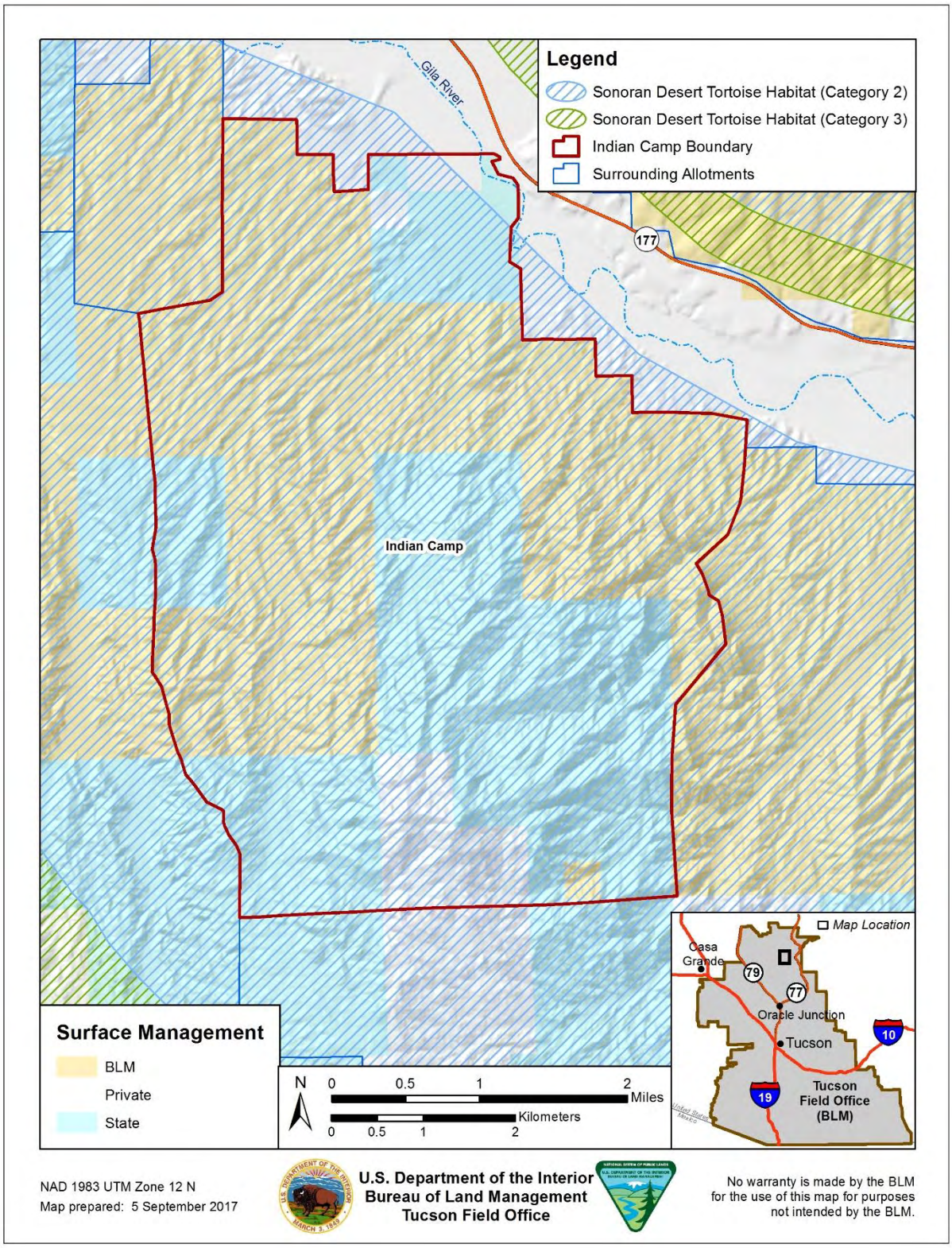
Sonoran desert tortoise occur most commonly on rocky, steep slopes and bajadas (lower mountain slopes) often formed by the coalescing of several alluvial fans and in paloverde-mixed cacti associations. Washes and valley bottoms may be used in dispersal. Sonoran desert tortoises in Arizona occur between 900 to 4,200 feet in elevation. This allotment contains category 2 Sonoran desert tortoise habitat totaling 10,244 acres, of which 5,400 acres overlap federal lands as shown in Figure 7 below. The tortoise

utilizes rugged uplands such as rocky bajadas, hillsides, mountain slopes, and canyons. The purpose of tortoise habitat categorization is to provide for the protection of tortoise habitat through the management of multiple uses to ensure that adequate forage, cover and space are available to tortoise throughout the year (USDI 1988).In order to monitor long-term condition and trend of wildlife habitats, particularly for Sonoran desert tortoise, key areas are established within mapped suitable tortoise habitat on the BLM lands of the allotment.

The bird species utilize the grasslands, upland saguaro-paloverde desert scrub, rocky and wooded hills, and cliff habitat for nesting and foraging. Some bird species utilize man-made water sources such as stock ponds where they occur in or near suitable habitats. No riparian habitat is present on the public lands on the allotment so riparian obligate bird species are absent.

The bat species that may occur on this allotment roost in cliffs, caves, or mines. Bat species utilize the desert habitats for foraging for nectar, pollen, insects or fruits.

Figure 7. Category 2 and 3 Habitat for the Sonoran Desert Tortoise within the Indian Camp Allotment



2.3.8 Migratory Birds

The Indian Camp allotment, which includes public, private, and state lands offers diverse habitats for migratory birds. Migratory species that may utilize the area (Corman) include: Bell's vireo, Bendire's thrasher, black-chinned sparrow, black-throated gray warbler, Brewer's sparrow, burrowing owl, calliope hummingbird, canyon towhee, chestnut-collared longspur, common black-hawk, Costa's hummingbird, elegant trogon, elf owl, flammulated owl, fox sparrow, Gila woodpecker, gilded flicker, golden eagle, Grace's warbler, gray vireo, lark bunting, Lawrence's goldfinch, Le Conte's thrasher, Lewis's woodpecker, loggerhead shrike, long-billed curlew, Lucy's warbler, northern beardless-tyrannulet, peregrine falcon, phainopepla, pinyon jay, prairie falcon, red-faced warbler, rufous hummingbird, rufous-crowned sparrow, short-eared owl, Sonoran yellow warbler, Swainson's hawk, Virginia's warbler, William's sapsucker, and willow flycatcher. No surveys have been conducted to determine presence but these species have the potential of occurring within the vegetation communities located on this allotment (Figure 6).

2.4 Special Management Areas

There are no Special Management Areas within the Indian Camp allotment boundary. Public lands in the allotment are within the White Canyon Resource Conservation Area, designated in the Phoenix Resource Management Plan to retain lands for long term management.

