United States Department of the Interior

Bureau of Land Management

Land Health Evaluation

Teacup Lease No. 6168 and Whitlow Lease No. 6032 September 2017

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1. INTRODUCTION

The purpose of this draft Land Health Evaluation (LHE) report is to evaluate whether the Arizona Standards for Rangeland Health (Standards) are being achieved on the Teacup and Whitlow 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 the land health.

In the case of non-achievement of Standards, determine whether livestock grazing is a significant factor causing that non-achievement.

2. ALLOTMENT PROFILE

2.1 Location

Teacup and Whitlow Allotments are located approximately 17 to 27 miles east of the town of Florence, Pinal County, Arizona. They are located 27 miles east of the weather stations at Casa Grande NM in Coolidge. The ranch is bordered by the Horse track Allotment to the northwest, the Cochran and LEN Allotments to the north, the A-Diamond Allotment to the east and the Box O Allotment to the south (Figure 2). The Teacup and Whitlow Allotments are leased by the same owner and are run together as part of the owner's operation, which also includes the Box O Allotment to the south and Hackberry Wash Allotments to the southeast.

2.2 Physical Description

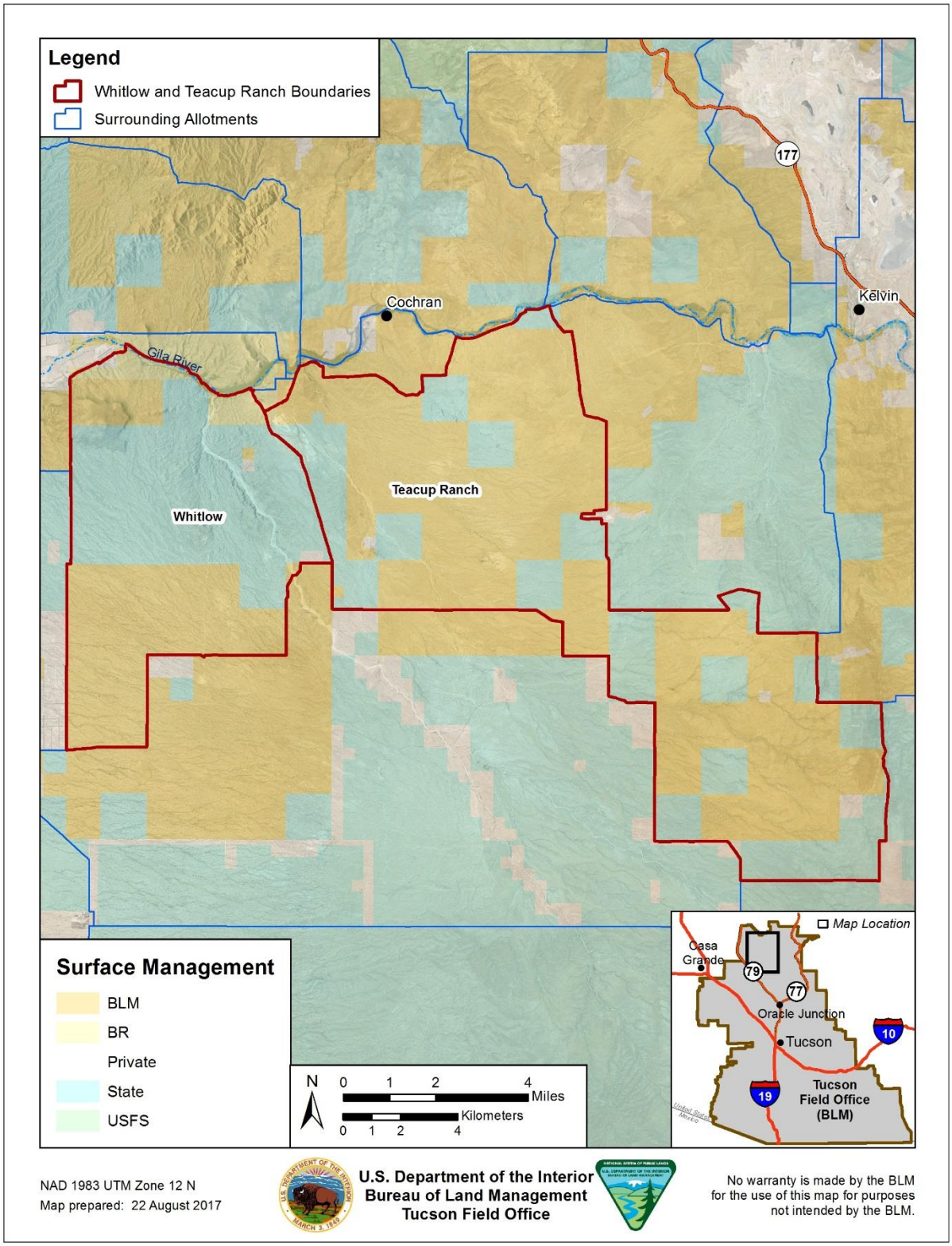
2.2.1 Acreage

The Teacup Allotment encompasses 35,777 acres, and the Whitlow Allotment encompasses 32,077 (Table 1). Lands within the allotment are predominately BLM, with a smaller amount of State Trust and Private land. Public lands constitute about 58 percent of the allotment. Spatial distributions of land ownership are displayed in (Figure 1). Public lands are located in the southeastern and central portions of the allotment.

Table 1. Acreage of landownership.

Land Classification	**Teacup Allotment**
Public Acres	23,302
State Acres	12,171
Private owned lands	240
Uncontrolled Private	64
Total Acres	**35,777**
Land Classification	**Whitlow Allotment**
Public Acres	19,721
State Acres	12,171
Private owned lands	40
Uncontrolled Private	145
Total Acres	**32,077**

Figure 1. Land Ownership of the Teacup and Whitlow Allotments



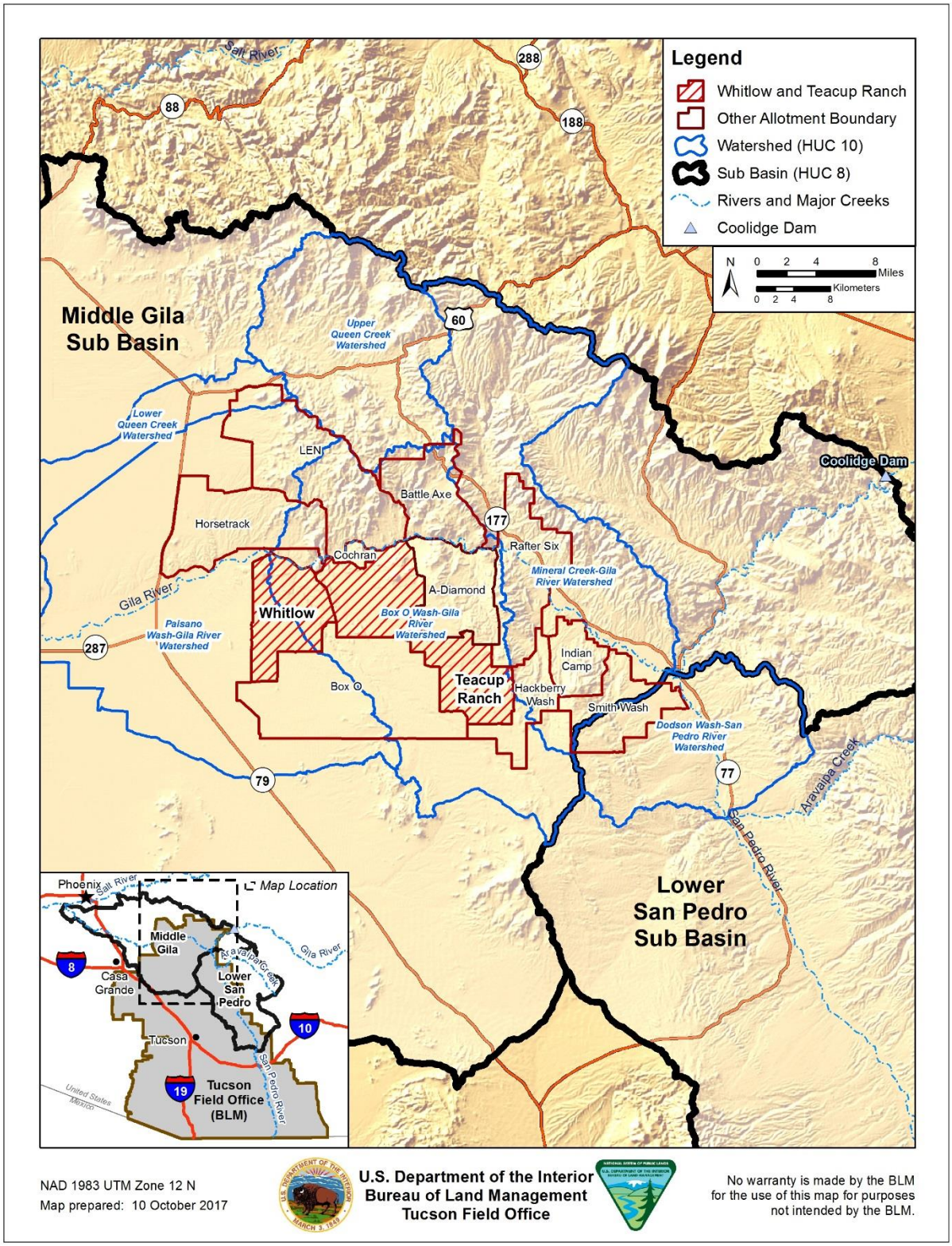
2.2.2 Watershed

The Whitlow and Teacup Allotments are located along the southern edge of the Gila River near Cochran, AZ. Both allotments are within the Middle Gila HUC-8 Sub Basin (Figure 2).

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 Whitlow Allotment is split between the smaller Paisano Wash – Gila River Watershed (HUC-10), with a drainage area of approximately 239,085 acres and the Box O Wash – Middle Gila River Watershed (HUC-10) with a drainage area of 190,705 acres. The Teacup Allotment is located entirely within the Box O Wash – Middle Gila River Watershed.

According to the USGS National Elevation Dataset, the Whitlow Allotment ranges in elevation from 1,550 to 2,400 feet, with an average elevation of 1,950 feet. Its slope varies from 0 to 76%, with an average slope of 10%. The Teacup Allotment ranges in elevation from 1,600 to 3,850 feet, with an average elevation of 2,750 feet. Its slope varies from 0 to 72%, with an average slope of 14%. Additional information about watershed characteristics is located in Section 2.3.1.

Figure 2. Watersheds in the Teacup and Whitlow Allotments



2.2.3 Soils

The dominant soil orders in the Major Land Resource Area (MLRA) are Aridisols and Entisols. The soils in the area dominantly have a thermic or hyperthermic soil temperature regime, an aridic soil moisture regime, and mixed mineralogy and formed in alluvium. They are very shallow to very deep and are well drained and 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 soil composition on the Teacup and Whitlow Allotments is varied as presented in Tables 2 and 3 (respectively) and derived from the Natural Resource Conservation Service (NRCS) Web Soil Survey system.

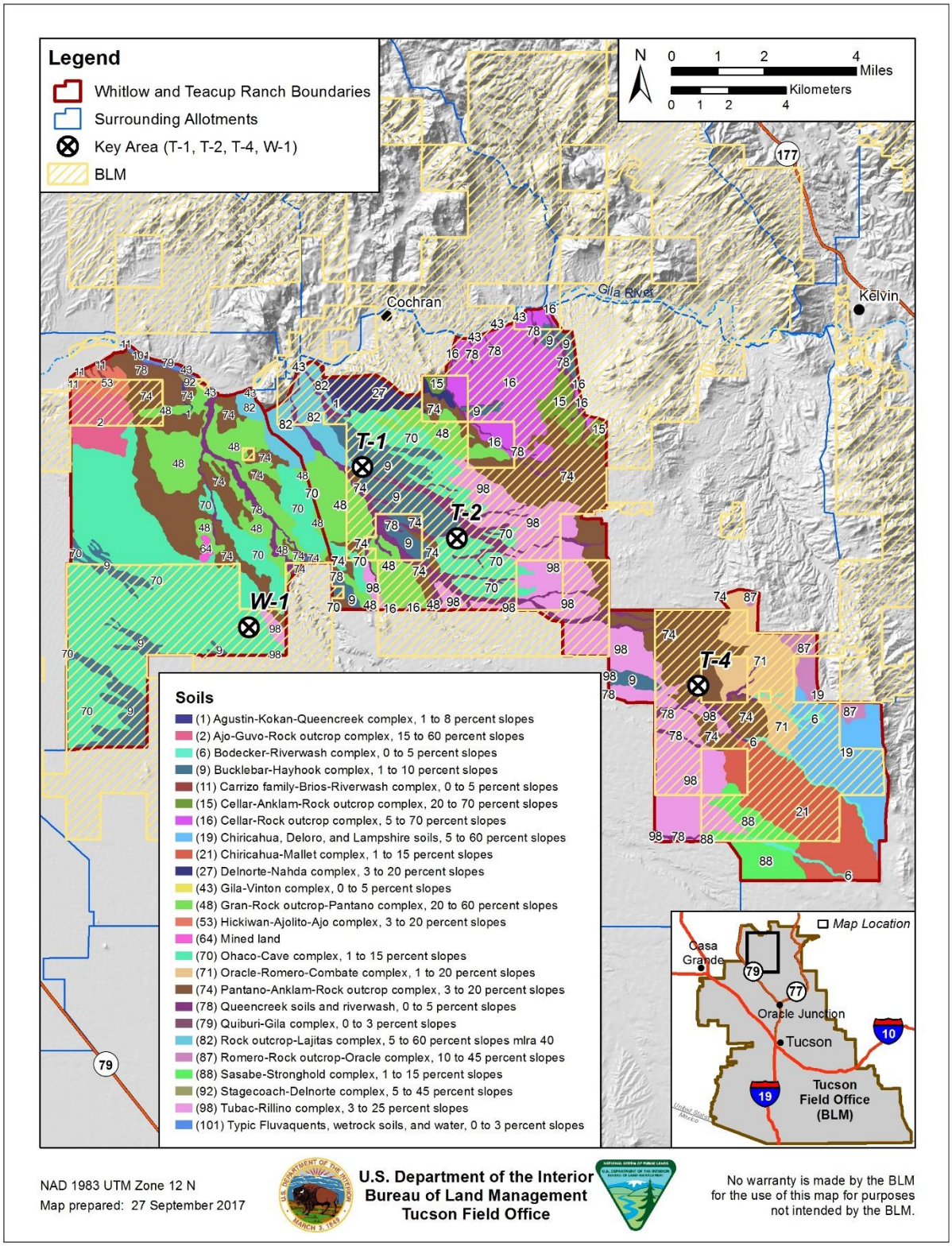
Table 2. NRCS web soil survey for Teacup Allotment.

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Agustin-Kokan-Queencreek complex, 1 to 8 percent slopes	76.28	0.19
6	Bodecker-Riverwash complex, 0 to 5 percent slopes	429.43	1.08
9	Bucklebar-Hayhook complex, 1 to 10 percent slopes	2,620.24	6.57
15	Cellar-Anklam-Rock outcrop complex, 20-70 percent slopes	699.36	1.75
16	Cellar-Rock outcrop complex, 5 to 70 percent slopes	3,234.18	8.11
19	Chiricahua, Deloro, and Lampshire soils, 5-60 percent slopes	2,469.43	6.19
21	Chiricahua-Mallet complex, 1 to 15 percent slopes	3,245.87	8.14
27	Delnorte-Nahda complex, 3 to 20 percent slopes	820.76	2.06
43	Gila-Vinton complex, 0 to 5 percent slopes	11.77	0.03
48	Gran-Rock outcrop-Pantano complex, 20 to 60 percent slopes	2,737.64	6.86
70	Ohaco-Cave complex, 1 to 15 percent slopes	2,592.20	6.50
71	Oracle-Romero-Combate complex, 1 to 20 percent slopes	2,042.59	5.12
74	Pantano-Anklam-Rock outcrop complex, 3 to 20 percent slopes	6,202.68	15.55
78	Queencreek soils and riverwash, 0 to 5 percent slopes	2,618.42	6.57
82	Rock outcrop-Lajitas complex, 5 to 60 percent slopes	1,202.64	3.02
87	Romero-Rock outcrop-Oracle complex, 10 to 45 percent slopes	636.02	1.59
88	Sasabe-Stronghold complex, 1 to 15 percent slopes	1,274.99	3.20
98	Tubac-Rillino complex, 3 to 25 percent slopes	6,965.91	17.47
101	Typic Fluvaquents, wetrock soils, and water, 0 to 3 percent slopes	0.05	0.00
Totals for Area of Interest (AOI)		**39,880.46**	**100.0%**

Table 3. NRCS web soil survey for Whitlow Allotment.

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Agustin-Kokan-Queencreek complex, 1 to 8 percent slopes	27.36	0.13
2	Ajo-Guvo-Rock outcrop complex, 15 to 60 percent slopes	948.57	4.46
9	Bucklebar-Hayhook complex, 1 to 10 percent slopes	1,419.88	6.67
11	Carrizo family-Brios-Riverwash complex, 0 to 5 percent slopes	77.28	0.36
43	Gila-Vinton complex, 0 to 5 percent slopes	9.78	0.05
48	Gran-Rock outcrop-Pantano complex, 20 to 60 percent slopes	3,010.55	14.15
53	Hickiwan-Ajolito-Ajo complex, 3 to 20 percent slopes	403.11	1.89
64	Mined land	72.13	0.34
70	Ohaco-Cave complex, 1 to 15 percent slopes	10,418.31	48.97
74	Pantano-Anklam-Rock outcrop complex, 3 to 20 percent slopes	3,676.23	17.28
78	Queencreek soils and riverwash, 0 to 5 percent slopes	494.27	2.32
79	Quiburi-Gila complex, 0 to 3 percent slopes	46.20	0.22
82	Rock outcrop-Lajitas complex, 5 to 60 percent slopes mlra 40	387.66	1.82
92	Stagecoach-Delnorte complex, 5 to 45 percent slopes	24.41	0.11
98	Tubac-Rillino complex, 3 to 25 percent slopes	136.60	0.64
101	Typic Fluvaquents, wetrock soils, and water, 0 to 3 percent slopes	124.17	0.58
Totals for Area of Interest		**21,276.51**	**100.0%**

Figure 3. Soils on the Teacup and Whitlow Allotments



2.3 Biological Resources

2.3.1 Major Land Resource Areas

Major Land Resource Areas (MLRAs) are geographically associated land resource units, usually encompassing several thousand acres. 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, *Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin,* issued 2006 is current as of October 2005. A unit may be one continuous area or several separate nearby areas. MLRAs are characterized by particular patterns of soils, geology, climate, water resources and land use.

The Whitlow and Teacup Allotments are in the Sonoran Desert Basin and Range MLRA. Many short, fault-block mountain ranges trending southeast to northwest rise abruptly from the smooth or gently sloping desert valley floors. Elevation ranges from 980 to 3,600 feet (300 to 1,100 meters) in most of this area, but it is as high as 4,590 feet (1,400 meters) in the mountains. The Gila River then flows west across the southern part of the MLRA to the Colorado River.

The average annual precipitation is 10 to 13 inches in most of this area. Rainfall can average 22 inches per year in the mountain ranges. Most of the rainfall occurs as high-intensity, convective thunderstorms, mainly from July to September, and as Pacific frontal storms from December to March. Snowfall is rare, except at the higher elevations. The average annual air temperature is 58 to 74 degrees F (15 to 23 degrees C). The freeze-free period averages 285 days and ranges from 205 to 365 days, decreasing in length with increasing elevation.

MLRAs 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). Naming and classification of ecological sites is 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/.

Fourteen ecological sites exist within the Teacup Allotment and thirteen ecological sites on the Whitlow Allotment. Key areas, T-1, 2, 4 and W-1 were established in 1992 on BLM lands within the allotments based on their representative features to measure the long-term trend of vegetation and ground cover within the Limy Uplands 10-13” and Loamy Uplands 10-13” precipitation zones (p.z.). The acreages of each ecological site on each allotment are shown in the tables below.

