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Jackson Tank Allotment Grazing Permit Renewal

Mohave County, Arizona

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Table of Contents

List of Tables

List of Acronyms

AGFD	Arizona Game and Fish Department
AMP	Allotment Management Plan
AUM	Animal Unit Month
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CBW	Composition by Weight
DFC	Desired Future Condition
DPC	Desired Plant Community
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GIS	Geographic Information System
GMU	Game Management Unit
IBLA	Interior Board of Land Appeals
LHE	Land Health Evaluation
NEPA	National Environmental Policy Act
NOFD	Notice of Final Decision
NOPD	Notice of Proposed Decision
NRCS	Natural Resources Conservation Service
OHV	Off-Highway Vehicle
PL	Public Law
PNC	Potential Natural Community
PRIA	Public Rangelands Improvement Act
p.z.	Precipitation Zone
RMP	Resource Management Plan
S&G	Standards and Guidelines
SWIFL	Southwestern Willow Flycatcher
UBWR	Utah Board of Water Resources
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management

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CHAPTER 1

1.0 PURPOSE AND NEED

1.1 Introduction and Background

In 2004 and 2010 the Bureau of Land Management (BLM) conducted evaluations of rangeland conditions on the Jackson Tank Allotment (see maps in Appendix A). A detailed discussion on rangeland health in this allotment can be found in Section 3.2.3 of this environmental assessment (EA). The Interdisciplinary Assessment Team, during the land health evaluation process, recommended that resource conditions on the Jackson Tank Allotment are meeting all applicable Standards for Rangeland Health. The BLM is now considering the renewal of an existing grazing permit on the allotment. Livestock grazing on public lands is managed according to grazing regulations found in the Code of Federal Regulations (CFR) at 43 CFR Part 4100. The BLM is responsible for determining the appropriate levels and management strategies for livestock grazing in this allotment.

This EA has been prepared to disclose and analyze the environmental consequences of the proposed grazing permit renewal, as well as alternative livestock management, for the Jackson Tank Allotment. This analysis provides information as required by the BLM implementing regulations for the National Environmental Policy Act (NEPA), the Taylor Grazing Act, and the Federal Land Policy Management Act (FLPMA) to determine whether to authorize grazing within this allotment, and whether changes to current management are necessary. This EA also serves as a tool to help the authorized officer make an informed decision that is in conformance with the Arizona Strip Field Office Resource Management Plan (RMP) (BLM 2008a). The action culminates an evaluation conducted on the allotment under the Arizona BLM Standards for Rangeland Health and Guidelines for Grazing Management. In addition, this EA determines if current grazing management practices would maintain desirable conditions and continue to allow improvement of public land resources, or whether changes in grazing management for the allotment is necessary. This EA is intended to evaluate the findings of the land health evaluation as it relates to vegetation conditions and resource values in the allotment. This is done in an effort to balance demands placed on the resources by various authorized uses within the allotment.

1.2 Purpose and Need

The BLM is proposing to fully process the term grazing permit on the Jackson Tank Allotment in accordance with all applicable laws, regulations, and policies. Because the existing grazing permit for the allotment expired on February 28, 2016, the BLM renewed the permit with the same terms and conditions pursuant to Section 402(c)(2) of FLPMA, pending compliance with applicable laws and regulations. Compliance with all applicable laws and regulations includes consultation, coordination and cooperation with affected individuals, interested publics, States, and Indian Tribes; completion of the applicable level of NEPA review; consultation with the United States Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species

Act, if applicable; and ensuring that the allotment is achieving or making significant progress toward achievement of land health standards and RMP objectives. The BLM now intends to consider whether to renew, renew with modifications, or not renew the grazing permit, in accordance with those applicable laws and regulations.

The purpose of this action is to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management and the Arizona Strip Field Office RMP (BLM 2008a).

BLM Arizona adopted the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management in 1997; these Standards for Rangeland Health were incorporated into the Arizona Strip Field Office RMP. Standards for rangelands should be achieving or making significant progress towards achieving the standards and to provide for proper nutrient cycling, hydrologic cycling, and energy flow. Guidelines direct the selection of grazing management practices and, where appropriate, livestock facilities to promote significant progress toward, or the attainment and maintenance of, the standards. The RMP identifies resource management objectives and management actions that establish guidance for managing a broad spectrum of land uses and allocations for public lands in the Arizona Strip Field Office. The RMP identified public lands within the Jackson Tank Allotment as available for domestic livestock grazing. Where consistent with the goals and objectives of the RMP and land health standards, allocation of forage for livestock use and the issuance of grazing permits to qualified applicants are provided for by the Taylor Grazing Act and FLPMA.

The land health evaluation completed for the Jackson Tank Allotment (completed in 2010) identified Standards 1 and 3[1] as being achieved on the allotment, including achievement of desired plant community (DPC) objectives and desired resource conditions. Current monitoring data indicates that the standards are still being met (see Section 3.2.3 and Appendix B).

The Arizona Strip Field Manager is the authorized officer responsible for the decisions regarding management of public lands within this allotment. Based on the results of the NEPA analysis, the authorized officer will issue a determination of the significance of the environmental effects and whether an environmental impact statement (EIS) would be required. If the authorized officer determines that it is not necessary to prepare an EIS, the EA will be deemed sufficient and will provide information for the authorized officer to make an informed decision whether to renew, renew with modifications, or not renew the permit and if renewed, which management actions, mitigation measures, and monitoring requirements will be prescribed for the Jackson Tank Allotment to ensure management objectives and Arizona Standards for Rangeland Health are achieved.