2.5 Recreation Resources

2.5.1 Access and Transportation

The Indian Camp grazing allotment (#6042) includes a system of existing primitive access routes (totaling approximately 28 miles) identified in a route inventory completed for the area in 2003, summarized in Table 6 below and shown on Figure 8. The existing route network provides access for the use, maintenance and operation of the grazing allotment and range improvements, for private land inholding access, for public recreational use, and for other uses (utilities such as the natural gas pipeline). Two existing routes are legally accessed from Camino Rio (Pinal County maintained) directly on public land, and four are accessed on State Trust land. Camino Rio is accessed from SR177 across the San Pedro River via the 'Dudleyville Crossing' and the Asarco Crossing near the town of Winkelman. Four of the existing access routes from Camino Rio cross private property and lack legal public access. Most of the routes are single lane, natural surfaced, primitive and un-maintained, with the exception of approximately 1 mile of Camino Rio across State Trust land in the allotment, which is regularly maintained by Pinal County. Over half of the route mileage in the allotment is in the channel of natural drainages, as shown on the Table 7 below and Figure 8.

The current Off Highway Vehicle designation established in the current Resource Management Plan limit use of motor vehicles to 'Existing Roads and Trails'. Figure 8 shows the route system that is considered to be the existing roads and trails available for motor vehicle use, along with the points of interest identified along the routes (range improvements, gates, cattle guards, etc.). A route evaluation was completed in this area in 2006 to consider possible route designations, but no comprehensive travel management plan has been completed for the allotment.

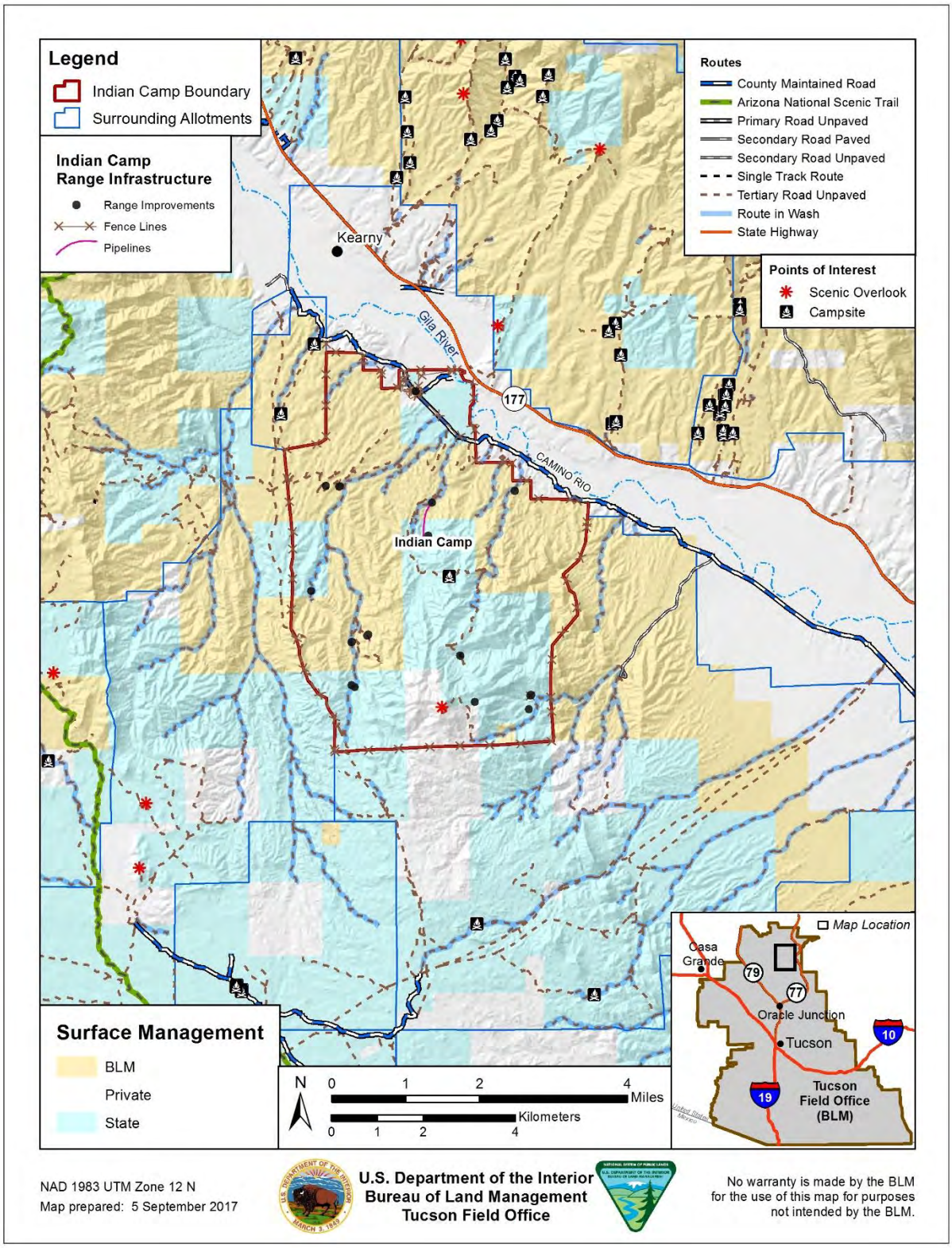
Table 6. Indian Camp Allotment Physical Access Route Inventory

Route Type	Miles	Percentage
Secondary Road Unpaved	1.4.	5%
Tertiary Road Unpaved	26.6	95%
Total	28.0	100%

Table 7. Indian Camp Allotment Routes in Natural Drainages

Route Location	Miles	Percentage
Upland Route	13.0	47%
Wash Route	15.0	53%
Total	28.0	100%

Figure 8. Indian Camp Allotment access route inventory, recreation activity areas and improvements.



2.5.2 Recreation Resources

The Indian Camp allotment includes public land available for public recreational use, comprising approximately 50% of the allotment. State Trust land, comprising approximately 44% of the allotment, is available for public use with a hunting license or a recreational permit issued by the State Land Department. The Allotment is within Game Management Unit 37B, and the area is in an Extensive Recreation Management area with essentially custodial visitor services and no facilities. A small part of the allotment, approximately 7%, is private land not open to public use without the land owner's permission, as shown on Table 8 and Figure 8.

Table 8. Indian Camp Allotment land base available for public recreational use.

Category	Acres	Percentage
BLM	4,376	50%
Private	588	7%
State	3,832	44%
Total	8,795	100%

This allotment is in panoramic flat to rolling bajada slopes and low hills bordering the west side of the Gila River valley south of the town of Kearny and west of Winkelman. The land base in the allotment provides recreational opportunities primarily related to hunting (deer, javelina, upland birds and small game, and predators), sightseeing, driving for pleasure and primitive camping. The area appears to receive primarily day use, with only a few dispersed campsites identified in the route inventory. Recreational off highway vehicle (OHV) driving occurs on the network of existing county maintained and primitive routes (4WD, ATV riding). The natural drainages attract OHV use (4WD, ATV) for access and recreational riding due to their relatively wide and unobstructed sand/gravel beds throughout the allotment. The Arizona National Scenic Trail is approximately 3 miles west of the allotment, as shown on Figure 8. The overall recreational use in the allotment is low, estimated at less than 1,000 visits annually.