Table 4. Teacup Allotment Ecological Site Acreage

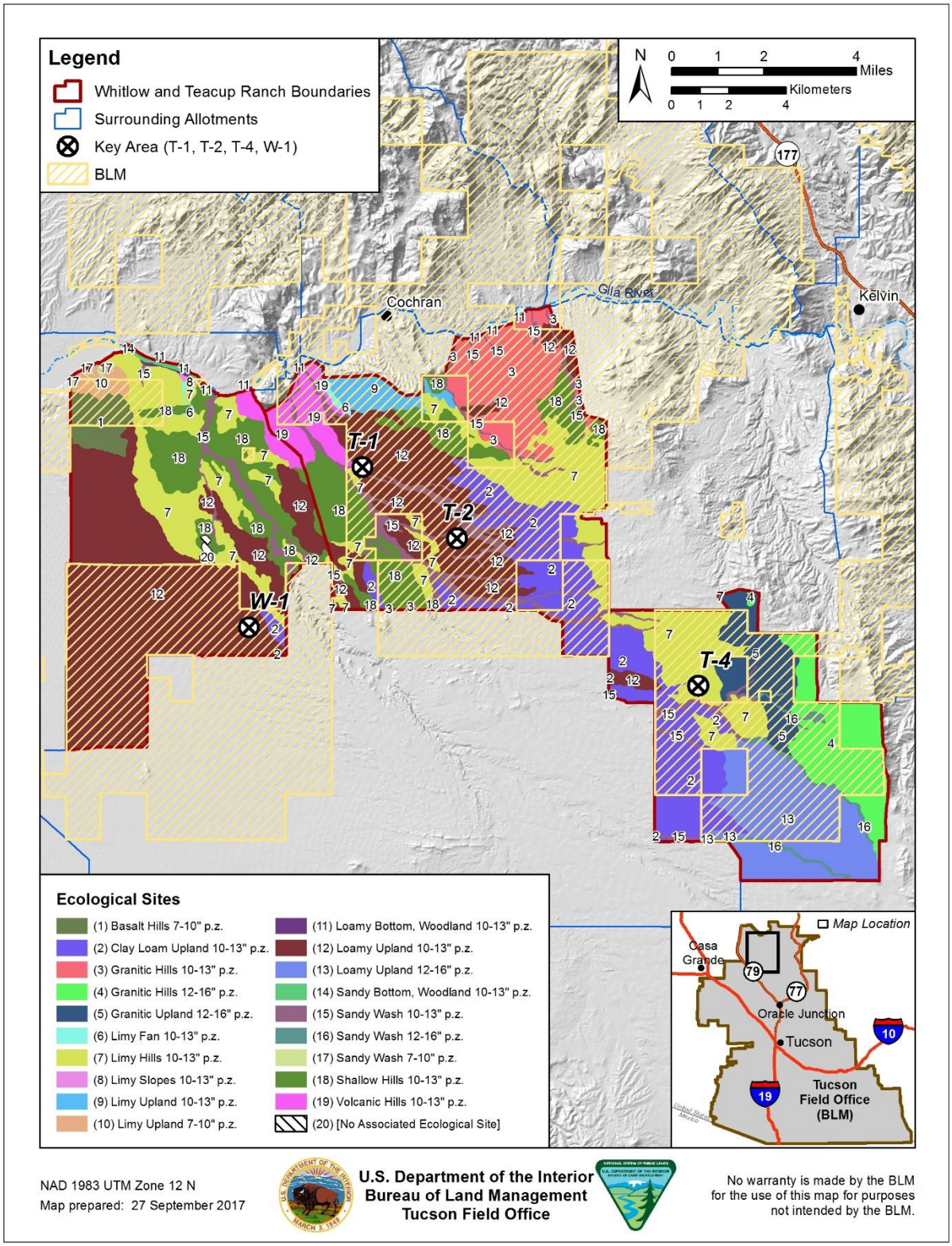
Teacup Ecological Site Acreage		
Ecological Site	***Acres**	**Percent**
Clay Loam Upland 10-13	6965.575	17.47
Granitic Hills 10-13	3,234.18	8.11
Granitic Upland 12-16	3,105.45	7.79
Limy Fan 10-13	2,042.59	5.12
Limy Hills 10-13	76.28	0.19
Limy Upland 10-13	6,202.68	15.55
Loamy Bottom, Woodland 10-13	820.76	2.06
Loamy Upland 10-13	11.77	0.03
Loamy Upland 12-16	5,212.44	13.07
Sandy Bottom, Woodland 10-13	4,520.86	11.34
Sandy Wash 10-13	0.05	0.00
Sandy Wash 12-16	2,618.42	6.57
Shallow Hills 10-13	429.43	1.08
Volcanic Hills 10-13	3,437.01	8.62
TOTAL	**39,880.53**	
**Ecological Site total acreage may not match area of allotment due to rounding errors and data type differences. Percentages are based on ecological site total acreage.		

*Ecological Site total acreage may not match area of allotment due to rounding errors and data type differences. Percentages are based on ecological site total acreage.

Table 5. Whitlow Allotment Ecological Site Acreage

Whitlow Ecological Site Acreage		
Ecological Site	***Acres**	**Percent**
Basalt Hills 7-10	948.57	4.46
Clay Loam Upland 10-13	136.60	0.64
Limy Fan 10-13	27.36	0.13
Limy Hills 10-13	3,676.23	17.28
Limy Slopes 10-13	24.41	0.11
Loamy Bottom, Woodland 10-13	403.11	1.89
Loamy Upland 10-13	55.98	0.26
Loamy Upland 7-10	11,838.19	55.64
Sandy Bottom, Woodland 10-13	124.17	0.58
Sandy Wash 10-13	494.27	2.32
Sandy Wash 7-10	77.28	0.36
Shallow Hills 10-13	3,010.55	14.15
Volcanic Hills 10-13	387.66	1.82
[No Associated Ecological Site]	72.13	0.34
TOTAL	**21,276.50**	

Figure 4. Ecological Sites within Teacup and Whitlow Allotments



The Key Area W-1 is within the Limy uplands 10-13" precipitation zone (R040XC111AZ). Key vegetative species for this site include Creosote (Larrea tridentata), palo verde (Parkinsonia microphylla) and triangle bursage (Ambrosia deltoidea). The potential plant community is a diverse community of desert trees, shrubs, cacti, and perennial forbs and grasses.

With continuous heavy grazing, herbaceous and suffrutescent forage species are replaced by increases in shrubs, cacti and trees. Well-developed gravel covers help protect the soil from erosion.

This site has a cycle of dominance by saguaro, alternating with large shrubs and trees that act as nurse plants for the giant cacti. This cycle takes approximately 300 years and starts from exceptionally wet years (El Nino) where saguaro establishes in large numbers.

The Key Areas T-1, 2 and W-1 are within the Loamy Uplands 10-13" precipitation zone (R040XC114AZ). Key vegetative species for this site include Triangle bursage (Ambrosia deltoidea), Cholla (Cylindropuntia versicolor), flattop buckwheat (Eriogonum fasciculatum) and slender janusia (Janusia gracilis). The potential plant community is an open stand of desert trees and cacti with a grassy understory. The major perennial grass species tend to be well dispersed throughout the plant community. The aspect is savannah.

With continuous grazing, perennial grasses and suffrutescent forbs are removed from the plant community and shrubs like burroweed and triangle bursage increase to dominate the understory. Trees grow to near maximum size on these deep coarse textured soils. A tree canopy of 5% to 10% is important on the site to keep diversity in the plant community. The potential of the site to produce grass is reduced as tree cover exceeds 15%. In severe drought, the cover of perennial grasses and herbs as well as bursage and burroweed can be greatly reduced in the plant community. Recovery can go back to perennial grasses and herbs if good summer rains follow drought. Recovery can go back to the half shrubs if good cool season rains follow the drought. Even with poor plant cover these soils produce very little runoff and have very low erosion rates. Staghorn and jumping cholla can increase with heavy grazing or increases can be episodic due to climate. Stand life spans range from 40-60 years without reproduction.

The Key Area T-4 is within the Limy Hills 10-13" precipitation zone (R040XC121AZ).

The potential plant community is a diverse mixture of desert shrubs, trees, cacti, and perennial grasses and forbs. The aspect is shrubland.

With continuous, heavy grazing, herbaceous forage species and palatable half shrubs are removed from the plant community and replaced by increases in shrubby species like little leaf paloverde, white brittlebush, creosote bush, ocotillo, triangle bursage, and cholla. Gravel and cobble covers are continuous but lack the size necessary to prevent erosion on steep slopes if the plant cover has been depleted. This site lacks stone or large cobble covers to protect forage species from heavy utilization. Plant populations of major shrubs range from 50 to 100 per acre for little leaf paloverde, 10 to 100 for ocotillo, 50 to 150 for creosote bush, 75 to 150 for large shrubs including jojoba and wolfberry, 10 to 50 for Mormon tea, and 50 to 200 plants per acre for the brittlebush and bursage group.

North exposures have a higher percentage cover of perennial grasses and suffrutescent forbs than warm exposures. Grass canopy cover ranges from 0-5% on north slopes and 0-1% on south slopes. Forb cover ranges from 1-15% on north slopes and 0-2% on south slopes. Warm exposures have a higher percentage of trees and succulents than north slopes. The half shrub community on north slopes is dominated by species like calliandra, goldeneye, flattop buckwheat and Mormon tea while on south slopes brittlebush, white ratany and bursage are dominant. Jojoba will have its higher cover on north

aspects while southern aspects will have more ocotillo, creosote bush, whitethorn and wolfberry. The percent of annual forbs and grasses in the plant community can range from 1% in dry years to nearly 50% in very wet winters or summers. The yearly production of annuals ranges from 2 lbs. per acre to over 400 lbs. per acre (from dry year to wet year).

Severe drought can reduce the cover of perennial grasses and suffrutescent forbs to less than 1%. Drought can also reduce the cover of sub-shrubs like brittlebush and bursage.

The dynamics of Saguaro on this site is unlike the 200-300 year cycle found on deep upland sites in the Upper Sonoran desert. Saguaro recruitment can occur in any favorable year due to numerous rocky habitats favorable for establishment. Saguaro populations tend to be multi-aged and persistent on this site although very favorable years for establishment may result in very heavy stands on some slopes many years later.

2.3.3 Climate Data for Ecological sites

The average annual precipitation is 10 to 13 inches in most of this area. Rainfall can average 22 inches per year in the mountain ranges. Most of the rainfall occurs as high-intensity, convective thunderstorms, mainly from July to September, and as Pacific frontal storms from December to March. Snowfall is rare, except at the higher elevations. The average annual air temperature is 58 to 74 degrees.

The freeze-free period averages 285 days and ranges from 205 to 365 days, decreasing in length with increasing elevation.

2.3.4 Vegetation Communities

The Sonoran Basin and Range MLRA supports desert grassland and desert shrub vegetation. Desert shrublands are at the higher elevations, where saguaro, littleleaf palo verde, and mesquite (*Prosopis spp*.), - not restricted to water courses - grow along with an understory of bush muhly (*Muhlenbergia porteri*) threeawns (*Aristida spp*.), Rothrock's grama (*Bouteloua rothrockii*), slim tridens, black grama (*Bouteloua eriopoda*), triangle-leaf bursage, creosotebush, whitethorn acacia, jojoba, desert zinnia, false mesquite, prickly pear, jumping cholla and staghorn cholla and needlegrass (*Achnatherum spp*.) characterize the understory. Whitethorn acacia (*Vachellia constricta*), grow on the drier soils at the lower elevations.

Many of the plant species occur in various vegetation communities across the MLRA, with the vegetation communities being defined by the dominant species that occur in them such as Sonoran palo verde – Mixed Cacti desert Shrub and Sonoran Mid Elevation Desert Shrub. The BLM lands within the allotment are mainly composed of those two vegetation communities (figure 5).

Tables 6 and 7 below show the vegetation community types within the Teacup and Whitlow Allotments based on Southwest Regional GAP Analysis Project.

Table 6. Vegetation Community types on the Teacup Allotment.

Vegetation	Acres	Percent
Apacherian-Chihuahuan Mesquite Upland Scrub	1617.00	4.06
Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe	5.12	0.01
Barren Lands, Non-specific	8.19	0.02
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	170.53	0.43
Chihuahuan Mixed Salt Desert Scrub	2.00	0.01
Chihuahuan Succulent Desert Scrub	57.95	0.15

Invasive Southwest Riparian Woodland and Shrubland	7.46	0.02
Madrean Pinyon-Juniper Woodland	1236.95	3.11
North American Warm Desert Riparian Mesquite Bosque	16.96	0.04
North American Warm Desert Riparian Woodland and Shrubland	36.80	0.09
North American Warm Desert Wash	1.11	0.00
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	346.71	0.87
Sonoran Mid-Elevation Desert Scrub	4188.48	10.52
Sonoran Paloverde-Mixed Cacti Desert Scrub	32111.69	80.67
TOTAL	**39,806.95**	

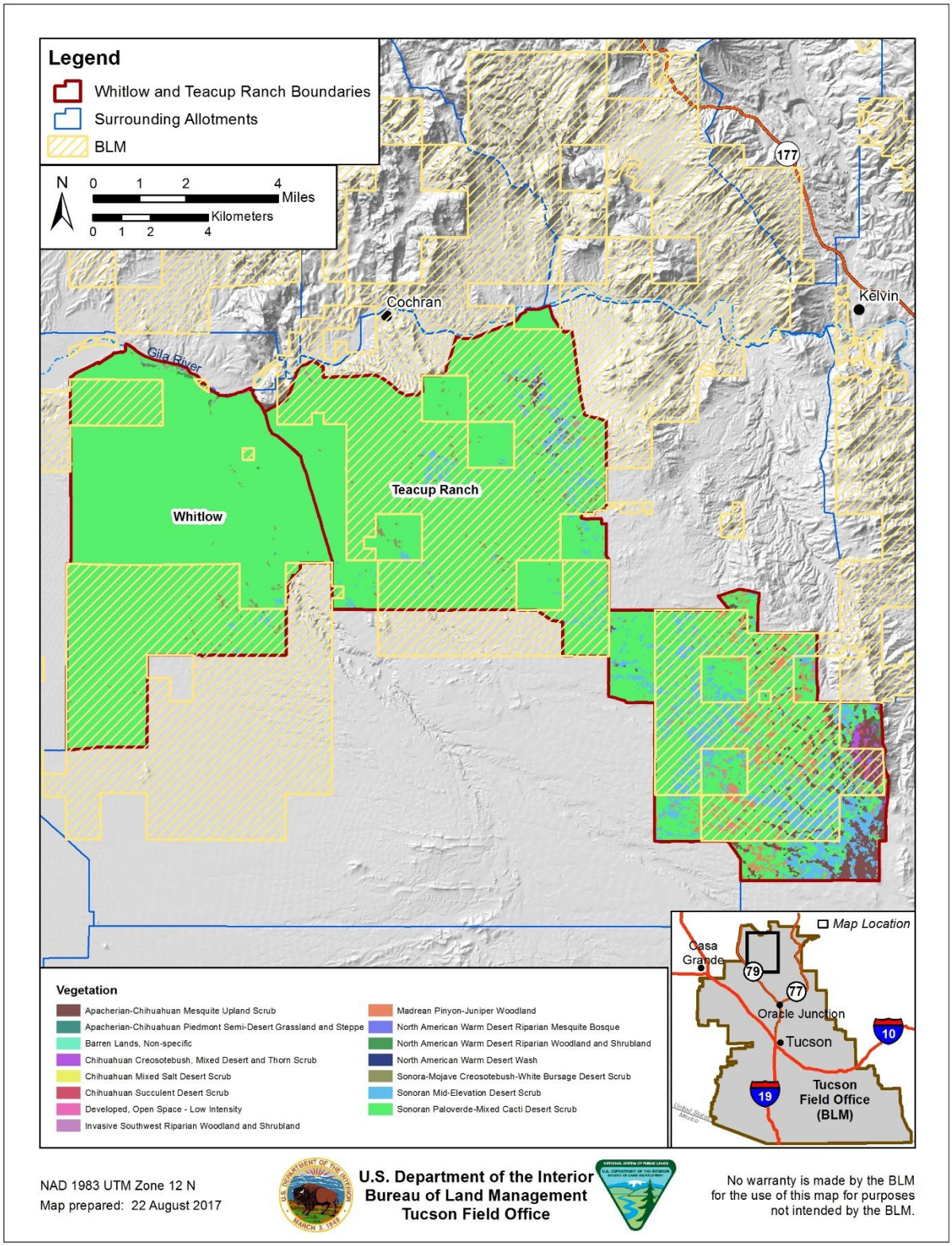
***Vegetation acreage may not match area of allotment due to rounding errors and data type differences. Percentages are based on vegetation total acreage.

Table 7. Vegetation Community types on the Whitlow Allotment.

Vegetation	Acres	Percent
Apacherian-Chihuahuan Mesquite Upland Scrub	3.33	0.02
Developed, Open Space - Low Intensity	16.71	0.08
Invasive Southwest Riparian Woodland and Shrubland	33.95	0.16
North American Warm Desert Riparian Mesquite Bosque	1.11	0.01
North American Warm Desert Riparian Woodland and Shrubland	47.79	0.23
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	122.98	0.58
Sonoran Mid-Elevation Desert Scrub	65.61	0.31
Sonoran Paloverde-Mixed Cacti Desert Scrub	20938.69	98.63
TOTAL	**21,230.17**	

***Vegetation acreage may not match area of allotment due to rounding errors and data type differences. Percentages are based on vegetation total acreage.

Figure 5. Vegetation Communities within the Teacup and Whitlow 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 these allotments include the following:

Mammals

- mule deer (*Odocoileus hemionus*),
- Desert bighorn sheep
- 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*),
- 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*).

Livestock affect wildlife in a variety of ways by their presence, through behavioral disturbance, and through competition for forage. Behavioral impacts resulting from inter-species encounters (including

human and livestock) are difficult to quantify, as they vary by species and by type of interaction. Wildlife currently present on the allotments have, to varying degrees, acclimated to the presence of livestock and associated human disturbances. Impacts to wildlife and habitat components include, but are not limited to removal of cover and forage, soil disturbance and erosion, reduction of fine fuels available to carry fire (altered fire regime), addition of artificial water and mineral sources; habitat fragmentation, changes in hydrologic flow regimes, and long-term vegetative community conversion.

Current livestock management dictates habitat conditions relative to the stable state vegetative community that has developed on each site. Overall, this allotment provides all the components (food, water and shelter) of suitable habitat for the wildlife species that occur on the allotment.

2.3.6 Threatened & Endangered Species

A query conducted on the USFWS Information for Planning and Conservation (IPaC; USDI 2016) website showed that the following threatened, endangered and proposed (TEP) species may occur within the allotment:

- Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*),
- Ocelot (*Leopardus pardalis*),
- Southwestern willow flycatcher (*Empidonax trailii extimus*)
- Yellow-billed cuckoo (*Coccyzus americanus*),
- Northern Mexican garter snake (*Thamnophis eques megalops*),
- Gila chub (*Gila intermedia*)
- Acuna cactus (*Echinomastus erectocentrus var. acunensis*)

Review of habitat requirements for each species was conducted to determine its potential to occur on the allotment and to inform the Effects Determination for each species (Table 8). Two designated or proposed critical habitats overlap with this allotment.

Table 8. Species indicated by 2016 USDI IPaC analysis for Teacup and Whitlow Allotment.

Species	Habitat	Potential for Occurrence on Teacup and Whitlow 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 Teacup and Whitlow 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 Teacup and Whitlow Allotments are about 50 miles from the nearest known maternity roost.**
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

Species	Habitat	Potential for Occurrence on Teacup and Whitlow Allotments and Effects Determination
		2009 and 2011 in Cochise County. No sightings are known from Teacup And Whitlow Allotment area. The nearest known location for an ocelot to the allotments was 20-30 miles away
Southwestern willow flycatcher	Nests in willows along streams and rivers, with nearby cottonwoods serving as foraging sites. Critical habitat designated on Teacup And Whitlow Allotment.	There is Southwestern willow flycatcher habitat on Teacup And Whitlow Allotments. The proposed action would pose very little risk of disturbance to migration, feeding, breeding or riparian resources that support the Southwestern willow flycatcher.
Yellow Billed Cuckoo	Nests in willows along streams and rivers, with nearby cottonwoods serving as foraging sites. Critical habitat designated on Teacup And Whitlow Allotment.	There is Yellow-billed Cuckoo habitat on Teacup And Whitlow Allotments. The proposed action would pose very little risk of disturbance to migration, feeding, breeding or riparian resources that support the yellow-billed cuckoo.
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 project area supports 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 project 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 project area supports a large and 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 project area or survives at very low population levels.

