United States Department of the Interior

Bureau of Land Management

Safford Field Office Safford, AZ

Land Health Evaluation Report

St. Johns Ranch Allotment

(No. 06255)

July 2020

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List of Acronyms

ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AZGFD	Arizona Game and Fish Department
AUM	Animal unit month
BLM	Bureau of Land Management
BO	Biological Opinion
CFR	Code of Federal Regulations
DPC	Desired plant community
EDIT	Ecological Dynamics Interpretive Tool
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESD	Ecological site description
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act
GPS	Global positioning system
HCPC	Historical climax plant communities
HUC	Hydrologic unit code
ID	Interdisciplinary
IPaC	Information for Planning and Conservation
LHE	Land health evaluation
LUP	Land use plan
LPI	Line point intercept
MLRA	Major Land Resource Area
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
P.L.	Public Law
p.z.	Precipitation zone
PRISM	Parameter-elevation Relationships on Independent Slopes Model
RAS	Rangeland Administration System
RHA	Rangeland Health Assessment
RMP	Resource Management Plan
RPS	Range Program Summary
ROD	Record of Decision
spp.	Multiple species of the same genus
STM	State and Transition Model
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USDI	United States Department of the Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

1.0 Introduction

The purpose of this Land Health Evaluation (LHE) report is to determine whether the Arizona standards for rangeland health are being achieved on the St. Johns Ranch Allotment, or if the standards are not being achieved, to determine if livestock are the causal factor for not achieving or making significant progress towards achieving land health standards. This 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.

The Secretary of the Interior approved the Bureau of Land Management (BLM) Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Arizona Standards and Guidelines) in April 1997. Arizona Standards and Guidelines and the final rule by the Department of the Interior apply to grazing administration on public lands.

Standards and guidelines are implemented through terms and conditions of grazing permits and leases, and other authorizations, grazing-related portions of activity plans (including Allotment Management 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.

The LHE report ascertains:

1. If standards are being achieved, not achieved, and if significant progress is being made towards achievement of the land health.
2. Whether livestock grazing is a significant causal factor where it is determined that land health standards are not being achieved.

This report covers an evaluation period of 10 years (2010-2020). This is a standard evaluation period that provides the BLM the ability to collect an adequate amount of information related to grazing use and environmental factors pertaining to the lease renewal process.

1.1 Consultation, Cooperation and Coordination

A letter to interested publics informing that the St. Johns Ranch Allotment was being considered for lease renewal was distributed via certified mail January 31, 2017. A list of the recipients are provided in Appendix C.

Coordination on data on special status species was obtained from the U.S. Fish and Wildlife Service (USFWS) and the Arizona Game and Fish Department (AZGFD).

1.2 Definition of Arizona Standards for Rangeland Health and Guidelines for Grazing Administration

The Arizona standards for rangeland health are expressions of levels of physical and biological condition or degree of function required for healthy, sustainable rangelands and defines minimum resource conditions that must be achieved and maintained. Determination of rangeland health is based upon conformance with these standards.

Guidelines for grazing administration consider the type and level of grazing use. Guidelines for grazing management are types of methods and practices determined to be appropriate to ensure the standards can be met or that significant progress can be made toward meeting the standards. Guidelines are tools that help managers and lessees achieve standards.

Although the process of developing standards and guidelines applies to grazing administration, present rangeland health is the result of the interaction of many factors in addition to grazing livestock. Other contributing factors may include, but are not limited to, past land uses, land use restrictions, recreation, wildlife, rights-of-way, wild horses and burros, mining, fire, weather, and insects and disease (Arizona Standards and Guidelines, 1997).

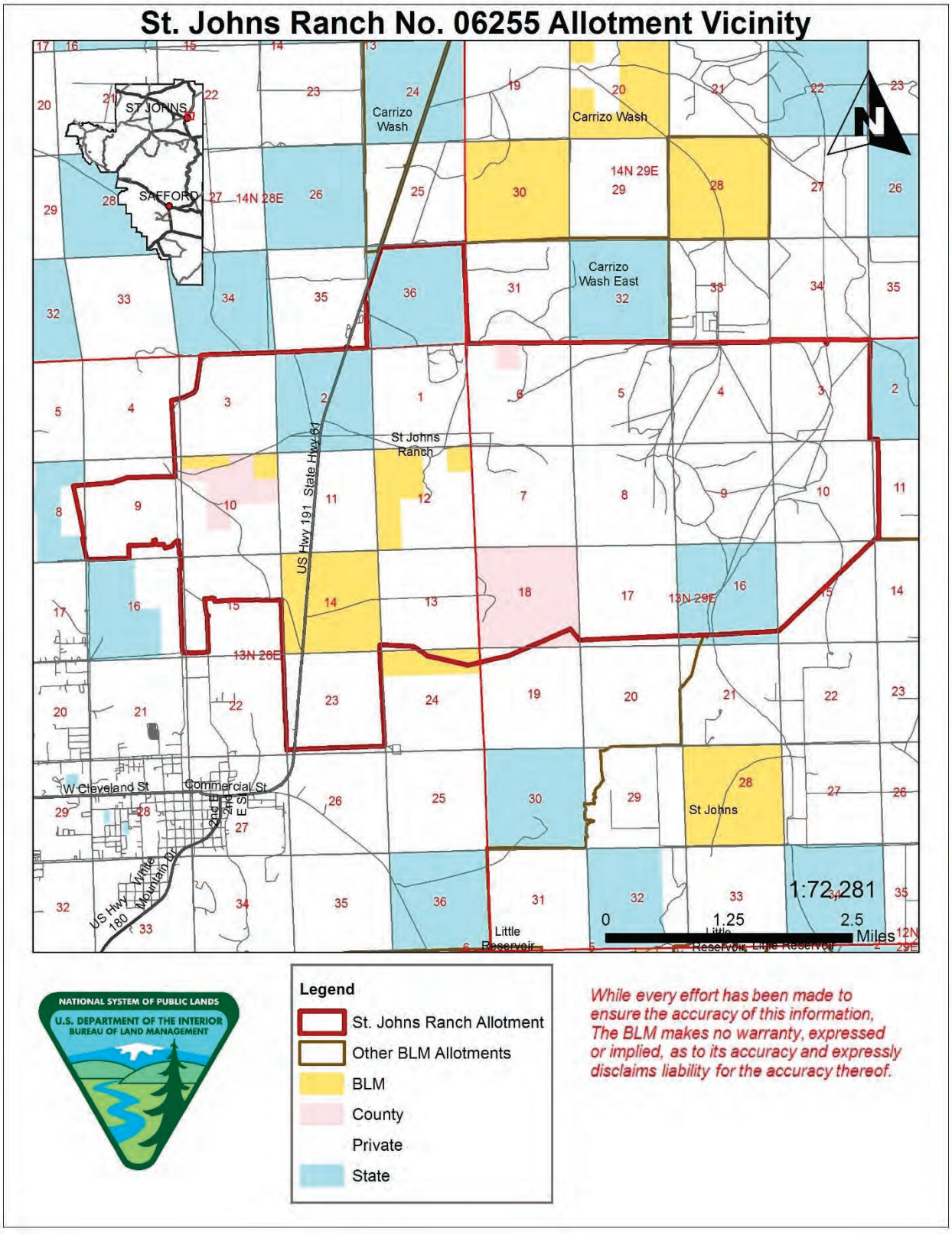
The Arizona Standards and Guidelines identify three standards regarding (1) upland sites, (2) riparian-wetland sites, and (3) desired resource conditions based on specific indicators, as discussed in *Section 5 Rangeland Inventory and Monitoring Methodology* of this document.

2. Allotment Profile and General Description

2.1 Location

The St. Johns Ranch Allotment (No. 06255) is located in Apache County, Arizona, approximately 1 mile north of Saint Johns, Arizona. State Route 61 passes through the middle of the allotment. The northern boundary of St. Johns Ranch Allotment borders Carrizo Wash Allotment, along with Carrizo Wash East Allotment. Carrizo Wash East Allotment wraps around on the east side of St. Johns Ranch Allotment. St. Johns Allotment borders the southeast portion, while the south and west sides are bordered by a mixture of private and State Lands (Figure 1).

Figure 1 St. Johns Ranch Vicinity



Source: USDI-BLM 2017, ADOT 2016

2.2 Physical Description

A physical description of the St. Johns Ranch Allotment follows.

2.2.1 *Surface Land Ownership*

The St. Johns Ranch Allotment is comprised predominately of private property and Arizona State Trust lands. The BLM-administered portion of the allotment is 1,040 acres, or approximately 7 percent of the allotment area. Landownership apportionments are displayed in Table 1.

Table 1 St. Johns Ranch Allotment Landownership

Land Classification	Acres
BLM-administered land	1,040
Arizona State Trust land	1,825
County land	910
Private property	10,839
Total Acres	**14,614**

Source: USDI-BLM GIS data set

2.2.2 *Precipitation*

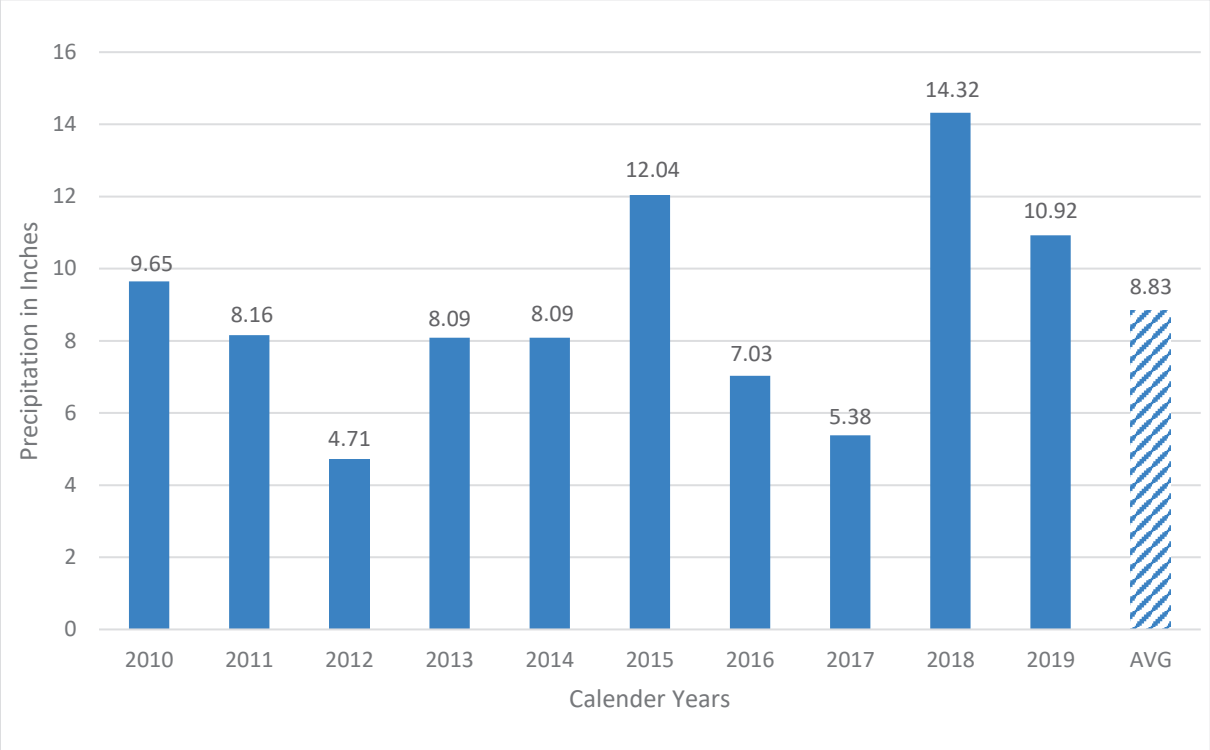
Average annual precipitation for most of the St. Johns Ranch Allotment ranges from 10-14 inches. The average annual rainfall on the St. Johns Ranch Allotment is 8.83 inches (Figure 2). The data show that out of 10 years, four years were above average, and six were below average, with 2012 and 2017 being well below the average for this area. Approximately 50-60 percent of the precipitation occurs during July through September.

Precipitation data from PRISM climate datasets (PRISM, 2017) were utilized by selecting a point within a mile of the BLM-administered land within the St. Johns Ranch Allotment as follows:

- Latitude: 34.5595
- Longitude: -109.3246
- Elevation: 5,735 feet

Climatic data from this source is not collected from a single station but is modeled using data collected from many stations and physiographic factors in the area.

Figure 2 Average Annual Precipitation from PRISM Time Series Data 2010-2019



2.2.3 *Temperatures*

The following Table 2 presents the minimum, maximum, and average temperature within the St. Johns Ranch Allotment between 2010 and 2019.

Table 2 Temperatures in Degrees Fahrenheit on St. Johns Ranch Allotment

Month	Average Minimum	Average Maximum	Average
January	19°F	48°F	34°F
February	23°F	54°F	39°F
March	29°F	64°F	46°F
April	36°F	70°F	53°F
May	42°F	77°F	59°F
June	54°F	91°F	72°F
July	61°F	90°F	76°F
August	59°F	88°F	73°F
September	52°F	83°F	68°F
October	39°F	73°F	56°F
November	27°F	60°F	44°F
December	21°F	49°F	35°F

Source: PRISM, 2017. Averaged 2010-2019.

2.2.4 *Soils*

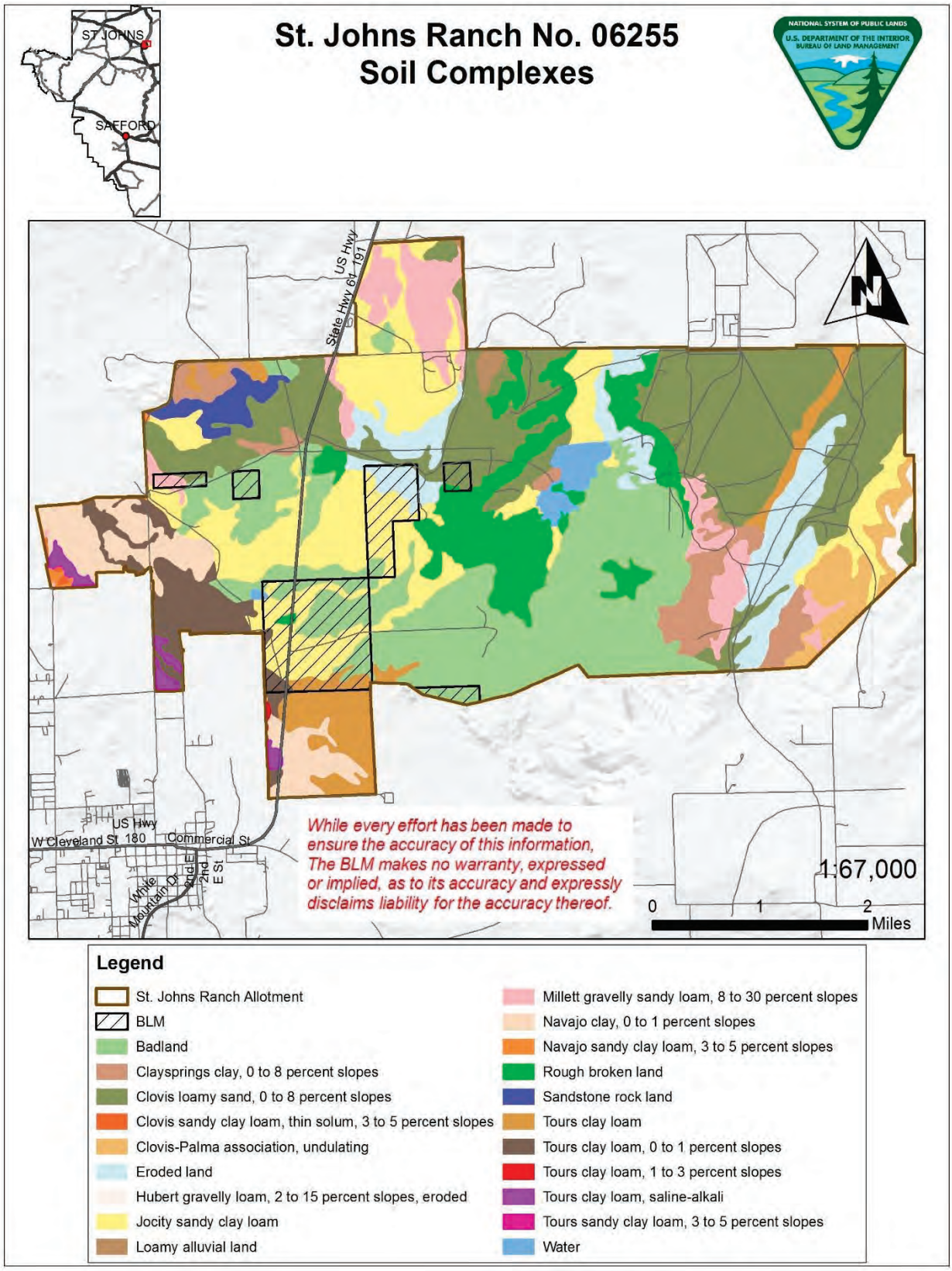
The soil composition on the St. Johns Ranch Allotment is varied as presented in Table 3 and Figure 3.

Table 3 Soil Composition within the St. Johns Ranch Allotment

Soil Map Unit Name	Percent Area Total Allotment	Percent Area BLM Portions
Clovis loamy sand, 0 to 8 percent slopes	21.5%	4.8%
Badland	21.0%	32.2%
Jocity sandy clay loam	16.0%	43.3%
Rough broken land	7.5%	1.4%
Eroded land	6.6%	7.2%
Millett gravelly sandy loam, 8 to 30 percent slopes	5.3%	2.0%
Navajo clay, 0 to 1 percent slopes	4.3%	0%
Tours clay loam	4.1%	6.0%
Tours clay loam, 0 to 1 percent slopes	3.4%	2.9%
Water	1.1%	0.2%
Other – 10 individual soil types/complexes with less than 4 percent area each: - Claysprings clay, 0 to 8 percent slopes - Clovis-Palma association, undulating - Clovis loamy sand, 0 to 8 percent slopes - Clovis sandy clay loam, thin solum, 3 to 5 percent slopes - Hubert gravelly loam, 2 to 15 percent slopes, eroded - Loamy alluvial land - Sandstone rock land - Tours clay loam, 1 to 3 percent slopes - Tours clay loam, saline-alkali - Tours sandy clay loam, 3 to 5 percent slopes	9.2%	0%

Source: Natural Resources Conservation Service (NRCS) Web Soil Survey

Figure 3 Soil Complexes on St. Johns Ranch Allotment



Source: USDI-BLM 2017, USDA-NRCS 2015

The following soil descriptions occur on BLM-administered lands within the St. Johns Ranch Allotment and will be carried forward in this LHE:

- Badland
- Clovis loamy sand, 0 to 8 percent slopes
- Eroded land
- Jocity sandy clay loam
- Millett gravelly sandy loam, 8 to 30 percent slopes
- Rough broken land
- Tours clay loam
- Tours clay loam, 0 to 1 percent slopes

Badland
Badland is not a soil type due to being made up of various layers of different soil types, and on this allotment, it is composed of the Chinle Formation (Late Triassic, 210-230 Ma). Badland consists of moderately steep to very steep, nearly barren areas of highly erodible, multicolored, clayey shales and siltstones interbedded with thin layers of harder sandstone and conglomerate. These shaly areas are dissected by numerous drainageways, leaving small remnants as ridges and low buttes capped by the more resistant sandstone and conglomerate rocks. The dominant slopes are 30 to 50 percent.