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 cultural significance to Native Americans. Should the BLM identify impacts to sites or traditional-use plants, 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 BLMTFO'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.) and its implementing regulations found at 36 C.F.R. 800, wherein the BLM has the legal responsibility to consider the effects of its actions on *historic properties*. BLM Manual 8100 Series and the Arizona BLM Protocol (the Statewide Protocol) provide applicable Section 106 compliance procedures 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 the 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 among the BLM and the Arizona State Historic Preservation Officer (SHPO; agreement executed December 14, 2014). Should the BLM determine that a routine undertaking would result in *no historic properties affected* or *no adverse effect*, as advised by a qualified cultural resources specialist, the undertaking may proceed under the terms and conditions of the Statewide Protocol. If the undertaking is determined to have an adverse effect, or otherwise meets stipulated consultation thresholds, project-specific consultation is then initiated with the SHPO.

A small number of controlled studies that examine potential grazing impacts on historic properties have been performed (e.g., Osborn and Hartley 1991, Osborn et al. 1987, Roney 1977, and Van Vuren 1982). For example, Alan Osborn and his colleagues (c.f., Osborn et al. 1987; Osborn and Hartley 1991) 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 6 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 fewer than 15 centimeters. (Osborn et al. 1987)

The results varied by study plot location with the greatest impacts recorded near water sources, where higher concentrations of livestock use occurred. 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 and other above-ground cultural features such as rock art (Broadhead 2001; Osborn et al. 1987). Indirect impacts from livestock concentrations may include accelerated soil erosion and gullying, 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 Indian Camp grazing allotment between June 20 and July 20, 2017. Data reviewed were obtained from BLMTFO 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 (2017), Arizona's statewide cultural resource inventory system, and the National Register of Historic Places Focus Database & NPGallery Digital Asset Search (2017). Archival information was compared with livestock grazing and range improvement data 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 identified one prior survey and two documented sites on the BLM-administered portion of the allotment. The prior survey was conducted on behalf of Salt River Project to support the ongoing maintenance and operation of the Eastern Mining Area 115 kV transmission line (see Motsinger et al. 1996). That study identified one site in the subject allotment (AZ V:13:16 [ASM]), that consists of a prehistoric artifact scatter with associated agricultural cairns. The record reviewed for the other known site, AZ V:13:5 (ASU), provides only locational data and indication that the site contains an "unidentified depression" and four "surface rooms." Historic-age GLO plat maps also were reviewed that depict no cultural features on the BLM-administered portion of the allotment (see map no. 1561, dated 1879; no. 1558-A, dated 1959; no. 1649, dated 1877; and no. 1646, dated 1878).

Statement of Effect Determination

Although no documented cultural sites coincide with any of the existing range improvements or potential livestock concentration areas, none of the six BLM-administered range improvement locations have been subject to field assessment or inspection. As a routine undertaking with no currently identified impacts to historic properties within the BLM-administered portion of the allotment, lease issuance for continued livestock use of the Indian Camp allotment is appropriate under a finding of *no adverse effect*, provided that a strategy for future cultural resources inspection, assessment, and/or monitoring is devised and implemented prior to lease issuance. Additionally, the following Conditions of Approval (COAs) are applicable 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. Newly proposed range improvements would be subject to individual project review and assessment for Section 106 compliance in accordance with 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 11 Native American tribes who claim cultural affiliation to and/or traditional use of the area—as determined through the online Arizona Government-to-Government Consultation Toolkit (last updated June 19, 2017)—by sending letters summarizing the results of the Class 1 cultural resources assessment and rangeland monitoring data for the Indian Camp allotment. Tribes consulted include the Fort McDowell Yavapai Nation, Gila River Indian Community, Hopi Tribe, Navajo Nation, Pascua Yaqui Tribe, the Pueblo of Zuni, San Carlos Apache Tribe, Tonto Apache Tribe, White Mountain Apache Tribe, Yavapai Apache Nation, and the Yavapai-Prescott Indian Tribe. Identified plant species in the subject allotment with potential cultural significance include saguaro (*Carnegiea gigantea*), buckhorn cholla (*Cylindropuntia acanthocarpa*), and 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 Indian Camp allotment. The BLM lands within the allotment comprise approximately 52 percent of the total livestock operation. There are 36 head of cattle run on the BLM lease. Between it and the other leased and private lands, there is a yearlong grazing system. The 432 Animal Unit Months (AUMs) under the BLM grazing lease are included with the total head of cattle on the private land and State lease, and are managed together on the entire allotment.

The management category given to the Indian Camp allotment is maintain (M). The management category given to the allotment is maintain (M). By definition, M category allotments have no serious resource conflicts and range condition and present management is satisfactory. Under this management BLM management actions are limited to licensing livestock use based on the AUMs available on the public lands, and the individual ranch operator determines the grazing system (if any) to be used. 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. If utilization is found to be excessive or the range trend to be down, BLM will work with the operator to adjust livestock numbers on the total grazing unit.

3.2 Grazing System

The allotment is 10,323.91 total acres, of which 5,400.25 acres is administered by the BLM. There is currently one lease issued for 432 Animal Unit Months (AUMs) on the BLM public lands for the Indian Camp 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 and state 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 Indian Camp allotment leases are in Table 9.