Species	Habitat	Potential for Occurrence on Teacup and Whitlow Allotments and Effects Determination
Acuña Cactus	This species is found in valleys and on small knolls and gravel ridges of up to 30 percent slope in the Palo 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.	Some potential for occurrence on allotment, though surveys have not been conducted. There is 4 acres of Box O Wash A subunit PCH designated critical habitat on the Whitlow Allotment.

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:

- Monarch Butterfly (*Danaus plexippus plexippus*)
- Sonoran Talussnail (*Sonorella magdalenensis*)
- 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*)
- Pima Indian Mallow (*Abutilon parishii*)
- Sonoran desert tortoise *(Gopherus morafkai*),
- American peregrine falcon (*Falco peregrinus*),
- bald eagle (wintering) (*Haliaeetus leucocephalus*),
- desert purple martin (*Progne subis hesperia*),
- gilded flicker (*Colaptes chrysoides*),
- golden eagle (*Aquila chrysaetos*),

The bird species utilize the grassland, open shrub, and cliff habitat for nesting and foraging. The invertebrate, mammal, reptile and plants occur in grasslands, rocky and wooded hills, and/or areas along the edge of rain pools, wash bottoms, and areas near water in semi-arid mesquite-grassland, creosote bush desert, and upland saguaro-paloverde desert scrub.

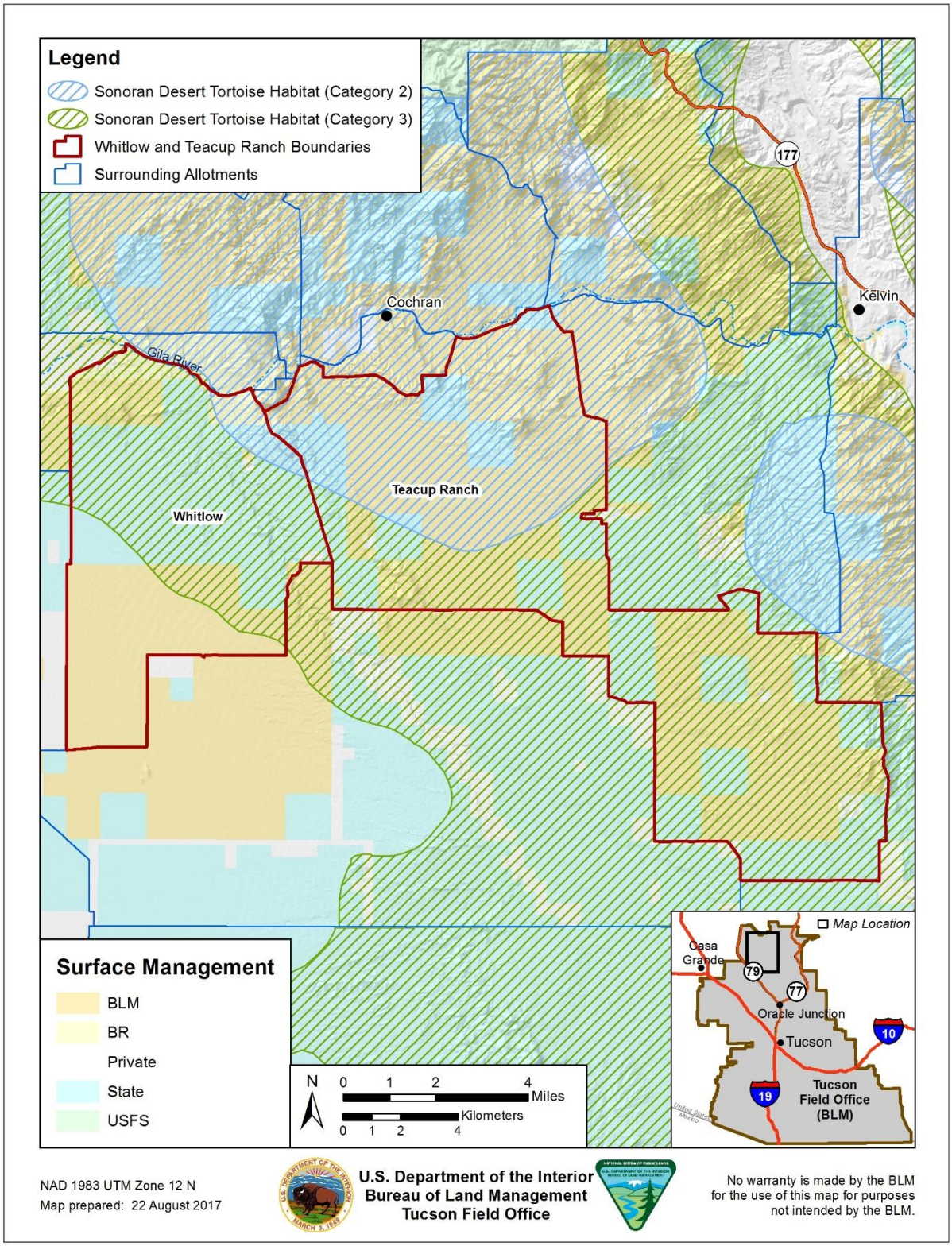
In order to monitor long-term condition and trend of wildlife habitats, particularly for Sonoran desert tortoise, key areas are established within mapped suitable tortoise habitat on the BLM lands. Sonoran desert tortoise occur most commonly on rocky, steep slopes and bajadas (lower mountain slopes) 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.

There are 14,975 total acres of Sonoran Desert Tortoise category 2 habitat (USDI 1988 Table 1. Pg. 12) within the Teacup Allotment, of which 12,229 acres of category 2 habitat overlap BLM managed lands (Figure 6). There are 24,905 total acres of Sonoran Desert Tortoise category 3 habitat within the Teacup Allotment, of which 15,120 acres of category 3 habitat overlap BLM managed lands (Figure 6).

There are 1,029 total acres of Sonoran Desert Tortoise category 2 habitat within the Whitlow Allotment, of which 8 acres category 2 habitat overlap BLM managed lands (Figure 6). There are 13,248 total acres of Sonoran Desert Tortoise category 3 habitat within the Whitlow Allotment, of which 2,772 acres of category 3 habitat overlap BLM managed lands (Figure 6).

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

Figure 6. Sonoran Desert Tortoise Category 3 habitat within Teacup and Whitlow Allotments



2.3.8 Migratory Birds

The Teacup and Whitlow Allotment, which includes the BLM managed public and other land jurisdictions, offer diverse habitats for migratory birds, providing valuable food, water, and cover. Migratory species that utilize the area include but are not limited to:

- Arizona woodpecker (*Leuconotopicus arizonae*),
- Bendire's thrasher (*Toxostoma bendirei*) ,
- Canyon towhee (*Melozone fusca*),
- Golden eagle (Aquila chrysaetos)
- Red-tailed hawk, (Buteo jamaicensis)
- Raven, (Corvus corax)
- Turkey vulture, (Cathartes aura),
- Western meadowlark, (Sturnella neglecta)
- Ladder-back woodpecker, (Dryobates scalaris)
- Ash-throated flycatcher, (Myiarchus cinerascens
- Canyon wren, (Catherpes mexicanus)
- Costa's hummingbird (*Calypte costae*),
- Gilded flicker (*Colaptes chrysoides*),
- Phainopepla (*Phainopepla nitens*),

No surveys have been conducted specifically within this allotment for this project to determine presence but these species have the potential of occurring within the vegetation communities located on this allotment (Figure 5).

2.4 Special Management Areas

2.4.1 National Scenic Trail

The Teacup Ranch allotment includes approximately 7.7 miles of the Arizona National Scenic Trail, designated by Congress as part of the National Trail System in 2009 (P.L. 111-11). The trail is intended to provide a single-track non-motorized route for hiking, mountain biking, and equestrian riding opportunities across the state from near the US-Mexico boundary to near the state of Utah and Arizona boundary. Approximately 4.2 miles of the trail in the allotment is located on primitive roads shared with motorized use, with the rest on constructed single track. Approximately 3.5 miles of the trail are on a Pinal County held trail right of way across State Trust land. The nearest trailhead is along the Florence-Kelvin Highway. The National Forest Service, the overall trail-administering agency, is preparing a trail-corridor management plan in consultation with the BLM, Pinal County, Arizona Trail Association and other trail partners. Potential trail realignment is being considered to move the existing trail away from an existing livestock water facility, and to move the trail off the primitive roads where possible.

2.4.2 Gila River Riparian Management Area

The Teacup and Whitlow Allotments includes part of the Gila River Riparian Management Area established in the Phoenix Resource Management Plan (RMP) dated Oct 5, 1989 The Riparian Management Area consists of the Gila River and bottomland, totaling approximately 1,490 acres of BLM land from the Florence-Kelvin Highway Bridge to the Ashurst-Hayden Dam. The bottomland is covered by mesquite riparian bosque and desert scrub, with cottonwood-willow on the riverbanks. Extensive tamarisk infestation is found throughout the area. The riparian management area provides critical habitat for Yellow-billed Cuckoo and Southwestern willow flycatcher, both listed threatened and endangered species.

2.4.3 Gila River Cultural Resource Management Area

The Teacup and Whitlow Allotments include part of the Gila River Cultural Resource Management Area, established in the Phoenix RMP, which includes approximately 22,920 acres of public land. The management area consists of the river valley and adjacent slopes where extensive cultural resources have been discovered. The area is significant in the region's prehistoric habitation and agriculture, historic mineral development, transportation, ranching and homesteading, and includes the historic town-site of Cochran.

2.5 Recreation Resources

2.5.1 Recreation Resources

The Teacup Allotment includes approximately 27,405 acres of public land administered by the BLM available for public recreational use, comprising approximately 69% of the allotment as shown in Table 9 below, and on the map in Figure 7. BLM land is available for public use subject to BLM recreation and OHV regulations. Approximately 12,171 acres, or 31% of the allotment, is State Trust land available for public use subject to a hunting license or recreational permit from the Arizona State Land Department. Approximately 304 acres, or 1% of the allotment, is private land not open to public use without the landowner's permission. 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. Public lands in the allotment receive a moderate amount of recreation, and a portal information site is planned at the public land entrance along Cochran Road to provide visitor information.

The Whitlow Allotment includes approximately 7,643 acres of public land administered by the BLM available for public recreational use, comprising approximately 35% of the allotment as shown in Table 10 below, and on the map in Figure 8. BLM land is available for public use subject to BLM recreation and OHV regulations. Approximately 10,976 acres, or 52% of the allotment, is State Trust land available for public use subject to a hunting license or recreational permit from the Arizona State Land Department. Approximately 186 acres, or 1% of the allotment, is private land not open to public use without the landowner's permission. The allotment is within Game Management Unit 37B, and the area is in a BLM Extensive Recreation Management area with essentially custodial visitor services and no facilities. Public lands in the allotment receive a moderate amount of recreation, and a portal information site is planned at the public land entrance along Whitlow Ranch Road to provide visitor information.

Table 9. Land base in the Teacup Allotment available for public recreational use

Category	Acres	Description
Bureau of Land Mgmt.	27,405	Available for public recreation
State Trust Land	12,171	Available for recreation with a permit
Private Land	304	Not available
Total	**39,880**	

Table 10. Land base in the Whitlow Allotment available for public recreational use

Category	Acres	Description
Bureau of Land Mgmt.	10,115	Available for public recreation
State Trust Land	10,976	Available for recreation with a permit
Private Land	186	Not available
Total	**21,277**	

The land base in the allotments provides recreational opportunities primarily related to OHV recreation, hunting (mule deer, upland birds and small game, and predators), sightseeing, driving OHVs for pleasure, primitive camping, hiking, mountain biking, and equestrian riding. The area receives primarily day use, with a substantial amount of overnight use. Dispersed camping areas have been identified along Cochran Road, and the Old Florence Road, which are the main access routes in the allotment. Recreational off highway vehicle (OHV) driving occurs on an extensive network of existing primitive routes (4WD, ATV, motorcycle riding), and in some of the washes. The natural drainages attract OHV use (4WD, ATV) for access and recreational riding due to their relatively wide and unobstructed sand/gravel beds. Several of the washes with rock beds and outcrops attract technical OHV driving for challenge and skill. The Gila River provides small craft floating opportunities but use is very low, limited by river flows and channel conditions. The Arizona National Scenic Trail crosses the southeastern part of the allotment along Tortilla Mountains, providing opportunities for hiking, mountain biking and equestrian riding. Overall, recreational use in the allotment is moderate, and has been increasing during the past decade. Visitation is estimated at approximately 8,000 visits annually on the Teacup Allotment and 6,000 visits annually on the Whitlow Allotment. Recreational use originates in the local area and region, with a significant amount by of out of state Arizona winter residents. Use occurs throughout the year, but typically peaks during the fall through spring. Recreational use at activity areas (i.e. campsites, parking areas) precludes vegetative cover and may impair soil function, and could be a contributing factor on the condition of rangeland health at the sites. However, even though widespread and relatively abundant, the localized and small-scale nature of the recreation impacts, the effects on overall rangeland health on public lands in the allotments are considered insignificant.

2.5.2 Access/Transportation

The Teacup Allotment includes approximately 165.2 miles of secondary and primitive roads, and the Whitlow Allotment includes approximately 128.9 miles of secondary and primitive roads identified in an interagency route inventory completed for the area in 2003, as shown the map in Figure 7 and summarized on Tables 11 and 12 below. The route network includes approximately 15.1 miles of Pinal County maintained roads. The route network is accessed from SR79 and SR177 by the Florence-Kelvin Highway, the main access route in the area. Approximately 7.7 miles of the Arizona National Scenic Trail is in the Teacup Allotment. Part of the Old Florence Road, a historic wagon road route between the town of Florence and Winkelman, crosses the southeastern part of the allotment. The existing roads provide access for the use, maintenance and operation of the grazing allotment and range improvements, access to private land inholdings, electric power lines, public recreational use, and other uses. With the exception of county maintained roads, most of the access routes are single lane, mostly unmaintained, natural soil surfaced, with surface material ranging from fine-grained sandy soil to gravel. The primitive routes vary in width from 10 feet to 20 feet, though for analysis purposes, an average width of 12 feet was used. On the Teacup Allotment, approximately 62 miles of the routes are in the channel of natural drainages, mostly on BLM land. On the Whitlow Allotment, approximately 27 miles of the routes are in the channel of natural drainages, mostly on State Trust land.

The current Off Highway Vehicle designations established in the current Resource Management Plan limit use of motor vehicles to ‘Existing Roads and Trails’ on public lands in the allotment. The Arizona National Scenic Trail is managed for non-motorized travel to accommodate hiking, bicycling and equestrian riding, but approximately 4.1 miles of the trail are on primitive roads along the APS electric transmission line and share the route with motorized vehicles, and the rest is on constructed single track. The 2003 route inventory in the part of the allotment north of the Florence-Kelvin Highway was evaluated

in 2006, and a comprehensive travel management plan was completed in 2010. The travel management plan identified the existing motorized route network.

The existing primitive roads typically alter natural drainage patterns by intercepting surface runoff in the roadway and ditches, and sometimes by intercepting small side drainages and diverting runoff along the road. The intercepted runoff may prevent some moisture from reaching soils and vegetation down slope from the route, potentially reducing vegetative production in localized areas. The routes that receive the heavier traffic volume typically preclude vegetative cover and organic litter on the roadway entirely. Routes that receive very low traffic volume, particularly those on stable sites, support vegetation growth between the wheel tracks while allowing passage by vehicles. Most of the primitive routes are poorly drained, and intercepted runoff is causing soil and roadbed erosion, which is severe on some of the routes. The natural soil surface and subgrade on most of the primitive routes allows water infiltration to occur, but is limited by compaction of the soils on the roadway, and by rapid runoff on routes with relatively steep grades. The routes in the wash bottoms may prevent vegetative grown in the streambed, and cause channelization in the vehicle tracks and potential erosion of the streambed. Because of the relatively small area affected, the impact on land health from the primitive routes in the allotment is considered insignificant. Although insignificant, impacts from travel routes and OHV use could be minimized by travel management, including route maintenance and implementation of the Arizona Resource Advisory Council Guidelines for Off-Highway Vehicle (OHV) Recreation Management.

Table 11. Existing route inventory in the Teacup Allotment

Route Type	Miles	Acres Disturbed
Secondary Road - Unpaved	2.0	4.8
Tertiary Road - Unpaved	159.1	231.4
Non-motorized route	4.1	2.5
Total	**244.9**	**238.8**

Table 12. Existing route inventory in the Whitlow Allotment

Route Type	Miles	Acres Disturbed
Secondary Road Paved	1.9	9.1
Secondary Road Unpaved	3.9	9.3
Tertiary Road Unpaved	122.7	178.5
Single Track	0.5	0.3
Total	**128.9**	**197.2**

Figure 7. Recreation resources, route inventory and recreation activity areas Teacup Allotment