Clovis loamy sand, 0 to 8 percent slopes
The Clovis series consists of very deep, well drained, moderately permeable soils that formed in medium and moderately fine textured sediments from quartzite gneiss, schist, sandstone, and limestone. The Clovis soils are on fan terraces, piedmont slopes, and plains. Elevations range from 4,500 to 7,200 feet. Slopes are 0 to 20 percent. The mean annual precipitation is about 11 inches. The mean annual temperature is about 53 degrees Fahrenheit (F). Clovis soils are well drained. Permeability is moderate or moderately slow. Runoff is negligible on slopes less than 1 percent, very low on 1 to 3 percent slopes, low on 3 to 5 percent slopes and medium on 5 to 20 percent slopes.

Eroded land
The Natural Resources Conservation Service (NRCS) only gives a landform description of Eroded land. The description states that it occurs as escarpments and terraces and is associated with the Sandy Upland 10-14” p.z. (R035XA118AZ) ecological site.

Jocity sandy clay loam
The Jocity series consists of very deep, well drained soils formed in stream alluvium. Jocity soils are on flood plains, and alluvial fans. Elevation is 4,400 to 6,200 feet. Slopes are 0 to 4 percent. The mean annual precipitation is about 10 inches and the mean annual air temperature is about 53 degrees F. They formed in Holocene stream alluvium from sandstone, shale and other rocks.

Millet gravelly sandy loam, 8 to 30 percent slopes
Millet gravelly sandy loam, 8 to 30 percent slopes soil are formed as gravelly alluvium derived from quartzite or sandstone, occurring as terraces on hills, consisting of moderately deep soils, moderately well drained to well drained, with elevations ranging from 5,500 to 7,000 feet. Slopes are from 8 to 30 percent. The mean annual precipitation has a range of 10 to 16 inches. The mean annual air temperature is 50 to 106 degrees F. The frost-free period is 130 to 140 days. Soils are well drained with medium run off.

Rough broken land
Described in the map unit description from Web Soil Survey (USDA 2017), rough broken lands are on breaks and terraces and have slopes of 10 to 60 percent. Elevations range from 5,400 to 7,000 feet. The mean annual precipitation is 8 to 16 inches. The mean annual air temperature is 48 to 55 degrees F. The frost-free period is 120 to 140 days. Runoff class is very high due to paralithic bedrock at 4 to 20 inches.

Tours clay loam, 0 to 1 percent slope
Tours clay loam, 0 to 1 percent slope soil consist of very deep, well drained, stratified soils that formed in stream alluvium. Tours clay loam soil occurs on alluvial fans and flood plains at elevations ranging from 5,400 to 7,000 feet. Slopes are from 0 to 1 percent. The mean annual precipitation is 8 to 12 inches. The mean annual air temperature is about 48 to 54 degrees F. The frost-free period is 120 to 140 days. Soils are well drained with low run off.

2.2.5 ***Watershed***
This allotment lies within two watersheds, the Little Colorado River, Lyman Lake to Big Hollow Wash and Lower Carrizo Wash watersheds (HUC-10 1502000201 and 1502000309 respectively). Big Hollow Wash and Lower Carrizo Wash are tributaries to the Little Colorado River. The Little Colorado River is an intermittent stream with some reaches flowing perennially closer to its headwaters. It flows through the western part of the allotment and is approximately 0.61 miles west of the nearest BLM-administered land. The Little Colorado River is one of two major tributaries in Arizona to the Colorado River and drains the Little Colorado Basin (HUC-6 150200). The Little Colorado Basin has a drainage area of 26,000 square miles extending into New Mexico.

The allotment lies entirely within the "Little Colorado River Plateau" Arizona Department of Water Resources (ADWR) Groundwater Basin and is not within an ADWR Active Management Area. The groundwater basin consists of the following aquifers: unconsolidated alluvium from streams, volcanic bedrock (Lakeside-Pinetop Aquifer), and consolidated sedimentary aquifers (B

idahochi, C, D, N, Springerville, and White Mountain Aquifers). Other than the Little Colorado River, the nearest surface waters to the allotment are ephemeral washes, primarily having peak flows from rainfall and snowmelt. Marion Haws Draw runs through the east side of the allotment and is approximately 2.71 miles from the nearest BLM-administered land. This draw is a tributary to Kearn Lake outside of the allotment, which is approximately 4.17 miles from the eastern most BLM-administered land. Alejandro Lake is situated behind a detention dam and is supplied by many unnamed ephemeral washes; it is approximately 0.79 miles from the nearest BLM-administered land. The majority of the allotment is located within a Federal Emergency Management Agency (FEMA) Zone D floodplain meaning undetermined but possible flood

hazard. The little Colorado and Marion Haws Draw lie within a 100-year (1 percent chance of flooding in any single year) floodplain. Water quality is monitored and listed by Arizona Department of Environmental Quality (ADEQ) for Environmental Protection Agency (EPA) 303(d) waterbody impairments under the federal Clean Water Act, and there are no impaired waters on the allotment. Lyman Lake lies on the Little Colorado River approximately 9.71 miles southwest of the allotment and was found impaired for mercury in fish from 2004-2010, with probable sources of Atmospheric Deposition and Resource Extraction of Abandoned Mine Lands.

Within the BLM portions of the allotment, there is one reservoir that has been constructed by the City of St. Johns. The pond is used to hold effluent water from the city. On the private land adjacent to the BLM-administered land is an additional two ponds used for the same purpose. Livestock and wildlife have access to this reservoir.

2.2.6 *Range Improvements*

The St. Johns Ranch Allotment consists primarily of private lands. There is one earthen reservoir (previously discussed in section 2.2.5) on BLM-administered land within the St. Johns Ranch Allotment. The reservoir is located within the northwest corner of Section 24. Although this reservoir is not a range improvement, livestock and wildlife can utilize the water source.

2.3 Biological Resources

This section discusses the biological resources within the St. Johns Ranch Allotment.

2.3.1 *Major Land Resource Areas*

A Major Land Resource Area (MLRA) is a broad geographic area that is characterized by a particular pattern of soils, climate, water resources, vegetation and land use. Each MLRA, in which rangeland and forestland occur can be further divided into sub-resource areas and into ecological sites. The St. Johns Ranch Allotment lies within the MLRA 35-Colorado Plateau and one Ecological Site Description (ESD). The MLRA 35-Colorado Plateau can be further divided into sub-resource area 35-1 Mixed Grass Plains which represents the BLM-administered lands of the St. Johns Ranch Allotment.

2.3.2 *Ecological Sites within the St. Johns Ranch Allotment*

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 and disturbances. The ESDs are developed by the NRCS and partners to document the properties of ecological sites. These include climate, soil, geomorphology, hydrology, and vegetation information that describe the behavior of individual ecological sites. Since an ecological site might feature several plant communities that occur over time or in response to land management, these descriptions can be used to interpret ecological changes (Perez, 2017).

Below, Table 4 and Figure 4 provide a summary of the ecological sites present within the St. Johns Ranch Allotment. The ESDs on BLM-administered land portions of the allotment are also summarized. Detailed NRCS ESD reports are stored and accessed within the Ecological Dynamics Interpretive Tool (EDIT) available online: https://edit.jornada.nmsu.edu/. Not all ESDs have been fully evaluated; in such cases, currently available information was used.

A key attribute of an ecological site is the historic climax plant community (HCPC), or reference state. The HCPC represents the natural potential plant community found on relatively undisturbed sites. The HCPC or reference state is often compared with existing range condition to determine current land health. Soils, topography, and climate are the factors that collectively form the basis for the classification of rangeland ecological sites.

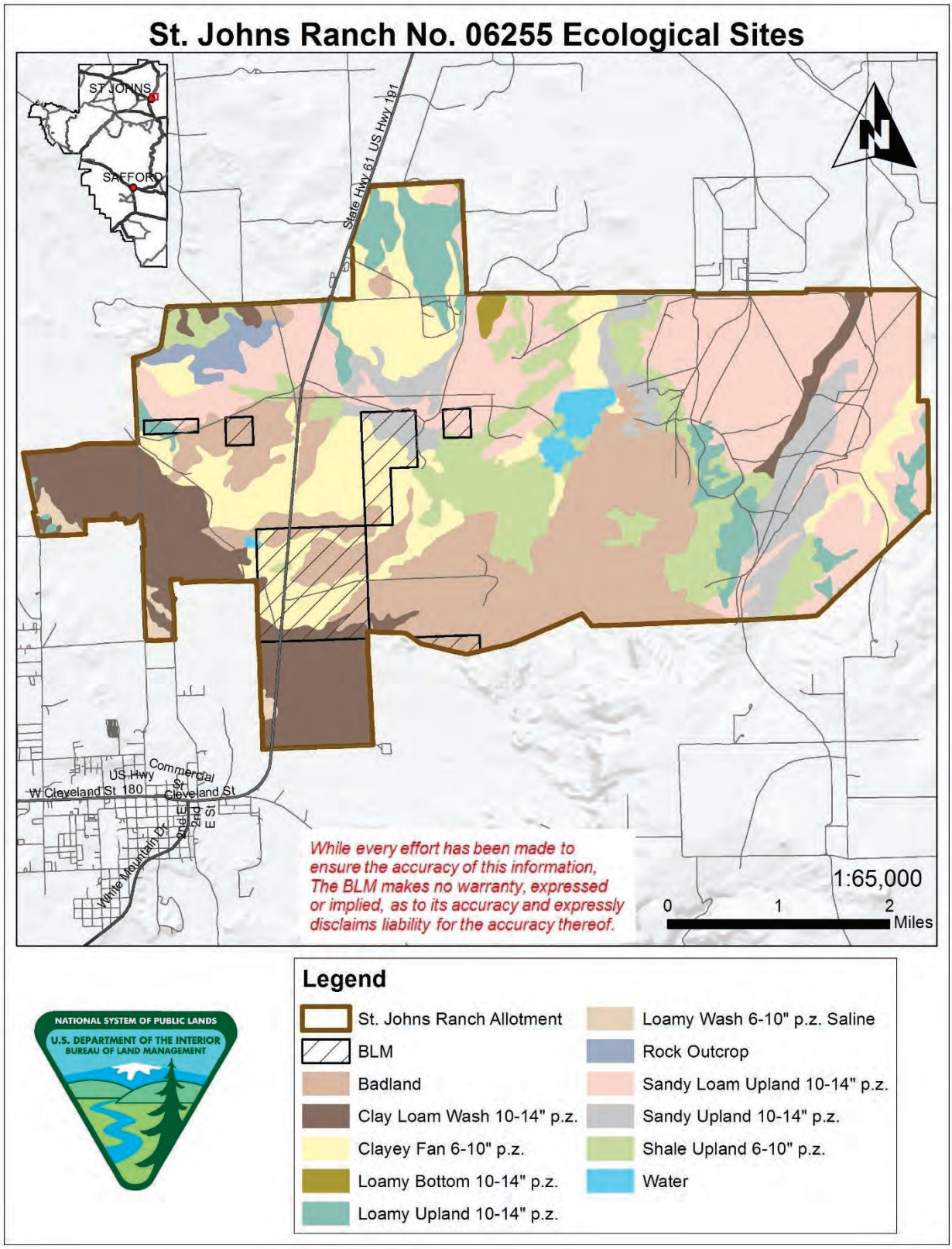
The areas selected to be evaluated occur on BLM-administered lands. Descriptions of these ecological sites are also summarized below. Monitoring occurred on Clay Loam Wash 10-14" Precipitation zone (p.z.) (R035XA104AZ), Clayey Fan 6-10" p.z. (R035XB239AZ), and Sandy Upland 10-14" p.z. (R035XA118AZ) by the NRCS. Badland, Water and Rock Outcrop are descriptions of landforms and not given an ecological site description by NRCS.

Table 4 Ecological Sites Located within St. Johns Ranch Allotment

Ecological Site	Allotment Acres	BLM Acres	BLM Composition
Badland	3,056	335.34	32.2%
Clay Loam Wash 10-14" p.z. (R035XA104AZ)	1,767	92	8.9%
Clayey Fan 6-10" p.z. (R035XB239AZ)	2,325	450.7	43.3%
Loamy Upland 10-14" p.z. (R035XA113AZ)	855	20.72	2.0%
Sandy Loam Upland 10-14" p.z. (R035XA117AZ)	3,501	49.84	5.0%
Sandy Upland 10-14" p.z. (R035XA118AZ)	962	75.28	7.2%
Shale Upland 6-10" p.z. (R035XB220AZ)	1,652	14.16	1.3%
Water	166	1.70	0.1%
Other - 3 individual ecological sites with less than 2 percent area each: - Loamy Bottom 10-14" p.z. (R035XA112AZ) - Loamy Wash 6-10" p.z. Saline (R035XB211AZ) - Rock Outcrop	330	0	0%

Source: Natural Resources Conservation Service (NRCS).

Figure 4 St. Johns Ranch Allotment Ecological Sites



Source: USDI-BLM 2017, USDA-NRCS 2015

Badland
The NRCS gives Badland a broad description as a landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Clay Loam Wash 10-14" p.z. (R035XA104AZ)
This ecological site occurs within the Major Land Resource Area 35.1 - Colorado Plateau Mixed Grass Plains in northeastern Arizona. Clay Loam Wash 10-14" p.z. occurs in a bottom position on floodplains, valley floors, stream terraces and drainage ways and benefits significantly from run-in moisture from adjacent areas. Precipitation ranges from 10-14 inches annually, with elevations ranging from 5,300 to 6,500 feet. Soils are deep to plant root restricting layers. The soil normally can absorb and hold most of the moisture the climate supplies.

The plant community historically (HCPC) found on this site has a plant community characterized as a native mid and short grasses with a relatively small percentage of forbs and shrubs.

Grass species found in the Clay Loam Wash 10-14" p.z. include, but are not limited to: alkali sacaton *(Sporobolus airoides)*, western wheatgrass *(Pascopyrum smithii)*, blue grama *(Bouteloua gracilis*), vine mesquite *(Panicum obtusum)*, and James' galleta *(Pleuraphis jamesii)*. Forb species found include*:* western tansymustard *(Descurainia pinnata)* and Rocky Mountain beeplant *(Cleome serrulata).* Shrub species found include: fourwing saltbush *(Atriplex canescens)*, prairie sagewort (*Artemisia frigida*), and shadscale saltbush *(Atriplex confertifolia)*.

Clayey Fan 6-10" p.z. (R035XB239AZ)
This ecological site occurs in an upland position as fans, stream terraces and fan terraces of flood plains. Elevation ranges from 4,800 to 6,100 feet. The area has a very dry and windy climate that is hot in the summer and cold in the winter. Average annual precipitation is from 6 to 10 inches. A slight majority of the precipitation arrives during the late fall, winter, and early spring. This winter season moisture originates in the Pacific Ocean and arrives as rain, or sometimes snow, during widespread frontal storms of generally low intensity. The majority of the snow falls from December through February, but rarely lasts more than a few days. The driest period is from late May to early July. Summer rains occur from July through September during brief intense local thunderstorms. The rain is sporadic in intensity and location. Soils are very deep and are well drained.

The HCPC for this range site is described as a plant community of mid and short grasses with shrubs and a relatively small percentage of forbs. It can be dominated by alkali sacaton and galleta. Non-native annuals may be present in trace amounts. Species most likely to increase or invade are broom snakeweed, rabbitbrush, cacti and annuals.

Common grasses include Indian ricegrass (*Achnatherum hymenoides*), black grama (*Bouteloua eriopoda*), blue grama (*Bouteloua gracilis*), squirreltail (*Elymus elymoides*), western wheatgrass (*Pascopyrum smithii*), James' galleta (*Pleuraphis jamesii*), alkali sacaton (*Sporobolus airoides*), and sand dropseed (*Sporobolus cryptandrus*). Few forbs may be present. Common shrubs may

include fourwing saltbush (*Atriplex canescens*), shadscale saltbush (*Atriplex confertifolia*), mound saltbush (*Atriplex obovata*), Greene rabbitbrush (*Chrysothamnus greenei*), broom snakeweed (*Gutierrezia sarothrae*), winterfat (*Krascheninnikovia lanata*), and black greasewood (*Sarcobatus vermiculatus*).

Loamy Upland 10-14" p.z. (R035XA113AZ)
This ecological site occurs within the Major Land Resource Area 35.1 - Colorado Plateau Mixed Grass Plains province of northeastern Arizona. Loamy Upland 10-14" p.z. occurs in an upland position as gently rolling plains, fans and terraces and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Precipitation ranges from 10 to 14 inches annually, with elevations ranging from 4,800 to 6,300 feet. Long periods with little or no effective moisture are relatively common. Soil moisture on this site is from rainfall between the months of July through September, and the remaining moisture comes as snow during winter. Soils have characteristics of being moderately deep or deeper to any plant root restricting layers.

The plant communities found on this ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The HCPC on this ecological site has a plant community made up primarily of perennial native grassland with warm season and cool season grasses and half shrubs.

Grass species found in the Loamy Upland 10-14" p.z. include but are not limited to: sideoats grama (*Bouteloua curtipendula)*, black grama *(Bouteloua eriopoda),* blue grama *(Bouteloua gracilis),* James' galleta *(Pleuraphis jamesii)* and needle and thread (*Hesperostipa comata*). Shrub species found include: winterfat (*Krascheninnikovia lantana*), Greene's rabbitbrush (*Chrysothamnus greenei*), broom snakeweed (*Gutierrezia sarothrae*) and fourwing saltbush (*Atriplex canescens*). Tree species found include: one-seed juniper (*Juniperus monosperma*), and Fremont barberry (*Mahonia fremontii*).

Sandy Loam Upland 10-14" p.z. (R035XA117AZ)
This ecological site occurs in Major Land Resource Area 35.1 - the Colorado Plateau Mixed Grass Plains. Elevations range from 4,800 to 6,300 feet and precipitation averages 10 to 14 inches per year. Fifty to sixty percent of moisture falls as rain from July through September and is the most effective moisture for plant growth. The remaining moisture comes as snow during the winter. Long periods with little or no effective moisture are relatively common. Cool season plants begin growth in early spring and mature in the early summer. Warm season plants take advantage of summer rains and grow from July through September.

The reference state plant community is composed primarily of warm season mid-grasses and short grasses with a small percentage of cool season grasses and half-shrubs.