1.3 Conformance with BLM Land Use Plan(s)

The alternatives described in Chapter 2 of this EA are in conformance with the Arizona Strip Field Office RMP, approved January 29, 2008 (BLM 2008a). The alternatives are consistent with the following decisions contained within this plan.

[1] As described in Section 2.1.1 of this EA, Standard 2 does not apply in the Jackson Tank Allotment.

The following decisions are from Table 2.11 in the RMP regarding management of livestock grazing:

- **DFC-GM-01:** Healthy, sustainable rangeland ecosystems will be maintained or improved to meet Arizona's Standards for Rangeland Health (1997), and produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.
- **DFC-GM-02:** Livestock use and associated management practices will be conducted in a manner consistent with other resource needs and objectives to ensure that the health of rangeland resources is preserved or improved so that they are productive for all rangeland values. Where needed, public rangeland ecosystems will be improved to meet objectives.
- **LA-GM-01:** All allotments will continue to be classified as available for grazing by livestock under the principle of multiple use and sustained yield, except where specifically noted.[2]
- **MA-GM-02:** Implementing the Arizona Standards for Rangeland Health will continue on all grazing allotments in accordance with established schedules and congressional requirements. The Arizona Standards for Rangeland Health and Guidelines for Grazing Management will apply to all livestock grazing activities. These guidelines address management practices at the grazing AMP-level and are intended to maintain desirable conditions or improve undesirable rangeland conditions within reasonable time frames.
- **MA-GM-03:** The interdisciplinary allotment evaluation process will continue to be used to provide specific guidance and actions for managing livestock grazing. Existing AMPs and other activity plans will be consistent with achieving the DFCs and standards for rangeland health. They will contain the site-specific management objectives, as well as actions, methods, tools, and appropriate monitoring protocols.
- **MA-GM-04:** Existing management practices and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet or are making progress toward meeting the Arizona Standards for Rangeland Health. Appropriate and timely actions will be implemented to deal with those areas not meeting the standards.
- **MA-GM-05:** The allotment management categorization process will continue to be used to define the level of management needed to properly administer livestock grazing according to management needs, resource conflicts, potential for improvement, and BLM funding/staffing constraints. The allotment categories are Custodial, managed custodially to protect resource conditions and values; Maintain, managed to maintain current satisfactory resource conditions and are actively managed to ensure that the condition of resource values do not decline; and Improve, actively managed to improve unsatisfactory resource conditions.
- **MA-GM-07:** Allowable use on key forage species is 50% on allotments with rotational grazing systems, except in tortoise habitat. On allotments in desert tortoise habitat or

[2] No restrictions are associated with the Jackson Tank Allotment.

being less intensively managed, then utilization is set at 45%[3].

- **MA-GM-08:** Any hay or other feed used in administering the livestock operation will be certified weed-free.

The allotment analyzed in this EA is classified as available for grazing under the RMP, with no seasonal restrictions. The alternatives would meet these land use plan decisions. It has also been determined that the alternatives would not conflict with other decisions throughout the RMP.

1.4 Relationship to Statutes, Regulations, or Other Plans

The authority to renew grazing permits is provided for in 43 CFR 4100 where the objectives of the regulations are "....to promote healthy, sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions; to promote the orderly use, improvement and development of the public lands; to establish efficient and effective administration of grazing of public rangelands; and to provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy public rangelands" (43 CFR 4100.0-2)

The alternatives comply with 43 CFR 4100.0-8 which states, in part, "The authorized officer shall manage livestock grazing on public lands under the principle of multiple use and sustained yield, and in accordance with applicable land use plans." The alternatives also comply with 43 CFR 4130.2(a) which states, in part, "Grazing permits or leases shall be issued to qualified applicants to authorize use on the public lands and other lands under the administration of the Bureau of Land Management that are designated as available for livestock grazing through land use plans".

The alternatives are consistent with the Fundamentals of Rangeland Health (43 CFR 4180.1) and Arizona's Standards and Guidelines, which were developed through a collaborative process involving the Arizona Resource Advisory Council and the BLM State Standards and Guidelines team. The Secretary of the Interior approved the Standards and Guidelines in April 1997. These standards and guidelines address watersheds, ecological condition, water quality, and habitat for special status species. These resources are addressed later in this document.

The regulations at 43 CFR Part 10 specifically require land use authorizations, including leases and permits, to include a requirement for the holder of the authorization to notify the appropriate Federal official immediately upon the discovery of human remains and other items covered by the Native American Graves Protection and Repatriation Act (see 43 CFR 10.4(g); the actual requirement for persons to notify the Federal agency official and protect the discovery is in 43 CFR 10.4(b) and (c)). This requirement has been incorporated into the alternatives.

Executive Order 13186 requires the BLM and other Federal agencies to work with the USFWS to provide protection for migratory birds. Implementation of the alternatives is not likely to adversely affect any species of migratory bird known or suspected to occur on the allotment. No take of any such species is anticipated**.**

[3] The Jackson Tank Allotment is managed under a rotational grazing system, so maximum utilization is set at 50%.

The subject allotment is in Mohave County, Arizona. The alternatives are consistent with the *Mohave County General Plan* (adopted in 1994 and revised December 5, 2005). While livestock grazing is not specifically addressed in the Mohave County General Plan, this action does not conflict with decisions contained within the Plan.