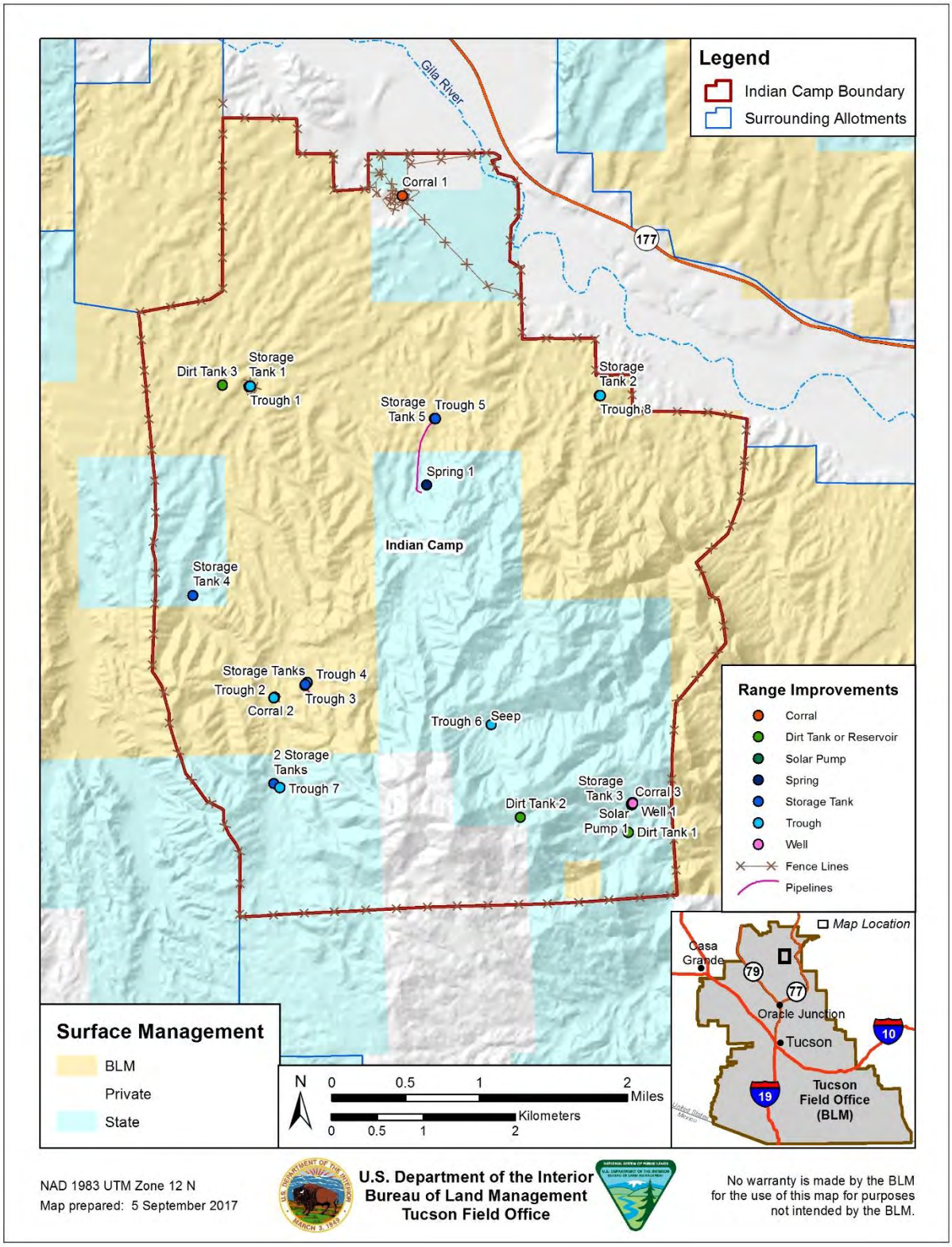
Table 9. Indian Camp Lease and AUMs

Ownership	Animal Unit Months (AUMs)	Animal Units (AU)
BLM – Indian Camp #6042	432 AUMs	36 AU Yearlong

3.2.1 Existing Range Improvements

After a review of the range improvement record for this allotment, there is one corral on the BLM lands. In addition, there are five water sources as well as a dirt tank located on the BLM land where livestock might congregate. Figure 9 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 9. Existing Range Improvements on the Indian Camp Allotment



3.3 Mandatory Terms and Conditions for Permitted Use

There is currently one lease issued for 432 AUMs on public lands. The Mandatory Terms and Conditions of the lease are listed below:

Table 10. 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
36	Cattle	3/1 to 2/28	100	Active	432

***** 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 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 Indian Camp 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 Area Key-1 Desired Plant Community Objectives for Conglomerate Hills 10-13" precipitation zone ecological site

Maintain plant species diversity such that the potential plant community is a diverse mixture of desert shrubs, trees, cacti, and perennial grasses and forbs. The aspect is shrubland.

- Maintain Grasses/Grass like plants composition of ≥5%
- 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 Conglomerate Hills 10-13" p.z".

Maintaining a perennial grass composition of 5 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 20 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 between 10 percent and 15 percent as per the reference sheet. A vegetative foliar cover of 10 percent or greater should serve to prevent accelerated erosion beyond what is expected in the reference state.

5 PLANT LIST

This section includes the list of plant species present or potentially present within the Conglomerate Hills 10-13" precipitation zone (p.z.) ecological site located on the public lands within the Indian Camp allotment. These plant species provide key forage and cover for wildlife species and livestock.

Table 11 presents a list of plant species from the Conglomerate Hills 10-13" p.z. ecological site description located on the Indian Camp allotment.

Table 11. Key Plant Species from the Conglomerate Hills 10-13" p.z. ecological site description

Common name	Scientific name
Purple three awn	*Aristida purpurea*
Slender janusia	*Janusia gracilis*
Bush muhly	*Muhlenbergia porteri*
Yerba de venado	*Porophyllum gracile*
Jojoba	*Simmondsia chinensis*
Desert globe mallow	*Sphaeralcea ambigua*
Slim tridens	*Tridens muticus*
Fishhook barrel cactus	*Ferocactus wislizeni*
False Mesquite	*Calliandra eriophylla*
Jumping cholla	*Cylindropuntia fulgida*
Fluffgrass	*Dasyochloa pulchella*
Engelmann prickly pear	*Opuntia engelmannii*
Buck-horn cholla	*Cylindropuntia acanthocarpa*
Foothill palo verde	*Parkinsonia microphylla*
Whitethorn acacia	*Acacia constricta*
Flattop buckwheat	*Eriogonum fasciculatum*

During the December 2013 and May 2017 data collection these species in table 12 and 13 were found on key area Key-1.

Table 12. Species List from Indian Camp Key-1 Key Area in December 2013.

Common Name	***Scientific Name***
Trees and Shrubs	
Yellow paloverde	*Parkinsonia microphylla*
Creosote bush	*Larrea tridentata*
Triangle bur ragweed	*Ambrosia deltoidea*
Succulents	
Buckhorn cholla	*Cylindropuntia acanthocarpa*
Annual forbs	
Annual grasses	

Table 13. Species List from Indian Camp Key-1 Key Area in May 2017.

Common Name	***Scientific Name***
Trees and Shrubs	
Whitethorn acacia	*Acacia constricta*
Catclaw acacia	*Acacia greggii*
Triangle-leaf bursage	*Ambrosia deltoidea*
Shortleaf baccharis	*Baccharis barchyphylla*
Algerita	*Berberis fremontii*
Coulter's brickellbush	*Brickellia coulteri*
False mesquite	*Calliandra eriophylla*
Saguaro	*Carnegiea gigantea*
Desert hackberry	*Celtis pallida*
Blue palo verde	*Cercidium microphyllum*
Little leaf palo verde	*Cercidium florida*
Buckhorn cholla	*Cylindropuntia acanthocarpa*
Teddybear cholla	*Cylindropuntia bigelovii*
Christmas cholla	*Cylindropuntia leptocaulis*
Whipple cholla	*Cylindropuntia whipplei*
Hedgehog cactus	*Echinocereus spp.*
Mormon tea	*Ephedra trifurca*
Turpentine bush	*Ericameria laricifolia*
Flattop buckwheat	*Eriogonum fasiculatum*
Ocotillo	*Fouquieria splendens*
Range ratany	*Krameria erecta*
Creosote bush	*Larrea tridentata*
Wolfberry	*Lycium pallida*
Rough menodora	*Menodora scabra*

Common Name	*Scientific Name*
Mesquite	*Prosopis velutina*
Jojoba	*Simmondsia chinensis*
Banana yucca	*Yucca baccata*
Graythorn	*Ziziphus obtusfolis*
Perennial forbs	
Desert senna	*Senna covesii*

6 INVENTORY AND MONITORING DATA

The following sections describe the inventory and monitoring protocols that were used on the Indian Camp allotment in 2013.