Dominant grasses include black grama (*Bouteloua eriopoda*), blue grama (*Bouteloua gracilis*), James' galleta (*Pleuraphis jamesii*), and alkali sacaton (*Sporobolus airoides*). Other grasses may include Indian ricegrass (*Achnatherum hymenoides*), squirreltail (*Elymus elymoides*), needle-and-thread (*Hesperostipa comata*), mat muhly (*Muhlenbergia richardsonis*), ring muhly (*Muhlenbergia torreyi*), spike dropseed (*Sporobolus contractus*), sand dropseed (*Sporobolus cryptandrus*), and mesa dropseed (*Sporobolus flexuosus*). Forbs may include Astralagus species

(*Astragalus spp.*), rose heath (*Chaetopappa ericoides*), Esteve's pincushion (*Chaenactis stevioides*), Cryptantha species (*Cryptantha spp.*), shortstem lupine (*Lupinus brevicaulis*), threadleaf groundsel (*Senecio flaccidus*), and western aster (*Symphyotrichum ascendens*). Dominant shrubs may include Bigelow sagebrush (*Artemisia bigelovii*), fourwing saltbush (*Atriplex canescens*), Ephedra (*Ephedra spp.*), and winterfat (*Krascheninnikovia lanata*). Other shrubs may include Chrysothamnus species (*Chrysothamnus spp.*), rubber rabbitbrush (*Ericameria nauseosa*), and snakeweed (*Gutierrezia spp.*). Common trees include Juniper (*Juniperus spp.*) and Colorado pinyon (*Pinus edulis*).

Sandy Upland 10-14" p.z. (R035XA118AZ)
This ecological site occurs in Major Land Resource Area 35.1 - the Colorado Plateau Mixed Grass Plains and occurs in an upland position as gently rolling plains and mesas. Slopes range from 0 to 15 percent. Elevations range from 4,800 to 6,700 feet and precipitation averages 10 to 14 inches per year. Fifty to sixty percent of moisture falls as rain from July through September and is the most effective moisture for plant growth. The remaining moisture comes as snow during the winter. Long periods with little or no effective moisture are relatively common. Cool season plants begin growth in early spring and mature in the early summer. Warm season plants take advantage of summer rains and grow from July through September. Soils have characteristics of being deep and well drained plant root restricting layers. Permeability is rapid and the soil can absorb all the moisture the climate supplies but has a very low available water capacity.

The plant communities found on this ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The HCPC on this ecological site has a plant community made up primarily of perennial of cool and warm season grasses with a small percentage of forbs and scattered large and half shrubs.

Dominant grasses include black grama (*Bouteloua eriopoda*), blue grama (*Bouteloua gracilis*), James' galleta (*Pleuraphis jamesii*), and alkali sacaton (*Sporobolus airoides*). Other grasses may include Indian ricegrass (*Achnatherum hymenoides*), squirreltail (*Elymus elymoides*), needle-and-thread (*Hesperostipa comata*), sandhill muhly (*Muhlenbergia pungens*), spike dropseed (*Sporobolus contractus*), sand dropseed (*Sporobolus cryptandrus*), threeawn (*Aristida spp.*), and mesa dropseed (*Sporobolus flexuosus*). Forbs may include rose heath (*Chaetopappa ericoides*), Cryptantha species (*Cryptantha spp.*), shortstem lupine (*Lupinus brevicaulis*), small wirelettuce (*Stephanomeria exigua*) and touristplant (*Dimorphocarpa wislizeni*). Dominant shrubs may include Bigelow sagebrush (*Artemisia bigelovii*), fourwing saltbush (*Atriplex canescens*), Ephedra (*Ephedra spp.*), and winterfat (*Krascheninnikovia lanata*). Other shrubs may include Chrysothamnus species (*Chrysothamnus spp.*), rubber rabbitbrush (*Ericameria nauseosa*), and snakeweed (*Gutierrezia spp.*). Common trees include one-seed juniper (*Juniperus monosperma*) and two needle pinyon (*Pinus edulis*).

Shale Upland 6-10" p.z. (R035XB220AZ)
This ecological site occurs in Major Land Resource Area 35.2 - the Colorado Plateau Shrub – Grasslands. Elevations range from 3,800 to 5,800 feet. This area has a very dry and windy climate that is hot in the summer and cold in the winter. Average annual precipitation is from 6 to 10 inches. A slight majority of the precipitation arrives during the late fall, winter, and early

spring. This winter season moisture originates in the Pacific Ocean and arrives as rain, or sometimes snow, during widespread frontal storms of generally low intensity. The majority of the snow falls from December through February, but rarely lasts more than a few days. The driest period is from late May to early July. Summer rains occur from July through September during brief intense local thunderstorms. The rain is sporadic in intensity and location. Windy conditions are common year-round with the strongest most frequently in the spring.

The HCPC for this ecological site is made up of primarily mid and short grasses with a significant percentage of cold desert shrubs and a few forbs. In the original plant community there is a mixture of both cool and warm season grasses. Plant species most likely to invade or increase on this site when it deteriorates are saltbushes, broom snakeweed and annuals.

Common grasses in this site include Indian ricegrass (*Achnatherum hymenoides*), squirreltail (*Elymus elymoides*), needle-and-thread (*Hesperostipa comata*), James' galleta (*Pleuraphis jamesii*), alkali sacaton (*Sporobolus airoides*), sixweeks grama (*Bouteloua barbata*), and Madagascar dropseed (*Sporobolus pyramidatus*). Forbs include mealy goosefoot (*Chenopodium incanum*), springparsley (*Cymopterus*), touristplant spectaclepod (*Dimorphocarpa wislizeni*), nodding buckwheat *(Eriogonum cernuum*), divergent buckwheat (*Eriogonum divaricatum*), and mallows (*Sphaeralcea spp.*). Shrub/Vines may include shadscale saltbush (*Atriplex confertifolia*), mound saltbush (*Atriplex obovata*), Whipple cholla (*Cylindropuntia whipplei*), Torrey Mormon tea (*Ephedra torreyana*), and broom snakeweed (*Gutierrezia sarothrae*).

2.3.3 ***Wildlife Resources***

This section discusses the wildlife resources in and around the St. Johns Ranch Allotment, including threatened and endangered species, BLM special status species, and species of economic and recreational importance. Refer to Appendix A for a list of species.

Threatened and Endangered Species

The grazing program for the BLM Gila District, including grazing activities within the St. Johns Ranch Allotment, was assessed pursuant to Section 7 of the Endangered Species Act (ESA) to determine whether the program would jeopardize the continued existence of an endangered or threatened species and/or their designated or proposed critical habitat. The USFWS rendered a Biological Opinion (BO) on the Gila District Livestock Grazing Program #22410-2006-F-0414 (2012). The BO determined that no conservation measures were needed for the St. Johns Ranch Allotment due to the absence of the consulted listed species and/or designated critical habitat. Additionally, a query conducted on March 31, 2020 of the USFWS Information for Planning and Conservation (IPaC; USDI USFWS N.d.) website identified a total of five species listed as threatened, endangered, or proposed species for consideration within the allotment (Appendix A). A report generated on April 1, 2020 from the AZGFD Environmental Online Review Tool (AZGFD N.d.) indicated that there was one additional Federally listed or candidate species with the potential to occur within 5 miles of the allotment boundary and/or within the allotment.

The IPaC query indicated the gray wolf as being potentially present within the allotment; however, "Mexican wolf" is the correct common name of *Canis lupus baileyi,* which is the regional subspecies of gray wolf, and will be referred to as Mexican wolf in this document. Other species indicated in the IPaC were the yellow-billed cuckoo, northern Mexican gartersnake, little Colorado spinedace, and Zuni bluehead sucker. The AZGFD report also included the black-

footed ferret.

Due to a general lack of forested habitat, the Mexican wolf is expected to be absent on the allotment. The allotment lacks suitable forested habitat to support Mexican wolves but is located within a Mexican wolf experimental population area and may be used by wolves for movement between blocks of suitable habitat.

The black-footed ferret is associated with native grassland communities and relies solely on prairie dog burrows for shelter and suitable dens to raise their young (USDI USFWS 2017). They are highly specialized predators that rely on prairied dogs for survival, which make up more than 90 percent of their diet (USDI USFWS 2017). Gunnison prairie dogs were noted in the AZGFD report as having the potential to occur in this area based on predicted range models; however, no prairie dogs have been observed on the allotment. Based on the ESDs of this allotment and the results of monitoring data, as described below in Section 6, BLM-administered portions of the allotment contain suitable habitat to support this species if it was present. Due to the lack of their primary prey species and source for burrows, this species is expected to be absent from the allotment.

The yellow-billed cuckoo is a riparian obligate species that utilize cottonwood gallery forests and may use upland areas for foraging. The allotment does not contain the primary riparian habitat; however, yellow-billed cuckoos may utilize the upland areas temporarily during times of migration.

The Zuni bluehead sucker and little Colorado spinedace are expected to be absent from the BLM-administered portions of the allotment due to the absence of perennial riparian areas.

The northern Mexican gartersnake is known to be found in both lotic and lentic habitats including cienegas, stock tanks, and river habitats including pools and backwaters (USDI USFWS 2014). There are no recorded observations of the northern Mexican gartersnake being present within the allotment, and the lack of appropriate riparian habitat suggests that the northern Mexican gartersnake is absent from the BLM-administered portions of the allotment.

BLM Special Status Species

The BLM sensitive species that have suitable habitat present and are known to exist or have the potential to exist within this allotment are the northern leopard frog (low potential), little Colorado sucker, speckled dace, bald eagle (wintering only), ferruginous hawk, golden eagle, Western burrowing owl, pinyon jay, Arizona myotis, spotted bat, pale Townsend's big-eared bat, and Gunnison's prairie dog. A total of six USFWS Birds of Conservation Concern (USDI USFWS 2008) not already addressed as BLM sensitive species have the potential to occur within the allotment and are included in Appendix A. The Birds of Conservation Concern 2008 list considers bird species that are nongame species, gamebirds without a hunting season, subsistence-hunted nongame birds in Alaska, and ESA candidate, proposed, and recently delisted species (USDI USFWS 2008). Data derived from the AZGFD Environmental Online Review Tool (AZGFD N.d.) was used for the migratory bird analysis.

The allotment offers an array of habitats for migratory birds, providing valuable food and cover. Migratory species of concern that have the highest potential to occur on the allotment include several raptor species (i.e. hawks, eagles, owls) and a variety of passerine species. No surveys

have been conducted specifically within this allotment for this LHE to determine presence, but these species have the potential of occurring if habitat is available. Bird species utilize the grassland and open shrub habitat for hunting prey. The Gunnison prairie dog utilizes grasslands and open shrub habitat for burrowing and foraging. Bat species may occur on the allotment if roosting habitat is available. Generally, the composition, structure, and distribution of habitat for all classifications of sensitive species are intact and would be suitable for use if the species were present.

Species of Economic and Recreational Importance

Game species within the St. Johns Ranch Allotment include the America pronghorn, mule deer, scaled quail, and the mourning dove (AZGFD N.d.). Grasslands with dispersed shrub thickets and cacti, as well as grasslands associated with juniper woodlands, offer forage and cover habitat for each of these species.

2.4 Special Management Areas

There are no special management areas within the St. Johns Ranch Allotment.

2.5 Recreation Resources

There are no developed recreation sites within the allotment. Dispersed recreation activities that may occur on the St. Johns Ranch Allotment, include small and big game hunting, target shooting, hiking, and off-highway vehicle operation. The allotment is comprised of mostly private lands, on which there are industrial yards, active and inactive landfills, railroad tracks and roads. These features present increased accessibility, which may lead to increased recreation on all lands within the St. Johns Ranch Allotment.

2.6 Cultural Resources

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

The BLM Safford Field Office Archaeologist completed a Class I cultural resources survey on April 10, 2017 and a Class III cultural resources survey on April 21, 2017. The Class III survey recorded one archaeological site. This site was found to be not eligible for inclusion on the National Register of Historic Places (NRHP). During the Class I and Class III surveys, no others archaeological sites, properties of traditional religious or cultural importance (i.e., traditional cultural properties), or sacred sites, were observed or noted.

3. Grazing Management

This section discusses the grazing history, authorized use, and terms and conditions of the current lease for the St. Johns Ranch Allotment.

3.1 Grazing History

The BLM grazing lease allows for 4 cattle year-round for a total of 48 animal unit months (AUM) on the BLM-administered land within the allotment. No changes have been made to the use in AUMs during the evaluation period. Grazing management on the St. Johns Ranch Allotment consists of grazing on private land, county land, State Trust land, and BLM-administered land. For allotments such as St. Johns Ranch, livestock grazing is authorized by the BLM under Section 15 of the Taylor Grazing Act. The carrying capacity for the whole allotment is not set by the BLM; instead, the lessee is billed for the available forage utilized on public lands only.

3.2 Terms and Conditions for Permitted Use

Grazing use on the St. Johns Ranch Allotment is in accordance with the terms and conditions of the term lease. Table 5 below, provides a summary of the current authorized use for the allotment.

Table 5 Mandatory Terms and Conditions of the St. Johns Ranch Allotment Lease

Allotment	Number and Kind of Livestock	Season of Use	Percent Public Land	Number of Animal Unit Months (AUM)
St. Johns Ranch No. 06255	4 Cattle	March 1- February 28	100	48

Source: BLM – Rangeland Administration System (RAS)

Existing Other Terms and Conditions:

- In order to improve livestock distribution on the public lands, all salt blocks and/or mineral supplements shall not be placed within a 1/4 mile of any riparian area, wet meadow or watering facility (either permanent or temporary) unless stipulated through a written agreement or decision in accordance with 43 CFR 4130.3-2 (c).
- If in connection with allotment operations under this authorization, any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; 104 Stat. 3048; U.S.C. 3001) are discovered, the Permittee shall stop operations in the immediate area of the discovery, protect the remains and objects, and immediately notify the Authorized Officer of the discovery. The Permittee shall continue to protect the immediate area of the discovery until notified by the Authorized Officer that operations may resume.

4. Objectives

This section provides an overview of the Safford Field Office management objectives that are associated with the St. Johns Ranch Allotment per the Phoenix Resource Management Plan (RMP) (BLM, 1989), as amended by the decision record for Arizona Standards and Guidelines. The Phoenix RMP incorporates by reference the decisions from the Eastern Arizona Grazing Final Environmental Impact Statement (FEIS) Record of Decision (1987).

4.1 Land Use Plan Management Objectives

- Grazing Management (GM-02) The grazing program in the area is managed under the provisions of the Taylor Grazing Act of 1934, [Federal Land Policy and Management Act of 1976] FLPMA, and the Public Rangelands Improvement Act of 1978. [Phoenix] RMP page 14-15.
- GM-03 Management of rangeland resources is guided by the Range Program Summary (RPS) Record of Decision (ROD) which selected the Preferred Alternative analyzed in the 1987 Arizona Grazing FEIS. [Phoenix] RMP page 15.
- Wildlife/Fisheries (WF-03) Wildlife and plants which are federally listed or proposed for listing as either threatened or endangered are protected under provisions of the Endangered Species Act of 1973, as amended. [Phoenix] RMP page 15.
- WF-04 It is BLM policy to avoid jeopardizing the continued existence of any listed or proposed species and to actively promote species recovery. [Phoenix] RMP page 15.
- WF-05 It is BLM policy to manage federal candidate species and their habitat to prevent the need for listing as threatened or endangered. [Phoenix] RMP page 15.

Further, the Phoenix RMP provides the following grazing management objectives: 1) to restore and improve rangeland condition and productivity, 2) to provide for use and development of rangeland, 3) to maintain and improve habitat and viable wildlife populations, 4) to control future management actions and 5) to promote sustained yield and multiple use.

4.2 Allotment-Specific Objectives

The St. Johns Ranch Allotment is subject to the following land health objectives as established in the Arizona Standards for Rangeland Health.

4.2.1 *Land Health Standards*

Standard 1 - Upland Sites

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

Standard 2 - Riparian-Wetland Site

Riparian-wetland areas are in proper functioning condition.

Standard 3 - Desired Resource Conditions

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

4.2.2 *Key Area Objectives*

In grazing administration, a key area is defined as a relatively small portion of a range selected because of its location, use, or grazing value as a monitoring point for grazing use. Key areas are indicator areas that reflect what is occurring on a larger area as a result of on-the-ground management actions.

In 2020, the key area monitoring was conducted by an BLM interdisciplinary (ID) Team made up of a specialist in range, natural resources (wildlife) and hydrologist. Key areas were selected within ecological sites which were established by NRCS as Clay Loam Wash 10-14" p.z. (R035XA104AZ), Clayey Fan 6-10" p.z. (R035XB239AZ), and Sandy Upland 10-14" p.z. (R035XA118AZ). The ID Team evaluated and determined that Clayey Fan 6-10" p.z. (R035XB239AZ) and Clay Loam Wash 10-14" p.z. (R035XA104AZ) key area locations occurred on BLM-administered land and are approximately one mile from water, which is expected to adequately represent livestock utilization for the majority of the allotment due to the distance cattle travel from water. This distance from water is appropriate for indicating vegetation changes that would be tied to livestock management. Although the Sandy Upland 10-14" p.z. (R035XA118AZ) occurs on BLM-administered land, it is a very small portion. This small area with several near water sources prohibited the establishment of a key area one mile from water. The key area for Sandy Upland 10-14" p.z. (R035XA118AZ) was established one-half mile from water.

Although there are six ecological sites on BLM-administered lands within the allotment, only three key areas were established. A key area should be a representative sample of a large stratum, such as a pasture, grazing allotment, wildlife habitat area, herd management area, watershed area, etc., depending on the management objectives being addressed by the study (USDI-BLM et al., 1996). These key areas (SJR-1, SJR-2, and SJR-3) were a representative sample of the majority of the grazing allotment. These locations were chosen because they are representative of the vegetation composition, soils, vegetative production, and overall grazing management on BLM-administered land for the allotment. The ID Team visited other sites within the Clayey Fan 6-10" p.z. (R035XB239AZ), Clay Loam Wash 10-14" p.z. (R035XA104AZ), and Sandy Upland 10-14" p.z. (R035XA118AZ) ecological sites which also occurred on BLM-administered lands. Through ocular surveys it was determined that the key areas were representative samples of the majority of the grazing allotment. Therefore, assessments of the remaining three ecological sites present on BLM-administered land within the St. Johns Ranch Allotment have not been undertaken, as they would not provide additional meaningful data to inform the LHE.