In addition, the alternatives would comply with the following laws and/or agency regulations, other plans and is consistent with applicable Federal, state and local laws, regulations, and plans to the maximum extent possible.

- Taylor Grazing Act of 1934
- Federal Land Policy and Management Act (FLPMA) of 1976 (43 U.S. Code 1701 et seq.)
- Public Rangelands Improvement Act (PRIA) of 1978
- Endangered Species Act of 1973, as amended
- 43 CFR 4100 Grazing Administration – Exclusive of Alaska
- Arizona Water Quality Standards, Revised Statute Title 49, Chapter II
- Section 106 of the National Historic Preservation Act of 1966, as amended
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S. Code 3001-3013; 104 Stat. 3048-3058)
- National Environmental Policy Act (NEPA) of 1969.

1.5 Identification of Issues

Identification of issues for this assessment was accomplished by considering the resources that could be affected by implementation of one of the alternatives. These issues were identified by the Rangeland Resources Team, Interdisciplinary Assessment Team, and livestock permittee during the scoping meeting held on October 27, 2004 and field visit held on November 17, 2004 for the Jackson Tank Allotment (see Standards for Rangeland Health and Guidelines for Grazing Administration Implementation Project: Allotment Assessment for Jackson Tank)[4] (BLM 2010), as well as through the public review process for this grazing permit renewal EA. The issues identified through the process described above are:

- Livestock grazing – permit renewal is required in order to allow continued livestock use on this allotment.

- Soils – the potential exists for impacts to soil quality or health in the allotment if proper livestock grazing practices are not followed.

- Vegetation – the potential exists for deterioration in ecological condition in the allotment if proper livestock grazing practices are not followed.

[4] The Jackson Tank Allotment evaluation is available at the BLM's Arizona Strip Field Office, 345 E. Riverside Drive, St. George, Utah 84790.

- Wildlife (including big game, sensitive species and migratory birds) – habitat for these species, as well as for their prey, may be impacted if proper livestock grazing practices are not followed.

CHAPTER 2

2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

NEPA and its implementing regulations require that an agency rigorously explore and objectively evaluate a reasonable range of alternatives. Reasonable alternatives are those that meet the purpose of and need for action and that are feasible to implement, taking into consideration regulatory, technical, economic, environmental, and other factors. This EA focuses on the alternatives of restoring suspended AUMs, reduced grazing, increased grazing, no grazing, and no action. The BLM interdisciplinary team explored and evaluated these different alternatives to determine whether the underlying need for the action, ensuring that the allotment is achieving land health standards, would be met.

2.2 Management Common to All Alternatives

The regulations at 43 CFR Part 10 specifically require land use authorizations, including leases and permits, to include a requirement for the holder of the authorization to notify the appropriate Federal official immediately upon the discovery of human remains and other items covered by the Native American Graves Protection and Repatriation Act (see 43 CFR 10.4(g); the actual requirement for persons to notify the Federal agency official and protect the discovery is in 43 CFR 10.4(b) and (c)). This requirement is incorporated as a term and condition of any grazing permit that would be issued.

2.2.1 Arizona Standards for Rangeland Health

The allotment would be managed to achieve the following objectives, as described in the Arizona Standards for Rangeland Health:

1) Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).
2) Riparian and wetland areas are in properly functioning condition.[5]
3) Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

2.2.2 Desired Plant Community

The allotment would be managed to achieve the DPC objectives developed for this allotment. The Jackson Tank Allotment land health evaluation was completed on August 20, 2010. The evaluation report listed a number of DPC objectives that were developed by consulting the Natural Resource Conservation Service's (NRCS) ecological site guides. Many factors influence changes or differences in frequency of vegetation as shown in these NRCS ecological site guides. It is important to note that the site guides are just that – they are "guides". Long-term monitoring of a site indicates what a particular area is capable of producing. The DPC objectives

[5] This standard does not apply in the Jackson Tank Allotment. As stated in Table 3.4 of this EA, there are no wetland/riparian areas in the allotment.

therefore reflect the potential of each site. The DPCs are expressed in species composition by weight (CBW).

The DPC objectives for the allotment have been updated using the description of the ecological site guides for the two key areas, as well as the potential of the sites based upon long-term monitoring (see the land health evaluation update in Appendix B). For example, monitoring of the key areas indicates that the shrub composition is not capable of meeting what the ecological site guides call for. The DPCs have also been updated and revised to reflect functional groups rather than specific plant species. Plant functional types are sets of plants exhibiting similar responses to environmental conditions and having similar effects on the dominant ecosystem processes (Gitay and Noble 1997). It is very difficult to manage large areas (such as a grazing allotment) for specific species because variations within such a large area can be quite dramatic (even within a single ecological site). By contrast, managing by functional groups allows rangeland managers to study patterns of vegetation responses from plant groups that have similar life history strategies and responses to environmental stress and disturbance (McIntyre 1999), which is more useful on the allotment scale. These DPCs provide for the habitat needs (both forage and cover) of wildlife, protection for soils and hydrologic functions, and forage for livestock.

The updated DPC objectives for Jackson Tank Allotment are:

Key Area #1 – West Pasture (Gyp Upland 7-11" p.z.)

- Maintain the perennial grass composition between 60-70%.
- Maintain the shrub/browse composition between 1-10%.
- Maintain the forb composition between 1-10%.

Key Area #2 – East Pasture (Sandy Loam Upland 7-11" p.z.)

- Maintain the perennial grass composition between 60-85%.
- Maintain the shrub/browse composition between 1-10%.
- Maintain the forb composition between 1-10%.