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 heath 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 Indian Camp 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). 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 Indian Camp 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 area Key-1 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 Indian Camp. 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 40 cm x 40 cm 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 USDOI, 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 seed stalks and young plants are little disturbed.
21-40%	The key species may be topped, skimmed, or grazed in patches. Between 60 and 80 percent of current seed stalks 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 seed stalks 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 seed stalks 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 seed stalks.
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 432 AUMs on the lease from 2012-2017.

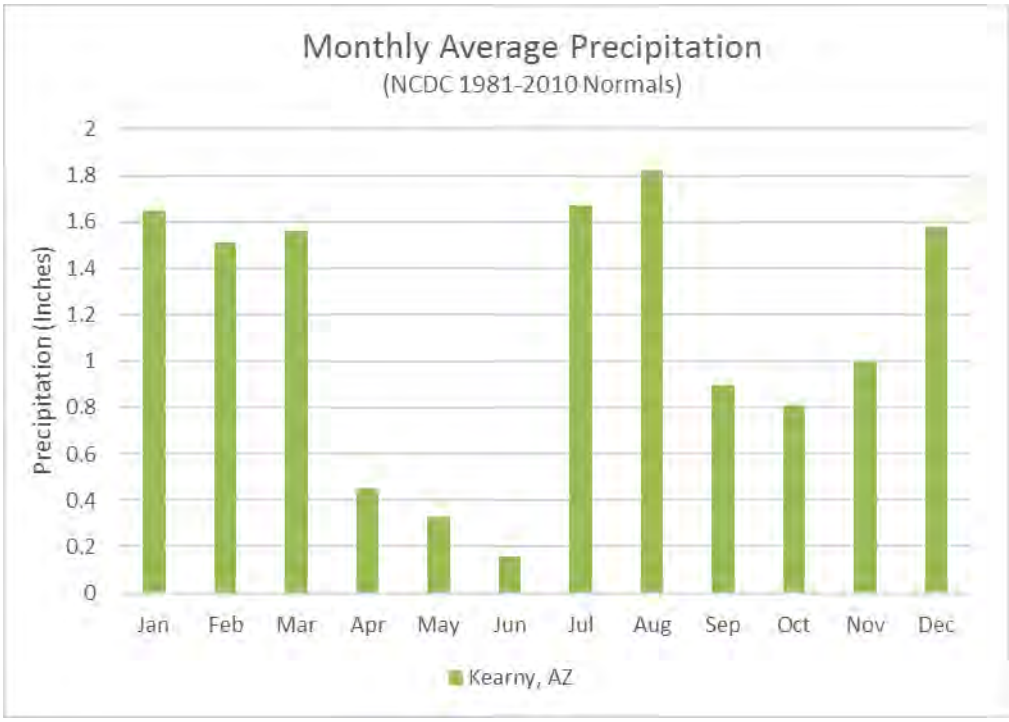
7.2 Precipitation

The closest long term climate monitoring station to the Indian Camp allotment is located in Kearny, AZ and is approximately 5 miles from the center of the allotment. Table 14 and Figure 10 below displays the most recent National Climatic Data Center (NCDC) 30-year Normals (1981-2010) from the Western Regional Climate Center.

Table 14. Precipitation Data (Inches) from Kearny, AZ COOP site – NCDC 30 Year Normals

	Elev. (ft.)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Kearny, AZ	1,840	1.65	1.51	1.56	0.45	0.33	0.16	1.67	1.82	0.9	0.81	1.00	1.58	13.44

Figure 10. Precipitation Data (Inches) from Kearny, AZ COOP site – NCDC 30 Year Normals



7.3 Key Area Data

Upland range health was evaluated at one key area (Key-1). The key area was selected for its consistency with average livestock use within the allotment. A quantitative and qualitative assessment of rangeland health indicators was conducted in order to determine if any gaps existed between existing condition and ecological reference condition. Using this assessment, it was determined whether or not applicable resource standards were being met within the allotment.

Vegetation monitoring was conducted by the University of Arizona Extension and the BLM range specialists at the two key areas, Key-1 and Key-2, in 2017. Upland range health was evaluated on Key-1 in 2013 by TEAMs.

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 area Key-1 is located in the Conglomerate Hills 10-13" p.z. These are shallow soils formed on limy conglomerate and fanglomerate. Bedrock is usually hard and unweathered. Soils are mostly calcareous and have lime accumulations in the fractures of the bedrock material. Soil surfaces have very well developed covers of gravels but lack cobble cover.

7.3.1 Utilization

Utilization measured at Key-1 at the time of the study was 0 percent.

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

Tables 15 and 16 below show the results from the land health evaluation completed in December 2013 on the Indian Camp allotment. Summary results are shown from the Rangeland Health Evaluation at key area Key-1. All but one attribute ranked none to slight from departure of the Conglomerate Hills 10-13" p.z. reference sheet.

Table 15. December 12, 2013 Summary Results from Rangeland Health Evaluation at Key Area Key-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	0	1	8

Table 16. Summary of 17 Indicators for Conglomerate Hills 10-13" p.z. Ecological Site on Key Area Key-1.

17 Indicators Reference Sheet	Rational from December 2013
1. **Number and extent of rills:** Current or past formation of rills as expected for the site.	None to slight. None observed.

17 Indicators Reference Sheet	Rational from December 2013
2. **Presence of water flow patterns:** Matches what is expected for the site; minimal evidence of past or current soil deposition or erosion.	None to slight. None observed.
3. **Number and height of erosional pedestals or terracettes:** Current or past evidence of pedestaled plants or rocks as expected for this site. Terracettes absent or uncommon.	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):** Amount and size of bare areas match that expected for the site.	None to slight. Almost no bare ground. Protected by vegetation, gravel or rock.
5. **Number of gullies and erosion associated with gullies:** Match what is expected for the site; drainages are represented as natural stable channels; vegetation common and no signs of erosion.	None to slight. None present.
6. **Extent of wind scoured, blowouts and/or depositional areas:** Match what is expected for the site.	None to slight. None observed.
7. **Amount of litter movement (describe size and distance expected to travel):** Matches that expected for the site with a fairly uniform distribution of litter.	None to slight. No litter movement observed.
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Matches that expected for the site. Surface soil is stabilizes by organic matter decomposition products and/or a biological crust.	None to slight. Resilient due to gravel/rock cover of soils.
9. **Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness):** Soil surface horizon intact. Soil structure and organic matter content match that expected for the site.	None to slight. No soil loss observed, gravelly rocky surface.
10. **Effect on plant community composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Infiltration and runoff are not affected by any changes in plant	None to slight. Slight difference in composition, but it does not affect infiltration.

17 Indicators Reference Sheet	Rational from December 2013
community composition and distribution. Any changes in infiltration and runoff can be attributed to other factors (e.g. compaction).	
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Matches that expected for the site; none to minimal, not restrictive to water movement and root penetration.	None to slight. None observed
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:** Functional/Structural groups slightly reduced and/or relative dominance of functional/structural groups has been modified from that expected for the site and/or number of species within functional/structural slightly reduced.	Slight to moderate. Lacking primarily perennial grasses, but drought and aspect may play a roll. Jojoba not as abundant as described in ESD.
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant mortality and decadence match that expected for the site.	None to slight. Healthy despite drought.
14. **Litter amount:** Amount is what is expected for the site potential and weather.	None to slight. Greater than the ESD
15. **Expected annual production (this is TOTAL above-ground production, not just forage production):** Exceeds 80% of the potential production for the site based on recent weather.	None to slight. Slight deviation due to difference in composition of vegetation.
16. **Invasive Plants:** If present, composition of invasive species, matches that expected for the site.	None to slight. None observed. Cholla in area but not a true invasive.
17. **Perennial plant reproductive capability:** Capability to produce seed or vegetative tillers is not reduced relative to recent climatic conditions.	None to slight. As productive as possible given drought conditions.