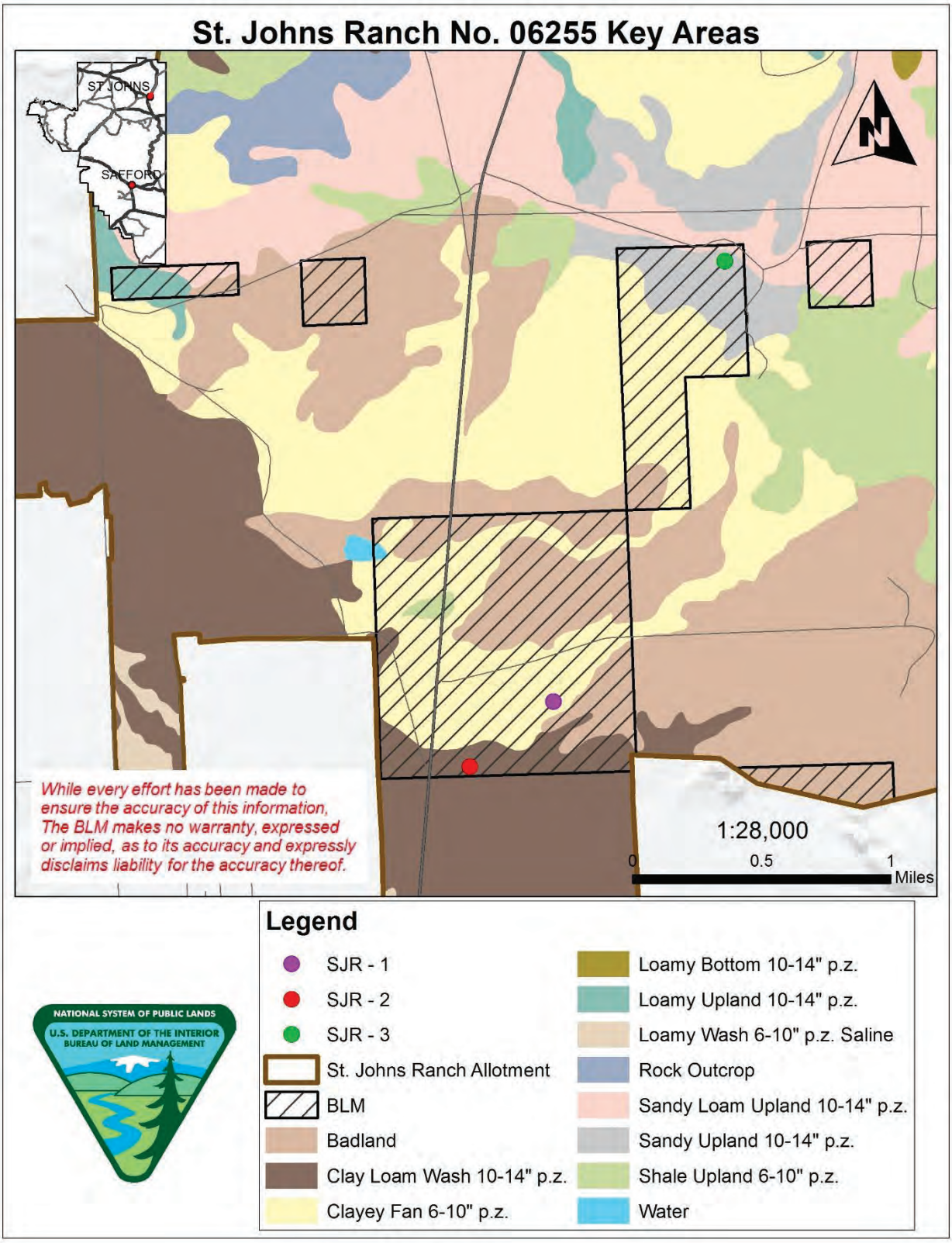
Addressed in this LHE report are the results from the key area monitoring conducted by the ID Team (Appendix B). Information for key areas SJR-1, SJR-2 and SJR-3 on the St. Johns Ranch Allotment is presented in Table 6 and Figure 5 below.

Table 6 Location of the St. Johns Ranch Allotment Key Areas

Key Area	Ecological Site	Ecological Site ID	GPS Coordinates (Web Mercator)
SJR-1	Clayey Fan 6-10" p.z.	(R035XB239AZ)	Latitude – 34.53074 N Longitude – 109.33779 W
SJR-2	Clay Loam Wash 10-14" p.z.	(R035XA104AZ)	Latitude - 34.52669 N Longitude - 109.34366 W
SJR-3	Sandy Upland 10-14" p.z.	(R035XA118AZ)	Latitude - 34.55526 N Longitude - 109.32556 W

Source: USDA-NRCS 2015, BLM ID Team

Figure 5 St. Johns Ranch Allotment Ecological Sites and Key Areas



Source: USDI-BLM 2017, USDA-NRCS 2015

Standard 1 - Upland Sites

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

Signs of accelerated erosion that are None to Slight or Slight to Moderate are appropriate for these ecological sites as indicated by ground cover, litter, rock, vegetative (canopy) cover, and signs of erosion. This objective applies to the key areas and corresponding ecological sites. A departure of Moderate or greater would indicate that the key area is not achieving this Standard. A departure rating of None to Slight or Slight to Moderate is considered achieving this Standard.

Standard 2 - Riparian-Wetland Site

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

Standard 2 is **not applicable** because no riparian-wetland sites exist within the St. Johns Ranch Allotment on BLM-administered land.

Standard 3 - Desired Resource Conditions

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

Desired plant community (DPC) objectives are criteria established to evaluate a site's capability of achieving desired resource conditions with consideration for all multiple uses. The DPC objectives are typically specific to the ecological site within the allotment and also address desired habitat characteristics for the wildlife species likely to be present.

Desired resource conditions are based upon the following DPC objectives:

- Canopy cover
- Plant community composition
- Bare ground
- Litter

The BLM-administered land comprises 7.1 percent of the overall St. Johns Ranch Allotment, which is generally intermingled in checkerboard fashion with state, private, and other land ownerships. As a Section 15 lease, there are limitations to the degree in which the BLM can control or influence plant community changes across the broader allotment. There have been no DPC objectives established for this allotment in the past. This LHE and the RHAs conducted are based on a comparison of the current conditions of each ESD with the State and Transition Model as described in each NRCS ESD reference sheets for Clayey Fan 6-10" p.z. (R035XB239AZ), Clay Loam Wash 10-14" p.z. (R035XA104AZ), and Sandy Upland 10-14" p.z. (R035XA118AZ).

The characteristics of suitable habitat for the wildlife species described above in Section 2.3.3 were also considered in the evaluation, as well as the establishment of new DPC objectives for the St. Johns Ranch Allotment. Antelope are considered to be an indicator species for rangeland health in grasslands and shrubsteppe ecosystems in North America due to being endemic to those areas (Yoakum et al. 2014). By managing the St Johns Ranch Allotment to achieve DPC objectives specific to the needs of antelope, other grass- and shrubsteppe-associated wildlife will also be supported. Antelope inhabit open, gentle landscapes, characterized by hills, ridges, and

draws that are associated with grasses being the dominant plant group followed by forbs and then shrubs (Yoakum et al. 2014).

Each ESD reference sheet describes the historic climax plant communities (HCPC) referred to as the reference state, along with a state and transition model (STM). The HCPC represents plant communities that would naturally be able to occur on that site without the influence of disturbances or disturbance patterns that would also naturally occur on the site. Natural disturbances, such as drought, fire, grazing of native fauna, and insects, were inherent in the development and maintenance of these plant communities. The effects of these disturbances are part of the range of characteristics of the site that contribute to the establishment of a dynamic equilibrium that helps to define the different states and transition periods as described in the STM. Some sites may have a small range of variation, while others have a large range. The HCPC of an ecological site is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. In all plant communities, variability is apparent in productivity and occurrence of individual species. Spatial boundaries of the communities; however, can be recognized by characteristic patterns of species composition, association, and community structure.

Plant communities that are subjected to abnormal disturbances and physical site deterioration or that are protected from natural influences, such as fire and grazing, for long periods seldom resemble the described HCPC. The physical site deterioration caused by the abnormal disturbance results in the crossing of a threshold or irreversible boundary to another state for the ecological site. There may be multiple thresholds and states possible for an ecological site, determined by the type and or severity of abnormal disturbance.

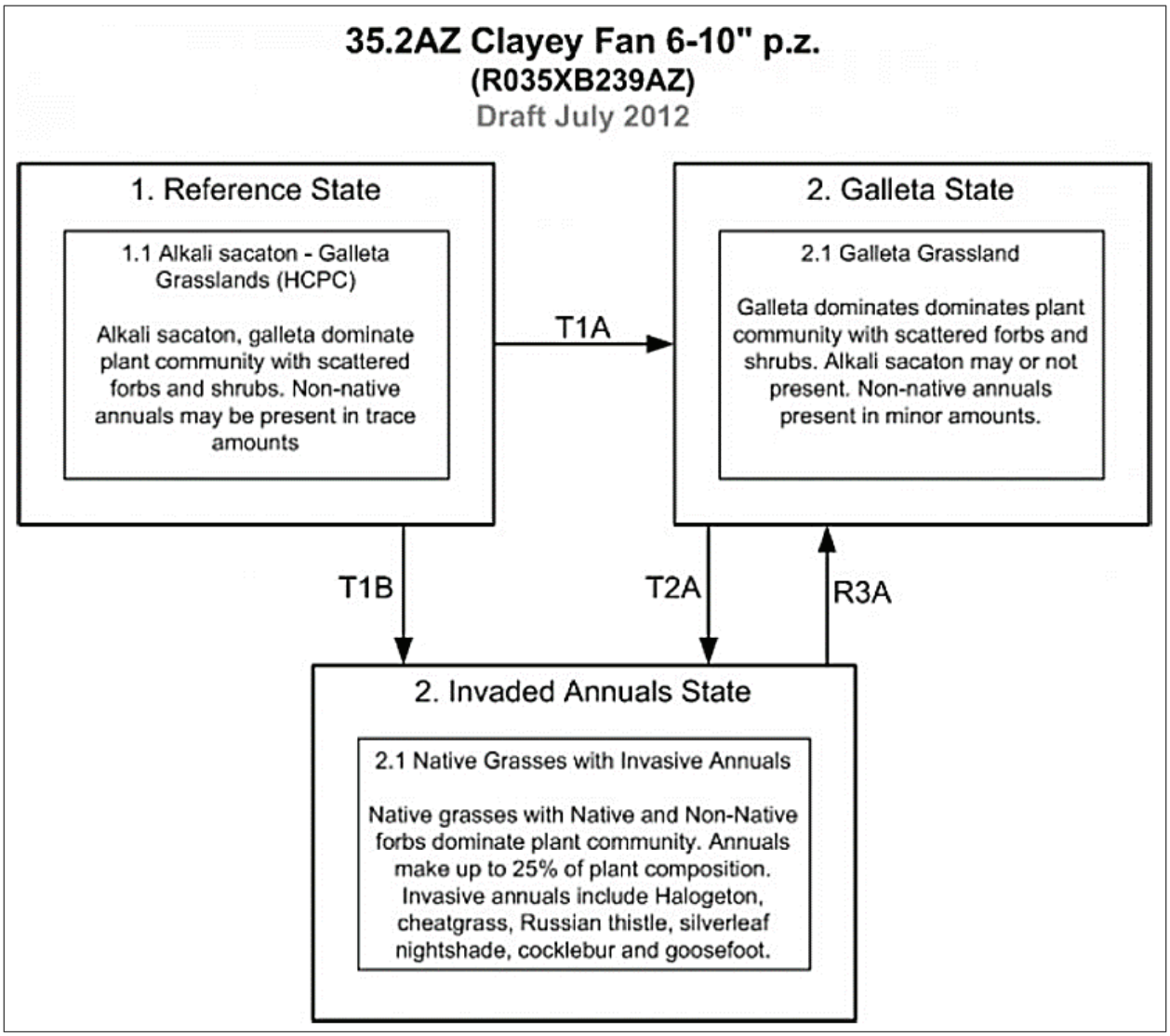
The Plant Community Plant Species Composition table provides a list of species and each species or group of species' annual production in pounds per acre (air-dry weight) expected in a normal rainfall year. Low and high production yields represent the modal range of variability for that species or group of species across the extent of the ecological site. The present plant community on an ecological site can be compared to the various common vegetation states that can exist on the site. The STM shows the most common occurring plant communities likely to be encountered on this ecological site. This model may not show every possible plant community, but only those that are most prevalent and observed through field inventory. As more data is collected these plant communities may be revised, removed, and some added to reflect the ecological dynamics of this site.

Clayey Fan 6-10" p.z. (R035XB239AZ)

The reference state (1.1) details a site that has an HCPC of alkali sacaton and galleta grassland (Figure 6). Alkali sacaton and galleta are dominant plant community with scattered forbs and shrubs. Non-native annuals may be present in trace amounts. The next state following a degree of departure from HCPC is the Galleta Grassland state, which is dominated by galleta with scattered forbs and shrubs with or without alkali sacaton, and with non-native annuals present in small amounts. The final transition state that has the greatest degree of departure from HCPC is the Invaded Annuals State. This state contains native grasses with native and non-native forbs dominating the plant community. The annuals make up about 25 percent of the plant composition, and invasive annuals include species like Halogeton glomeratus, cheatgrass, Russian thistle, silverleaf nightshade, cocklebur, and goosefoot.This ESD does not give specific

information on the influences that may cause a site to transition away from the reference state. The influences are likely similar to those listed for the other two sites such as drought, unmanaged grazing, insect herbivory and the absence of a natural fire regime.

Figure 6 Clayey Fan 6-10" p.z. State and Transition Model



Source: USDA-NRCS 2012

Clay Loam Wash 10-14" p.z.

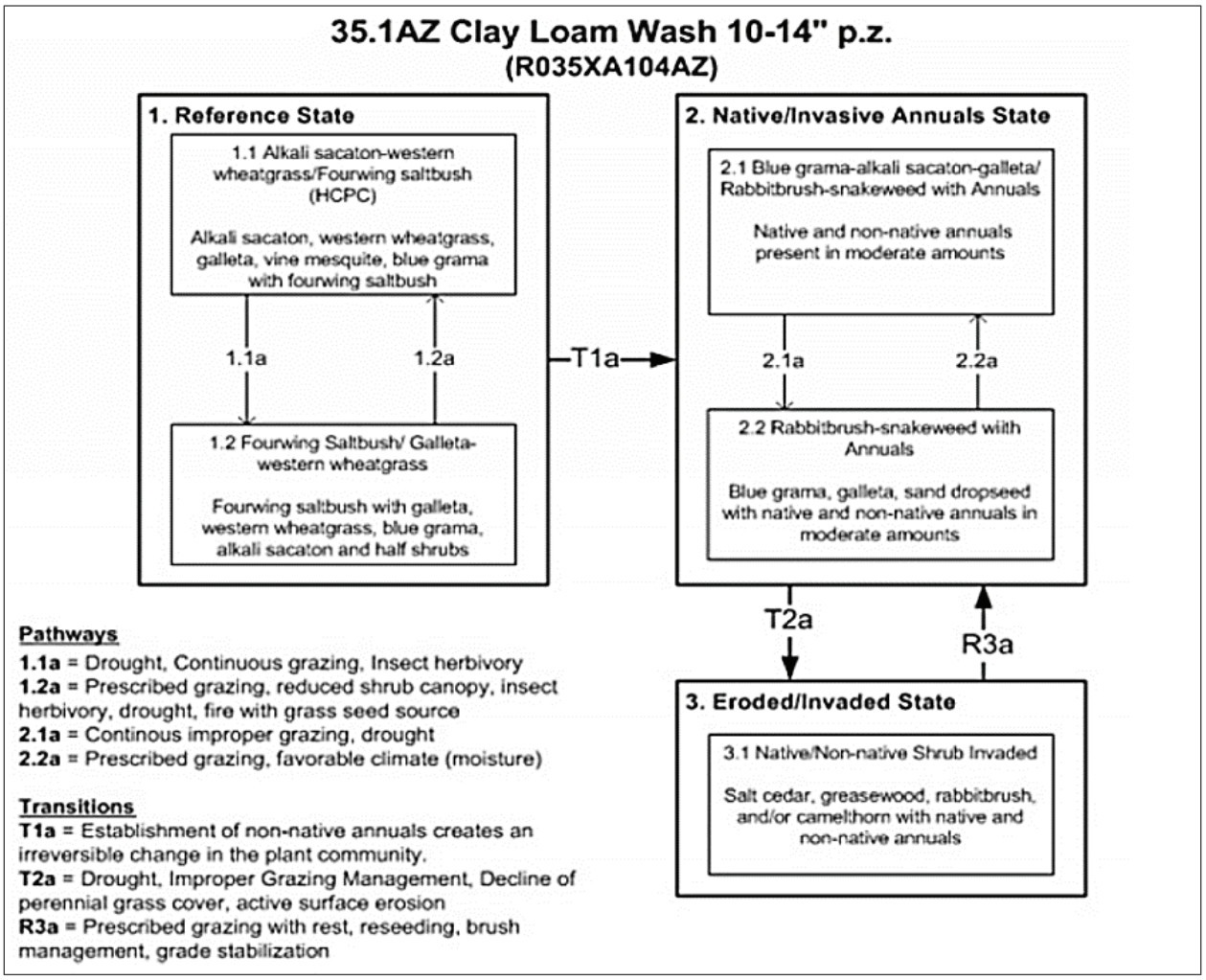
The reference state gives two communities at which a site could alternate between. The first community details an HCPC site with alkali sacaton, western wheatgrass and fourwing saltbush (Figure 4 of the ESD (USDA NRCS (a), 2012, p.5). The second community of HCPC consists of fourwing saltbush, galleta and western wheatgrass. There are two pathways that can influence a site to alternate between communities. The pathway that shifts HCPC from an alkali-dominant site to a fourwing saltbush-dominant site includes drought, continuous grazing and insect herbivory. The opposite shift within HCPC is due to prescribed grazing, reduced shrub canopy,

insect herbivory, drought, fire with grass seed source.

The next state following a degree of departure from HCPC is the Native/Invasive Annuals State. This state had two communities at which a site could alternate between. The first community describes a site with blue grama, alkali sacaton, galleta, rabbitbrush, snakeweed and with native and non-native annuals present in small amounts. The second community describes a site with rabbitbrush, snakeweed and annuals. This community can also provide for blue grama, galleta, sand dropseed and non-native annuals. There are two pathways that can influence a site to alternate between communities. The first pathway (2.1a) is by continuous, improper grazing and drought, and the second pathway (2.2a) is prescribed grazing, and favorable climate (moisture).

The final transition state that has the greatest degree of departure from HCPC is the Eroded/Invaded State (3). This community, Native/Non-native Shrub Invaded (3.1), is characterized by a dominance of shrubs such as salt cedar, greasewood, snakeweed, rabbitbrush and/or camelthorn with native and non-native annuals. The influencing transition pathway is the establishment of non-native annuals that create an irreversible change in the plant community. If a Native/Invasive Annuals State transitions, it will move into the Eroded/Invaded State. This transition pathway is influenced by drought, improper grazing management, decline of perennial grass cover and active soil erosion. The Eroded/Invaded State can transition back into the Native/Invasive Annuals State by a transition pathway of prescribed grazing with rest, reseeding, brush management and grade stabilization.

Figure 7 Clay Loam Wash 10-14" p.z. State and Transition Model



Source: USDA-NRCS 2012

Sandy Upland 10-14” p.z.

The reference state gives five plant communities that the site could alternate between. The first community details a site that has a HCPC of a Native Grassland with Shrubs (1.1) composed of perennial grasses with a small percentage of forbs and scattered large and half shrubs (Figure 4 of the ESD (USDA NRCS (a), 2012, p.4). Dominant species include Indian ricegrass, needle and thread, black grama, sand sagebrush, winterfat, four wing saltbush, and Mormon tea. Trees may be present but are widely scattered.

The second community is the Shrubland with Native Grasses (1.2), which describes a plant community that is characterized by a mix of shrubs and well-developed understory of perennial grasses and forbs. Common species include four wing saltbush, rabbitbrush, sand sagebrush, Indian ricegrass, needle and thread, galleta, dropseed spp., blue grama and native grasses. Junipers may be present but occur scattered across the landscape. Shrub canopy is usually less than 25 percent.