2.2.3 Range Improvements

The land health evaluation for this allotment did not indicate the need for new range improvements. Thus, none are proposed under any of the alternatives. Existing range improvements would be maintained as currently required. Any new range improvements proposed in the future to assist in grazing practices and promote rangeland health would be considered through a separate NEPA process.

2.3 Alternative A – Restoring Suspended AUMs

The livestock grazing management practices proposed under this alternative (i.e., season of use; utilization levels; and ecological condition and desired plant community objectives) were designed to manage the overall rangeland resources present, provide for a diversity of wildlife and plant species, maintain functioning ecosystems, and maintain and/or improve ecological condition. Specifically, under this alternative the BLM would:

- Cancel the existing grazing permit and issue a new grazing permit for the Jackson Tank Allotment for a period of ten years. There is no proposed change in season of use for the allotment. Livestock grazing would occur during the season of use, and with the number of Animal Unit Months (AUMs)[6] shown in Table 2.1. The action would not change the total number of cattle or horses permitted. During preparation of this EA, it was discovered that there was an administrative (paperwork) error dating back to 1991. The permits issued since 1991 authorized 101 cattle and 8 horses to graze from 9/16 to 6/15 (which equals 981 AUMs), but the permit also lists active AUMs as 857 AUMs, with the remaining 124 AUMs being suspended (based upon a 1981 grazing decision). There was thus a discrepancy between the number of livestock/season of use and the AUMs actually listed on the permit. This alternative would issue a new permit with a correction to this error – i.e., all 981 AUMs would be listed as active, which would be consistent with the authorized number of livestock/season of use.

Table 2.1 Jackson Tank Allotment Proposed Grazing Use under Alternative A

Kind of Livestock	Livestock Numbers	Season of Use	Active AUMs	Suspended AUMs	Public Land Acres	% Federal Land
Cattle Horses	101 8	9/16 – 6/15	981	0	8,013	100%

- Allowable use on key forage species on the allotment (which implements a rotational grazing system) would be no more than 50% utilization of current year's production, removed through grazing or other loss. (Key species for Jackson Tank Allotment are listed in Section 3.4.3 of this EA.) The BLM would assess resource conditions through field inspections and determine, in consultation with the permittee, whether management changes (e.g., changes in livestock numbers, adjustment of move date, or other changes or use within the parameters identified under this alternative) may be implemented prior to reaching maximum utilization. Move dates (i.e., removal of livestock from a pasture) may be adjusted if monitoring indicates maximum utilization has been reached, or due to unusual climatic conditions, fire, flood, or other acts of nature. If maximum utilization is reached on key species/areas in the allotment before a scheduled move date, the use of salt, herding, or other management options may be used to distribute livestock away from an area where maximum utilization has been reached, or livestock may be removed from the pasture (after consultation with the permittee), as deemed necessary by the BLM.

    - Manage the allotment to achieve the DPC objectives listed in Section 2.2.2 of this EA.

2.3.1 Grazing System

Cattle graze the allotment from September 16 to June 15 each grazing period. The entire allotment is rested from June 16 to September 15 each year. A simple two-pasture rotation grazing system designed to protect and enhance desirable plant succession has been implemented on the allotment (in an allotment management plan developed in 1973). Use of the two pastures

[6] An AUM, or Animal Unit Month, is a unit of measurement indicating how much forage is eaten by a cow/calf pair in one month.

on the Jackson Tank Allotment is alternated on successive years so that each pasture receives different use from the previous grazing period (see Chapter 3 for a detailed description of the grazing system for this allotment).

2.3.2 Terms and Conditions of Grazing Permit

- The permittee must submit an actual use report within 15 days after completing the annual grazing use. Livestock may be moved 15 days before or after scheduled move dates.

- Use of nutritional livestock supplements is allowed, including protein, minerals and salt. However, any supplements used must be dispersed at a minimum of ¼ mile from any known water sources, riparian areas, populations of special status plant species, and cultural or any other sensitive sites. Any hay or other feed used in administering the livestock operation must be certified weed-free.

2.3.3 Monitoring and Adaptive Management

This alternative includes adaptive management, which provides management options that may be needed to adjust decisions and actions to meet desired conditions as determined through monitoring. Adaptive management is a decision process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. BLM resource specialists would periodically monitor the allotment over the 10-year term of the grazing permit to ensure that the fundamentals or conditions of rangeland health are being met or making progress towards being met, in accordance with 43 CFR 4180 (see Section 4.7 of this EA). If monitoring indicates that desired conditions are not being achieved and current livestock grazing practices are causing non-attainment of resource objectives, livestock grazing management of the allotment would be modified in cooperation with the permittee. Adaptive management allows the BLM to adjust the timing, intensity, frequency and duration of grazing; the grazing management system; and livestock numbers temporarily or on a more long-term basis, as deemed necessary. For example, drought conditions, fire, or flood events could require adaptive management adjustments to be made. If a permittee disagrees with the BLM's assessment of the resource conditions or the necessary modifications, the BLM may nevertheless issue a Full Force and Effect Grazing Decision to protect resources. In addition, the principles of adaptive management would be used to ensure treatments are meeting objectives and minimizing adverse impacts over the course of project implementation while also considering other factors (such as drought) in the success of treatments and any adjustments in treatment methods that may be needed to ensure success.