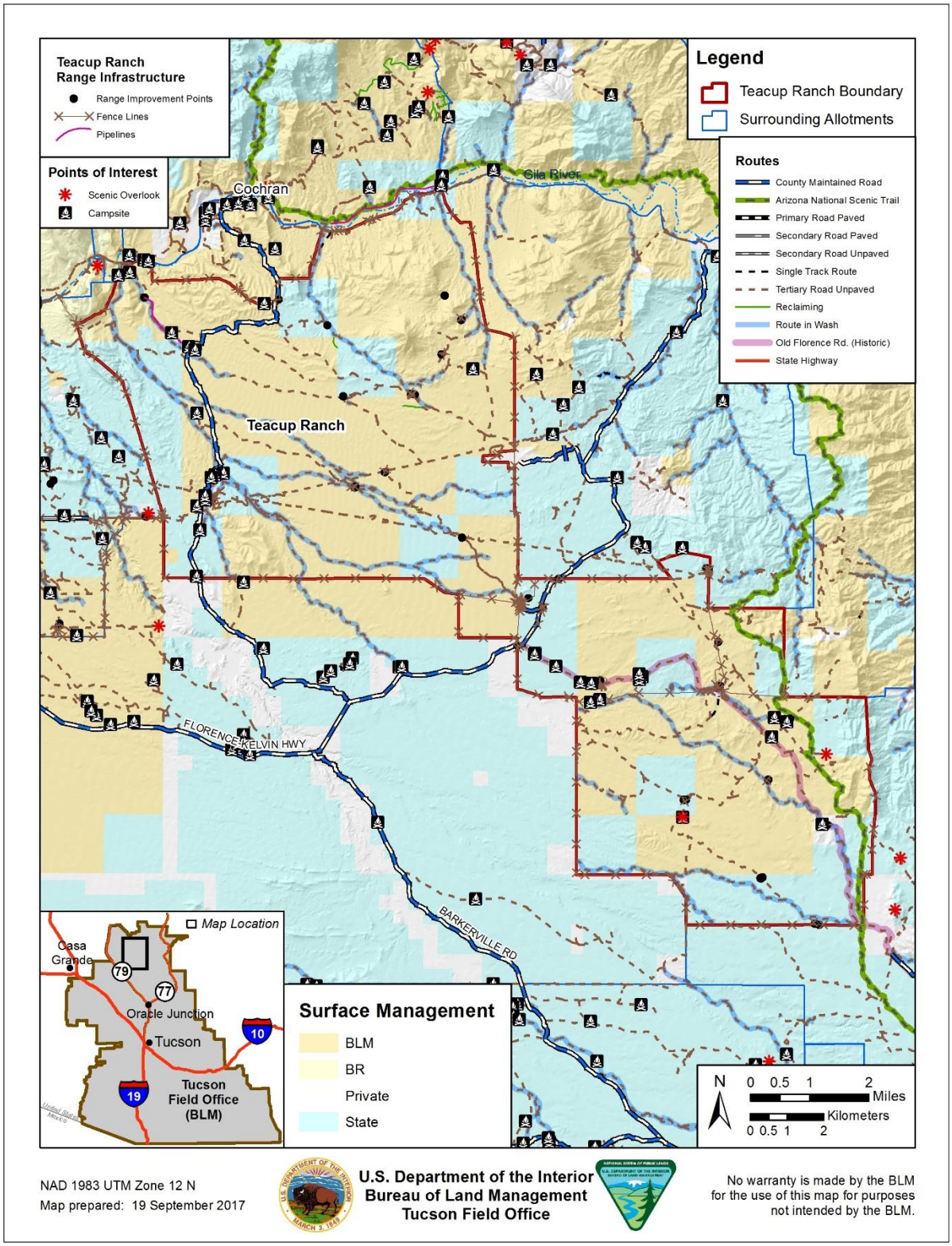
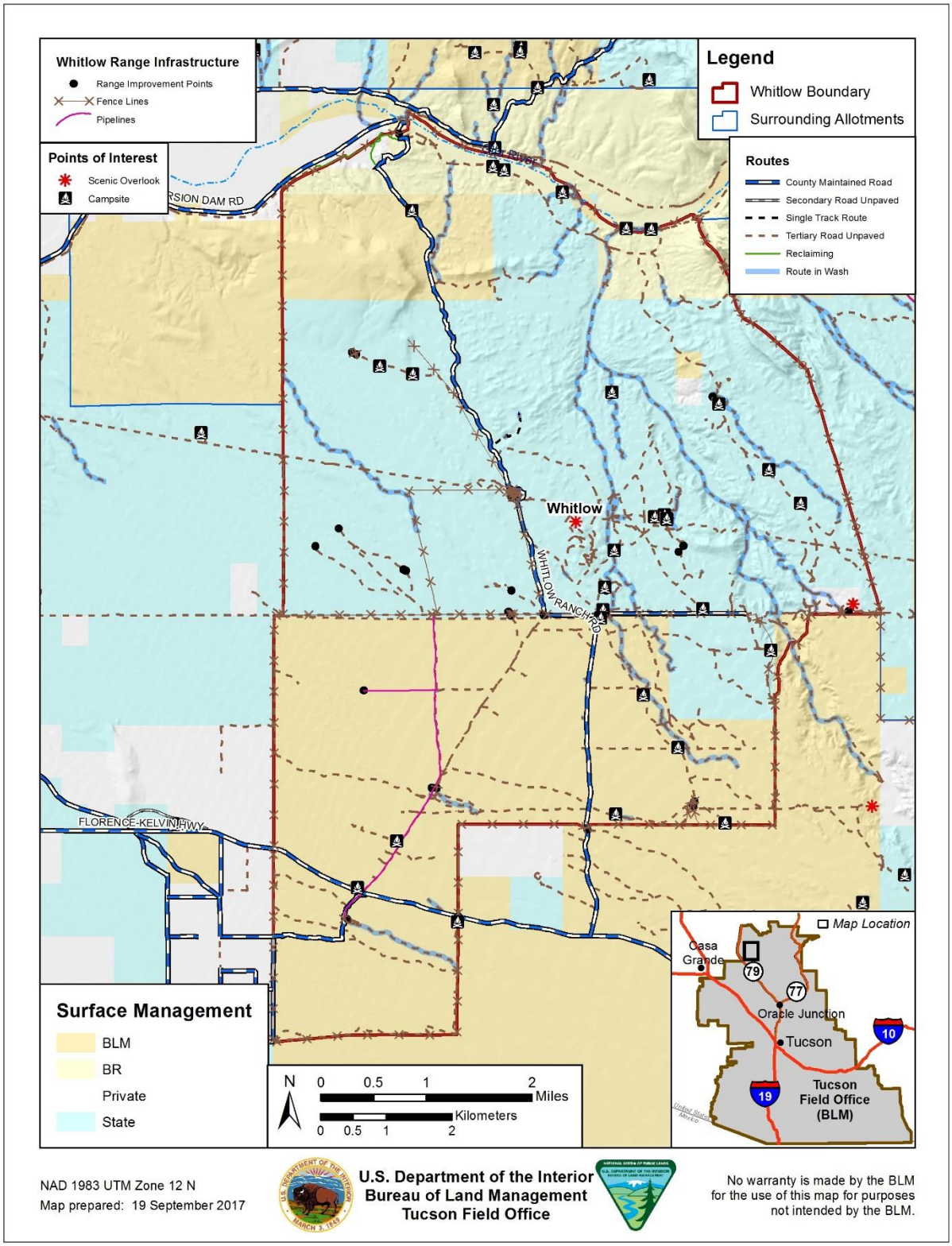


Figure 8. Recreation resources, route inventory and recreation activity areas Whitlow Allotment



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 BLM'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, "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 (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 Whitlow and Teacup Allotments between June 20 and August 8, 2017. Data reviewed were obtained from BLM Tucson Field Office (TFO) cultural program project files, site reports, and atlases, in addition to BLM maintained General Land Office (GLO) plats and patent records. Electronic files were reviewed using online cultural resource databases including *AZSite* (2017), Arizona's statewide cultural resource inventory system, and the *National Register of Historic Places Digital Asset Management System & NPGallery* (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 22 prior cultural resources investigations (Table 13) that, collectively, have resulted in the inventory and documentation of approximately 1,700 acres and 28 sites on BLM-managed surface. Known site types include prehistoric habitation, resource procurement, and/or processing locales; a historic-age railroad spur; mining-related features, and ranching and habitation features.

Table 13. Prior Cultural Resources Investigations within the Whitlow and Teacup Allotments

№	Project No.	Project Name	Reference(s)
1	1963-8.ASM	Buttes Dam Site Survey	Vivian 1964
2	1973-2.ASM; 1975-83.ASM	Buttes Reservoir Project	Grady et al. 1974; Debowski et al. 1976
3	1974-16.ASM	Cholla-Saguaro Transmission Line	Teague and Mayro 1979

№	Project No.	Project Name	Reference(s)
4	BLM-17-19	Fitch Plastering Corrals	AZSite 2017; BLM-TFO Files
5	BLM-17-30	Grayback Catchment	AZSite 2017; BLM-TFO Files
6	BLM-17-32	Mining Plan Assessment	AZSite 2017; BLM-TFO Files
7	BLM-17-35	Pipeline Range Improvement	AZSite 2017; BLM-TFO Files
8	BLM-17-44	Bader Ranch Re-Seeding	AZSite 2017; BLM-TFO Files
9	BLM-17-46	Four T-Cup Corrals	AZSite 2017; BLM-TFO Files
10	BLM-17-57	Bader Pipeline and Reservoir	AZSite 2017; BLM-TFO Files
11	BLM-17-67	Bader Fenceline	AZSite 2017; BLM-TFO Files
12	1988-194.ASM	Salt-Gila Aqueduct Water Catchments	AZSite 2017; BLM-TFO Files
13	1993-369.ASM	Eastern Mining Area 115kV Line	Motsinger et al. 1996
14	1997-59.ASM	Arizona Trail Survey	Sullivan 1997
15	BLM-060-MG-98-1	Diablo Canyon Outfitters SRP	AZSite 2017; BLM-TFO Files
16	AZ-0001114	BLM Grazing Lease Assessment	AZSite 2017; BLM-TFO Files
17	2003-1178.ASM	SCIP Coolidge-Hayden 69kV Line	Rinker 2001
18	2003-1209.ASM	SCIP Tea Cup Substation Area	Rinker and Morgan 2001
19	2008-276.ASM	AGFD Tortilla Mountain Catchments	Barr 2007
20	2010-114.ASM	Saguaro Grande LLC	Shrieve 2010
21	2010-369.ASM	Middle Mountain	McKee 2010
22	2012-270.ASM	Grayback Mountain Survey	Jones 2012

Historic GLO plat maps also were reviewed that depict the “Road from Florence to Butte Smelter” and the “Road from Gila Ri. to Cottenwood” (plat no. 1554, dated 1893); “Donnelly’s Ranch” with associated features, a mine, a cluster of ranch features labeled “Robdard,” the Arizona Eastern Railroad and related features (plat no. 1555, dated 1924); a network of unnamed roads and a pasture fence (plat no. 1643, dated 1943); and “Zellweger’s Pasture” with associated features (plat no. 1645, dated 1918).

Although none of these features correspond with range improvements or livestock concentration areas on BLM-managed surface, historic mining and ranching-related land-use features may exist throughout the subject allotment; however, many such features remain in-use and serve as evidence of long-term grazing and/or mining within the subject allotments and surrounding vicinity, some of which predate the early 1900s.

Statement of Effect Determination

Of the 20 identified range improvement/livestock concentration areas on BLM administered surface, 15 have been subject to cultural resources inventory with no cultural resources identified near the assessed locations. 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 Whitlow and Teacup Allotments is appropriate under a finding of *no adverse effects,* provided that an assessment strategy is devised for the five un-surveyed range improvement locations 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 10 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* (accessed June 20, 2017; last updated June 19, 2017)—by sending letters summarizing the results of the Class 1 cultural resources assessment and rangeland monitoring data for the Whitlow and Teacup Allotments. Tribes consulted include the Fort McDowell Yavapai Nation, Gila River Indian Community, Hopi Tribe, 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 with potential cultural significance include buckhorn cholla (*Cylindropuntia acanthocarpa*), broom snakeweed (*Gutierrezia sarothrae*), and mesquite (*Prosopis velutina*).

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

The Teacup and Whitlow Allotments are located approximately 17 to 27 miles east of the town of Florence, Pinal County, Arizona. The ranch is bordered by the Horsetrack Allotment to the northwest, the Cochran and LEN Allotments to the north, the A Diamond Allotment to the east, and the Box O and Hackberry Wash Allotments to the south and southeast respectively (Figure 1).

In the 1860s and 1870s, ranchers began moving large numbers of cattle and sheep into the region (Bahre 1991). By 1891, cattle in southeast Arizona reached nearly 400,000, before the severe drought of 1891-1893 caused a massive die-off (Bahre 1991). After the drought, major changes in the grasslands became apparent, many of which persist to the present in the form of increased shrubs and reduced perennial plant populations. In 1902, the American Forestry Association reported, "My experience forces me to the assertion that the diminution of the flow of springs and streams in Arizona is due more to the destruction of brush, grass or herbage, than the destruction of forests proper. I would not be understood as opposing the pasturing of public lands as a principle, but it cannot be denied that the free ranging of stock on public domain is measurably responsible for the unfavorable conditions which we find on the watershed today." (American Forestry Association. 1902)

The allotments were fenced from the surrounding allotments in the 1950s. Before that, the area was open range, mostly divided by natural barriers. The current configuration of the Whitlow Allotment is about what it has always been, and the Teacup Allotment is made up of the old Donnelly and Ripsey ranches. The ranches were improved throughout the 1960s to the 1980s with water developments and corrals for working the livestock.

The management category given to the allotment is Maintain (M). "The management objective for M allotments is to maintain current resource conditions." Range condition and trend, precipitation and actual livestock use will be monitored on M allotments by priority ranking as funding permits. M allotments will have second priority for funding of range improvements and for allotment management plan (AMP) development. Selection of public land areas for custodial management is based on the following criteria:

(1) Present range condition is satisfactory.
(2) Allotments have moderate or high resource production potential and are producing near their potential (or trend is moving in that direction).
(3) No serious resource-use conflict/controversy exists.
(4) Opportunities may exist for positive economic return from public investments.
(5) Present management appears satisfactory.
(6) Other criteria appropriate to EIS area.
(7) Generally, allotments in the M category have no serious resource conflicts and range condition and present management are satisfactory. (USDI 1987)

Grazing System
The BLM lands associated with this allotment are used in conjunction with the private and state lands in a rotational grazing system. An Annual Unit Month (AUM) is the amount of forage required by one Animal Unit (AU) for a period of 30 days or one month. An 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.

There is currently one lease issued for 3058 AUMs on public lands for the Teacup Allotment and one lease issued for 588 AUMs on public lands for the Whitlow Allotment. The BLM land, however, is not fenced off from State Trust lands. AUM totals for the Teacup and Whitlow Allotments leases are in Table 14.

Table 14. Teacup and Whitlow Leases and AUMs

Grazing Lease	Animal Unit Months	Authorized Animal Units
State Trust #005-1230	1646 AUMs	137 AU Yearlong
State Trust #005-1441	1044 AUMs	87 AUYearlong
BLM #06168 Teacup	3058 AUMs	392 AU Yearlong @ 65% Public land
BLM #06032 Whitlow	588 AUMs	136 AU Yearlong @ 36% Public land
Total	**6336 AUMs**	**528 AU Yearlong**

3.1.1 Existing Range Improvements

The Whitlow Allotment is divided into three pastures: River, Black Mesa and BLM. The Teacup Allotment has six pastures, Donnelly, Grayback, 8-section, Mountain trap, D-H and 2 section. Allotment case file records, augmented by direct field observations and project inspections document existing range improvements on the Whitlow Allotment as follows:

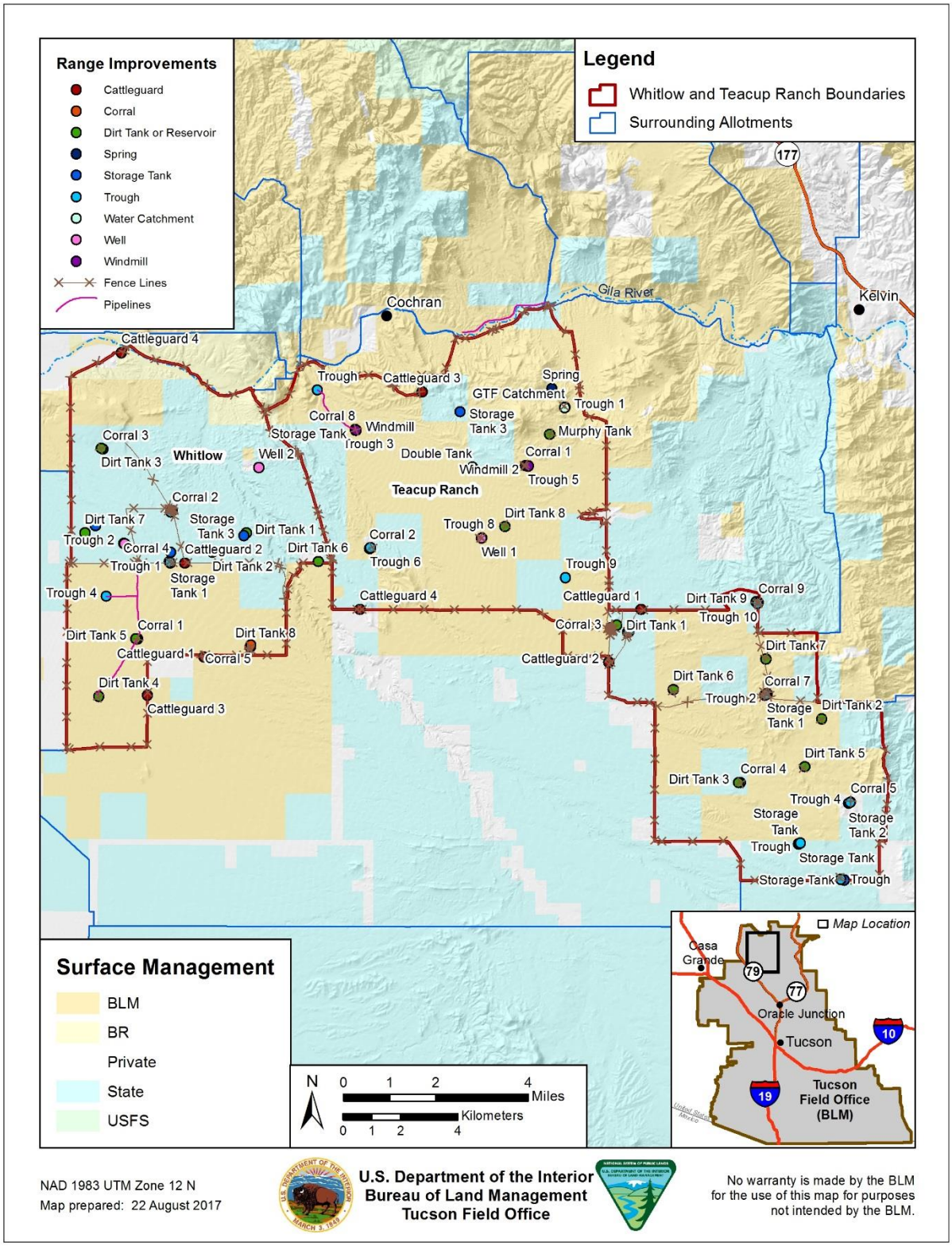
- Whitlow Fence
- Charco reservoir
- Fence, 4 and 5 south, 11 & 12 East
- Whitlow dam
- Corral
- Pipeline
- Florence canal fence

On the Teacup Allotment, the improvements are

- Upper Mountain well Corral
- Powerline well corral
- Murphree reservoir corral
- Powerline reservoir corral
- El Dopreso corral and reservoir
- Ripsey Hill reservoir and corral
- Horse reservoir and corral
- House pipeline
- New well pipeline
- Allotment boundary and pasture fences

Figure 9 is a map of the existing range improvements throughout the entire allotment. The map was completed using aerial imagery as well as verification from the leaseholder.

Figure 9. Existing range improvements on the Teacup and Whitlow Allotments



3.2 Mandatory Terms and Conditions for Permitted Use

There is currently one lease issued for 3058 AUMs on public lands in the Teacup Allotment and one lease issued for 588 AUMs on public land in the Whitlow Allotment. The Mandatory Terms and Conditions of the leases are listed below:

Table 15. Mandatory Terms and Conditions of the Leases

Livestock Kind	Grazing Period of Use	Percent Public Land*	Type Use	AUMs
Cattle	3/1 to 2/28	65	Active	3058
Cattle	3/1 to 2/28	36	Active	588

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

4. OBJECTIVES

4.1 Relevant Planning and Environmental Documents

- Eastern Arizona Grazing Environmental Impact Statement (1987)
- Phoenix District Resource Management Plan (1989)
- Gila District Livestock Grazing Program Biological Opinion, (2012)

4.2 Allotment Specific Objectives

4.2.1 Land Health Standards

This section identifies the land health standards and desired plant communities (DPC) to inventory and monitor in support of the land evaluation health process for the Teacup and Whitlow Allotments.

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."

Criteria for meeting Standard 2:

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

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

As indicated by such factors as:

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

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.

The above indicators shall be applied to the potential of the ecological site.

As part of the LHE 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.

Key Areas T-1 ,T-2 and W-1 DPC Objectives Loamy Uplands 10-13" precipitation zone (p.z.) ecological site.

Key Area T-1 is located on a northern facing slope at an elevation of approximately 2,000 feet. Key Area T-2 is located on a western facing gentle hillslope terrace at about 2,400 feet elevation.

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

- Maintain Grasses/Grasslike plants composition of ≥5 %
- Maintain annual grass and forb composition of ≥5 %
- Maintain a shrub composition of ≥20 %
- Maintain vegetative foliar cover at ≥10 %
- Maintain current vegetative diversity in the area.

Maintaining a perennial grass composition of 5% 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 30% 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% and 15% as per the reference sheet. A vegetative foliar cover of 10% or greater should serve to prevent accelerated erosion beyond what is expected in the reference state. The range of bare ground cover class on the site ranges from 1-2% (Low values due to high rock and gravel cover) based on the reference sheet. Maintaining a bare ground cover class of 10% or less will ensure that soil erosion on the site is consistent with the expected erosion rate of the reference state.