Key Area Key-1 on Conglomerate Hills 10-13” 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 area Key-1 is Conglomerate Hills 10-13” precipitation zone ecological site. Vegetative cover collected at Key-1 is adequate to ensure soil stabilization, and appropriate permeability rates within the ecological system. There were no rills/gullies present at the site, pedestals and/or terracettes were slight to non-existent. Wind-scouring and litter movement were none to slight (Figure 11).

Figure 11. Key Area Key-1 looking West in December 2013

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 Conglomerate Hills 10-13", and the current conditions of Key-1 in December 2013 and May 2017. Table 18 address the kind and amount (by cover) of vegetation at the sites.

The ecological site for Key-1 is Conglomerate Hills 10-13". Litter should be in the range of 5 to 35 percent, with 15 to 60 percent surface fragments. A tolerable range of bare ground would be between 10 and 55 percent. Foliar cover collected at Key-1 was 66 percent with 1 percent basal cover of native shrubs. Total litter at Key-1 was measured at 37 percent, with bare ground measuring 1 percent. Rock and rock fragments covered 17 percent of the soil surface. Total litter at Key-1 was measured at 37 percent, with bare ground measuring 1 percent. Rock and rock fragments covered 92 percent of the soil surface. Utilization, measured at the key area, was 0 percent, and no livestock sign was observed.

Table 17. A comparison between conditions described in the ESD (R040XA128AZ – NRCS 2008) and current conditions of key area Key-1. Soil cover components include: plants (including basal cover), biological crusts, litter, and surface fragment.

	Basal Cover				Biological Crust	Litter	Surface Fragments > ¼" & <= 3"	Surface Fragments > 3"	Bedrock	Bare Ground
	Grass/ Grass like	Forb	Shrub / Vine	Tree						
Key-1 ESD R040XA128AZ	0-1%	0-1%	1-4%	0-1%	1-10%	5-35%	15-60%	0-15%	1-10%	10-55%

Key-1 2013	0%	0%	2%	0%	0%	37%	75%	17%	0%	1%
Key-1 2017	0%	0%	1.2%	0%	0%	26.4%	28.6%	13.8%	0%	30%

Table 18. Foliar cover of species recorded in the LPI plot for key area Key-1.

Key area information		Species	Line point intercept canopy cover at Key-1
Key-1 Indian Camp Allotment		Annual forbs	50%
Range site: R040XA128AZ		Annual grasses	4%
		Yellow paloverde (*Parkinsonia microphylla*)	13%
		Triangle bur ragweed *(ambrosia deltoidea)*	6%
		Creosote bush *(Larrea tridentate)*	4%
		Buckhorn cholla *(Cylindropuntia acanthocarpa)*	2%
Cover/Litter/Bare Ground			
Foliar Cover	2%		
Basal Cover	66%		
Bare Ground	1%		

Figure 12 is the percent frequency data collected by U of A, using pace frequency, on the Indian Camp allotment from 5-15-17 on key area Key-1. Paloverde, bursage, creosote and whitethorn make up the largest percent composition on the site. Figure 13 is the most recent photo of transect Key-1 from 5-15-17. Production data, figure 14, was also collected to determine how many pounds per acre the site produced for a total of 353 lbs. /acre. Figure 15 shows the percent ground cover for Key-1. Litter is within range as expected for the site (5-45 percent) at 28 percent and bare ground is within range expected for the site (5-20 percent) at 11 percent.

Figure 12. Data Summary from University of Arizona Extension on Key Area Key-1

Cover by Transect (Line-Intercept)

Site Class: BLM > Tucson > Indian Camp

Site ID: Key 1 **Date:** 5/15/2017

Examiner(s): Button Dubois, Carol Dubois, Mike McIntire, Peggy Monkemeier, Darrell Tersey

% Canopy Cover

Species	Transect (% Cover*)					% Cover*	% Comp.*
	1	2	3	4	5		
Woody Species							
whitethorn acacia			16.80	7.20		4.80	14.48
catclaw acacia					3.90	0.78	2.35
triangle-leaf bursage	1.60	10.30	8.20	7.35	3.90	6.27	18.92
false mesquite				1.25		0.25	0.75
littleleaf paloverde	6.00	20.90	3.00		13.60	8.70	26.25
buck-horn cholla		2.80	3.00	0.10	1.00	1.38	4.16
longleaf jointfir					0.60	0.12	0.36
flattop buckwheat		1.80		1.90	1.00	0.94	2.84
range ratany		1.30	1.30			0.52	1.57
creosote bush	18.20	5.20	0.90			4.86	14.67
wolfberry			2.90			0.58	1.75
jojoba	5.80	4.60	8.90			3.86	11.65
Unclassified							
desert senna		0.40				0.08	0.24
Total Cover							
TOTAL**	29.00	42.50	41.00	17.40	23.00	30.58	

* Number of decimal places does not imply level of precision
** Total cover accounts for inter-species overlap and is not the sum of individual species cover