2.4 Alternative B – Issue New 10-Year Grazing Permit with Reduced Grazing (Actual Use)

The livestock grazing management practices proposed under this alternative would be similar to those proposed for Alternative A. A new grazing permit would be issued for the Jackson Tank Allotment for a period of ten years. However, Alternative B would reissue the ten-year term grazing permit based on the average actual use level of the allotment over the past 49 years

(1970-2018), which is calculated at 687 AUMs. The difference between actual use average AUMs and the current active preference (which amounts to 170 AUMs) would be converted to suspended AUMs; when added to the current 124 suspended AUMs, this would result in a total of 294 suspended AUMs, or a 30% decrease in active preference as compared to Alternative A (see Table 2.2).

Table 2.2 Jackson Tank Allotment Proposed Grazing Use under Alternative B

Kind of Livestock	Livestock Numbers	Season of Use	Active AUMs	Suspended AUMs	Public Land Acres	% Federal Land
Cattle	68	9/16 – 6/15	687	294	8,013	100%
Cattle	1	9/16 – 2/15				
Horses	8	9/16 – 6/15				

Proposed utilization levels, ecological condition and DPC objectives would be the same as those described for Alternative A in order to manage the overall rangeland resources present, provide for a diversity of wildlife and plant species, maintain functioning ecosystems, and maintain and/or improve ecological condition. Terms and conditions of the grazing permit would be the same as those for Alternative A. In addition, monitoring and adaptive management described for Alternative A would also be a part of this alternative (Alternative B).

2.4.1 Alternative C – Issue New 10-Year Grazing Permit with Increased Grazing (Potential Stocking Level analysis)

Livestock grazing management practices proposed under this alternative would also be similar to those proposed for Alternative A. A new ten-year term grazing permit would be issued for the Jackson Tank Allotment. The livestock grazing use that would occur in this alternative would be the result of a potential stocking level analysis average; this potential stocking level is calculated using utilization at both key areas, as well as actual use data collected on the allotment from 1970 to 2018 (utilization data was collected during 28 of those years, so the potential stocking level analysis calculation is based on 28 years of data). The potential stocking level analysis formula is taken from BLM Technical Reference 4400-7 (BLM 1985).

Potential Stocking Level Formula: $\frac{\text{Actual Use}}{\text{Avg. Utilization}} = \frac{\text{Potential Actual Use}}{\text{Desired Avg. Utilization}}$

As shown, this formula factors in actual use, the average utilization percentage, and the desired average utilization (which is 50% for Jackson Tank Allotment). From this data, a potential stocking level (permitted use) was calculated.

Table 2.3 Jackson Tank Allotment Potential Stocking Level Analysis

Year[7]	Actual Use AUMs	Desired Utilization%	Avg. Utilization	Potential Stocking Level
1970	709	50% (based upon utilization objective in the Arizona Strip Field Office RMP)	Weighted average utilization for all years data collected	Average potential stocking level for all years data collected
1975	865			
1976	696			
1978	770			
1979	661			
1981	742			
1982	768			
1984	841			
1985	1,081			
1986	312			
1987	712			
1988	264			
1989	625			
1990	854			
1991	690			
1995	693			
1996	606			
1997	650			
1998	805			
1999	857			
2000	764			
2009	845			
2013	664			
2014	891			
2015	870			
2016	886			
2017	844			
2018	860			
Average	**744**	**50%**	**27.6%**	**1,349 AUMs**

As shown in Table 2.3, this analysis shows that the potential stocking level for the allotment is 1,349 AUMs. Under this alternative, the active preference of the allotment would be increased by 492 AUMs, from 857 to 1,349, AUMs. Utilization levels, ecological condition, DPC objectives, and goals to manage resources to meet rangeland health standards would be unchanged, as described for Alternative A. Terms and conditions of the grazing permit would be the same as those for Alternative A. In addition, monitoring and adaptive management described for Alternative A would also be the same for this alternative.

Grazing use under this alternative would be as shown in Table 2.4.

[7] Years included in this analysis are those that have both actual use and utilization data available.

Table 2.4 Jackson Tank Allotment Proposed Grazing Use under Alternative C

Kind of Livestock	Numbers	Season of Use	Active AUMs	Suspended AUMs	Public Land Acres	% Federal Land
Cattle & Horses	140 8	9/16 – 6/15	1,325	0	8,013	100%

2.5 Alternative D – No Grazing

Alternative D is to reissue a ten-year term grazing permit on the Jackson Tank Allotment with 0 authorized AUMs for active preference – all 981 AUMs would be suspended (i.e., livestock grazing would be deferred for the ten-year permit period).

2.6 Alternative E – No Action (Renew Grazing Permit with Current Terms and Conditions)

Livestock grazing management practices proposed under this alternative would be similar to those proposed for Alternative A. Under this alternative, a new ten-year term grazing permit would be issued for the Jackson Tank Allotment with the same terms and conditions as the current permit, which was renewed under the authority of Section 402(c) of FLPMA pending full processing of a new permit (as described in Section 1.2). Specifically, under this alternative the BLM would:

- Cancel the existing grazing permit and issue a new grazing permit for the Jackson Tank Allotment for a period of ten years. This alternative proposes a change in number of livestock permitted in order to correct the administrative error described for Alternative A. It would correct the number of livestock to coincide with the season of use and active AUMs (857) listed on the permit. The number of livestock would therefore change to 88 head of cattle and 8 head of horses. Livestock grazing would occur during the season of use, and with the number of AUMs limited to the preference listed in Table 2.5.