Rationale for the DPC listed above is taken from the NRCS Loamy Upland 10-13" p.z. Reference Sheet (R040XA114AZ). The reference sheet shows an expected foliar cover of 3-27% perennial grasses and 2-

19% shrubs. This site contains significantly more perennial grass than expected in the reference state. Due to this large grass composition percentage, palatable shrub composition requirements have been reduced. Both grass and shrub DPC objectives meet or exceed Sonoran desert tortoise habitat requirements. The reference sheet estimates foliar cover at 26%. Maintaining vegetative foliar cover at 15% or greater should serve to prevent accelerated erosion of the site. Bare ground cover class in the reference state is expected to be between 25-75% stipulating that "moist areas with higher slopes the gravel cover is higher and bare ground cover lower". This site falls within that stipulation and contains a high gravel and rock cover class component. The Bare Ground cover class DPC of 50% or less will ensure that soil erosion on the site is consistent with, or lower than, the expected erosion rate at the reference site.

Key Areas T-4 DPC Objectives Limy Hills 10-13" p.z. ecological site

Key Area T-4 is located on a northern facing slope at an elevation of approximately 3120 feet. Key Area W-1 is located on a flat at an approximate elevation of 2,010 feet.

Maintain plant species diversity such that the potential plant community on the site is a diverse mixture of desert shrubs, cacti, trees and perennial grasses and forbs. Annuals are of minor importance on the site. All of the major shrub and perennial grass and forb species on the site tend to be well dispersed throughout the plant community. The appearance is shrubland.

- Maintain Grasses/Grasslike plants composition of ≥10 %
- Maintain a palatable shrub composition of ≥15 %
- Maintain vegetative foliar cover at ≥10 %
- Maintain current vegetative diversity in the Key Area.

Rationale for the DPC listed above is taken from the NRCS Reference Sheet. The reference sheet used for this Key Area is the Limy Hills 10-13" p.z. (R040XA129AZ)

Maintaining a perennial grass composition of 5% 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 30% 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 5% and 35% as per the reference sheet. Maintaining the shrub composition and foliar cover will ensure adequate forage for pollinators for the Acuna cactus. A vegetative foliar cover of 10% or greater should serve to prevent accelerated erosion beyond what is expected in the reference state. The range of bare ground cover class on the site ranges from 5% to 55% based on the reference sheet. Maintaining a bare ground cover class of 20% or less will ensure that soil erosion on the site is consistent with the expected erosion rate of the reference state.

5. PLANT LIST

This section includes the list of plant species present or potentially present on ecological sites located on the public lands within the Teacup and Whitlow Allotment. These plant species provide key forage and cover for wildlife species and livestock.

Table 16 presents a list of species from the Loamy Upland 10-13" p.z. ecological site description located on the Teacup and Whitlow Allotments (T-1, T-2, and W-1).

Table 16. Key Plant Species from the Loamy Upland 10-13" p.z. ecological site description.

Common name	Scientific name
purple threeawn	Aristida purpurea
false mesquite	Calliandra eriophylla
slender janusia	Janusia gracilis
range ratany	Krameria erecta
bush muhly	Muhlenbergia porter
yerba de venado	Porophyllum gracile
jojoba	Simmondsia chinensis
desert globemallow	Sphaeralcea ambigua
desert zinnia	Zinnia acerosa
orange Indianmallow	Abutilon incanum
shrubby ayenia	Ayenia microphylla
cane cholla	Cylindropuntia spinosior
staghorn cholla	Cylindropuntia versicolor
fishhook barrel cactus	Ferocactus wislizeni
desert lavender	Hyptis emoryi
ironwood	Olneya tesota
Parry penstemon	Penstemon parryi
curly mesquite	Hilaria belangeri
Engelmann pricklypear	Opuntia engelmannii
desert agave	Agave deserti
velvet mesquite	Prosopis velutina

Table 17 presents a list of plant species from the Limy Hills 10-13" p.z. ecological site description located on the Whitlow allotment (W-1).

Table 17. Key Plant Species from the Limy Hills 10-13" p.z. ecological site description.

Common name	Scientific name
narrowleaf silverbush	Argythamnia lanceolata
false mesquite	Calliandra eriophylla
slender janusia	Janusia gracilis
rough jointfir	Ephedra fasciculata
bush muhly	Muhlenbergia porter
Jojoba	Simmondsia chinensis
purple threeawn	Aristida purpurea
fluffgrass	Dasyochloa pulchella
desert agave	Agave deserti
yerba de venado	Porophyllum gracile
foothill palo verde	Parkinsonia microphylla
desert globemallow	Sphaeralcea ambigua
jumping cholla	Cylindropuntia fulgida
buckhorn cholla	Cylindropuntia acanthocarpa
fishhook barrel cactus	Ferocactus wislizeni
saguaro	Carnegiea gigantea
Engelmann pricklypear	Opuntia engelmannii

Table 18. Species List for Teacup and Whitlow Allotments.

Teacup Allotment Species List – collected Sep & Dec 2016

Common Name	*Scientific Name*
Perennial Grasses	
Bush muhly *	*Muhlenbergia porteri*
Perennial threeawn*	*Aristida spp.*
Perennial Forbs	
Ragweed	*Ambrosia spp.*
Spurge*	*Camaesyce spp.*
Slender janusia*	*Janusia gracilis*
Yerba de venado*	*Porophyllum gracile*
Globemallow*	*Spaeralcea spp.*
Trees and Shrubs	
Whitethorn acacia	*Acacia constricta*
Catclaw acacia	*Acacia greggii*
Triangle-leaf bursage	*Ambrosia deltaoidea*
Shortleaf baccharis	*Baccharis brachypylla*
False Mesquite (Guajilla) *	*Calliandra eriophylla*
Littleleaf palo verde	*Circidium microphyllum*
Buckhorn cholla	*Cylindropuntia acanthocarpa*
Jumping cholla	*Cylindropuntia flugida*
Christmas cactus	*Cylindropuntia leptocaulis*
Staghorn cholla	*Cylindropuntia versicolor*
Hedgehog cactus	*Echinocereus spp.*
Mormon tea	*Ephedra spp.*
Turpentine bush	*Ericameria laricifolia*
Shrubby buckwheat*	*Eriogonum wrightii*
Flattop buckwheat*	*Eriogonum fasiculatum*
Ocotillo	*Fouquieria splendens*
Broom snakeweed	*Gutierrezia sarothrae*
Range ratany	*Krameria erecta*
White ratany	*Kermeria grayii*
Wolfberry	*Lycium pallida*
Prosopis spp.	*Mesquite*
Prickleypear	*Opuntia spp.*
Jojoba	*Simondsia chinensis*
Whitlow Allotment Species List - collected July 2017	
Common Name	***Scientific Name***
Trees and Shrubs	
Acacia constricta	Whitethorn acacia
Ambrosia deltoidea	Triangle leaf bursage
Circidium microphyllum	Foothills Paloverde
Cylindropuntia fulgida	Jumping cholla
Cylindropuntia leptocaulis	Christmas cactus
Cylindropuntia versicolor	Staghorn cholla

Echinocereus spp.	Hedgehog cactus
Ephedra trifurca	Mormon tea
Krameria grayi	White ratany
Larrea tridentata	Creosote bush
Mammillaria grahamii	Graham's nipple cactus
Opuntia	Pricklypear
Simmondsia chinensis	Jojoba

6. INVENTORY AND MONITORING DATA

The following information is the inventory and monitoring protocols that were used on the Teacup and Whitlow Allotment over the last several years. The dates for monitoring for Key Areas T-1, 2 and 4 were November 2012, and September and December 2016. The dates for W-1 were November 2012, July 2016 and July 2017. A Land Health Evaluation was completed at T-1, 2, 4 and W-1 in December 2013. Proper Functioning Condition (PFC) assessments were completed at the Donnelly Wash on the Teacup Allotment, and Box O Wash on the Whitlow Allotment in July 2015.

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

6.1.2 Proper Functioning Condition

Riparian areas are complex, dynamic ecosystems incorporating biological, physical, and chemical processes. The proper functioning condition (PFC) assessment method was created to qualitatively evaluate the foundation of these processes—specifically the functionality of the physical processes occurring on a stream. These physical processes include the interactions of hydrology, stabilizing vegetation, and geomorphology (soils and landform). A quality assessment requires that an interdisciplinary (ID) team with expertise in these subjects assess the stream together. Because the PFC assessment compares each stream to its own potential, it is universally applicable to all but the most highly modified perennial and intermittent streams.

The abbreviation PFC describes both the assessment method and a defined, on-the-ground condition of a riparian area. The on-the-ground condition termed PFC refers to how well physical processes are functioning. A system in PFC has a high likelihood of withstanding a moderately high flow event (such as the 5-, 10- or 25-year flow). If impairment does occur with higher magnitude events, a system in PFC can recover more quickly.

The PFC assessment method refers to a consistent approach for considering hydrologic, vegetative, and geomorphic attributes and processes to assess the condition of riparian areas at a point in time. Information pertaining to 17 attributes and processes of a riparian system is foundational to determining its physical function and is synthesized on an assessment form. Based on the responses and comments on the assessment form, an ID team places the stream reach in one of three rating categories:

Proper functioning condition (PFC): A lotic riparian area is considered to be in PFC, or “functioning properly,” when adequate vegetation, landform, or woody material is present to:

- Dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality.
- Capture sediment and aid floodplain development.
- Improve floodwater retention and ground water recharge.
- Develop root masses that stabilize streambanks against erosion.
- Maintain channel characteristics.

A riparian area in PFC will, in turn, provide associated values, such as wildlife habitat or recreation opportunities.

Functional–at risk (FAR): These riparian areas are in limited functioning condition; however, existing hydrologic, vegetative, or geomorphic attributes make them susceptible to impairment.

Nonfunctional (NF): These riparian areas clearly are not providing adequate vegetation, landform, or woody material to dissipate stream energy associated with moderately high flows, and thus are not reducing erosion, improving water quality, etc.

6.2 Monitoring Protocols

The Land Health Standards were assessed for the Teacup and Whitlow 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). The interdisciplinary team used rangeland monitoring data, professional observations, and photographs to assess achievement of the standards. All study sites were recorded with a GPS using projection of NAD 83.

6.2.1 Line Point Intercept (species composition and ground cover)

Quantitative cover, and species composition, collected along each transect (Line Point Intercept) 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 W-1 and T-1, 2, and 4 within the Teacup and Whitlow Allotments. 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 W-1, T-1, T-2, and T-4 were the 17 indicators of rangeland health (NRCS 2005) and utilization.

Table 19. Key T-4, Teacup Allotment, percent cover compared from November 2012 to December 2016.

Species	2012	2016
Cover (T = trace)	%	%
Bush Muhly	1	1
Threeawn	T	T
Ragweed		T
Globemallow	1	1
Spruge	T	T
Yerba de venado		T
False mesquite	T	2
Mormon tea	T	T
Flattop buckwheat	T	T
Shrubby buckwheat	T	T
Slender janusia	T	T
Turpentine bush	12	8
Little leaf palo verde	16	11
Mesquite	3	T
Catclaw acacia		2

Table 20. Key T-4, Teacup Allotment, percent composition compared from November 2012 to December 2016.

Species	2012	2016
Cover (T = trace)	%	%
Bush Muhly	3	4
Threeawn	T	T
Ragweed		2
Globemallow	3	4
Spruge	1	1
Yerba de venado		T
False mesquite	1	8
Mormon tea	1	T
Flattop buckwheat	1	1
Shrubby buckwheat	1	T
Slender janusia	T	T
Turpentine bush	35	29
Little leaf palo verde	46	38
Mesquite	7	2
Catclaw acacia		6

Table 21. Key W-1, Whitlow Allotment, percent cover compared from November 2012 to July 2016.

Species	2012	2016
Cover (T = trace)	%	%
Creosote bush	1	1
Hedgehog cactus	T	T
Jojoba	3	5
Palo verde	3	7
Range ratany	3	2
Prickle pear	1	2
Jumping cholla	1	1
Triangle-leaf bursage	7	5
Staghorn cholla	0	1
Christmas cactus	0	1
Graham's nipple cactus	0	T

Table 22. Key W-1, Whitlow Allotment, percent composition compared from November 2012 to July 2016.

Species	2012	2016
Cover (T = trace)	%	%
Creosote bush	5	5
Hedgehog cactus	1	T

Jojoba	14	26
Palo verde	16	17
Range ratany	16	6
Prickle pear	6	4
Jumping cholla	7	6
Triangle-leaf bursage	35	29
Staghorn cholla	0	3
Christmas cactus	0	2
Graham's nipple cactus	0	T

Table 23. Key W-1, Whitlow Allotment, comparison of jojoba density/ age form class from November 2012 to July 2016.

Jojoba	2012	2016
Y-1	7.3	21.8
Y-2	0	15.4
M-1	50.8	36.3
M-2	29.0	29.0
Total	**87.1**	**101.6**

*Values represent the density of each age form class and the number of all jojoba in plants per acre. Line Point Intercept (species composition and ground cover)

The method used to obtain transect data pertaining to species composition, and soil cover is the Line Point Intercept (LPI). This method consists of a horizontal, linear measurement of plant intercepts along the course of a line (tape) 100' in Teacup and Whitlow. 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.

6.2.1 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).

6.2.2 Fetch

Fetch is the distance from the nearest perennial plant base within 360 degrees of the quadrats 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.

6.2.3 Dry Weight Rank

Dry weight rank estimates plant composition on a dry weight production basis. This data collection was made using a 40cm x 40cm plot frame and 100 placements. The three perennial species within a vertical projection of quadrats placed repeatedly (100 times) comprising the most annual biomass production on a dry weight basis are ranked (1st, 2nd, and 3rd most biomass). Multiple ranks are given when less than three 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.

6.2.4 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 24. Herbaceous (grasses and forbs) utilization classes

Rating	Description
0-5%	The rangeland shows no evidence of grazing use or negligible use.

Rating	Description
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 25. 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 to appear artificially clipped or consistent browsing of terminal buds of browse species that result 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). According to billed use the lease has been paid for the full 336 AUMs on the lease from 2006-2016.

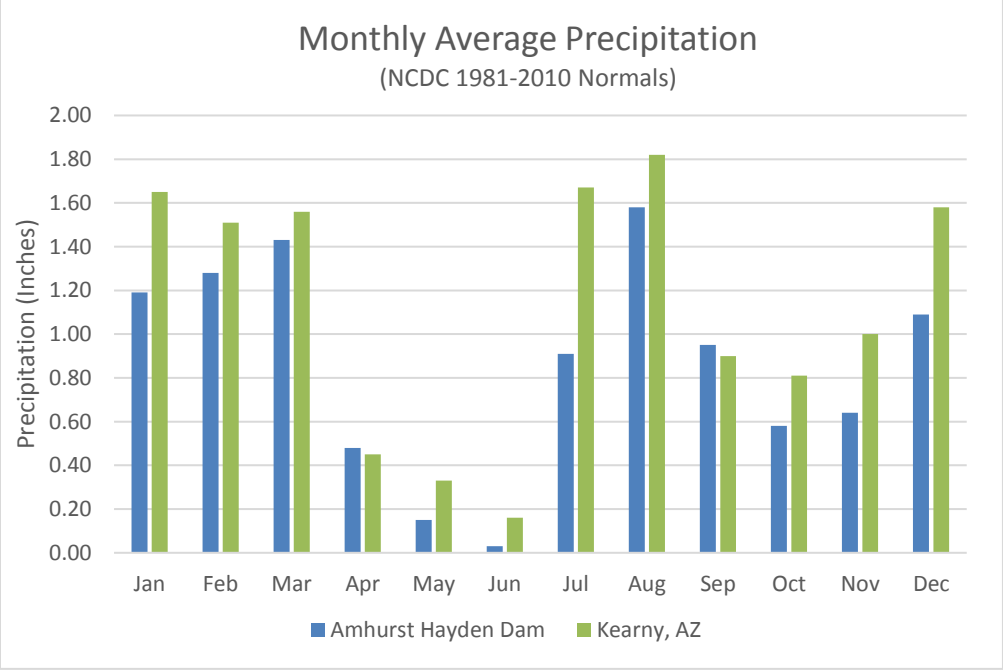
7.2 Precipitation

The closest long-term climate monitoring stations to the Teacup and Whitlow Allotments are located at the Ashurst-Hayden Dam, and in Kearny, AZ. Tables 26 and 27 below display the most recent National Climatic Data Center (NCDC) 30-year Normal (1981-2010) from the Western Regional Climate Center.

Table 26. Precipitation Data (Inches) from Ashurst Hayden Dam and Kearny, AZ COOP sites – NCDC 30 Year Normal

Location	Elev. (ft.)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Ashurst Hayden Dam	1,640	1.19	1.28	1.43	0.48	0.15	0.03	0.91	1.58	0.95	0.58	0.64	1.09	**10.31**
Kearny, AZ	1,840	1.65	1.51	1.56	0.45	0.33	0.16	1.67	1.82	0.9	0.81	1.0	1.58	**13.44**

Table 27. Precipitation Data (Inches) from Kearny, AZ and Ashurst Hayden Dam COOP sites – NCDC 30 Year Normal



7.3 Key Area Data

Upland range health was evaluated at four key areas and two reaches' of the Gila River (T-1, 2, 4, W-1, Donnelly and Box O wash PFC). 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 or not applicable resource standards were being met within the Teacup and Whitlow Allotment and whether adequate perennial grass was present.

7.3.1 Utilization

Utilization measured at the two key areas on Teacup and Whitlow Allotment at the time of the study was 0 percent.

7.3.2 Rangeland Health Evaluations

Tables 28, 32, , 36 and 41 below show the results from the evaluation completed in December 2013 and July 2015 on the Teacup and Whitlow Allotment at T-1, 2, 4, Donnelly Wash PFC, W-1 and Box O Wash PFC respectively. Every attribute ranked none to slight from the departure of the Loamy Upland 10-13" p.z. reference sheet.

Table 28. December 10, 2013 summary results from Rangeland Health Evaluation for T-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	0	9

Table 29. Summary of 17 indicators for Loamy Upland 10-13" p.z. ecological site for T-1.

17 Indicators Reference Sheet	Rationale from December 2013
1. **Number and extent of rills:** None	None to slight. None observed
2. **Presence of water flow patterns:** Uncommon; probably cover no more than 10% of area, discontinuous, very short, usually less than 1 foot in length; broken primarily by high rock and gravel cover.	None to slight. None observed
3. **Number and height of erosional pedestals or terracettes:** Most perennial grass and shrub plants have accumulated pedestals 1-2 inches in height, respectively. Terracettes are 15-20 feet apart along water flow paths with a 2-inch elevation difference from above to below the terracete. Terracettes are not as stable as those observed in 12-16" p.z., in that they are breached more often on this site.	None to slight. None to minor due to wind.
4. **Bare ground from Ecological Site Description or other studies (rock, litter, standing dead, lichen, moss, plant canopy are not bare ground):** 40-	None to slight. Within what is described in ESD.

17 Indicators Reference Sheet	Rationale from December 2013
45%, some areas have higher cover on gentler slopes and lower cover on steeper slopes.	
5. **Number of gullies and erosion associated with gullies:** none	None to slight. None observed.
6. **Extent of wind scoured, blowouts and/or depositional areas:** none	None to slight. None observed.
7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter transported in water flow paths 30-50 feet in length and herbaceous litter moving from bare soil areas.	None to slight. No litter movement.
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** No slake test done. Expect ratings of 2-3 in bare areas, and 4-5 under shrub and perennial grass canopies.	None to slight. Soil stable, letter good.
9. **Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness):** Weak angular to sub angular blocky; color is 10YR7/3 dry, 10YR5/3 moist; thickness to 13 inches.	None to slight. No real soil loss.
10. **Effect on plant community composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** 30% canopy cover of large shrubs, succulents, half shrubs and grasses; 50-55% litter cover; approximately 2.5% basal cover; 25% of cover is perennial grasses; 30% of cover is trees and shrubs; cover is well dispersed throughout the site. Note: reference area has a higher cover of mesquite than expected for the site.	None to slight. Well drained soil.
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer on this site; bare soil areas have thin laminar crust from raindrop impact; penetrometer tests with weight drop distance from top of weight to top of impact ring = 2.24 feet were: average = 3.92 inches, s.d. = 1.19 inches. Tests outside IBP enclosure on SRER were average = 2.17, s.d. = 0.4.	None to slight. None observed.
12. **Functional/Structural Groups (list in order of descending dominance by above-ground weight using symbols:**	None to slight. Slight departure due to diminished primary grasses, otherwise as described in ESD.