Figure 13. Key-1 Key Area on 5/15/2017

Figure 14. Key-1 Key Area Production by Species on 5/15/2017

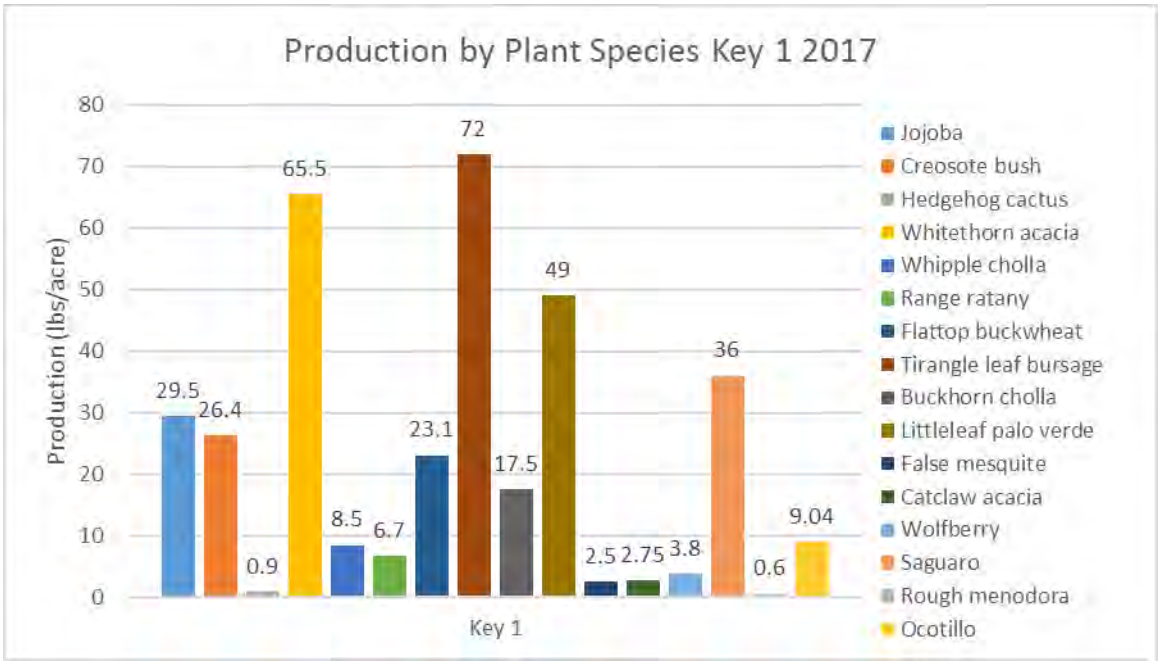


Figure 15. Data Summary from University of Arizona Extension on Key Area Key-1

% Ground Cover Summary (Point)

Site Class: BLM > Tucson > Indian Camp

Site ID: Key 1 **Date:** 5/15/2017

Examiner(s): Button Dubois, Carol Dubois, Mike McIntire, Peggy Monkemeier, Darrell Tersey

% Ground Cover							
Species	Transect (#Hits)						% Cover*
	1	2	3	4	5	Total	
Bare Soil	30	31	32	34	23	150	30.00
Gravel (1/4" - 3")	37	24	28	25	29	143	28.60
Litter	24	29	27	26	26	132	26.40
Rock >3"	9	14	9	11	26	69	13.80
Live Basal Veg.		2	4			6	1.20

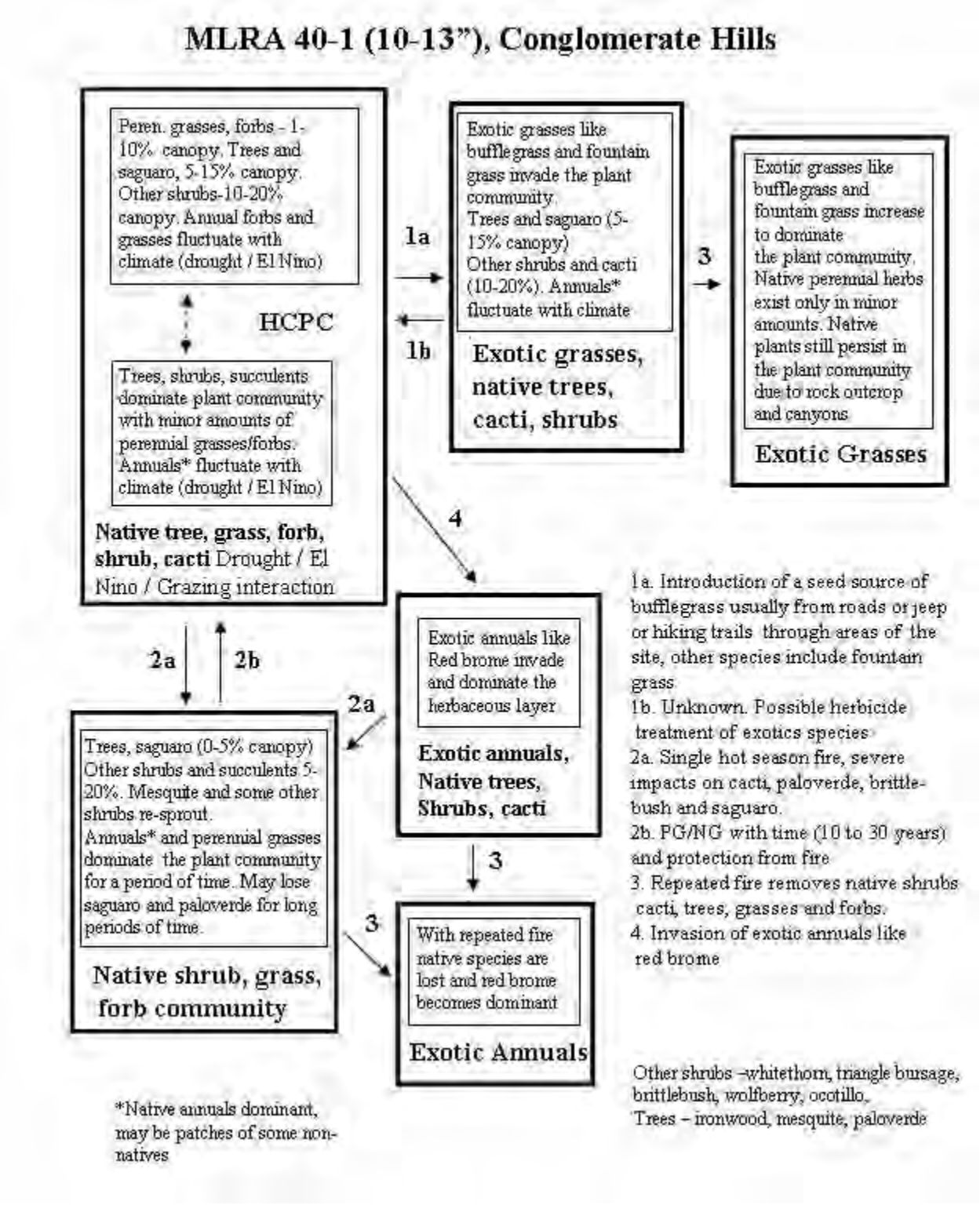
* Number of decimal places does not imply level of precision

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. TEAMs observed almost no signs of soil erosion, rills, gullies, or litter dams. Pedestalling was not occurring around the plant species present.

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 16).

Figure 16. State and transition model for Conglomerate Hills



7.3.2.2 Standard 2: Riparian-Wetland Sites

Not Applicable to Indian Camp 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 distribution are present as described within the ESDs throughout a majority of the allotment. However, line point intercept (LPI) cover data collected at both of the key areas indicates that primary plant species, such as tobosa (Pleuraphis mutica), black grama (Bouteloua eriopoda), bush muhly (Muhlenbergia porteri), and native Aristida grasses are significantly reduced. These warm season grammanoid species are desirable/preferred species by livestock and wildlife and are decreasers within a range site as a result of herbivory. These species were observed within the allotment though at significantly reduced frequencies. Only one of these species occurred within the established monitoring site. Historical livestock grazing combined with drought has caused a significant decrease of primary species within these ecological sites resulting in the annual native and non-native species to become dominate in many cases. The current vegetative composition of both perennial and annual native species within the allotment, even though shifted from a Climax Community is appropriate 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.

Key Area Key-1

The vegetative community at Key-1 represents the composition, structure, and distribution of the state within the state and transition model called "Native shrub, grass, forb community." The ESD describes (Table 19) this state as: "Annuals and perennial grasses dominate the plant community for a period of

time. Trees and saguaros make up less than 5% of the canopy cover and shrubs and other succulents range from 5-20% canopy cover." The functional/structure group was found to have none or only a slight deviation from the reference community as described within the ESD (Table 20). This slight departure is due to the diminished quantity of perennial grasses that would be found in an HCPC community.