The third community is Sand Sagebrush with Native Grasses (1.3), which describes a plant community that is characterized by an increase of sand sagebrush with a well-developed understory of perennial grasses. This plant community phase is maintained by some soil disturbance and sand sage's ability to thrive after surface disturbance. This also includes other shrubs such as rabbitbrush, Mormon tea, sand buckwheat, snakeweed, fourwing saltbush and/or other native shrubs. Dominant grasses include Indian ricegrass, blue grama, needle and thread, sand dropseed, sandhill muhly and other native grasses. Shrub canopy is usually less than 25 percent with an occasional scattered juniper.

The fourth community is the Active Dunes with Shrubs (1.4), which describes a plant community that is characterized by areas of bare ground with scattered shrubs and grasses. Vegetation is highly variable and tends to be patchy on more active dunes. Shrubs dominate the canopy with species such as sand sagebrush, Mormon tea, dune broom, frosted mint and sand buckwheat. Dominant grasses include Indian ricegrass, sandhill muhly and dropseed spp. Bare ground ranges from 60 to 90 percent with large connected bare areas common.

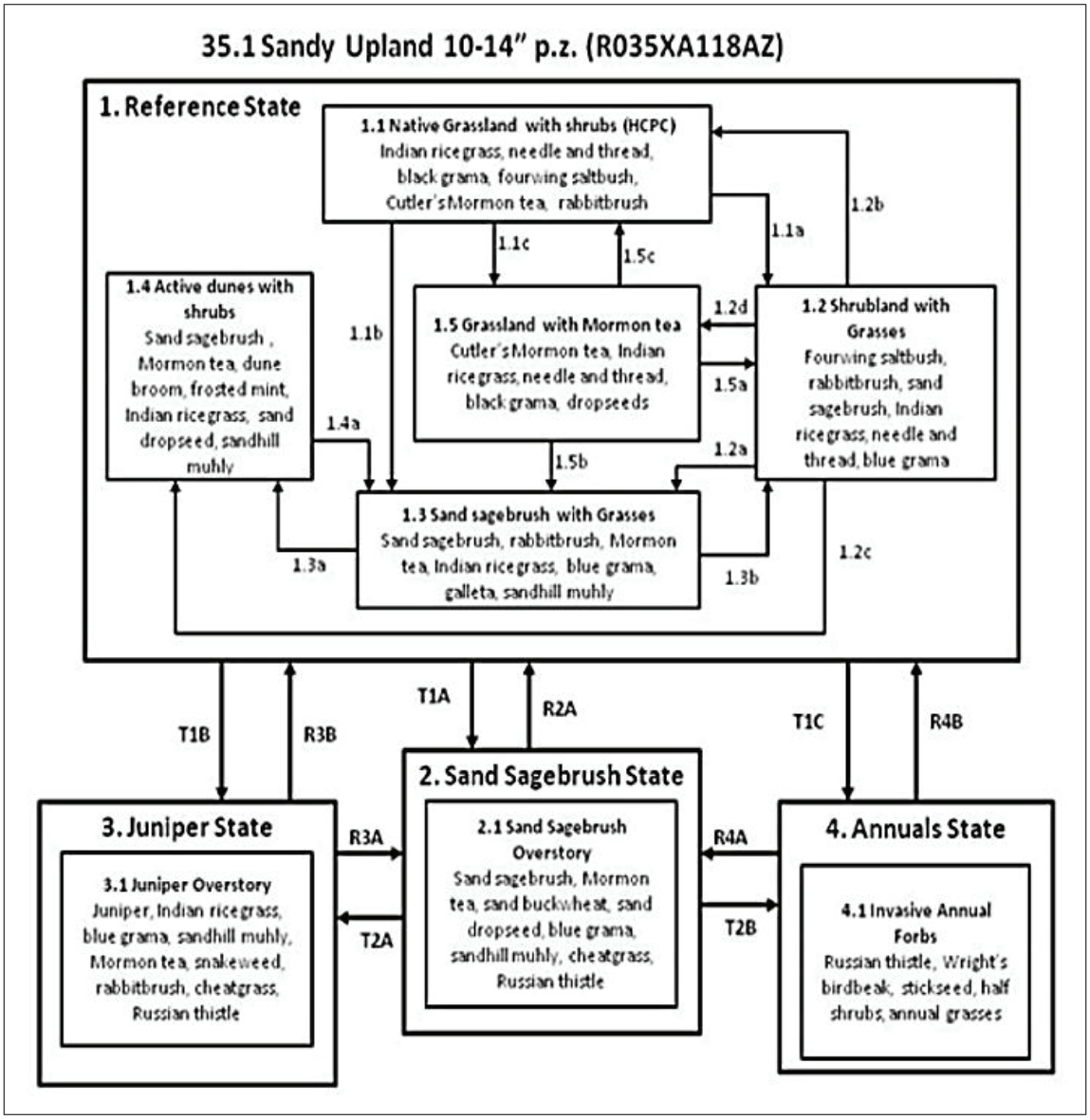
The fifth community of the reference state is the Grassland with Mormon tea (1.5), which has a plant community that is characterized by a dominance of Mormon tea, Indian ricegrass, blue grama and dropseed spp. This plant community can result from a combination of drought and/or unmanaged grazing. The first transition state following a degree of departure from HCPC is the Sand Sagebrush State. This state lends the site to a Sand Sagebrush Overstory (2.1) with sand sagebrush as the dominant species. Perennial grasses are sub-dominant with scattered forbs and occasional junipers. Species likely to be present are Mormon tea, sand buckwheat, sand dropseed, rabbitbrush, blue grama, sandhill muhly, threeawn, dropseed spp., and galleta. Shrub canopy is usually greater than 25 percent, with sand sagebrush being dominant and most productive. Reduced competition from perennial grasses, increased bare ground, unmanaged grazing and drought conditions favor sand sagebrush persistence. Bare ground ranges between 60 to 80 percent with large connected bare patches common.

The first transition state following a degree of departure from HCPC is the Juniper State (3). This state lends the site to a Juniper Overstory (3.1) that has a plant community of increased juniper canopy greater than 10 percent with a mixed understory. Grass cover is generally low, but forb cover is highly variable depending on climatic events. Bare ground ranges between 50 to 80 percent with large connected bare patches being common. Common herbaceous vegetation includes Indian ricegrass, sandhill muhly, blue grama, sand dropseed and other native grasses. Shrubs include Mormon tea, snakeweed, sand sage, rabbitbrush, sand buckwheat along with other native shrubs. Non-native annuals such as cheatgrass and Russian thistle are present along with other introduced annuals.

The second transition state following a degree of departure from HCPC is the Annuals State (4). This state lends the site to Invasive Annual Forbs (4.1) with a plant community is characterized by a dominance of non-native and native annual forbs with half shrubs and few annual grasses. Some perennial grasses and forbs may be present in smaller amounts. Russian thistle is the most prevalent annual forb and very productive at this site. Other common annuals include croton, stickweed, woolly plantain, buckwheat spp., wire lettuce, false buffalograss, cheatgrass and scorpionweed.

The HCPC reference state gives multiple pathways for which a site could alternate between the communities. The movement and shifts between communities are influenced by insect/wildlife herbivory, drought, use of and lack of natural fire, increased or decreased soil surface disturbance (soil deposition from wind or water), managed and unmanaged grazing, reseeding, and favorable moisture that supports an increase of large shrubs that provide increased soil stability. The ESD for Sandy Upland lists possible influences for the transition from the reference state to a juniper state. These influences for the establishment of junipers on the site are the reduced competition from perennial grasses and shrubs, lack of fire, unmanaged grazing, juniper seed source available from adjacent sites coupled with increased bare ground to allow for seedling establishment and encroachment. Favorable precipitation may increase seedling establishment even with moderate grass or shrub cover.

Figure 8 Sandy Upland 10-14" p.z. State and Transition Model



Source: USDA-NRCS 2012

5. Rangeland Inventory and Monitoring Methodology

The Arizona standards for rangeland health were assessed for the St. Johns Ranch Allotment by the BLM ID Team on March 9 - 10, 2020. The ID Team consisting of specialist in the field of range, natural resources (wildlife) and hydrology. Documents and publications used in the assessment process include the Web Soil Survey (NRCS, 2017), ESDs located within MLRA 35 (NRCS, 2009), Interpreting Indicators of Rangeland Health Technical Reference 1734-6 (USDI BLM et al., 2005, Sampling Vegetation Attributes (USDI BLM et al., 1996), and the National Range and Allotment Handbook (USDA NRCS, 2003). A complete list of references is included at the end of this document. All are available for public review in the BLM Safford Field Office. The ID Team used rangeland monitoring data and professional observations to assess conformance with the Arizona standards for rangeland health.

5.1 Monitoring Protocols

Monitoring occurred on the St. Johns Ranch Allotment at key areas SJR-1, SJR-2, and SJR-3.

Quantitative measurements for cover and species composition were collected along each transect and were analyzed in conjunction with qualitative indicators of soil quality, hydrologic function, and biological health. These were completed to assess the existing conditions within the ecological sites Clay Loam Wash 10-14" p.z. (R035XA104AZ), Clayey Fan 6-10" p.z. (R035XB239AZ), and Sandy Upland 10-14" p.z. (R035XA118AZ). The existing conditions were compared to site specific reference conditions established by the NRCS, which are considered to be representative of relatively undisturbed sites within a given soil-plant community type. This comparison between existing and reference conditions determines the level of departure from the potential natural community.

The key areas were recorded with a global positioning system (GPS) unit using a projection of Web Mercator.

5.1.1 *Line Point Intercept*

The method used to obtain transect data pertaining to species composition and soil cover is line point intercept (LPI). This method consists of a horizontal, linear measurement of plant intercepts along the course of a line (tape) 100 feet in length. The LPI is a rapid and accurate method for measuring occurrence of grass or grass-like plants, forbs, shrubs, and trees in which vegetation composition is extrapolated. It also quantifies soil cover, including vegetation, litter, rocks, and biotic crusts. These measurements are indicators of wind and water erosion, water infiltration, and the ability of the site to resist and recover from degradation. A summary of the LPI measurements collected by the ID Team in March 2020 is provided below in Appendix B and is incorporated into the discussions for Standards 1 and 3.

5.1.2 *Indicators of Rangeland Health*

The five steps for a rangeland health assessment (RHA) are protocols for evaluating the three rangeland health attributes (soil and site stability, hydrologic function, and biotic integrity), as outlined in Technical Reference 1734-6. They are as follows:

Step 1. Identify the Key Area; Determine the Soil and Ecological Site

Step 2. Obtain or Develop the Reference Sheet and the Corresponding Evaluation Matrix

Step 3. Collect Supplementary Information

Step 4. Rate the 17 Indicators on the Evaluation Sheet

Step 5. Determine the Functional Status of the Three Rangeland Health Attributes:

1. Soil and site stability (S) – The capacity of an area to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water.
2. Hydrologic function (H) – The capacity of an area to capture, store, and safely release water from rainfall, run-on and snowmelt (when relevant), to resist a reduction in this capacity, and to recover this capacity when a reduction does occur.
3. Biotic integrity (B) – The capacity of the biotic community to support ecological processes within the normal range of variability expected for the site, to resist a loss in the capacity to support these processes, and to recover this capacity when losses do occur. The biotic community include plants, animals, and microorganisms occurring both above and below ground.

The RHA provides information on the functioning 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 assessment provides information that is not available with other methods of evaluation. It gives an indication of the status of the three rangeland attributes chosen to represent the health of the "key area" (i.e., the area where the evaluation of the rangeland health attributes occurs). The following are the 17 indicators that are evaluated during a RHA assessment 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 Run off: 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

Attribute ratings reflect the degree of departure from expected levels for each indicator per the ecological site reference sheet. The degree of departure may be categorized (rated) as:

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

6. Management Evaluation and Summary of Studies Data

The following information is the evaluation and summary of the 2020 RHA utilizing the inventory and monitoring protocols that have been conducted on the St. Johns Ranch Allotment.

6.1 Actual Use

Full permitted AUMs have been implemented on the allotment during the evaluation period years (2010-2019) totaling 4 head of cattle or 48 AUMs each year.

Livestock grazing for the St. Johns Ranch Allotment is permitted as a Section 15 grazing lease. Allowable AUMs are calculated for BLM-administered land only. Lease holders are billed for their maximum use available on public lands unless nonuse is requested and approved. Nonuse by the lessee was not requested during the evaluation period.

6.2 Rangeland Health Assessments

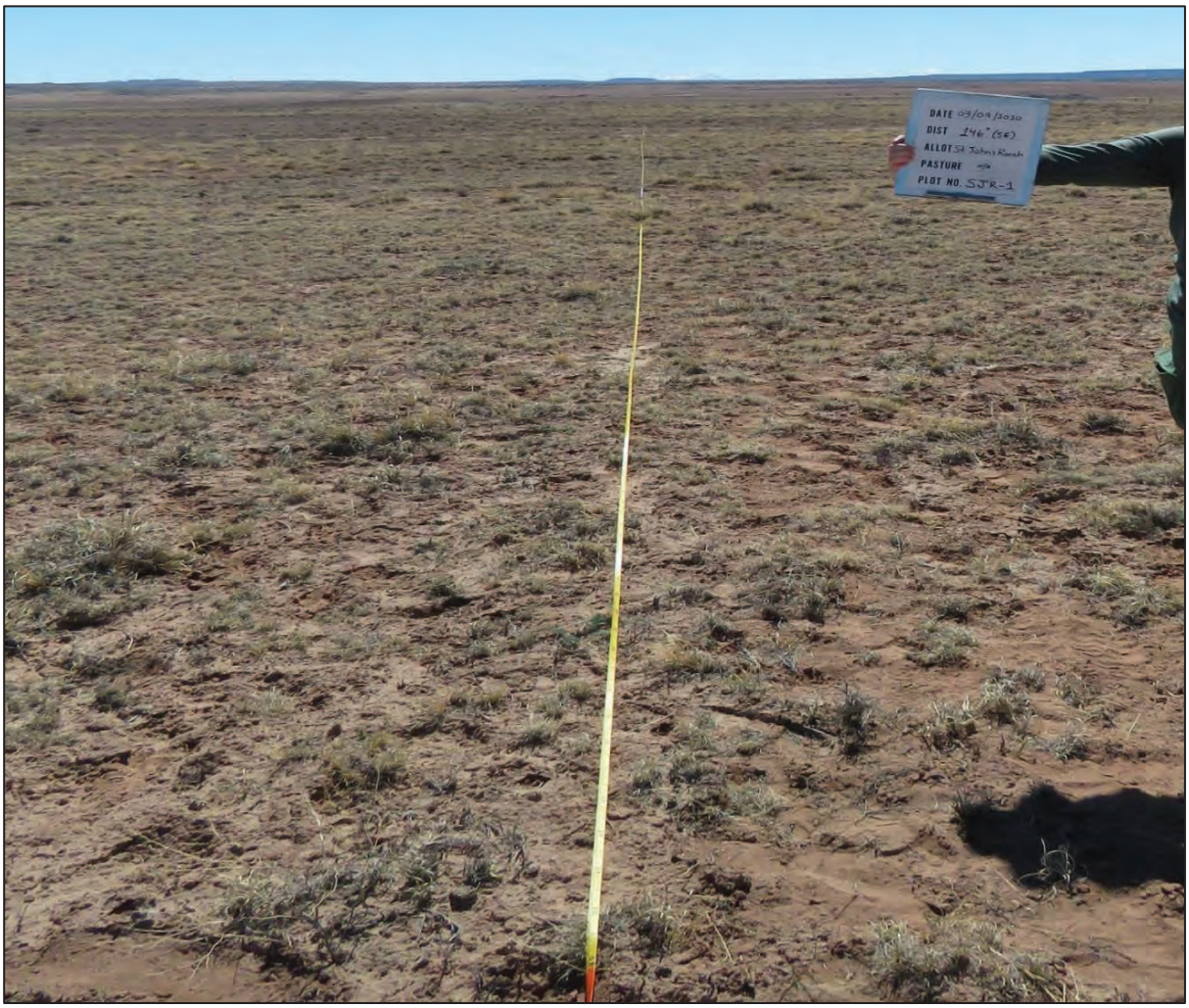
A RHA of the three rangeland attributes was completed at key areas SJR-1, SJR-2 and SJR-3 (Figures 6-8).

Ratings of Moderate or greater are considered to indicate resource concerns for soil erosion, water quantity, and plant productivity. It is important to remember that these ratings are made relative to the potential for the site. For example, a site with highly erodible soils and low potential for stabilizing vegetation may be rated as having a Slight departure from reference conditions even though the actual amount of soil movement is significant, while a site with a high potential for stability rated Moderate may have relatively little soil movement. A summary of the assessments conducted at key areas SJR-1, SJR-2 and SJR-3 on the St. Johns Ranch Allotment are presented in Table 7 below.

Table 7 Summary of Range Health Assessment Rat

Key Area	Ecological Site	Range Health Attributes – Degree of Departure		
		Soil and Site Stability	Hydrologic Function	Biotic Integrity
SJR-1	Clayey Fan 6-10” p.z. (R035XB239AZ)	None to Slight	None to Slight	None to Slight
SJR-2	Clay Loam Wash 10-14” p.z. (R035XA104AZ)	None to Slight	None to Slight	None to Slight
SJR-3	Sandy Upland 10-14” p.z. (R035XA118AZ)	None to Slight	None to Slight	None to Slight

Figure 9. SJR-1 looking southeast in March 2020



6.2.1 *Clayey Fan 6-10" p.z. (R035XB239AZ)*
17 Indicators: Key Area SJR-1

For the 17 indicators of rangeland health for Clayey Fan 6-10" p.z. (R035XB239AZ), the ecological site reference sheet condition indicates:

1. None to very few rills occur.
2. On slopes less than or equal to 3 percent there are no water flow patterns. On slopes greater than 3 percent water flow patterns of 15 to 30 feet in length at 10 to 15 feet spacing and very sinuous may occur.
3. Generally, there are no pedestals or terracettes, but on slopes greater than 3 percent pedestaling of less than 1 inch in height may occur on long lived plants.
4. Bare ground occurrences on a LPI transect ranges from 45 to 55 percent.
5. No gullies or erosion should be present.
6. No wind scours, blowouts or depositional areas are present on this site.
7. Generally, there is no litter movement, but on slopes greater than 3 percent, some movement of herbaceous litter is expected. This movement is generally limited to the water flow patterns and is less than 5 to 10 feet in length.
8. Average soil surface stability rating under canopy and in the interspaces is 1.0 to 1.5.
9. Soil surface is reddish gray (5YR 5/2), sandy clay loam with coarse, granular structure about 7 inches thick.
10. Plant community composition, by utilizing the LPI monitoring, is expected that grass and grass-likes will have a canopy cover of 34 to30 percent and basal cover of 3 to18 percent. An expected average for fetch is 4 to 6 inches with a maximum fetch distance of 14 to 18 inches.
11. No compaction layer occurs. The soil profile describes a layer of sandy clay loam about 7 inches in depth from the soil surface, with massive structure becoming hard when dry.
12. Functional/Structural Groups lists the dominant to subdominant: Grass/Grass-likes are much greater than Shrubs which are much greater than Forbs.
13. Some plant decadence and mortality are expected. It should be less than 10 percent on a LPI transect, except during and after a prolonged severe drought.
14. The ESD for Clayey Fan 6-10 p.z. does not provide litter data. Litter cover is expected to be high due to the amount of vegetative cover the site produces.
15. The median air-dry production is expected to have an annual production of 475 pounds per acre.
16. Russian thistle and cheatgrass occur as invasive in minor amounts of less than 1 percent. Potentially, they could invade the site due to severe disturbances. Camelthorn is a common noxious weed in the area with the potential to invade the site.
17. The only natural limitations to reproductive capability are weather related and natural disease or herbivory that reduces reproductive capability.