17 Indicators Reference Sheet	Rationale from December 2013
>>, >, = to indicate much greater than, greater than, and equal to) with dominants and sub-dominants and "others" on separate lines: Dominant: large shrubs (mesquite #1, desert hackberry #2, blue paloverde #3, and Mormon tea) > perennial grasses > succulents > half shrubs = annual forbs & grasses.	
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Approximately 50% basal cover of perennial grass species and 50% basal cover of sub shrub species has been lost due to prolonged drought.	None to slight. Normal, average mortality.
14. **Average percent litter cover (50%) and depth (0.5 inches):**	None to slight. Good amount of regular and wood litter.
15. **Expected annual production (this is TOTAL aboveground production, not just forage production):** 175 lbs. /ac unfavorable precipitation; 750 lbs. /ac normal precipitation; 1340 lbs. /ac favorable precipitation.	None to slight. Stunted due to drought but OK.
16. **Potential invasive (including noxious) species (native and non-native). List Species that BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicator, we are describing what is NOT expected in the reference state for the ecological site:** mesquite, Opuntia, burroweed, & snakeweed are increasing not invading. Buffelgrass and Lehmann lovegrass.	None to slight. None observed.
17. **Perennial plant reproductive capability:** Not affected even following several years of drought period for the region. Good age class distribution of plants.	None to slight. Good, would be better with precipitation.

Table 30. A comparison of canopy cover by species or groups of species between the state and transition model in the ESD and the LPI data collected in December 2013 at T-1.

State in Transition of Native tree, grass, forb, shrub, cacti (Drought/El Nino/Grazing interaction)	***LPI Data***
Perennial grasses – 1 to 5% Canopy cover	Perennial grasses – 0% Canopy cover

Trees, Saguaros – 5-10 %	Trees, Saguaros – 0% Canopy cover
Other shrubs and succulents – 15 to 35% Canopy cover	Other shrubs and succulents - 27% Canopy cover

Table 31. Functional/structural plant groups at T-1.

Ranking	Species List for Functional/Structural Groups at T-1
D	Triangle leaf bursage AMDE4
S	Yellow Palo Verde PAMI5
S	Cholla or prickly pear cactus OPUNT
S	Annual Grasses AAGG
S	Saguaro CAGI10
M	Jojoba SICH
T	Catclaw acacia ACGR
T	Annual Forbs AAFF

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.

Figure 10. Photo of T-1

Table 32. December 10, 2013 summary results from Rangeland Health Evaluation for T-2.

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	0	9

Table 33. Summary of 17 indicators for Loamy Upland 10-13" p.z. ecological site for T-2.

17 Indicators Reference Sheet	Rationale from December 2013
1. **Number and extent of rills:** None	None to slight. None observed
2. **Presence of water flow patterns:** Uncommon; probably cover no more than 10% of area, discontinuous, very short, usually less than 1 foot in length; broken primarily by high rock and gravel cover.	None to slight. None observed
3. **Number and height of erosional pedestals or terracettes:** Most perennial grass and shrub plants have accumulated pedestals 1-2 inches in height, respectively. Terracettes are 15-20 feet apart along water flow paths with a 2-inch elevation difference from above to below the terracete. Terracettes are not as stable as those observed in 12-16" p.z., in that they are breached more often on this site.	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):** 40-45%, some areas have higher cover on gentler slopes and lower cover on steeper slopes.	None to slight. Similar to described in ESD
5. **Number of gullies and erosion associated with gullies:** none	None to slight. None observed.
6. **Extent of wind scoured, blowouts and/or depositional areas:** none	None to slight. None observed.
7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter transported in water flow paths 30-50 feet in length and herbaceous litter moving from bare soil areas.	None to slight. None observed.
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** No slake test done. Expect ratings of 2-3 in bare areas, and 4-5 under shrub and perennial grass canopies.	None to slight. Soils stable and functioning properly.

17 Indicators Reference Sheet	Rationale from December 2013
9. **Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness):** Weak angular to sub angular blocky; color is 10YR7/3 dry, 10YR5/3 moist; thickness to 13 inches.	None to slight. None observed.
10. **Effect on plant community composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** 30% canopy cover of large shrubs, succulents, half shrubs and grasses; 50-55% litter cover; approximately 2.5% basal cover; 25% of cover is perennial grasses; 30% of cover is trees and shrubs; cover is well dispersed throughout the site. Note: reference area has a higher cover of mesquite than expected for the site.	None to slight. Well drained sandy soil with good structure.
11. **Presence and thickness of compaction layer (usually none; describe soil profile features, which may be mistaken for compaction on this site.** No compaction layer on this site; bare soil areas have thin laminar crust from raindrop impact; penetrometer tests with weight drop distance from top of weight to top of impact ring = 2.24 feet were: average = 3.92 inches, s.d. = 1.19 inches. Tests outside IBP enclosure on SRER were average = 2.17, s.d. = 0.4.	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:** Dominant: large shrubs (mesquite #1, desert hackberry #2, blue paloverde #3, and Mormon tea) > perennial grasses > succulents > half shrubs = annual forbs & grasses.	None to slight. Similar to as described in ESD.
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Approximately 50% basal cover of perennial grass species and 50% basal cover of sub shrub species has been lost due to prolonged drought.	None to slight. None observed.
14. **Average percent litter cover (50%) and depth (0.5 inches):**	None to slight. Good Litter.
15. **Expected annual production (this is TOTAL aboveground production, not**	None to slight. Stunted due to drought but good considering

17 Indicators Reference Sheet	Rationale from December 2013
just forage production): 175 lbs. /ac unfavorable precipitation; 750 lbs. /ac normal precipitation; 1340 lbs. /ac favorable precipitation.	
16. **Potential invasive (including noxious) species (native and non-native). List Species that BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicator, we are describing what is NOT expected in the reference state for the ecological site:** mesquite, Opuntia, burroweed, & snakeweed are increasing not invading. Buffelgrass and Lehmann lovegrass.	None to slight. None observed.
17. **Perennial plant reproductive capability:** Not affected even following several years of drought period for the region. Good age class distribution of plants.	None to slight. Vigorous and healthy despite drought conditions.

Table 34 A comparison of canopy cover by species or groups of species between the state and transition model in the ESD and the LPI data collected in December 2013 at T-2.

State in Transition of Native tree, grass, forb, shrub, cacti (Drought/El Nino/Grazing interaction)	***LPI Data***
Perennial grasses – 1 to 5% Canopy cover	Perennial grasses – 0% Canopy cover
Trees, Saguaros – 5-10 %	Trees, Saguaros – 0% Canopy cover
Other shrubs and succulents – 15 to 35% Canopy cover	Other shrubs and succulents - 47% Canopy cover

Table 35. Functional/structural plant groups at T-2.

Ranking	Species List for Functional/Structural Groups at T-2
S	Triangle leaf bursage AMDE4
S	Yellow palo verde PAMI5
S	Cholla or prickly pear cactus OPUNT
S	Jojoba SICH
S	Saguaro CAGI10
M	Annual Grasses AAGG
M	Annual Forbs AAFF
M	Turpentine bush ERLA12
M	Ocotillo FOSP2
M	Slender janusia JAGR
M	Creosote bush LATRT
T	Catclaw acacia ACGR

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.

Figure 11. Photo of T-2

Table 36. December 10, 2013 summary results from Rangeland Health Evaluation for T-4.

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	0	9

Table 37. December 10, 2013 summary results from Rangeland Health Evaluation for T-4.

17 Indicators Reference Sheet	Rationale from December 2013
1. **Number and extent of rills:** None	None to slight. None observed
2. **Presence of water flow patterns:** Uncommon; probably cover no more than 10% of area, discontinuous, very short, usually less than 1 foot in	None to slight. None observed

17 Indicators Reference Sheet	Rationale from December 2013
length; broken primarily by high rock and gravel cover.	
3. **Number and height of erosional pedestals or terracettes:** Most perennial grass and shrub plants have accumulated pedestals 1-2 inches in height, respectively. Terracettes are 15-20 feet apart along water flow paths with a 2-inch elevation difference from above to below the terracete. Terracettes are not as stable as those observed in 12-16" p.z., in that they are breached more often on this site.	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):** 40-45%, some areas have higher cover on gentler slopes and lower cover on steeper slopes.	None to slight. Average for site – Good vegetation cover.
5. **Number of gullies and erosion associated with gullies:** none	None to slight. Natural gullies located @SS
6. **Extent of wind scoured, blowouts and/or depositional areas:** none	None to slight. None observed.
7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter transported in water flow paths 30-50 feet in length and herbaceous litter moving from bare soil areas.	None to slight. Litter is scattered throughout the site.
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** No slake test done. Expect ratings of 2-3 in bare areas, and 4-5 under shrub and perennial grass canopies.	None to slight. Surface is naturally armored.
9. **Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness):** Weak angular to sub angular blocky; color is 10YR7/3 dry, 10YR5/3 moist; thickness to 13 inches.	None to slight. None observed.
10. **Effect on plant community composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** 30% canopy cover of large shrubs, succulents, half shrubs and grasses; 50-55% litter cover; approximately 2.5% basal cover; 25% of cover is perennial grasses; 30% of cover is trees and shrubs; cover is well dispersed throughout the site. Note:	None to slight. Appropriate vegetation cover per ESD.

17 Indicators Reference Sheet	Rationale from December 2013
reference area has a higher cover of mesquite than expected for the site.	
11. **Presence and thickness of compaction layer (usually none; describe soil profile features, which may be mistaken for compaction on this site.** No compaction layer on this site; bare soil areas have thin laminar crust from raindrop impact; penetrometer tests with weight drop distance from top of weight to top of impact ring = 2.24 feet were: average = 3.92 inches, s.d. = 1.19 inches. Tests outside IBP enclosure on SRER were average = 2.17, s.d. = 0.4.	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:** Dominant: large shrubs (mesquite #1, desert hackberry #2, blue paloverde #3, and Mormon tea) > perennial grasses > succulents > half shrubs = annual forbs & grasses.	None to slight. Appropriate vegetation composition per ESD.
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Approximately 50% basal cover of perennial grass species and 50% basal cover of sub shrub species has been lost due to prolonged drought.	None to slight. Normal for site.
14. **Average percent litter cover (50%) and depth (0.5 inches):**	None to slight. Average for site.
15. **Expected annual production (this is TOTAL aboveground production, not just forage production):** 175 lbs. /ac unfavorable precipitation; 750 lbs. /ac normal precipitation; 1340 lbs. /ac favorable precipitation.	None to slight. Stunted due to drought but as productive as possible.
16. **Potential invasive (including noxious) species (native and non-native). List Species that BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicator, we are**	None to slight. None observed.

17 Indicators Reference Sheet	Rationale from December 2013
describing what is NOT expected in the reference state for the ecological site: mesquite, Opuntia, burroweed, & snakeweed are increasing not invading. Buffelgrass and Lehmann lovegrass.	
17. **Perennial plant reproductive capability:** Not affected even following several years of drought period for the region. Good age class distribution of plants.	None to slight. Reproductively successful.

Table 38. A comparison of canopy cover by species or groups of species between the state and transition model in the ESD and the LPI data collected in December 2013 at T-4.

State in Transition of Native tree, grass, forb, shrub, cacti (Drought/El Nino/Grazing interaction)	***LPI Data***
Perennial grasses, forbs – 1 to 15% Canopy cover	Perennial grasses – 2% Canopy cover
Trees, Saguaros – 5-15 %	Trees, Saguaros – 14% Canopy cover
Other shrubs and succulents – 5 to 15% Canopy cover	Other shrubs and succulents - 28% Canopy cover

Table 39. Functional/structural plant groups at T-4

Ranking	Species List for Functional/Structural Groups at T-4
D	Catclaw acacia ACGR
D	Yellow palo verde PAMI5
S	Velvet mesquite PRVE
S	Threeawn grass Aristida
S	Turpentine bush ERLA12
M	Saguaro CAGI10
M	False mesquite CAER
M	Desert globemallow SPAM
M	Hairy Grama BOER4

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.

Figure 12. Photo of T-4

Table 40. Summary of Proper Functioning Condition Assessment on Gila River at Donnelly Wash on Teacup Allotment

Summary of Proper Functioning Condition Assessment on Gila River at Donnelly Wash			
Yes	**No**	**N/A**	**Hydrology**
X			Floodplain above bankfull is inundated in “relatively frequent” events
		X	Where beaver dams are present, they are active and stable. *No beaver dams present*
X			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
X			Riparian-wetland area is widening or has achieved potential extant. *Has achieved potential extant*
	X		Upland watershed is not contributing to riparian-wetland degradation. *Stable*
			Vegetation
X			Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery). *Few young willows*
X			There is diverse composition of riparian-wetland vegetation (recruitment for maintenance/recovery).
X			Species present indicate maintenance of riparian-wetland soil moisture characteristics
X			Streambank vegetation comprised of those plants or pant communities that have root mass capable of withstanding high streamflow events
X			Riparian-wetland plants exhibit high vigor
X			Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows
X			Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery)
			Erosion/Deposition
X			Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) are adequate to dissipate energy
X			Point bars are revegetating with riparian-wetland vegetation.
		X	Lateral stream movement associated with natural sinuosity. *Geologic lock down by bedrock*
X			System is vertically stable (not incising)

X			Stream is in balance with water and sediment being supplied by watershed (i.e., no excessive erosion or deposition). *High turbidity*

Summary Determination

Functional rating (check one)
XX Proper functioning condition
□□Functional–at risk
□□Nonfunctional

Trend (check one)

Monitored trend	**Apparent trend**
□□Upward	□□Upward
□□Downward	□□Downward
□□Static	XX Not apparent

Rationale for rating: **Regulated flow from Coolidge Dam/San Carlos Reservoir. River is used to transport irrigation water to farmlands downstream. Upstream dam that regulates flow, affecting regeneration of cottonwood and willow trees.**

Figure 13. Photo of Donnelly Wash PFC site.

Table 41. December 10, 2013 summary results from Rangeland Health Evaluation for W-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	0	9

17 Indicators Reference Sheet	**Rationale from December 2013**
1. **Number and extent of rills:** None	None to slight. None observed
2. **Presence of water flow patterns:** Uncommon; probably cover no more than 10% of area, discontinuous, very short, usually less than 1 foot in length; broken primarily by high rock and gravel cover.	None to slight. None observed
3. **Number and height of erosional pedestals or terracettes:** Most perennial grass and shrub plants have accumulated pedestals 1-2 inches in height, respectively. Terracettes are 15-20 feet apart along water flow paths with a 2-inch elevation difference from above to below the terracete. Terracettes are not as stable as those observed in 12-16" p.z., in that they are breached more often on this site.	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):** 40-45%, some areas have higher cover on gentler slopes and lower cover on steeper slopes.	None to slight. Less than observed in ESD.
5. **Number of gullies and erosion associated with gullies:** none	None to slight. Natural gullies located @SS
6. **Extent of wind scoured, blowouts and/or depositional areas:** none	None to slight. None observed.
7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter transported in water flow paths 30-50 feet in length and herbaceous litter moving from bare soil areas.	None to slight. Slight to no litter movement.
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** No slake test done. Expect ratings of 2-3 in bare areas, and 4-5 under shrub and perennial grass canopies.	None to slight. Gravely, sandy, rocky - armored.
9. **Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness):** Weak angular to sub angular	None to slight. None observed.

17 Indicators Reference Sheet	Rationale from December 2013
blocky; color is 10YR7/3 dry, 10YR5/3 moist; thickness to 13 inches.	
10. **Effect on plant community composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** 30% canopy cover of large shrubs, succulents, half shrubs and grasses; 50-55% litter cover; approximately 2.5% basal cover; 25% of cover is perennial grasses; 30% of cover is trees and shrubs; cover is well dispersed throughout the site. Note: reference area has a higher cover of mesquite than expected for the site.	None to slight. Well drained soil.
11. **Presence and thickness of compaction layer (usually none; describe soil profile features, which may be mistaken for compaction on this site.** No compaction layer on this site; bare soil areas have thin laminar crust from raindrop impact; penetrometer tests with weight drop distance from top of weight to top of impact ring = 2.24 feet were: average = 3.92 inches, s.d. = 1.19 inches. Tests outside IBP enclosure on SRER were average = 2.17, s.d. = 0.4.	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:** Dominant: large shrubs (mesquite #1, desert hackberry #2, blue paloverde #3, and Mormon tea) > perennial grasses > succulents > half shrubs = annual forbs & grasses.	None to slight. Similar to composition described in ESD.
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Approximately 50% basal cover of perennial grass species and 50% basal cover of sub shrub species has been lost due to prolonged drought.	None to slight. Typical of site.
14. **Average percent litter cover (50%) and depth (0.5 inches):**	None to slight. Good amount of litter for dry site.
15. **Expected annual production (this is TOTAL aboveground production, not just forage production):** 175 lbs. /ac unfavorable precipitation; 750 lbs. /ac normal precipitation; 1340 lbs. /ac favorable precipitation.	None to slight. Normal for drought year.

17 Indicators Reference Sheet	Rationale from December 2013
16. **Potential invasive (including noxious) species (native and non-native). List Species that BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicator, we are describing what is NOT expected in the reference state for the ecological site:** mesquite, Opuntia, burroweed, & snakeweed are increasing not invading. Buffelgrass and Lehmann lovegrass.	None to slight. Few annual forbs, but very limited.
17. **Perennial plant reproductive capability:** Not affected even following several years of drought period for the region. Good age class distribution of plants.	None to slight. Good given drought.

Table 42. A comparison of canopy cover by species or groups of species between the state and transition model in the ESD and the LPI data collected in December 2013 at W-1.

State in Transition of Native tree, grass, forb, shrub, cacti (Drought/El Nino/Grazing interaction)	***LPI Data***
Perennial grasses – 1 to 15% Canopy cover	Perennial grasses – 1% Canopy cover
Trees, Saguaros – 5-15 %	Trees, Saguaros – 2% Canopy cover
Other shrubs and succulents –5 to 15% Canopy cover	Other shrubs and succulents - 16% Canopy cover

Table 43. Functional/structural plant groups at W-1.

Ranking	Species List for Functional/Structural Groups at W-1
S	Triangle leaf bursage AMDE4
S	Jojoba SICH
S	Saguaro CAGI7
S	Christmas cactus CYLE8
S	Prickly pear OPUNT
S	Teddybear cholla CYBI9
M	Creosote bush LATRT
M	Turpentine bush ERLA12
M	Flattop buckwheatERFA2
M	Annual Grass AAGG
M	Annual Forb AAFF
M	Yellow palo verde PAMI5
T	Longleaf jointfir EPTR

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.

Figure 14. Photo of W-1

Table 44. Summary of Proper Functioning Condition Assessment on Gila River at Box O wash

Summary of Proper Functioning Condition Assessment on Gila River at Box O wash			
Yes	**No**	**N/A**	**Hydrology**
X			Floodplain above bankfull is inundated in “relatively frequent” events
		X	Where beaver dams are present, they are active and stable. *No beaver dams present*
X			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e., landform, geology, and bioclimatic region)
X			Riparian-wetland area is widening or has achieved potential extant. *Has achieved potential extant*
X			Upland watershed is not contributing to riparian-wetland degradation. *Stable*
			Vegetation
X			Diverse age-class distribution of riparian-wetland vegetation (recruitment for maintenance/recovery).
X			There is diverse composition of riparian-wetland vegetation (recruitment for maintenance/recovery). *Dominated by Salt Cedar*
X			Species present indicate maintenance of riparian-wetland soil moisture characteristics. *Some evidence of dieback of Willow tops based on dam releases*
X			Streambank vegetation comprised of those plants or pant communities that have root mass capable of withstanding high streamflow events *Dominated by salt cedar*
X			Riparian-wetland plants exhibit high vigor
X			Adequate riparian-wetland vegetative cover is present to protect banks and dissipate energy during high flows
X			Plant communities are an adequate source of coarse and/or large woody material (for maintenance/recovery)
			Erosion/Deposition
X			Floodplain and channel characteristics (i.e., rocks, overflow channels, coarse and/or large woody material) are adequate to dissipate energy
		X	Point bars are revegetating with riparian-wetland vegetation. *No point bars present*
		X	Lateral stream movement associated with natural sinuosity. *Geologic formation prevents lateral movement.*

X			System is vertically stable (not incising)
	X		Stream is in balance with water and sediment being supplied by watershed (i.e., no excessive erosion or deposition). *Excess of sediments in Box O wash due to recreation traffic in wash.*

Summary Determination

Functional rating (check one)
XX Proper functioning condition
□□Functional–at risk
□□Nonfunctional
Trend (check one)

Monitored trend	**Apparent trend**
□□Upward	□□Upward
□□Downward	□□Downward
□□Static	XX Not apparent

Comments: Regulated flow from Coolidge Dam/San Carlos Reservoir. Lots of cattle sign, several cows observed. High recreation impacts, lots of trash. Salt cedar dominates no cottonwood. Some Willows and some mesquite. Willow tops dieback due to flow fluctuation – variable dam releases.