Table 2.5 Jackson Tank Allotment Proposed Grazing Use under Alternative E

Kind of Livestock	Numbers	Season of Use	Active AUMs	Suspended AUMs	Public Land Acres	% Federal Land
Cattle Cattle Horses	87 1 8	9/16 – 6/15 9/15 – 1/15 9/15 – 6/15	857	124	8,013	100%

CHAPTER 3

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter provides information to assist the reader in understanding the existing situation and current grazing management on the Jackson Tank Allotment. The affected environment is tiered to the Arizona Strip Proposed RMP/Final EIS (BLM 2007). This EA also incorporates by reference the Standards for Rangeland Health and Guidelines for Grazing Administration Implementation Project: Allotment Assessment for Jackson Tank (BLM 2010). This assessment describes the resources and issues applicable to the allotment.

The affected environment of this EA was considered and analyzed by an interdisciplinary team. Table 3.4 addresses the elements and resources of concern considered in the development of this EA; this table indicates whether the element/resource is not present in the project area, present but not impacted to a degree that requires detailed analysis or present and potentially impacted. The resources identified below include the relevant physical and biological conditions that may be impacted with implementation of the alternatives, and provides the baseline for comparison of impacts described in Chapter 4.

3.2 General Setting

The Arizona Strip is comprised of 2.8 million acres of BLM-administered land in the northwestern portion of Arizona. The Jackson Tank Allotment (see map in Appendix A) is located in Mohave County, Arizona on lands managed by the BLM's Arizona Strip Field Office. The Jackson Tank Allotment is located in the Hurricane Valley, approximately 12 miles south of the Utah - Arizona border. The Hurricane Cliffs border the allotment on the east side. The Navajo Trail crosses Hurricane Valley approximately two miles south of the allotment. The allotment lies outside of Grand Canyon-Parashant and Vermilion Cliffs National Monuments.

3.2.1 Topography

The allotment consists of rolling grasslands that are typical throughout the Hurricane Valley. Elevation ranges from 4,200 to 4,500 feet. The eastern half of the allotment consists of an outwash plain sloping from the Hurricane Rim to Hurricane Wash. The area west of Hurricane Wash is made up of gentle to steep rolling hills.

3.2.2 Climate

The climate in the area of the allotment is characterized by low rainfall (approximately 9.5 inches annually), mild winters, and warm summers. Temperatures in the region average 30 degrees in winter and 80+ degrees in summer. The climate at the allotment has an average frost-free period of 160 days with temperatures ranging from a high of 105°F in summer to a low of 10°F in winter. Precipitation data on the allotment is taken from the Gyp Pockets rain gauge located just north of the allotment boundary. A breakdown of average precipitation by season for this rain gauge is presented in Table 3.1.

Table 3.1 Jackson Tank Allotment Precipitation Data

Rain Gauge	Fall Average		Winter Average		Spring Average		Summer Average		Annual Average
	Percent of total	Inches	Percent of total	Inches	Percent of total	Inches	Percent of total	Inches	Inches
Gyp Pockets	14	1.37	28	2.74	18	1.70	40	3.81	9.63

Precipitation in Arizona typically occurs in a bimodal fashion, with a very dry May and June. Winter moisture is influenced by Pacific oceanic temperatures and airstreams; summer moisture is influenced by the North American monsoon. Summer moisture generally occurs from July through September. It should be recognized that summer rainstorms exhibit considerable variability in their location and intensity (Sprinkle et al. 2007).

Precipitation over the last 25 years has been at or above normal[8] for 12 of those years at the Gyp Pockets rain gauge, precipitation has been below normal for 12 years, and data is incomplete for one year. The highest precipitation received during that time period was in 2005 when annual precipitation was 179% of normal; the lowest was in 2002 when precipitation was 25% of normal. Annual precipitation over the past five years has generally been at or above normal, ranging from 91% to 131% of normal. However, it should be noted that departures from normal are not unusual – in fact, departures from normal are quite typical (Doswell 1997), and precipitation may very often be either well above or well below the seasonal average (National Drought Mitigation Center 2015).

3.2.3 Land Health Evaluation

The BLM regularly conducts inventories and assessments of natural resource conditions on public lands. The need for natural resource inventories was established in 1976 by Congress in Section 201(a) of FLPMA and reaffirmed in 1978 in Section 4 of PRIA. These Acts mandate that Federal agencies develop and maintain inventories of range conditions and trends on public rangelands and update inventories on a regular basis.

Rangeland landscapes are divided into ecological sites for the purposes of inventory, evaluation, and management. An ecological site is a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. It is the product of all the environmental factors responsible for its development. Within each precipitation zone, ecological sites are classified based on the differences in site factors (soil, slope, aspect, parent material, topographic potential, etc.) that affect the potential to produce vegetation.

[8] "At or above normal" for this analysis is considered 95% of average annual precipitation or greater.

Ecological sites have developed a characteristic kind and amount of vegetation. The natural plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in annual production (BLM 2001). While the natural plant community of a particular ecological site is recognized by characteristic *patterns* of species associations and community structure, the *specific species* present from one location to another may exhibit natural variability - the natural plant community is not a precise assemblage of species for which the proportions are the same from place to place, or even in the same place from year to year. Variability is the rule rather than the exception. The distinctive plant communities associated with each ecological site (including the variability which frequently occurs) can be identified and described, and are called ecological site descriptions.