Rangeland Health Attribute 1: Soil and Site Stability

There were no rills or gullies observed, these indicators were rated None to Slight. Water flow patterns, pedestals and/or terracettes were not observed and were rated None to Slight. Bare ground was measured at 50 percent, indicating the site has evenly spaced, moderate to high plant cover and was rated None to Slight and within ESD parameters. There was no evidence of wind-scouring observed and was rated None to Slight. All litter size classes remained at the base of plants with little to no movement, no litter dams detected and was rated None to Slight. Soil surface resistance to erosion was rated None to Slight. In the soil surface stability (Indicator 8) the soil scored a rating of one, which verified that the soil was a highly erodible soil and matched the ESD parameters. Canopy cover was measured at 19 percent and 4 percent basal cover. Soil surface loss or degradation was rated None to Slight as soils are stable and in place with the color a reddish brown, matching sandy clay loam. Compaction layers were not present and not restricting water infiltration or root penetration and were rated None to Slight.

All ten indicators for soil and site stability were rated None to Slight, therefore the overall rating for the soil and site stability attribute was None to Slight.

Rangeland Health Attribute 2: Hydrologic Function

There were no rills or gullies observed, these indicators were rated None to Slight. Water flow patterns, pedestals and/or terracettes were not observed and were rated None to Slight. Bare ground was measured at 50 percent, indicating the site has moderate to high plant cover and was rated None to Slight. There was no evidence of wind-scouring observed and was rated None to Slight. All litter size classes remained at the base of plants with little to no movement, and no litter dams being detected and were rated None to Slight. Soil surface resistance to erosion was rated None to Slight. Soil surface is naturally armored by canopy cover. Canopy cover was measured at 19 percent and 4 percent basal cover. Soil surface loss or degradation was None to Slight as soils are stable and in place. Compaction layers were not present and not restricting water infiltration or root penetration and was rated None to Slight.

Litter was measured at 41 percent and is appropriate with the amount of vegetation occurring at the site, therefore it was rated None to Slight. Plant community composition and distribution relative to infiltration was rated None to Slight. Vegetative cover is comprised of primarily perennial grasses and few shrubs. This vegetation composition is effective at soil stability due to the basal area cover and root systems that are not restricted by a compaction layer. This type of plant community is moderately to highly effective at capturing and storing precipitation.

The overall rating for the hydrologic function attribute was None to Slight, with all ten indicators for hydrologic function being rated None to Slight.

Rangeland Health Attribute 3: Biotic Integrity

Soil surface resistance to erosion was rated None to Slight and had a score of one. Soil surface is naturally armored by canopy cover and litter. Canopy cover was measured at 19 percent and 4 percent basal cover. Soil surface loss or degradation was None to Slight as soils are stable and in place. Compaction layers were not present and not restricting water infiltration or root penetration and was rated None to Slight.

Functional structural groups were rated None to Slight. Functional structural groups were as described in the ESD, with relatively even distribution of mostly grasses with some shrubs and a few forbs. Plant mortality/decadence was rated None to Slight, as all age classes were evenly represented. The ESD describes the functional structural group as grasses/grass-likes are much at 41 percent and is appropriate with the amount of vegetation occurring at the site, therefore it was rated None to Slight. Annual production was rated as Slight to Moderate due to the ratio of bare ground to cover. Invasive plants were rated None to Slight, Russian thistle, cacti and tamarisk were present, but not in large amounts. These species have the ability to increase and dominate the site after unmanaged grazing and/or ground disturbance. Reproductive capability of perennial plants was rated None to Slight. The ESD describes that plant reproductive capabilities are only limited by weather conditions, natural disease, or herbivory.

The overall rating for the biotic function attribute was None to Slight, with eight indicators for biotic function being rated as None to Slight, and one Slight to Moderate.

At the SJR-1 site, the ID Team verified that the site exhibited conditions that indicate it is within the reference state. Although alkali sacaton and galleta were not detected on the LPI transect, they were present at the site. Non-native annuals were not detected nor observed at the site. With the canopy, basal and litter covers measuring lower than the acceptable range, and bare ground in the middle of the acceptable range, the ID Team attributed these differences to repeated years of drought as all of the other land health indicators point to the site properly functioning.

Figure 10 SJR-2 looking southeast in March 2020

6.2.2 *Clay Loam Wash 10-14" p.z. (R035XA104AZ)*

17 Indicators: Key Area SJR-2

For the 17 indicators of rangeland health for Clay Loam Wash 10-14" p.z. (R035XA104AZ), the ecological site reference sheet condition indicates:

1. Very few rills expected due to high plant cover potential of this site. Rills may occur due to finer textures with slow permeability, medium run off, moderate to high shrink/swell (cracking) characteristic of many soils and rare to occasional flooding. The number and length of rills will be limited by the low slopes on the site.
2. Water flow patterns and occasional ponding may be common due to the slow permeability of the soils. Water flow patterns should be short and shallow.
3. A few erosional pedestals or terracettes can be expected. Pedestals should be very short and along water flow patterns. Terracettes should also be very short and stop at obstructions.
4. Bare ground is expected to be less than 20 to 40 percent.

5. Very few gullies or erosion associated with gullies should occur. Due to occasional flooding and extra run on moisture, a few gullies can form in areas where water flow is concentrated from adjacent uplands. There should be no active erosion and there will be vegetation stabilizing the gully.
6. No wind scours, blowouts or depositional areas are to be expected on this site.
7. No litter movement expected. During or after severe droughts, a few minor areas of deposition or hummock clay deposits may be present.
8. Soil surface textures range from sandy clay loam to clay but are mostly silty clay loam and sandy clay loam. The expected soils stability average ranges between 3 to 4. When well vegetated and not subjected to severe flood events, these soils have a low to moderate resistance to water erosion and a moderate resistance to wind.
9. Soil surface structure is usually massive or granular (moderate, fine to medium). It may occasionally be platy (weak to moderate, medium to thick) or subangular blocky (weak, fine). Surface horizon thickness is generally 2 to 8 inches. Some soils may have been altered by past farming practices and have altered soil structures and thickness. Color is variable depending upon parent material.
10. Plant community composition for this site is characterized by a relatively even distribution of vegetation dominated by grasses with some shrubs. This plant community structure is highly effective at capturing and storing precipitation.
11. No compaction layer occurs. Due to this site's position on the landscape, it accumulates finer particles such as silts and clays. The associated soil structure is platy or subangular blocky in the soil subsurface. These should not be considered compaction layers.
12. Functional/Structural Groups lists the dominant to other: Dominate are warm season bunchgrasses which are much greater than subdominant warm season colonizing grasses which are greater than cool season colonizing grasses that are greater than large shrubs which are greater than forbs which are greater than cool season bunchgrasses that are equal to half shrubs that are greater than cacti.
13. All plant functional groups are adapted to survival in all but the most severe droughts. Severe winter droughts affect shrubs the most. Severe summer droughts affect grasses the most.
14. Litter cover is mostly fine with depths usually less than 1/2 inch. Litter depths will be the greatest under canopies. Of the total litter amount of 15 to 35 percent, it would be expected that approximately 80 to 90 percent would be herbaceous litter and 10 to 20 percent would be woody litter. Litter amounts increase during the first few years of drought, then decrease in later years.
15. The median air-dry production is expected to have an annual production of 1,600 to 2,400 pounds per acre in a year of average annual precipitation.
16. Ring muhly, tumble grass, burrograss, snakeweed and rubber rabbitbrush are all native to the site, but they have the potential to increase and dominate the site after unmanaged grazing or surface disturbance. Russian thistle, filaree and cheatgrass are non-native annuals that can invade with or without disturbance.
17. All plants native to this site are adapted and are capable of producing seeds, stolons and rhizomes in all but the most severe drought.

Rangeland Health Attribute 1: Soil and Site Stability

There were no rills observed, these indicators were rated None to Slight. Water flow patterns were rated None to Slight as a very small water flow pattern was detected at the site. Pedestals and/or terracettes were not observed and were rated None to Slight. Bare ground was measured at 41 percent, with an increased amount of measured litter in the interspaces and grasses evenly dispersed, this indicates the site has a moderate to high plant cover and was rated None to Slight and within ESD parameters. Gullies were rated as None to Slight as the site only contained one gully which was created by a nearby roadbed disrupting the over land water flow, and causing a funneling effect of run-off water. Within this gully, the banks were well vegetated and in stabilized. There was no evidence of wind-scouring observed and was rated None to Slight. All litter size classes remained at the base of plants with little to no movement, no litter dams detected and was therefore rated None to Slight. Soil surface resistance to erosion was rated None to Slight, and the sites soil was verified as a silty clay. In the soil surface stability (Indicator 8) the soil scored a 3.5 rating, which verified that the soil was a moderately erodible soil and matched the ESD parameters. The soil surface is also stabilized by litter and canopy cover. Canopy cover was measured at 33 percent, there were no hits of basal cover on the LPI transect. Soil surface loss or degradation was None to Slight as soils are stable and in place. Compaction layers were not present and therefore not restricting water infiltration or root penetration and were rated None to Slight.

The overall rating for the soil and site stability attribute was None to Slight, as all ten indicators for soil and site stability were rated None to Slight.

Rangeland Health Attribute 2: Hydrologic Function

There were no rills observed, these indicators were rated None to Slight. A very small water flow pattern was detected in an area and was rated None to Slight. Pedestals and/or terracettes were not observed and were rated None to Slight. Bare ground was measured at 41 percent, with more increased amount of measured litter in the interspaces and grasses evenly dispersed, this indicates the site has a moderate to high plant cover and was rated None to Slight and within ESD parameters. Gullies were rated as None to Slight as a gully was detected near the roadbed. The roadbed created a funneling effect and the gully banks were well vegetated. Soil surface resistance to erosion was rated None to Slight with a 3.5 stability rating score and the soil was verified as a silty clay. The soil surface is naturally armored by litter and canopy cover. Canopy cover was measured at 33 percent and there were no hits of basal cover on the LPI transect. Soil surface loss or degradation was None to Slight as soils are stable and in place. Compaction layers were not present and not restricting water infiltration or root penetration and were rated None to Slight.

Litter was measured at 46 percent, therefore rated None to Slight as it exceeds the desired average of 15 to 35 percent. Plant community composition and distribution relative to infiltration was rated None to Slight as it is within ESD parameters. Vegetative cover is comprised of primarily perennial grasses and few shrubs. This vegetation composition is effective at soil stability due to the basal area cover and root systems that are not restricted by a compaction layer. This type of plant community is moderately to highly effective at capturing and storing precipitation.

The overall rating for the hydrologic function attribute was None to Slight, as all ten indicators for hydrologic function were rated None to Slight.

Rangeland Health Attribute 3: Biotic Integrity

Soil surface resistance to erosion was rated None to Slight the sites soil was verified as a silty clay, with a 3.5 stability rating score. The soil surface is also stabilized by litter and canopy cover. Canopy cover was measured at 33 percent, there were no hits of basal cover on the LPI transect. Soil surface loss or degradation was None to Slight as soils are stable and in place. Compaction layers were not present and not restricting water infiltration or root penetration and was rated None to Slight.

Litter was measured at 46 percent, therefore rated None to Slight, as it exceeds the desired average of 15 to 35 percent. Plant community composition and distribution relative to infiltration was rated None to Slight. Vegetative cover is comprised of primarily perennial grasses and few shrubs. This vegetation composition is effective at soil stability due to the basal area cover and root systems that are not restricted by a compaction layer. This type of plant community is moderately to highly effective at capturing and storing precipitation.

Functional structural groups were rated Slight to Moderate due to a monoculture of alkali sacaton grass, with no other grass species encountered. The ESD states that alkali sacaton dominates the plant community, followed by subdominant western wheatgrass. No large shrubs were observed, however half-shrub, shadscale saltbush was detected. Plant mortality/decadence was rated None to Slight as the site has an even cover of only alkali sacaton grass. This monoculture of alkali sacaton may have been caused by the past drought events. Litter was measured at 46 percent, therefore rated None to Slight, as it exceeds the desired average of 15 to 35 percent. Annual production was rated as Slight to Moderate as the ID Team determined that there could have more species of grass present in the interspaces. Invasive plants were rated None to Slight, cocklebur seeds were present, but few actual plants were detected. Reproductive capability of perennial plants was rated None to Slight, as the alkali sacaton grass is adapted to the climate and is capable of producing seeds and tillers in all but the most severe droughts. Previous year's growth showed that alkali sacaton and shad scale had seeded and flowered.

The overall rating for the biotic function attribute was None to Slight, seven indicators for biotic function were rated as None to Slight while two were rated Slight to Moderate.

At the SJR-2 site, the ID Team verified that the site exhibited conditions that indicate it is within the reference state. The LPI data showed a dominance of alkali sacaton and along with few fourwing saltbush shrubs that were detected. Although western wheatgrass, vine mesquite and blue grama were not detected or observed, this site has maintained an alkali sacaton-dominant plant community. Although this site has experienced several years of repeated drought along with a historical overgrazing past, these disturbances have not caused the site to depart from the reference state. The absence of some of the key plant species for the alkali sacaton community is attributed to the repeated years of drought.

Figure 11 SRJ-3 looking southwest in March 2020

6.2.3 *Sandy Upland 10-14" p.z. (R035XA118AZ)*

17 Indicators: Key Area SJR-3

For the 17 indicators of rangeland health for Sandy Upland 10-14" p.z. (R035XA118AZ), the ecological site reference sheet condition indicates:

1. No rills expected. The sandy surface textures and well drained nature of the soils should preclude the presence of rills.
2. A very few scattered water flow patterns may be present on the steepest slopes. Water flow patterns on these soils are commonly 1 to 2 meters long, generally occupying less than 5 percent of the ground cover.
3. Uncommon are pedestals or terracettes. If present, pedestals are typically of less than 1 inch in height, often associated with deposition areas and water flow patterns. Terracettes are absent. This site has potential for significant development of biological crust. Well-developed biological crust should not be confused with pedestals.
4. Bare ground averages from 35 to 55 percent. Drought may cause an increase in bare

ground.

5. No gullies or erosion associated with gullies should be present.
6. Wind scoured areas, blowouts and/or depositional areas are mostly uncommon in well vegetated herbaceous plant communities. However, in certain plant communities some deposition and wind scour may occur, especially during droughts due to high wind erosion hazard of the soil. Sites dominated by sand sage and juniper are most likely to suffer from excessive blowouts and depositions.
7. Most herbaceous and fine woody litter will be transported by wind and in water flow pathways, while a small percentage stays in place. Coarse woody litter and duff will accumulate under shrub and tree canopies.
8. Expected soil aggregate stability ranges from 2 to 4. Under canopies the range is 3 to 4 and 2 to 3 in the low interspaces. When well vegetated, these soils have a moderate to high resistance to water erosion, but only a low resistance to wind erosion.
9. Soil surface structure is loose granular, with a weak physical crust. Surface thickness ranges from 3 to 6 inches. Color is variable depending on parent material.
10. Plant community composition for this site is a grassland community consisting of about 70 percent grasses, 25 percent shrubs and 5 percent composition of forbs. This community promotes infiltration and reduces run off.
11. No compaction layers occur.
12. Functional/Structural Groups list the dominant to other: warm season bunchgrasses (35 to 45 percent) are greater than warm season grasses. Subdominant are shrubs (15 to 25 percent). Other are forbs (5 to 10 percent) which are greater than trees (1 to 5 percent).
13. In a normal year up to 10 percent of grasses and shrubs die off. During and after drought years there can be from 10 to 20 percent die off of shrubs and grasses. Severe winter droughts affect shrubs, trees and cool season grasses the most. Severe summer droughts affect the warm season grasses the most.
14. Within plant interspaces litter ranges from 10 to 20 percent cover, while under shrub and tree canopies it ranges from 25 to 60 percent cover with depths from 1/8 to 1/4 inch thick.
15. Expected annual production is 250 to 350 pounds per acre (dry weight) in drought years, 450 to 550 pounds per acre in normal years and 600 to 700 pounds per acre in wet years.
16. Mormon tea, broom snakeweed, sand sagebrush and rabbitbrush are all native to the site, but they have the ability to increase and dominate the site after disturbance. Oneseed juniper is native to the site but has the ability to increase and dominate the site after unmanaged grazing and/or fire exclusion. Introduced annuals that have the ability to increase and dominate the site after unmanaged grazing and/or ground disturbance include Russian thistle and cheatgrass.
17. All plants native to this site are adapted to the climate and are capable of producing seeds, stolons and rhizomes except during the most severe drought.

Rangeland Health Attribute 1: Soil and Site Stability

There were no rills or gullies observed, these indicators were rated None to Slight. Water flow patterns were observed to be small on steeper slopes and were rated None to Slight as it falls

within ESD parameters. Pedestals and/or terracettes were not observed and were rated None to Slight. Bare ground was measured at 34 percent, indicating the site has moderate to high plant cover and was rated None to Slight and within ESD parameters. There was no evidence of wind-scouring observed and was rated None to Slight. All litter size classes remained at the base of plants with little to no movement, no litter dams were detected and was therefore rated None to Slight. Soil surface resistance to erosion was rated Slight to Moderate. In the soil surface stability (Indicator 8) the soil scored a one, which was below the parameters set in the ESD. Although the soil was highly erodible the surface is naturally armored by moderate gravel and canopy cover. Rock or rock fragments greater than 1/4 and less than or equal to 3 inches covered 26 percent. Canopy cover was measured at 23 percent and 1 percent basal cover. Soil surface loss or degradation was None to Slight as soils are stable and in place with various classes of rock present. Compaction layers were not present and not restricting water infiltration or root penetration and were rated None to Slight.

The overall rating for the soil and site stability attribute was None to Slight, as nine indicators for soil and site stability were rated None to Slight, with one rated Slight to Moderate.

Rangeland Health Attribute 2: Hydrologic Function

There were no rills or gullies observed, these indicators were rated None to Slight. Water flow patterns were observed to be small on steeper slopes and were rated None to Slight as it falls within ESD parameters. Bare ground was measured at 34 percent, indicating the site has moderate to high plant cover and was rated None to Slight and within ESD parameters. Soil surface resistance to erosion was rated Slight to Moderate with the soil scoring a one. The soil surface is naturally armored by moderate gravel and canopy cover. Rock or rock fragments greater than 1/4 and less than or equal to 3 inches covered 26 percent. Canopy cover was measured at 23 percent and 1 percent basal cover. Soil surface loss or degradation was None to Slight as soils are stable and in place. Compaction layers were not present and not restricting water infiltration or root penetration and were rated None to Slight.