Rationale for rating: River is used to transport irrigation water to farmlands downstream. Upstream dam that regulates flow, affecting regeneration of cottonwood and willow trees.

Figure 15. View of Box O Wash PFC site.

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

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 all four of the key areas indicates that primary plant species, such as tanglehead (Heteropogon contortus), sideoats grama (Bouteloua curtipendula), 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 because 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. Designated critical habitat for Southwestern willow flycatcher and yellow-billed cuckoo proposed critical habitat overlap BLM-administered lands on the southern border of the allotment. Fences, other control devices, and topography are functioning to exclude cattle from the Gila River on BLM lands (USDI FWS 2012).

The ecological site for the T-1 and T-2 key areas is R040XC114AZ *Loamy Upland 10-13" precipitation zone* ecological site. The ecological site guide indicates litter should be in the range of 10 to 70 percent, with 0 to 10 percent surface fragments. A tolerable range of bare ground would be between 25 and 75 percent.

In 2013, it was observed that overall; the soil on the allotment is stable. The allotment exhibits biotic integrity, and it is in a productive and sustainable condition. Currently, soil loss or degradation is not occurring. Perennial, native shrubs are very effective at holding soil cover due to their basal area and their fine fibrous root systems. These shrubs contribute organic matter directly into the soil and help build stable soil aggregates. In addition the plant and litter cover provide protection against wind erosion, and it increases infiltration and decreases runoff.

Cover collected at T-1, T-2, T-4 and W-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. The ground is naturally armored by rock/gravel (Tables 30, 34, 38, and 42).

The approximate potential ground cover (surface, basal, and foliar) is described in Table 44, which specifically provides a comparison between the desired conditions as described by the ESD (NRCS 2005) and the current conditions of T-1, T-2, T-4 and W-1 in December 2013. Table 45 address the kind

and amount (by cover) of vegetation at the sites. Litter should be in the range of 10 to 70 percent, with 1 to 65 percent surface fragments. A tolerable range of bare ground would be between 25 and 75 percent. Foliar cover collected at T-1 was 27 percent with 1 percent basal cover of shrubs. Total litter was measured at 32 percent, with bare ground measuring 0 percent. Gravel covered 68 percent of the soil surface.

Table 45. A comparison between conditions described in the ESD (R040XC114AZ) and current conditions of key management areas T-1. Soil cover components include plants (including basal cover), biological crusts, litter, surface fragments, rock, and bare ground.

	Basal Cover				Biological Crust	Litter	Surface Fragments > ¼" & <= 3"	Surface Fragments > 3"	Bedrock	Bare Ground
	Grass/ Grass like	Forb	Shrub /Vine	Tree						
ESD	0-4%	0-2%	1-4%	0-1%	15-30%	10-70%	1-65%	0-10%	0-0%	25-75%
T-1	0%	0%	1%	0%	0%	32%	67%	0%	0%	0%

Table 46. Foliar cover of species recorded in the Line point intercept (LPI) plot for key area T-1, T-2, T-4 and W-1 in December 2013.

Key area information Range site: R040XC114AZ	Species	Line point intercept cover at T-1	
		Foliar Cover	Basal Cover
	Annual forbs	1%	0%
	Annual grasses	54%	0%
	Plains pricklypear *(Opuntia polyacantha)*	2%	0%
	Triangle Bursage Ambrosia deltoidea)	25%	1%

Cover/Litter/Bare Ground	
Foliar Cover	82%
Basal Cover	1%
Bare Ground	17%

Key area information Range site: R040XC114AZ	Species	Line point intercept cover at T-2	
		Foliar Cover	Basal Cover
T-2 Teacup Allotment Range site: R040XC114AZ	Annual forbs	5%	1%
	Annual grasses	18%	0%

	Triangle Bursage (Ambrosia deltoidea)	23%	1%
	Cholla sp.	16%	0%
	Flattop buckwheat	6%	1%
	Turpentine bush (Ericameria laricifolia)	5%	0%
	Ocotillo *(Fouquieria splendens)*	1%	0%
	slender janusia *(Janusia gracilis)*	3%	0%
	Littleleaf ratany *(Krameria erecta)*	2%	0%

Cover/Litter/Bare Ground	
Foliar Cover	63%
Basal Cover	3%
Bare Ground	2%

Key area information **Range site: R040XC129AZ**	**Species**	**Line point intercept cover at T-4**	
		Foliar Cover	**Basal Cover**
T-4 Teacup *Allotment* Range site: R040XC129AZ	Annual forbs	24%	0%
	Palo verde (Parkinsonia microphylla)	6%	0%
	globemallow (Sphaeralcea ambigua)	2%	0%
	Velvet mesquite (Prosopis velutina)	8%	0%
	Black grama (Bouteloua eriopoda)	2%	0%
	Turpentine bush (Ericameria laricifolia)	23%	1%
	whitethorn acacia *(Acacia constricta)*	1%	0%

Cover/Litter/Bare Ground	
Foliar Cover	54%
Basal Cover	1%
Bare Ground	2%

Key area information	**Species**	**Line point intercept cover at W-1**

Range site: R040XC129AZ		Foliar Cover	Basal Cover
W-1 Whitlow *Allotment* Range site: R040XC129AZ	Annual forbs	6%	1%
	Annual grasses	44%	0%
	Triangle Bursage (Ambrosia deltoidea)	8%	0%
	Threeawn grasses (Aristida sp.)	1%	0%
	creosote bush (Larrea tridentata)	1%	0%
	Turpentine bush (Ericameria laricifolia)	5%	0%
	Yellow Palo verde (*Parkinsonia microphylla)*	2%	0%
	Jojoba *(Simmondsia chinensis)*	6%	2%
	lotebush *(Ziziphus obtusifolia)*	1%	0%

Cover/Litter/Bare Ground	
Foliar Cover	54%
Basal Cover	2%
Bare Ground	0%

Conclusion: The data at the trend plots T-1, T-2, T-4 and W-1 shows that cover and litter are adequate to ensure soil stabilization and appropriate permeability rates within the ecological site. The ESDs describe the Ecological Dynamics of the Site on the allotment as plant communities that are "naturally variable" (NRCS 2005). These variations occur due to site aspect, soils, and other natural conditions. The ESD for T-1 and T-2 describes the Historical Climax Plant Community (HCPC) as "The potential plant community is an open stand of desert trees with an understory of low shrubs, cacti and perennial grasses and forbs. The appearance is shrubby." The ESD for T-4 and W-1 describes the Historical Climax Plant Community (HCPC) as "The potential plant community on the site is a diverse mixture of desert shrubs, cacti, trees and perennial grasses and forbs. Annuals are of minor importance on the site. All of the major shrub and perennial grass and forb species on the site tend to be well dispersed throughout the plant community. The appearance is Shrubland." T-1, T-2, T-4 and W-1 reflects these conditions as described within the ESDs. Overall throughout the allotment the soils are productive, stable and in a sustainable condition. There were no rills/gullies present at any of the ecological sites, pedestals and/or terracettes were slight to non-existent. Wind scouring and litter movement were none to slight. Finally, rocks armor almost the entire allotment. The allotment is within the variability of the state and transition models as delineated in the ecological site descriptions (Figures 6 and 7).

Figure 16. State and transition model for Loamy Upland 10-13 MLRA

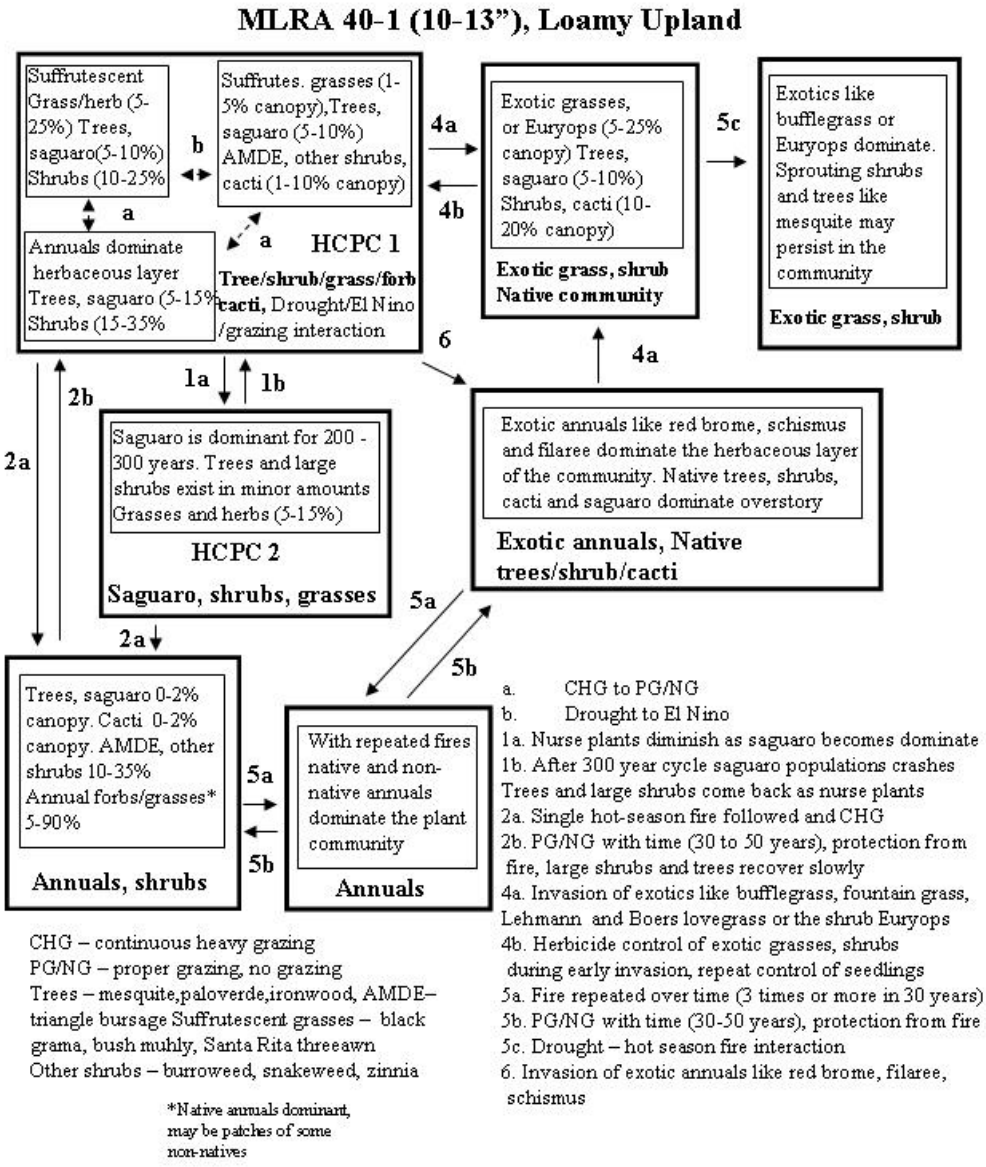
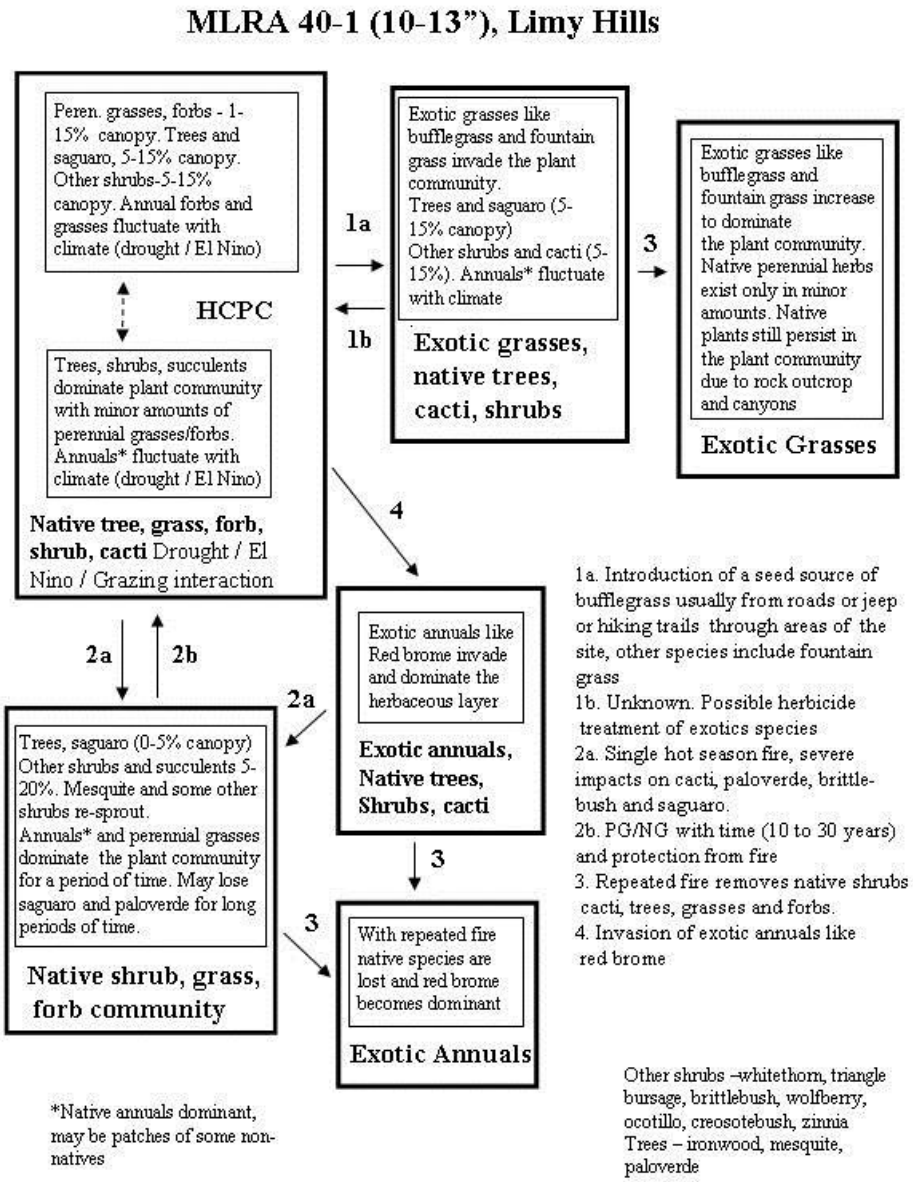


Figure 17. State and transition model for Limy Hills 10-13 MLRA



Standard 2: Riparian-Wetland Sites

Criteria for meeting Standard 2:

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

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

As indicated by such factors as:

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

Evaluation: Proper Functioning Condition assessments were conducted on 7-15-2015 along the Gila River at the Donnelly wash on the north end of the Teacup Allotment and at the Box O wash on the north end of the Whitlow Allotment.

On the Teacup Allotment, the assessment found that the area was in proper function condition with a stable trend. Of the 17 indicators of condition, only one was not properly functioning. That one was the upland watershed was contributing to degradation due to high recreational activities causing increased sedimentation and trash into the riparian area.

On the Whitlow Allotment, the assessment found that the area was in proper function condition with a stable trend. Of the 17 indicators of condition, only two were not properly functioning. Those two were diverse age class distribution of riparian-wetland vegetation and diverse composition of riparian-wetland vegetation. Those two were rated as not functioning because there were few young willows along the banks, and there were only seven trees/shrub species, three perennial forb/grass/grasslike and four annual grasses present.

Standard 3 Desired Resource Conditions

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

Criteria for meeting Standard 3:

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

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

As indicated by such factors as:

- Composition
- Structure
- Distribution

Exceptions and exemptions (where applicable):

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

Evaluation: In general, the composition, structure and distributions of plant communities are present as described within the ESDs throughout a majority of the allotment. The current vegetative composition of both perennial and annual native species within the allotment 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.

Current livestock presence and management dictates habitat condition relative to the stable state vegetative community that has developed on each site because of the long term grazing impacts. Overall, this allotment provides adequate habitat for wildlife species.

The ESD for T-1 and T-2 describes the Historical Climax Plant Community (HCPC) as “The potential plant community is an open stand of desert trees with an understory of low shrubs, cacti and perennial grasses and forbs. The appearance is shrubby.” The ESD for T-4 and W-1 describes the Historical Climax Plant Community (HCPC) as “The potential plant community on the site is a diverse mixture of desert shrubs, cacti, trees and perennial grasses and forbs. Annuals are of minor importance on the site. All of the major shrub and perennial grass and forb species on the site tend to be well dispersed throughout the plant community. The aspect is Shrubland.” T-1, T-2, T-4 and W-1 reflects these conditions as described within the ESDs.

Though all four sites are lacking some species that are described within the state and transition model, this is a direct result of “*natural variability of the site*” with respect to soil, aspect and precipitation. The functional/structure group was found to have none or only a slight deviation from the reference community as described within the ESD (Figures 16 and 17). Overall throughout the allotment the soils are productive, stable and in a sustainable condition. There were no rills/gullies present at any of the ecological sites, pedestals and/or terracettes were slight to non-existent. Wind scouring and litter movement were none to slight. Finally, rocks armor almost the entire allotment. The allotment is within the variability of the state and transition models as delineated in the ecological site descriptions (Figures 16 and 17).This helps maintain plant diversity overtime as described in the ESD. Based on observations, the allotment had only a slight deviation from the reference community as described by the ESD for the functional/structural groups. Although slight deviations from the reference community could exist within the allotment, the composition and structure of the vegetation still provides well-distributed habitat for wildlife (general wildlife and sensitive species.

8. DETERMINATION OF LAND HEALTH STANDARDS

Standard 1: Upland Sites

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

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

Conclusion: (Standard Achieved).

Rationale: The data at the trend plot shows that cover and litter are adequate to ensure soil stabilization and appropriate permeability rates within the ecological site. The ESDs describe the ecological dynamics of the site on the allotment as plant communities that are "naturally variable" (NRCS 2005). These variations occur due to site aspect, soils, and other natural conditions. The ESD for Loamy Upland 10-13" p.z. (T-1, T-2 and W-1) describes the Historical Climax Plant Community (HCPC) as "The potential plant community is an open stand of desert trees with an understory of low shrubs, cacti and perennial grasses and forbs. The aspect is shrubby." The ESD for Limy Hills 10-13" p.z. (T-4) describes the Historical Climax Plant Community (HCPC) as "The potential plant community on the site is a diverse mixture of desert shrubs, cacti, trees and perennial grasses and forbs. Annuals are of minor importance on the site. All of the major shrub and perennial grass and forb species on the site tend to be well dispersed throughout the plant community. The appearance is shrubland. With continuous, heavy grazing, perennial grass species are removed from the plant community and shrubs like triangle bursage and snakeweed can increase to dominate the understory. Mesquite tends to be shrubby on this site due to the thin surfaces over clayey horizons. Paloverde and ironwood reach moderate size on the site. With thin soil surfaces, this site can be a very ineffective user of intense summer rainfall if the herbaceous cover has been depleted. A 5 to 10% tree canopy is important on the site to keep diversity in the plant community. The potential of the site to produce grass is reduced as tree cover exceeds these amounts. Triangle bursage understories are long lived, persistent, and will not easily be replaced by perennial grass, as will snakeweed or burroweed understories with good grazing management. In severe drought, the cover of perennial grasses and herbs as well as bursage and burroweed can be greatly reduced in the plant community. Recovery can go back to perennial grasses and herbs if good summer rains follow drought. Recovery can go back to the half shrubs if good cool season rains follow the drought. Prickly pear can increase under heavy grazing pressure. Jumping cholla can increase due to poor grazing management or such increases can be episodic due to climate. Stand lifespans range from 50-70 years without reproduction." The key areas reflect these conditions as described within the ESDs as steady state 4 on Figure 16, and steady state 6 in Figure 15 above. Overall throughout the allotment the soils are productive, stable and in a sustainable condition. There were no rills/gullies present at any of the ecological sites, pedestals and/or terracettes were slight to non-existent. Wind-scouring and litter movement were none to slight. Finally, almost the entire allotment is armored by rocks. The allotment is within the variability of the state and transition models as delineated in the ecological site descriptions.