The BLM measures range condition, or ecological condition, by the degree to which the existing vegetation of a site is different from the Potential Natural Community (PNC) for the respective ecological site, as identified in the ecological site description. PNC is "the biotic community that would become established if all successful sequences were completed without interferences by humans under the present environmental conditions. It may include naturalized non-native species" (BLM 2005 and BLM 2001). This differs from "historic climax plant community" in that an historic climax plant community is "the plant community that existed before European immigration and settlement" (BLM 2001). The BLM uses "potential natural community" terminology rather than "historic climax plant community" because PNC recognizes past influences by man. Knowing the PNC of the area, and using the ecological site descriptions as a guide, DPC objectives can be developed. The DPC then becomes the objectives by which management actions would be measured (Section 2.2.2 DPC).

Ecological condition expresses the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the potential natural plant community for the site. Ecological condition for most of the sites in this area change slowly. Ecological condition is reported in the following four classes, or seral stages, which are the developmental stages of ecological succession:

- **Early Seral:** 0-25% of the expected potential natural community exists.
- **Mid Seral:** 26-50% of the expected potential natural community exists.
- **Late Seral:** 51-75% of the expected potential natural community exists.
- **Potential Natural Community or PNC:** 76-100% of the expected potential natural community exists.

In 2004, a land health evaluation was conducted for this allotment, and an evaluation report was completed in 2010 (BLM 2010). This evaluation was made in accordance with the Arizona Standards and Guidelines for the Fundamentals of Rangeland Health and standard BLM methods for estimating ecological condition and current trend. Attempting to monitor 100% of any given rangeland is not physically possible. Instead, representative study sites are selected based on their ability to predict range conditions over much larger areas (University of Arizona 2010). Evaluation sites, or key areas as defined in Technical Reference 1734-4 (BLM 1999b), were selected (location and amount) using professional judgment based upon terrain, past uses of the area, and location of waters. Specific locations of key areas are available in the project file. Existing trend studies, ecological condition data, actual use, and utilization studies for the

allotment was analyzed. The trend identified in the rangeland health assessment survey assessed erosion status, vegetative cover, vigor, species diversity, location of the most palatable plants in relation to access to a grazing animal, and general age classes. The land health evaluation identified trend over a wider area within each ecological site or sites surveyed than the 3- foot x 3-foot and 5-foot x 5-foot areas the monitoring studies represent.

Additional monitoring (pace-frequency and utilization) data has been collected since the land health evaluation was completed. Utilization monitoring was conducted at both key areas in 2013, 2014, 2015, 2016, 2017, and 2018. As shown in Table 3.2, utilization at both key areas has been light.

Table 3.2 Jackson Tank Allotment Recent Utilization Percentages[9] of Key Species

Key Area	Species	2013	2014	2015	2016	2017	2018
1	Grasses	21%	20%	33%	27%	26%	33%
	Shrubs	18%	23%	31%	33%	28%	30%
	Average all species	**21%**	**23%**	**32%**	**30%**	**27%**	**31%**
2	Grasses	30%	30%	27%	33%	33%	36%
	Shrubs	20%	19%	16%	24%	13%	24%
	Average all species	**31%**	**28%**	**24%**	**30%**	**27%**	**30%**

Both of the key areas were read for pace-frequency, trend and dry weight rank in 2013 and 2018 (since the 2010 land health evaluation was completed) – trend monitoring is conducted every five years. The frequency of key species at Key Area #1 increased from 39% in 1981 to 119%[10] in 2018. Live vegetative cover increased from 0% to 10%, while litter increased from 17% to 32%. Based on frequency data, trend is upward at Key Area #1.

The frequency of key species at Key Area #2 increased from 146% in 1984 to 169% in 2018. Live vegetative cover increased from 7% to 9%, while litter decreased from 36% to 23%. Total score for all components used to calculate trend was 189 in 1984, and 201 in 2018. Based on this frequency data, trend is upward at Key Area #2.

Observations and data collected for Jackson Tank Allotment indicate that the rotation grazing system has resulted in widely dispersed grazing with good rest and recovery periods. The north pasture contains one catchment which provides reliable water from year to year. There are additional reservoirs in the north and south pasture that are unreliable due to the nature of catching water. When they do not catch and hold water, livestock distribution in the north pasture becomes limited and the south becomes unavailable. The livestock permittee has

[9] Utilization is defined as the proportion or degree ***of current year's forage production*** that is consumed or destroyed by animals (including insects).

[10] When referring to frequency monitoring results, the total number represents a combined percentage of many key species, relative to the number of quadrats (200), so can therefore exceed 100%.

discussed other possibilities to improve reliability of water. If a proposal is received in the future, appropriate NEPA would be completed.

The majority of the public lands within the Jackson Tank Allotment are in late seral, or good ecological condition. Table 3.3 lists key areas, ecological sites of both key areas, and current ecological status. Also listed is the current trend of the vegetation based on pace-frequency studies.

Table 3.3 Jackson Tank Allotment Vegetation Characteristics

Pasture	Key Area	Ecological Site	Ecological Status	Trend
West	1	Gyp Upland 7-11" p.z.	Late seral	Upward
East	2	Sandy Loam Upland Gypsic 7-11" p.z.	Late seral	Upward

Based on analyses of the allotment monitoring data and supporting documentation contained in the land health evaluation report (BLM 2010) and the 2019 evaluation update (Appendix B), including achievement of DPC objectives, resource conditions on the allotment meet all applicable standards for rangeland health.