Litter amount was measured at 38 percent, therefore it was rated None to Slight, as it exceeds the desired average of 20 to 35 percent . Plant community composition and distribution relative to infiltration was rated None to Slight, as it is within ESD parameters. Vegetative cover is comprised of primarily perennial grasses and shrubs. This vegetation composition is effective at soil stability due to the basal area cover and root systems that are not restricted by a compaction layer. This type of plant community is moderately to highly effective at capturing and storing precipitation.

The overall rating for the hydrologic function attribute was None to Slight, as nine indicators for hydrologic function were rated None to Slight, with one rated Slight to Moderate.

Rangeland Health Attribute 3: Biotic Integrity

Soil surface resistance to erosion was rated Slight to Moderate with the soil scoring a one. The soil surface is naturally armored by moderate gravel and canopy cover. Rock or rock fragments greater than 1/4 and less than or equal to 3 inches covered 26 percent. Canopy cover was measured at 23 percent and 1 percent basal cover. Soil surface loss or degradation was None to Slight as soils are stable and in place. Compaction layers were not present and not restricting water infiltration or root penetration and were rated None to Slight.

Functional structural groups were rated Slight to Moderate, as cool season grasses were present, but there was an abundance of warm season grasses and juniper. Functional structural groups are described in the ESD as having a dominance of cool season grasses (35 to 45 percent) followed by warm season grasses (30 to 40 percent). Further ESD descriptions of functional structural group is the subdominant presence of shrubs (15 to 25 percent), followed by forbs (5 to 10 percent) and trees (1 to 5 percent). The abundance of warm season grasses and juniper may be attributed to past droughts events. Plant mortality/decadence was rated None to Slight, as all age classes were evenly represented. Litter was measured at 38 percent; therefore, it was rated None to Slight as the desired average is 20 to 35 percent. Annual production was rated as None to Slight due to the ratio of bare ground to cover. Invasive plants were rated Slight to Moderate, due to frequency of juniper. Reproductive capability of perennial plants was rated None to Slight, as the native plants are adapted to the climate and are capable of producing seeds, stolons, and rhizomes except during the most severe droughts.

The overall rating for the biotic function attribute was Slight to Moderate, as six indicators for biotic function were rated as None to Slight, three Slight to Moderate.

Due to the presence of juniper on the sloped site, and the described plant community transition state for this ESD, the ID Team determined that site SJR-3 had moved into the STM Juniper State (3), with a Juniper Overstory (3.1). This departure is due to historical overgrazing as well as an absence of a natural fire regime that this ecological site should be experiencing. Due to the departure from the reference state, the evaluation of SJR-3 in regard to Standard 1 was made based on the expected conditions for the Juniper State rather than HCPC. This site does not have the ability to return to HCPC without taking management actions to physically manipulate the plant community by reducing the amount of juniper present so as to encourage an increase in grass species.

7. Determinations of Land Health Standards

7.1 Standard 1: Upland Sites

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

Determination:

☒ Meeting the Standard
☐ Not Meeting the Standard; Making Significant Progress Toward Standard
☐ Not Meeting the Standard; Not Making Significant Progress Toward Standard

Rationale:
Overall, the soils throughout the St. Johns Ranch Allotment are productive, stable, and in a sustainable condition. The key area monitoring data aligns with the conditions described within the ESD's reference sheets and are acceptable for meeting the upland sites standard. Although the data from the key areas shows that canopy cover, basal cover, litter, and plant composition cover in some areas are below the expected range according to the ESDs, they are adequate in ensuring soil stabilization and appropriate permeability rates within the ecological sites. This reduced amount of canopy cover, basal cover, litter, and plant community composition can be attributed to the repeated drought conditions experienced in past years.

Little to no signs of erosion was observed at any of the sites. There were no rills present and it was rated None to Slight. At SJR-2 a gully was detected and was attributed to a raised roadbed creating a funneling effect resulting in the formation of a gully. At SJR-3, a few small gullies were present in the steeper slopes running parallel to the ridges. Overall, gullies were within ESD parameters for all sites and were rated None to Slight. Pedestals and/or terracettes were rated None to Slight and were not observed. Wind-scouring and litter movement were both rated None to Slight. Soil surfaces are naturally armored by canopy cover, litter and at SJR 3 the soil is armored by rocks.

7.2 Standard 2: Riparian-Wetland Sites

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

Determination:

☐ Meeting the Standard
☐ Not Meeting the Standard; Making Significant Progress Toward Standard
☐ Not Meeting the Standard; Not Making Significant Progress Toward Standard
☒ Standard Does Not Apply

Rationale:
There are no riparian-wetland sites located on the St. Johns Ranch Allotment within the BLM-administered portions. The USFWS rendered BO on the Gila District Livestock Grazing Program #22410-2006-F-0414 (2012). Although Table 3 of the BO shows that the St. Johns Ranch Allotment contained 960 acres of "not yet evaluated" riparian habitat, it also acknowledges in Table 1 that the St. Johns Ranch Allotment contained no riparian habitat. It has been determined through ID Team site visits, review by the Safford Field Office Hydrologist and analysis in section 2.2.5 of this document that there is no riparian habitat on BLM-administered portion of the allotment. Standard 2 does not apply.

7.3 Standard 3: Desired Resource Conditions

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

Standard 3 is determined by evaluating whether DPC objectives are being supported and provided with consideration for all multiple uses: rangeland health, State water quality standards, and habitat for endangered, threatened, and sensitive species. Standards 1 and 2, when present, help to inform whether the desired plant communities are being supported or have the ability to function as desired.

Determination:

☒ Meeting the Standard
☐ Not Meeting the Standard; Making Significant Progress Toward Standard
☐ Not Meeting the Standard; Not Making Significant Progress Toward Standard

Rationale:

Based on the monitoring data and this land health evaluation, current livestock grazing is not preventing the St. Johns Ranch Allotment from providing a productive and diverse upland native plant community that provides for all multiple uses. Due to the absence of riparian-wetland habitat there are no riparian-wetland plant communities considered in this evaluation of Standard 3.

The RHAs indicated that the soil and site stability, hydrologic function, and biotic integrity attributes were within or were close to acceptable ranges to meet the criteria for Standard 1, as described in Sections 6.2 and 7.1. The allotment was also found to be providing adequate grass, shrub and forb composition and density to provide sufficient forage and shelter for wildlife species, as described in Section 2.3.3. Therefore, the ID Team determined that the St. Johns Ranch Allotment is currently meeting Standard 3.

The following DPC objectives were established to ensure current conditions on the allotment are maintained or improved. The DPC objectives provide a diverse plant community that will allow for natural ecological functions and provide habitat features, such as increased sources for shelter, cover and foraging, for the wildlife species described above in Section 2.3.3. These DPC objectives will ensure rangeland health State water quality standards are also being met.

Clayey Fan 6-10 p.z. (Key Area SJR-1)

Canopy cover - The LPI monitoring measured the canopy cover at 19 percent and basal cover at 4 percent. The ESD for this site suggests that the canopy cover should be between 24 to 30 percent, and the basal cover should be between 3 to 18 percent (Indicator 10). Repeated drought conditions in recent years have prevented this site from increasing its productivity to provide greater canopy and basal cover, and it will remain a limiting factor for this site if drought conditions continue. The ESD states that both canopy and basal covers decrease during prolonged drought, which supports the ID Team's observations. This ESD range remains a reasonable objective to manage for even with the limitations this site is experiencing. The ESD does not provide a suggested range for plant composition but indicates that alkali sacaton and galleta should be the dominant species for this site, followed by scattered forbs and shrubs with non-native annuals present in trace amounts. By managing this site to meet the canopy and basal cover objectives for grasses the expected composition of a grass-dominant site will also be

achieved.

Bare ground - The DPC objective for bare ground at this site is to maintain 45 to 55 percent bare ground. The LPI monitoring measured bare ground to be at 50 percent which is within the ESD range of 45 to 55 percent of the total ground cover (Indicator 4). With bare ground meeting the DPC objective, this would show that the site is able to maintain the vegetation cover necessary to stabilize the soil in place.

Litter - The DPC objective for litter at this site is to increase litter amounts to 43 to 53 percent. The ESD does not indicate an acceptable litter average. The ESD does state that the litter cover is mostly herbaceous (Indicator 12) and movement of this type of fine litter (Indicator 7) is expected on slopes greater than 3 percent, generally limited to the water flow patterns with movement of less than 5 to 10 feet. The LPI monitoring measured litter at 41 percent. This DPC litter cover range is a reasonable objective to manage for, while factoring in the site's limitations of increasing the plant cover due to having experienced repeated drought conditions in past years.

This site is meeting the standard for desired resource conditions even though it has endured repetitive years of drought which is evident from the monitoring data collected at SJR 1. The monitoring data depicts a lower amount of canopy cover with bare ground meeting DPC objectives. With bare ground not increasing out of the desired range, this indicates that the site is stable, that the soil is able to withstand water and wind erosion due to the amount of cover present at the site.

Managing for these DPC objectives for the Clayey Fan site will encourage a continued increase in the overall canopy and basal cover for grasses and shrubs, which will allow for more wildlife species such as antelope and small game to be supported through the increased availability of shelter and forage sources, as well as nesting opportunities. A greater amount of cover that is also diverse in its functional and structural group composition (i.e. grasses, shrubs, forbs, and trees) will be capable of supporting a greater variety of wildlife species. Continuing to provide an acceptable amount of bare ground is also important for the burrowing wildlife species, as discussed in Section 2.3.3.

Clay Loam Wash 10-14 p.z. (Key Area SJR-2)

Canopy cover - The new DPC objective for canopy cover at this site is 35 to 45 percent and basal cover is 1 to 10 percent. The ESD reference sheet did not provide a suggested range for canopy cover, but it does indicate a desired range of basal cover (in Table 7 of the ESD) for grasses (10 to 25 percent), shrubs (1 to 5 percent), and forbs (1 to 5 percent) (USDA NRCS (a), 2012, p.6). The new DPC objectives were established based on the measured LPI data and the observations of the ID Team. The ID Team noted a dominance of alkali sacaton, which has the ability to grow and reproduce during the summer months when most of the area's precipitation is received. This site is bottom land that collects precipitation runoff from the surrounding area and is capable of producing 1,600 to 2,400 pounds, per acre, of annual production in a normal year of precipitation (Indicator 15). The ID Team estimated the annual production to be 1,200 pounds, per acre, which is lower than the acceptable range. Effects of past drought conditions are apparent at this site. Canopy cover was measured to be 33 percent and basal cover was zero percent. Percent bare ground (Indicator 4) was slightly higher than expected at 41 percent. This indicates that the canopy cover is lower than it should be because the amount of bare ground is greater than

expected. Increasing the canopy cover and basal cover would help reduce the percent bare ground so that it meets the suggested range of the ESD.

Plant community composition - The ESD for this site characterizes the plant community composition as a range of 70 to 80 percent grasses, 5 to 10 percent shrubs, and 10 to 20 percent forbs (USDA NRCS (a), 2012, p.5). The measured percent grass from LPI monitoring was 30 percent of predominately alkali sacaton, shrubs were 3 percent, and forbs were not detected during the LPI monitoring but were observed at the site by the ID Team. Repeated drought conditions have hindered the site's production and may continue to prevent the site from experiencing a large increase in cover for these plant communities if drought conditions persist. Due to drought being a limiting factor, the DPC objective for plant community composition at this site is to increase the grass composition to a range of 35 to 45 percent, shrub composition to 5 to 10 percent, and the forb composition to 5 to 10 percent.

Bare ground - The DPC objective for bare ground is a range of 20 to 40, which is the range provided by ESD as an acceptable bare ground range (Indicator 4). The LPI monitoring found that bare ground was at 41 percent, which is slightly higher than the expected range. The RHA indicators, evaluated by the ID Team, associated with soil and site stability did not indicate that the site was experiencing erosion from wind or water greater than what is expected for the site; therefore, although the bare ground is slightly above its expected range it does not appear to be prohibiting the site from functioning.

Litter - The DPC objective for litter at this site is to maintain litter amounts at 15 to 35 percent. This is the acceptable litter range provided by ESD reference sheet (Table 6 of the ESD (USDA NRCS (a), 2012, p.6). The LPI data totaled the measured litter cover at 46 percent which is within the acceptable range. The ESD also states that of the 15 to 35 percent litter range, it would be expected that approximately 80 to 90 percent would be herbaceous litter and 10 to 20 percent would be woody litter (Indicator 14). Litter amounts increase during the first few years of drought, then decrease in later years.

Managing for these DPC objectives for the Clay Loam Wash site will encourage a continued increase in the overall canopy and basal cover for grasses and shrubs, which will allow for more wildlife species such as antelope and small game to be supported through the increased availability of shelter and forage sources, as well as nesting opportunities. A greater amount of cover that is also diverse in its functional and structural group composition (i.e. grasses, shrubs, forbs, and trees) will be capable of supporting a greater variety of wildlife species. Continuing to provide an acceptable amount of bare ground is also important for the burrowing wildlife species, as discussed in Section 2.3.3.

Sandy Upland 10-14 p.z. (Key Area SJR-3)

Canopy cover - The DPC objective for canopy cover at this site is 35 to 45 percent and basal cover is 1 to 12 percent. In Table 6 of the ESD, a desired range of canopy cover was not given, but it did include a desired range basal cover of 1 to 12 percent for grasses, 1 to 7 percent for shrubs, 1 to 4 percent for forbs and 0 to 2 percent trees (USDA NRCS (e), 2008, p.5). The DPC objective were established based on the measured LPI data and the observations of the ID Team. The LPI measured canopy cover at 23 percent and 1 percent basal cover. The total percent litter cover measuring 38 percent, which is above the 20 to 35 percent range given in the ESD. This

data indicates that the canopy cover is lower than it should be, while basal cover is just with the lowest part of the desired range. Increasing the canopy and basal covers would help to reduce the percent bare ground so that it continues to meet the suggested range of the ESD.

Plant community composition - The ESD for this site characterizes the plant community composition (Indicator 12) as a range of 35 to 45 percent cool season grasses, 30 to 40 percent warm season grasses, 15 to 25 percent shrubs, 5 to 10 percent forbs and 1 to 5 percent trees. The LPI monitoring measured cool season grasses at 1 percent, warm season at 13 percent, 9 percent shrubs, and 2 percent forbs. Trees were not captured on the LPI transect, but the ID Team visually determined that trees made up approximately 10 percent of the site. The total composition was grasses at 14 percent, shrubs 9 percent, and forbs were 2 percent. Repeated drought conditions have hindered the sites production and may continue to prevent the site from experiencing a large increase in cover for these plant communities if drought conditions persist. Due to this limiting factor, the DPC objective for plant community composition at this site is to increase the grass composition to a range of 15 to 25 percent, the shrub composition to 10 to 20 percent, and the forb composition to 5 to 10 percent. Tree composition is expected to be 1 to 5 percent at this site. Lack of fire and drought conditions at the SJR-3 site also attribute to the encroachment of one-seed juniper, while drought attributes to the decrease of the percent of vegetative cover. This increased tree cover does provide habitat for elk and it was noted that elk sign was detected.

Bare ground - The ESD (Indicator 4) for this site indicates that bare ground has an acceptable range of 35 to 55 percent. The LPI monitoring measured bare ground to be at 34 percent, slightly lower than the ESD; therefore, the DPC objective at this site is to maintain 35 to 55 percent bare ground. The ESD does note that drought conditions may cause an increase in bare ground.

Litter - The ESD (Indicator 14) gives an acceptable litter cover range of 20 to 35 percent and characterizes litter cover as a range of 25 to 60 percent cover under shrub and tree canopies with a depth of one eighth to one quarter inch thick, while the interspaces between plants have a range of 10 to 20 percent. The LPI monitoring measured litter at 34 percent, which falls within the acceptable litter cover range given by the reference sheet. The DPC objective will remain at 20 to 35 percent range for litter cover.

Overall, by increasing the amount of grass, shrub, and forb cover and composition and decreasing the amount of trees (i.e. one-seed juniper), the site will continue to support a broad range of mammals, migratory and songbirds, and ungulate species such as antelope. The juniper tree cover does provide food for pinyon jays and shelter habitat for elk, which was confirmed by the noted presence of elk droppings but decreasing the tree cover percent would allow for a more diverse group of wildlife species to be supported at this site. At this point in time, the site has transitioned to the Juniper State on the STM (Section 4.2.2), and the site will naturally remain in this state due to the absence of a natural fire regime.

8. Recommended Management Actions

8.1 Terms and Conditions

Based on the determinations in *Section 7 Determinations of Land Health Standards*, the following management actions are recommended:

1. Grazing management on the St. Johns Ranch Allotment to continue in accordance with the mandatory terms and conditions of the term lease, as follows:

Allotment Name/ Number	Livestock Number/Kind	Grazing Period Begin - End	Percent Public Land	Active Use (AUM)
St. Johns Ranch (No. 06255)	4 Cattle	3/1 - 2/28 Yearlong	100	48

Source: BLM – Rangeland Administration System (RAS)

2. Continue with the current Other Terms and Conditions:

   - In order to improve livestock distribution on the public lands, all salt blocks and/or mineral supplements shall not be placed within a 1/4 mile of any riparian area, wet meadow or watering facility (either permanent or temporary) unless stipulated through a written agreement or decision in accordance with 43 [Code of Federal Regulations] CFR 4130.3-2(c).

3. Add to the current Other Terms and Conditions:

   - The lessee shall submit, upon request, a report of the actual grazing use made on this allotment for the previous grazing period, March 1 to February 28. Failure to submit such a report upon request by March 15 of the current year may result in suspension or cancellation of the grazing lease.

   - Lessee shall provide reasonable administrative access across private and leased lands to the BLM for the orderly management and protection of the public lands.

4. The following Other Terms and Conditions should be deleted as it is a duplicate of the Standard Terms and Conditions associated with this BLM lease:

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

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10. Consultation

Arizona Game and Fish Department
USFWS, Arizona Ecological Services
Double R Cattle Company, St. Johns Ranch Allotment lessee

11. Authorized Officer Concurrence

I have reviewed the determinations presented in *Section 7 Determinations of Land Health Standards* and the grazing and other management actions identified in *Section 8 Recommended Management Actions*.

☒ I concur with the conclusions and recommendations as written.

☐ I do not concur.

☐ I concur, but with the following modifications.

SCOTT COOKE Digitally signed by SCOTT COOKE
Date: 2020.07.28 06:41:07 -07'00'

Scott C. Cooke
Field Manager

Date

References

Arizona Department of Environmental Quality (ADEQ). Available online athttp://www.azdeq.gov/.

Arizona Game and Fish Department (AZGFD). (N.d.). Arizona Environmental Online Review Tool Report – Generated Report. Produced 04/01/2020. Retrieved from https://azjgis2.esri.com/content/map.

Hughes, Janice M. 2015. Yellow-billed Cuckoo (Coccyzus americanus), version 2.0. The Birds of North America (P.G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA. Available online at https://birdsna.org/Species-Account/bna/species/yebcuc/introduction. Accessed 03/25/2020.