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

Cover data described by the ESD	LPI Data Key-1 Canopy Cover
Trees and Saguaro – 0-5% Canopy cover	Yellow paloverde- 2% Canopy cover (Saguaros present, but not in transect)
Other shrubs and succulents – 5 to 20% Canopy cover	Other shrubs and succulents - 16% Canopy cover
Annuals and perennial grasses may dominate the plant community for a period of time	Annual grasses – 44% Canopy cover Annual forbs – 6% Canopy cover

Figure 17. Species Composition at Key Area Key-1

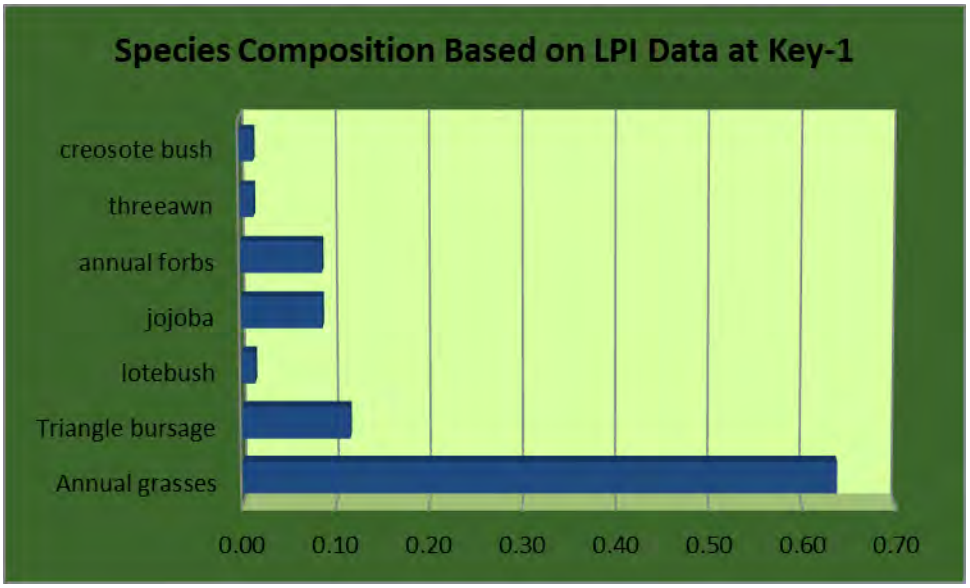


Table 20. Functional/structural plant groups at Key-1

Ranking	Species List for Functional/Structural Groups at Key-1
S	Jojoba (*Simmondsia chinensis*)
S	Triangle bur ragweed (*Ambrosia deltoidea*)
S	Saguaro (*Carnegiea gigantea*)
S	Christmas cactus (*Cylindropuntia leptocaulis)*
S	Teddybear cholla (*Cylindropuntia bigelovii*)
S	Pricklypear (*Opuntia spp*)
M	Yellow paloverde (*Parkinsonia microphylla*)
M	Eastern Mojave buckwheat (*Eriogonum fasciculatum*)
M	Annual forbs

Ranking	Species List for Functional/Structural Groups at Key-1
M	Annual grasses
M	Turpentine bush (*Ericameria laricifolia*)
M	Cholla
T	Longleaf joint fir (*Ephedra trifurca*)
	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.

Conclusions:

Key Area Key-1

- Maintain Grasses/Grass like plants composition of ≥5% NOT ACHIEVED
- Maintain a palatable shrub composition of ≥20% NOT ACHIEVED
- Maintain vegetative foliar cover at ≥20% ACHIEVED

Rationale: The grass composition objective is not being met at this Key Area, although it is close to the established objective of greater than or equal to 5%. The most current long-term monitoring data shows a grass composition of 4% (Table 17). Composition of grasses palatable to Sonoran desert tortoise totaled 1 percent. Assessment of the general area around the transect shows no additional presence of palatable grasses (Table 12 and 13). Palatable shrub composition on the site is not met for Sonoran desert tortoise and mule deer with the defined palatable browse (Van Devender, et al. 2002; Oftedal 2002; Krausman et al. 1997; Heffelfinger et.al. 2006), consisting of 6% of the plant community for desert tortoise and 13% composition for mule deer, both below the objective of greater than or equal to 20%. Additional palatable shrub presence was noted in the area surrounding the transect (Table 13), with subdominant amounts (roughly 10-40%) of Simmondsia chinensis, and Opuntia spp., and minor amounts (roughly 2-5% composition) of Eriogonum fasciculatum. The vegetative foliar cover objective is being met at this site, with foliar cover of 66%, well above the objective of 20%. No sign of utilization (0 percent) by livestock was observed at the site.

8 CONCLUSIONS

8.1 Determination of Land Health Standards

8.1.1 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*:* The data at the trend plots shows that cover and litter are adequate to ensure soil stabilization and appropriate permeability rates within the ecological sites. The ESDs describe the ecological dynamics of the sites on the allotment as plant communities that are "naturally variable" (NRCS 2008). These variations occur due to site aspect, soils, and other natural conditions. We observed almost no signs of soil erosion, rills, gullies, or litter dams. Pedestalling was not occurring around the plant species present.

Energy flow and nutrient cycling is occurring on the allotment as plant vigor, diversity, and cover is high. Other shrubs and some succulents tend to dominate these sites. Annual forbs and grasses (both native and non-native) are important in their respective seasons and provide litter to minimize the effects of erosion. Overall throughout the allotment the soils are productive, stable, and in a sustainable condition as described in one of the states of the state and transition model in the ESD.

8.1.2 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 Indian Camp allotment public lands.

8.1.3 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 native species within the allotment, though skewed towards annual species of grasses and increases in desert shrubs, is appropriate for the range site according to the ESD and the state and transition models. The vegetative composition is conducive to meeting 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 native biotic community. The frequency of desirable native primary grammanoid species is less than what is recommended in the ESDs, but the presence of the species within the allotment is an indicator that the overall ecological condition within the community is functioning within the parameters of the ESDs. Historical livestock grazing combined with drought has caused a skewing towards presence of annual grasses and increased desert shrubs within these ecological sites. In order for ecological site improvements to occur with a trend toward HCPC, a reduction in severity or cessation of ongoing drought conditions may be necessary for longer periods of time. No utilization by livestock was observed on the Key Area so recent livestock grazing is not likely to be a factor.

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:

8.2 Proposed Terms and Conditions:

Terms:

Allotment	Livestock # and Kind	Grazing Period of Use	Percent Public Land	AUMs	Type Use
Indian Camp	66 Cattle	3/1 to 2/28	100	432	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.

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10 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.

__X_ I concur with the determinations and recommendations as written.

___ I do not concur.

___ I concur, but with the following modifications:

_/s/ Karen Simms, Acting_____09/15/2017_____

Karen McKinley Date

Field Office Manager

BLM Tucson Field Office

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