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: Evaluation: Within the Teacup and Whitlow Allotments, one riparian-wetland area exist. It is located along the Gila River. Proper Functioning Condition (PFC) evaluations were conducted at two sites in May 2015. The evaluations were conducted by a BLM interdisciplinary team that concluded that the portion of the Gila River within the Teacup and Whitlow Allotments is in Proper Functioning Condition with a stable trend. Current livestock management within these allotments prevents livestock grazing from occurring within the Gila River riparian area during critical growing seasons. The PFC evaluations found that the Gila River in these allotments is a stream channel with a substrate comprised of primarily sands, silts, and clays with cobble substrate where riffles form. The area has a wide active floodplain. Figure 12 and Figure 14 shows typical views of the reaches.

There are areas where there is limited sinuosity and areas where the channel is actively moving providing higher sensuosities. Through this area, the Gila River is perennial and can produce significant channel altering floods from time to time. At the time of the PFC evaluations in May 2015, the last significant flood had occurred in September 2013. Evidence of this event could be seen throughout the reaches with debris high in the riparian vegetation. Even with these higher flows, the channel appears to be relatively resilient due to the roughness provided by the riparian vegetation along the majority of both the streambanks and floodplain. The perennial flow supports a riparian forest woody component of primarily willow, box elder, and cottonwood with annual grasses sedges and rushes and other forbs in the understory.

For the most part, the sinuosity, gradient, and width to depth ratio are in balance with the landscape setting. Most banks are stable except for areas where natural lateral migration is occurring. The riparian area within the reaches have greater than 2 age classes of vegetation and the vegetation provides roughness more to the streambanks and floodplain as little in channel wood is present.

For the Teacup and Whitlow Allotments, Standard 2 is considered to be meeting the standard. Since the river corridor is fenced out to livestock grazing during the growing season, there are minimal to no impacts to river channeling and stream bank stability.

Donnelly Wash PFC

Functional rating (check one)
XX Proper functioning condition
□□Functional–at risk
□□Nonfunctional
Trend (check one)

Monitored trend	**Apparent trend**
□□Upward	□□Upward
□□Downward	□□Downward
□□Static	XX Not apparent

Rationale for rating: Regulated flow from Coolidge Dam/San Carlos Reservoir. River is used to transport irrigation water to farmlands downstream. Upstream dam that regulates flow, affecting regeneration of cottonwood and willow trees.

Box O Wash PFC

Functional rating (check one)
XX Proper functioning condition
□□Functional–at risk
□□Nonfunctional
Trend (check one)

Monitored trend	**Apparent trend**
□□Upward	□□Upward
□□Downward	□□Downward
□□Static	XX Not apparent

Comments: Regulated flow from Coolidge Dam/San Carlos Reservoir. Lots of cattle sign, several cows observed. High recreation impacts, lots of trash. Salt cedar dominates no cottonwood. Some Willows and some mesquite. Willow tops dieback due to flow fluctuation – variable dam releases.

Rationale for rating: River is used to transport irrigation water to farmlands downstream. Upstream dam that regulates flow, affecting regeneration of cottonwood and willow trees.

Standard 3: Desired Resource Conditions

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

- Maintain Grasses/Grasslike plants composition of ≥50%
- Maintain a palatable shrub composition of ≥15%
- Maintain vegetative foliar cover at ≥20%
- Maintain current vegetative diversity in the key area.

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

Conclusion: (Standard Achieved).

Key Area T-1

- Maintain Grasses/Grasslike plants composition of ≥5 % Not Achieved
- Maintain annual grass and forb composition of ≥5 % Achieved

- Maintain a shrub composition of ≥20 % — Achieved
- Maintain vegetative foliar cover at ≥10 % — Achieved
- Maintain current vegetative diversity in the area — BASELINE ESTABLISHED

The perennial grass composition objective is not being met at this Key Area. The most current long-term monitoring data shows that annual grass composition totals 54% (Table 19); however, no perennial grasses were detected along the transect or described as occurring on the site (Table 19). Palatable shrub composition on the site is not met for Sonoran desert tortoise and mule deer. Palatable browse for both species (Van Devender, et al. 2002; Oftedal 2002; Krausman et al. 997; Heffelfinger et.al. 2006) constitutes 2% of plant composition on the transect. Palatable shrub presence described for the area surrounding the transect (Table 18), included subdominant amounts (roughly 10-40% composition) of triangle leaf bursage (Ambrosia deltoidea) and minor amounts (2-5%) of Jojoba (Simmondsia chinensis), both of which are utilized by Sonoran desert tortoise and desert mule deer. Additional amounts of yellow paloverde (Parkinsonia microphylla), described as subdominant, would contribute to available browse where it occurs in younger (shrub-like) form. The vegetative foliar cover objective is being met at this site, with foliar cover of 63%. No sign of utilization (0%) by livestock was observed at the site. Because the transect layout used in past monitoring was not documented and was not repeated in 2013, they cannot be directly compared to current monitoring data. Therefore, the data collected in 2013 establishes the baseline for monitoring trend in vegetative diversity.

Key Area T-2

- Maintain Grasses/Grasslike plants composition of ≥5 % — Not Achieved
- Maintain annual grass and forb composition of ≥5 % — Achieved
- Maintain a shrub composition of ≥20 % — Achieved
- Maintain vegetative foliar cover at ≥10 % — Achieved
- Maintain current vegetative diversity in the area — BASELINE ESTABLISHED

The perennial grass composition objective is not being met at this Key Area. The most current long-term monitoring data shows that annual grass composition totals 18% (Table 40); however, no perennial grasses were detected along the transect or described as occurring on the site (Table 40). Assessment of the general area around the transect shows no perennial grass presence within the site. Palatable shrub composition on the site is achieved for Sonoran desert tortoise and mule deer. Palatable browse for desert tortoise consisting predominately of triangle leaf bursage, with lesser amounts of Krameria (Krameria erecta), California buckwheat (Eriogonum fasciculatum), and slender janusia (Janusia gracilis) (Van Devender, et al. 2002; Oftedal 2002) constitutes 35% of plant composition. Mule deer browse consisting of those same species, plus Ocotillo (Fouquieria splendens) (Krausman et al. 1997; Heffelfinger et.al. 2006) constitutes about 36% of the plant community (Table 40). Palatable shrub presence described for the area surrounding the transect included subdominant amounts (roughly 10-40% composition) of jojoba and Opuntia spp., both of which are palatable to desert tortoise and mule deer. The vegetative foliar cover objective is being met at this site, with foliar cover of 63%. Utilization observed at the site was 20% and restricted to jojoba. Because the transect layout used in past monitoring was not documented and was not repeated in 2013, they cannot be directly compared to current monitoring data. Therefore, the data collected in 2013 establishes the baseline for monitoring trend in vegetative diversity.

Key Area T-4

- Maintain Grasses/Grasslike plants composition of ≥10% — ACHIEVED
- Maintain a palatable shrub composition of ≥15% — NOT ACHIEVED
- Maintain vegetative foliar cover at ≥10% — ACHIEVED

- Maintain current vegetative diversity in the Key Area. BASELINE ESTABLISHED

The grass composition objective is being met at this Key Area. The most current long-term monitoring data shows that grass composition totals 26% (Table 40); however, perennial grass detection along the transect totals only 2% of composition. Assessment of the general area around the transect shows subdominant amounts (roughly 10-40% composition) of three-awn spp., some of which may include perennial species (Table 13). Palatable shrub composition on the site is not achieved for Sonoran desert tortoise or mule deer. Palatable browse for desert tortoise consists of globemallow spp. at 6% of composition. Additional amounts (up to 6%) of palo verde would contribute to available browse where it occurs in younger (shrub-like) form. Palatable shrub presence described for the area surrounding the transect (Table 14), included dominant amounts (roughly 40-100% composition) of palo verde and white thorn acacia (palatable to mule deer only) as well as minor amounts (roughly 2-5%) of false mesquite. The vegetative foliar cover objective is being met at this site, with foliar cover of 54%. Utilization observed at the site was 0%. Because the transect layout used in past monitoring was not documented and was not repeated in 2013, they cannot be directly compared to current monitoring data. Therefore, the data collected in 2013 establishes the baseline for monitoring trend in vegetative diversity.

Key Area W-1

- Maintain Grasses/Grasslike plants composition of ≥5 % ACHIEVED
- Maintain annual grass and forb composition of ≥5 % ACHIEVED
- Maintain a shrub composition of ≥20 % ACHIEVED
- Maintain vegetative foliar cover at ≥10 % ACHIEVED
- Maintain current vegetative diversity in the area. BASELINE ESTABLISHED

The grass composition objective is being met at this Key Area. The most current long-term monitoring data shows that grass composition totals 44% (Table 40); however, perennial grasses detected along the transect totaled only 1% composition (Aristida spp.), with no additional perennial grasses described as occurring on the site surrounding the transect (Table 5). Palatable shrub composition on the site is not met for Sonoran desert tortoise and mule deer. Palatable browse for both species (Van Devender, et al. 2002; Oftedal 2002; Krausman et al. 1997; Heffelfinger et.al. 2006) constitutes 14% of plant composition on the transect (jojoba and triangle leaf bursage). Palatable shrub presence described for the area surrounding the transect (Table 13), included subdominant amounts (roughly 10-40% composition) of triangle leaf bursage, jojoba, and Opuntia spp., and minor amounts (2-5%) of buckwheat. Additional minor amounts of palo verde would contribute to available browse where it occurs in younger (shrub-like) form. The vegetative foliar cover objective is being met at this site, with foliar cover of 54%. No sign of utilization (0%) by livestock was observed at the site. Because the transect layout used in past monitoring was not documented and was not repeated in 2013, they cannot be directly compared to current monitoring data. Therefore, the data collected in 2013 establishes the baseline for monitoring trend in vegetative diversity.

9. RECOMMENDED MANAGEMENT ACTIONS

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

9.1 Proposed Terms and Conditions

Terms:

Allotment	Livestock # and Kind	Grazing Period of Use	Percent Public Land	AUMs	Type Use
TEACUP	392 cattle	3/1 to 2/28	65	3,058	Active
WHITLOW	136	3/1 to 2/28	36	588	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.

13. 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.

14. Livestock will not be grazed on public lands within the Gila River during the period from April 1 to October 1 annually. If livestock are found in the river inside the exclusion fencing, they will be promptly removed within 14 days and the fence repaired by the lessee to prevent further unauthorized grazing. The BLM will be notified within 5 business days of all instances of livestock grazing within the riparian area during the time of exclusion.

10. LIST OF PREPAREERS AND REVIEWERS

List of Preparers:

Name	Organization	Title
Darrell Tersey	Tucson Field Office USDI Bureau of Land Management	Natural Resource Specialist
Kim Ryan	Tucson Field Office USDI Bureau of Land Management	Cultural Resources Specialist
Francisco Mendoza	Tucson Field Office USDI Bureau of Land Management	Outdoor Recreation Planner
Dave Murray	Tucson Field Office USDI Bureau of Land Management	Hydrologist
Zach Driscoll	Tucson Field Office USDI Bureau of Land Management	Geographic Information Specialist

List of Reviewers:

Name	Organization	Title
Eric Baker	Tucson Field Office USDI Bureau of Land Management	Rangeland Management Specialist
Amy Markstein	Gila District Office USDI Bureau of Land Management	Planning & Environmental Specialist
Kristen Duarte	Tucson Field Office USDI Bureau of Land Management	Rangeland Management Specialist

11. AUTHORIZED OFFICER CONCURRENCE

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

X__ I concur with the determinations and recommendations as written.

___ I do not concur.

___ I concur, but with the following modifications:

___/s/____Karen McKinley____for_____ ___9/22/17_____

Jayme Lopez Date

Field Office Manager

BLM Tucson Field Office

12. REFERENCES

American Forestry Association. 1902. The Boundary Line between Desert and Forest, S. J. Holsinger. Forestry and Irrigation, Vol. 8

Arizona Government-to-Government Consultation Toolkit. 2017. Available online at https://sites.google.com/view/az-consultation-toolkit/home (accessed June 20, 2017; last update June 19, 2017).

AZSite. 2017. Arizona's Cultural Resource Inventory, maintained by the Arizona State Museum. Available online at http://azsite3.asurite.ad.asu.edu/azsite/ (accessed August 8, 2017).

Barr, David M. R. 2007. *An Archaeological Survey of Water Catchment Sites 748, 749, and 764 Located in the Tortilla Mountain Area, Pinal County, Arizona*. Accession No. 2008-276.ASM. SWCA Environmental Consultants, Inc., Tucson.

Linford, Lewis R. 1981. Behavioral Archaeology and the "Pompeii Premise". *Journal of Anthropological Research,* 37(3):195-208.

Broadhead, Wade. 2001. *Brief Synopsis of Experiments Concerning Effects of Grazing on Archaeological Sites*. Bureau of Land Management, Gunnison Field Office, Gunnison, Colorado.

Brown, Patricia E. and Connie L. Stone. 1982. *Granite Reef: A Study in Desert Archaeology*. Anthropological Research Papers No. 28, Arizona State University, Tempe.

Debowski, Sharon S., Anique George, Richard Goddard, and Deborah Mullon. 1976. *An Archaeological Survey of the Buttes Dam Reservoir*. Archaeological Series No. 93. Arizona State Museum, University of Arizona, Tucson.

Grady, Mark A., Veletta Canouts, and David Phillips. *An Archaeological Survey of the Buttes Reservoir. Phase I: Preliminary Report*. Accession No. 1975-83.ASM. Arizona State Museum, University of Arizona, Tucson.

Jones, Jeffrey T. 2012. *A Class III Cultural Resources Inventory of a Proposed Meteorological Tower Site West of Kearny in Pinal County, Arizona*. Accession No. 2012-270.ASM. Tierra Right of Way Services, Ltd., Tucson.

Bahre, C.J. The Desert Grassland. 1995. edited by Mitchel P. McClaran, Thomas R. Van Devender . University of Arizona Press

McKee, Brian R. 2010. *Middle Mountain and Red Hills July 2010 Class I Inventory and Class III Survey, Southeast of Florence, Arizona*. Accession No. 2010-369.ASM. William Self Associates, Inc., Tucson.

Motsinger, Thomas N., Heidi Roberts, and Richard V.N. Ahlstrom. 1996. *The Eastern Mining Area 115 kV Transmission Line Survey: Archaeological Resources in the Salt-Gila Uplands of Central Arizona*. Accession No. 1993-369.ASM. SWCA Environmental Consultants, Inc., Tucson.

National Register of Historic Places Digital Asset Management System & NPGallery. 2017. Maintained by the National Park Service. Available online at https://www.nps.gov/nr/research/ (accessed August 8, 2017).

Osborn, Alan J. and Ralph J. Hartley. 1991. Adverse Effects of Domestic Livestock Grazing on the Archaeological Resources of Capitol Reef National Park, Utah, p.136-153. In *Proceedings of the*

First Biennial Conference of Research in Colorado Plateau National Parks. U.S. Geological Survey, Washington, D.C.

Osborn, Alan J., Susan Vetter, Ralph J. Hartley, Laurie Walsh, and Jesslyn Brown. 1987. Impacts of Domestic Livestock Grazing on Archaeological Resources of Capitol Reef National Park, Utah. *Occasional Studies in Anthropology*, No. 20. U.S. Dept. of the Interior, National Park Service, Midwest Archaeological Center, Lincoln, Nebraska.

Rinker, J. R. 2001. *A Cultural Resources Assessment and Historical Documentation of 35 Miles of the San Carlos Irrigation Project (SCIP) Coolidge-Hayden 69kV Electrical Power Transmission Line, Pinal and Gila Counties, Arizona*. Accession No. 2003-1178.ASM. Gila River Indian Community, Sacaton.

Rinker, J. R. and D. Morgan. 2001. *A Cultural Resources Survey of Approximately 15 Miles of Right-of-Way for the Tea Cup Substation Area Project of the San Carlos Irrigation Project (SCIP), Pinal County, Arizona*. Accession No. 2003-1209.ASM. Gila River Indian Community, Sacaton.

Roney, John. 1977. Livestock and Lithics: The Effects of Trampling. Unpublished Manuscript. U.S. Department of the Interior, Bureau of Land Management, Winnemucca District Office, Winnemucca, Nevada.

Schiffer, Michael B. 1987. *Formation Processes of the Archaeological Record*. University of New Mexico Press, Albuquerque.

Shrieve, James. 2010. *Archaeological Survey of Approximately 5 Acres for an Easement Across State Trust Land near Florence, Pinal County, Arizona*. Accession No. 2010-114.ASM. SWCA Environmental Consultants, Inc., Phoenix.

Sullivan, Mark E. 1997. *A Cultural Resources Inventory of Approximately 54 Miles of the Arizona Trail from Oracle to Kelvin, Pinal County, Arizona*. Accession No. 1997-59.ASM. Aztlan Archaeology, Tucson.

Teague, Lynn S. and Linda L. Mayro. 1979. *An Archaeological Survey of the Cholla-Saguaro Transmission Line Corridor*. Archaeological Series No. 135. Arizona State Museum, University of Arizona, Tucson.

USDA. 1997. National Range and Allotment Handbook

USDA. 2009. Ecological Site Description System. NRCS. Online. http://esis.sc.egov.usda.gov/esis_report/fsReport.aspx?approved=yes&id=R041XC323AZ

USDA. 2009. MLRA Explorer. NRCS. Online. http://ceiwin3.cei.psu.edu/MLRA/pdf/rep6339915994964689 00.pdf

USDA. 2009. Soil Survey of Arizona. Natural Resource Conservation Service.

USDA-NRCS. 2017. Culturally Sensitive Plants Database. Available online at https://plants.usda.gov/java/factSheet?cultural=yes (accessed August 8, 2017).

USDI. 1987. Eastern Arizona Grazing EIS. Bureau of Land Management

USDI. 1996. Sampling Vegetation Attributes. Bureau of Land Management.

USDI. 1997. Arizona Approved Standards for Rangeland Health and Guidelines for Grazing Management. Bureau of Land Management.

USDI. 2005. Interpreting Indicators of Rangeland Health. Interagency Protocol (BLM, ARS, NRCS).

USDI. 2015. Draft Recovery Plan for the Sonoran pronghorn (Antilocapra Americana sonoriensis), Second Revision. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, NM. https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/SonoranPronghorn/SonoranPronghorn_DraftRecoveryPlan_Final_December2014.pdf.

USDI. 2016. Information for Planning and Conservation (IPaC). U.S. Fish and Wildlife Service. Accessed online at: https://ecos.fws.gov/ipac/

Van Devender, T.R. 2002. The Sonoran Desert Tortoise: natural history, biology, and conservation. University of Arizona Press.

Van Vuren, Dirk H. 1982. Effects of Feral Sheep on the Spatial Distribution of Artifacts on Santa Cruz Island. *Bulletin of the Southern California Academy of Science,* 81(3):148-151.

Vivian, R. Gwinn. 1964. Report of Surveys Conducted by the Arizona State Museum for the National Park Service under Contract 14-10-0333-995. Buttes Dam Site Survey Project; Accession No. 1963-8.ASM. MS, Archives, Arizona State Museum, University of Arizona, Tucson.

Western Regional Climate Center. (2017, 7 24). Arizona COOP Sites. Retrieved from WRRC Desert Research Institute: https://wrcc.dri.edu/summary/Climsmaz.html