Pellant, M., P. Shaver, D.A. Pyke, and J.E. Herrick. (2005). Interpreting indicators of rangeland health, version 4. Technical Reference 1734-6. U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center, Denver, CO. BLM/WO/ST-00/001+1734/REV05. 122 pp. USDA-NRCS. 2003. National range and pasture handbook. Washington, D.C.

Perez, J. (2017). The Jornada Rangeland Research Programs. Retrieved from https://jornada.nmsu.edu/esd.

PRISM. (2017). PRISM Climate Group, Oregon State University. Retrieved 3/19/2020 from http://prism.oregonstate.edu.

Society for Range Management. (1989). A glossary of terms used in range management. 3rd ed. Society for Range Management, Denver, CO.

U.S. Department of Agriculture, Forest Service, and U.S. Department of Interior, Bureau of Land Management (USDA FS/USDI BLM). (1996). Sampling Vegetation Attributes. Technical Reference l734-4 Denver, CO.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). Ecological Dynamics Interpretive Tool. Retrieved from https://edit.jornada.nmsu.edu/

U.S Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). (2011) Ecological Site Description (ESD) System for Rangeland and Forestland. https://esis.sc.egov.usda.gov/Welcome/pgESDWelcome.aspx

_____a. 2012. Ecological site description of R035XA104AZ. Available online at https://edit.jornada.nmsu.edu/catalogs/esd/035X/DX035X01I104 Accessed 03/05/2020.

_____b. 2006. Ecological site description of R035XA112AZ. Available online at https://edit.jornada.nmsu.edu/catalogs/esd/035X/DX035X01I112 Accessed 03/05/2020.

_____c. 2006. Ecological site description of R039XA113AZ. Available online at

https://edit.jornada.nmsu.edu/catalogs/esd/035X/DX035X01I113 Accessed 03/05/2020.

_____d. 2008. Ecological site description of R035XA117AZ. Available online at https://edit.jornada.nmsu.edu/catalogs/esd/035X/DX035X01I117 Accessed 03/05/2020.

_____e. 2008. Ecological site description of R035XA118AZ. Available online at https://edit.jornada.nmsu.edu/catalogs/esd/035X/R035XA118AZ Accessed 03/05/2020.

_____f. 2008. Ecological site description of R035XB211AZ. Available online at https://edit.jornada.nmsu.edu/catalogs/esd/035X/R035XB211AZ Accessed 03/05/2020.

_____f. 2012. Ecological site description of R035XB220AZ. Available online at https://edit.jornada.nmsu.edu/catalogs/esd/035X/R035XB220AZ Accessed 03/05/2020.

_____f. 2010. Ecological site description of R035XB239AZ. Available online at https://edit.jornada.nmsu.edu/catalogs/esd/035X/R035XB239AZ Accessed 03/05/2020.

U.S. Department of Agriculture (USDA). (2003). National range and pasture handbook. Washington, D.C.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). (2020). Soil Series Descriptions. Accessed 03/05/2020 Available online at https://soilseries.sc.egov.usda.gov/.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). (2020). Web Soil Survey. Accessed 03/05/2020. Retrieved from https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

U.S. Department of Interior, Bureau of Land Management (USDI BLM). (1997). Arizona Standards for Rangeland Health and Guidelines for Grazing Administration. Phoenix, AZ. 164 pp.

U.S. Department of Interior, Bureau of Land Management (USDI BLM). (1987). Eastern Arizona Grazing Environmental Impact Statement Final. Phoenix, AZ

U.S. Department of Interior, Bureau of Land Management (USDI BLM). (1989). Phoenix Resource Management Plan, Environmental Impact Statement. Phoenix, AZ.

U.S. Department of Interior, Bureau of Land Management (USDI BLM). (2018). Rangeland Administration System. Accessed 03/02/2020. Retrieved from https://www.blm.gov/ras/.

U.S. Department of the Interior, U.S. Fish and Wildlife Service (USDI USFWS). (N.d.). Information for Planning and Conservation (IPaC). Accessed 03/31/2020. Retrieved from https://ecos.fws.gov/ipac/.

U.S. Department of the Interior, U.S. Fish and Wildlife Service (USDI USFWS). (2008). Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife

Service, Division of Migratory Bird Management, Arlington, VA. 85 pp. Retrieved from http://www.fws.gov/migratorybirds/pdf/management/BCC2008.pdf.

U.S. Department of the Interior, U.S. Fish and Wildlife Service (USDI USFWS). (2012). Biological opinion on the BLM Gila District Livestock Grazing Program [#22410-2006-F-0414]. Arizona Ecological Services Office, Phoenix, AZ.

U.S. Department of the Interior, U.S. Fish and Wildlife Service (USDI USFWS). (2017). Black-footed ferret (*Mustela nigripes*). U.S. Fish and Wildlife Service, Region 6 – Mountain-Prairie Region. https://www.fws.gov/mountain-prairie/factsheets/Black-Footed-Ferret.pdf

Yoakum, J.D., Jones, P.F., Cancino, J., Guenzel, R.J., Seidler, R., Manguia-Vega, A., Cassaigne, I., and Culver, M. (2014). Pronghorn management guides. Fifth edition. Western Association of Fish and Wildlife Agencies' Pronghorn Workshop and New Mexico Department of Game and Fish, Santa Ana Pueblo, New Mexico. 159 pp.

Appendix A. Federally Listed, BLM Special Status, and General Wildlife Species

Threatened & Endangered Species			
Species	**Status**	**Critical Habitat**	**Comments**
Black-footed ferret *Mustela nigripes*	Endangered	No Designation	The black-footed ferret relies solely on native grasslands and the presence of prairie dogs for their prey source and for providing burrows to use for shelter and nesting. The BLM-administered portions of the St Johns Ranch Allotment provide suitable grassland habitat to support this species; however, no prairie dogs are known to occur within the allotment. Due to the absence of the key prey source this species is expected to be absent from the allotment.
Western yellow-billed cuckoo (distinct population segment) *Coccyzus americanus*	Threatened	Proposed	Yellow-billed cuckoos primarily occur in cottonwood-willow gallery forests of riparian zones of Arizona. Cuckoos may utilize upland areas of the allotment, comprised of pinyon-juniper, for 2-3 weeks prior to migration to and from suitable breeding habitat (Hughes, 2015). St. Johns Ranch Allotment is not within the designated critical habitat and lacks suitable riparian plant communities to support this species.
Little Colorado spinedace *Lepidomeda vittata*	Threatened	Designated	No suitable aquatic habitat exists on the BLM-administered portions of the St Johns Ranch Allotment to support this species. This species was consulted on in the 2012 BO (USDI USFWS 2012) and conservation measures were provided for the allotments containing critical habitat for this species, which does not include the St Johns Allotment.
Mexican wolf *Canis lupus baileyi*	Endangered, experimental	No Designation	No wolves occur within the action area. If individual wolves disperse from the experimental population into the action area, humans working near individuals could disturb the wolves, but they would only move to other areas. Livestock grazing would be managed to improve or maintain the productivity of the area and would not affect the native prey base of the wolf. The USFWS issued a letter of concurrence (USDI USFWS 2012) for the determination of "may affect, not likely to adversely affect" regarding the Gila District Grazing Program's actions. Conservation measures will continue to be followed and implemented.
Northern Mexican gartersnake *Thamnophis eques megalops*	Threatened	Proposed	Allotment is not within the designated critical habitat. Allotment lacks suitable riparian plant communities to support this species.
Zuni bluehead sucker *Catastomus discobolus yarrowi*	Endangered	Designated	No perennial water or suitable aquatic habitat exist on the St Johns Ranch Allotment to support this species.

Migratory Birds, Birds of Conservation Concern [1, 2]	
Species	**Comments**
Bald eagle *Haliaeetus leucocephalus*	Addressed as BLM Sensitive Species in table below.
Bendire's thrasher *Toxostoma bendirei*	Found in desert habitats including arid grasslands, shrublands, and agricultural habitats. Prefers more open areas with shorter vegetation. The allotment provides adequate habitat to support this species if present. Low-to-moderate potential for this species to occur.
Chestnut-collared longspur *Calcarious ornatus*	Found in shortgrass prairies, rangelands, and desert grasslands. Eastern Arizona contains wintering habitat for this species. The allotment provides a minimal amount of potentially suitable wintering habitat to support this species. Low potential for this species to occur.
Ferruginous hawk *Buteo regalis*	Addressed as BLM Sensitive Species in table below.
Golden eagle *Aquila chrysaetos*	Addressed as BLM Sensitive Species in table below.
Gray vireo *Vireo vicinior*	Found in pinyon-pine/juniper, mesquite scrub, oak scrub, and chaparral habitats. They prefer hot, arid habitats that usually have dense brush from near the ground to six feet high. There is a low potential for this species to occur on the allotment.
Juniper titmouse *Baeolophus ridgwayi*	Found mainly in dry, open pinyon-pine/juniper woodlands of the Great Basin and Upper Sonoran Zone. The species occurs with sagebrush, Joshua tree, and other understory shrub species. Older pinyon-pine/juniper trees are needed for nesting cavities. This allotment provides a minimal amount of low-quality pinyon-pine/juniper habitat to support this species. Low potential for this species to occur.
Peregrine falcon *Falco peregrinus*	Found near cliffs for nesting and in any open habitat that is near large open bodies of water. This allotment could be used for foraging but would not support breeding or wintering individuals. Low potential for this species to occur.
Pinyon jay *Gymnorhinus cyanocephalus*	Addressed as BLM Sensitive Species in table below.
Prairie falcon *Falco mexicanus*	Found near bluffs and cliffs for nesting, including in alpine habitat. Breeding habitats include grasslands, shrub steppe desert, areas of mixed shrubs and grasslands, or alpine tundra that supports their prey base. Foraging sometimes occurs in agricultural fields. The allotment lacks the majority of their required habitat for nesting and breeding but may be used for opportunistic foraging. Low potential for this species to occur.
Western burrowing owl *Athene cunicularia*	Addressed as BLM Sensitive Species in table below.
Western yellow-billed cuckoo *Coccyzus americanus*	Addressed as Federally Listed Species in table above.

[1]The migratory birds species listed are species of particular conservation concern (e.g. Birds of Conservation Concern) that may occur on or near the allotment. It is not a list of every bird species that may be found in this location, nor a guarantee that all of the bird species on this list will be found on or near this location. This list was compiled from data provided for multiple allotments ion the region, including this allotment.
[2] Habitat information and determinations compiled from species profiles found on USFWS website. https://ecos.fws.gov

BLM Sensitive Species	
Species	**Justification**
Amphibians	
Northern leopard frog *Lithobates pipiens*	No perennial water or suitable aquatic habitat exist on the St. Johns Ranch Allotment. Low potential of occurrence.
Birds	
Bald eagle (wintering) *Haliaeetus leucocephalus*	Wintering bald eagles occur along the Little Colorado river and may use the allotment as foraging habitat. There are no known impacts of livestock on bald eagles.
Ferruginous hawk *Buteo regalis*	Ferruginous hawk nest in grasslands, shrublands and forest lands. Suitable nesting habitat occurs on the St. Johns Ranch Allotment. There are no known impacts of livestock on ferruginous hawks.
Golden eagle *Aquila chrysaetos*	There is no suitable nesting habitat for golden eagles on the St. Johns Ranch Allotment. Golden eagles may fly and hunt over the areas of the allotment. There are no known impacts of livestock on golden eagles.
Pinyon jay *Gymnorhinus cyanocephalus*	Pinyon jay occurs in pinyon-juniper woodland. This habitat is available on the allotment in limited amounts; therefore, this species may be impacted by livestock browsing seedling trees or low-hanging branches. This species is known to travel vast distances in response to localized abundance or shortages of forage.
Western burrowing owl *Athene cunicularia hypugaea*	Can be found in open, treeless areas with low, sparse vegetation, usually on gently sloping terrain. Often associated with grasslands, deserts, and steppe environments as well as golf courses, pastures, agricultural field, airport medians, and road embankments. They are often associated with burrowing mammals such as prairie dogs and ground squirrels. This allotment provides suitable wintering habitat but lacks the presence of burrowing animals.
Fish	
Little Colorado sucker *Catostomus sp. 3*	There is no perennial water or appropriate riparian habitat within the BLM-administered portions of the St Johns Ranch Allotment to support this species.
Speckled dace *Rhinichthys osculus*	There is no perennial water or appropriate riparian habitat within the BLM-administered portions of the St Johns Ranch Allotment to support this species.
Invertebrates	
There are no BLM sensitive invertebrates known to occur on the St. Johns Ranch Allotment.	
Mammals	
Arizona myotis *Myotis occultus*	Arizona myotis occurs in ponderosa pine and oak-pine woodlands near water. Little of this habitat exists on this allotment. The species will not be impacted.
Gunnison's prairie dog *Cynomys gunnisoni*	Gunnison's prairie dog is not known to be present on the allotment, however suitable habitat does exist and may be colonized if the species becomes more abundant in the surrounding area.
Pale Townsend's big-eared bat *Corynorhinus townsendii*	This species occurs in pine forests and arid desert scrub, always near caves or other roosting sites. Little of this habitat occurs on the allotment. This species will not be impacted.
Spotted bat *Euderma maculatum*	Spotted bats inhabits desert scrub and open forests and are always associated with a water source such as a spring, river, creek or lake. Little of this habitat occurs on the allotment. This species will not be impacted.
Reptiles	

BLM Sensitive Species	
Species	**Justification**
There are no BLM sensitive reptiles known to occur in the St. Johns Ranch Allotment.	
Plants	
There are no BLM sensitive plants known to occur in the St. Johns Ranch Allotment.	

Species of Economic and Recreational Importance	
Common Name	**Scientific Name**
America pronghorn	*Antilocapra americana*
Mule deer	*Odocoileus hemionus*
Mourning dove	*Zenaida macroura*
Scaled quail	*Callipepla squamata*

Appendix B. BLM ID Team Monitoring Data 2020

SJR-1 - Summary Line Point Intercept Data.

Line Point Intercept Data for SJR-1				
Plant Species	**Cover by Species**		**Site Cover/Bare Ground**	
	Canopy	**Basal**	Bare Ground	50%
Blue grama (*Bouteloua gracilis*)	12%	3%	Basal Cover	4%
Sand dropseed *(Sporobolus cryptandrus)*	3%	1%	Canopy Cover	19%
Russian thistle *(Salsola tragus)*	3%	0%	Litter Cover	41%
Bluedicks *(Dichelostemma capitatum)*	1%	0%	Surface Fragments > ¼" & <= 3"	0%
			Surface Fragments > 3"	0%

SJR-1 - Desired Plant Community with species composition and Functional/Structural Plant Group.

DPC Objectives for Plant Community Composition for Clayey Fan 6-10 p.z. (R035XB239AZ)	Species Composition SJR-1	Functional/Structural Group Ranking [1]
Grasses 20-30% Composition	Blue grama − 12% Sand dropseed – 3%	Dominant
	Total − 15%	
Shrubs 5-10% Composition	None	None
	Total − 0%	
Forbs 5-10% Composition	Russian thistle – 3% Bluedicks – 1%	Minor
	Total − 4%	
Trees 1-5% Composition	None	None
	Total – 0%	

[1] Dominant (D) roughly 20-100% composition, Sub-dominant (S) roughly 5-20% composition, Minor Composition (M) roughly 2-10% composition, or Trace (T) roughly <2% composition.

SJR-2 - Summary Line Point Intercept Data.

Line Point Intercept Data for SJR-2				
Plant Species	**Cover by Species**		**Site Cover/Bare Ground**	
	Canopy	**Basal**	Bare Ground	41%
Alkali sacaton (*Sporobolus airoides*)	30%	0%	Basal Cover	0%
Shadscale saltbush *(Atriplex confertifolia)*	3%	0%	Canopy Cover	33%
			Litter Cover	46%
			Surface Fragments > ¼" & <= 3"	0%
			Surface Fragments > 3"	0%

SJR-2 - Desired Plant Community with species composition and Functional/Structural Plant Group.

DPC Objectives for Plant Community Composition for Clay Loam Wash 10-14 p.z. (R035X104AZ)	Species Composition SJR-3	Functional/Structural Group Ranking [1]
Grasses 25-35% Composition	Alkali sacaton– 30%	Dominant
	Total – 30%	
Shrubs 5-15% Composition	Shadscale saltbush – 3%	Minor
	Total – 3%	
Forbs 5-10% Composition	None	None
	Total – 0%	

[1] Dominant (D) roughly 20-100% composition, Sub-dominant (S) roughly 5-20% composition, Minor Composition (M) roughly 2-10% composition, or Trace (T) roughly <2% composition.

SJR-3 - Summary Line Point Intercept Data.

Line Point Intercept Data for SJR-3				
Plant Species	**Cover by Species**		**Site Cover/Bare Ground**	
	Canopy	**Basal**	Bare Ground	34%
Sandhill muhly (*Muhlenbergia pungens*)	8%	0%	Basal Cover	1%
Threeawn *(Aristida spp.)*	4%	1%	Canopy Cover	23%
Jointfir *(Ephedra spp.)*	8%	0%	Litter Cover	38%
James' galleta (*Pleuraphis jamesii*)	1%	0%	Surface Fragments > ¼" & <= 3"	26%
Indian ricegrass *(Achnatherum hymenoides)*	1%	0%	Surface Fragments > 3"	0%

SJR-3 - Desired Plant Community with species composition and Functional/Structural Plant Group.

DPC Objectives for Plant Community Composition for Sandy Upland 10-14 p.z. (R035XA118AZ)	Species Composition SJR-3	Functional/Structural Group Ranking [1]
Grasses 15-25% Composition	Sandhill muhly − 8% Threeawn – 5% Indian ricegrass – 1%	Dominant
	Total − 14%	
Shrubs 10-20% Composition	Jointfir – 8%	Sub-dominant
	Total − 8%	
Forbs 5-10% Composition	None	None
	Total − 0%	

[1] Dominant (D) roughly 20-100% composition, Sub-dominant (S) roughly 5-20% composition, Minor Composition (M) roughly 2-10% composition, or Trace (T) roughly <2% composition.

Appendix C. Interested Public

Arizona Cattle Growers
1811 S. Alma School Road #255
Mesa, AZ 85210

Arizona Game and Fish Department
WMHB – Project Evaluation Program
5000 West Carefree Highway
Phoenix, AZ 85086-5000

Arizona Game and Fish Department
Region I – Pinetop
c/o James Eddy
2878 East White Mountain Boulevard.
Pinetop, AZ 85935

Arizona State Land Department
c/o Ronnie Tsosie
1616 West Adams
Phoenix, AZ 85007

Double R Cattle Company
P.O. Box 602
St. Johns, AZ 85936

Larry Humphrey
P. O. Box 894
Pima, AZ 85543

Natural Resource Conservation Service
c/o Thomas Vanzant
P.O. Box 329
Springerville, AZ 85938-0329

Western Watersheds Project
c/o Greta Anderson and/or Cyndi Tuell
738 North 5th Avenue, Suite 206
Tucson, AZ 85705

William K. Brandau
P.O. Box 127
Solomon, AZ 85551-0127