3.3 Elements of Resources of the Human Environment

The BLM is required to consider many authorities when evaluating a federal action. Those elements of the human environment that are subject to the requirements specified in statute, regulation, or executive order, and must be considered in all EAs (BLM 2008b) have been considered by BLM resource specialists to determine whether they would be potentially affected by any of the alternatives. These elements are identified in Table 3.4, along with the rationale for determination on potential effects. If any element was determined to potentially be impacted, it was carried forward for detailed analysis in this EA. If an element is not present or would not be affected, it was not carried forward for analysis. Table 3.4 also contains other resources that have been considered in this EA. As with the elements of the human environment, if these resources were determined to be potentially affected, they were carried forward for detailed analysis.

Table 3.4 Elements/Resources of the Human Environment

NP = not present in the area impacted by any of the alternative
NI = Present, but not affected to a degree that detailed analysis is required
PI = Present with potential for impact – analyzed in detail in the EA

Resource	Determination	Rationale for Determination
Air Quality	NI	The Jackson Tank Allotment is included in an area that is unclassified for all pollutants and has been designated as Prevention of Significant Deterioration Class II. Although livestock grazing can create fugitive dust, this dust creation is localized and temporary. Thus, none of the alternatives would cause Class II standards to be exceeded. The alternatives would therefore not measurably impact air quality. Cattle grazing on public land (and elsewhere) eat vegetation that potentially stores carbon, and cattle do generate methane. The

		proposed action would be a minute source of carbon dioxide (CO_2) and other greenhouse gases (GHGs). This analysis is unable to identify the specific impacts of the alternatives' GHGs on global warming and climate change because there is insufficient information, and there are numerous models that produce widely divergent results. It is difficult to state with any certainty what impacts may result from GHG emissions, or to what extent the proposed action could contribute to those climate change impacts. It has therefore been determined that the alternatives would have a negligible effect on local, regional, and global climate change.
Areas of Critical Environmental Concern	NP	There are no Areas of Critical Environmental Concern within this grazing allotment.
Environmental Justice	NI	Minority, low income populations, and disadvantaged groups may be present within the county and may use public lands within and around the Jackson Tank Allotment. The alternatives would not cause any disproportionately high and adverse effects on minority or low-income populations, individually or collectively because there are no exposure pathways by which any population would come into contact to environmental or health hazards with chemical, biological, physical, or radiological effects.
Farmlands (Prime or Unique)	NP	Prime farmland is described as farmland with resources available to sustain high levels of production. In the southwest, it normally requires irrigation to make prime farmland. In general, prime farmland has a dependable water supply, a favorable temperature and growing season, acceptable levels of acidity or alkalinity, an acceptable content of salt and sodium, and few or no rocks. Based on these definitions, no prime or unique farmlands exist within the Jackson Tank Allotment or anywhere within the Arizona Strip Field Office
Floodplains	NI	No actions are proposed that result in permanent fills or diversions or placement of permanent facilities in floodplains or special flood hazard areas. Continued properly managed livestock grazing use would not affect the function of the floodplains within the allotment.
Native American Religious Concerns	NP	The alternatives would not limit access to any ceremonial use of Indian sacred sites, or adversely affect the physical integrity of any such site.
Threatened, Endangered or Candidate Plant Species	NP	No Threatened, Endangered, or Candidate plant species occur in the allotment.
Threatened, Endangered or Candidate Animal Species	NI	The California condor is the only known federally listed animal species that may occur within this allotment – condors may occasionally fly over or feed in this allotment at any time of year. California condors are federally listed as endangered and a population of these condors was reintroduced on the Arizona Strip in 1996. This population is designated as experimental non-essential under Section 10(j) of the Endangered Species Act. Condors are strictly scavengers and prefer to eat large, dead animals such as mule deer, elk, pronghorn, bighorn sheep, cattle, and horses. Condors range widely, easily covering over 100 miles in a day, and their current range includes the entire Arizona Strip. Although condors may either fly over or feed within the allotment, they have not been observed doing so. There is no evidence that rangeland health on this allotment is limiting or

		restricting condor population growth. Thus, no effect to this species is expected from any of the alternatives.
Cultural Resources	NI	The nature of the alternatives is such that no impact can be expected on significant cultural resources. Livestock grazing has occurred in these allotments for many years. The BLM would manage the allotment to ensure that livestock grazing would continue to be in compliance with Section 106 of the National Historic Preservation Act (36 CFR 800.3). The proposed alternatives, with no newly proposed range improvement activities, would not greatly alter the grazing activity already in place within the allotments. New range improvement actions, including fences, water facilities, and vegetation treatments, are subject to a Class III inventory and consultation with the Arizona State Historic Preservation Office. In any of the alternatives described in this EA, the regulations found within the Native American Graves Protection and Repatriation Act (NAGPRA) would apply: *If in connection with allotment operations any human remains, funerary objects, sacred objects, or objects of cultural patrimony as defined in NAGPRA (P.L. 101-601, 104 Sat. 3048, 25 U.S.C. 3001) are discovered, the permittee shall stop use in the immediate area of the discovery, protect the remains and objects (see 43 CFR 10.4(b) and (c)), and immediately notify the Authorized Officer (see 43 CFR 10.4(g)). The permittee shall continue to protect the immediate area of the discovery until notified by the Authorized Officer that operations may resume*. These regulations would not be waived and would be followed regardless of which alternative is selected, as this requirement would be included as a term and condition on the grazing permit. The renewal of grazing permits, in the absence of any construction of new range improvements, therefore does not constitute a potential adverse effect to cultural resources.
Invasive, Non-native Species	NI	Some Scotch thistle has occurred around Gardner Reservoir in the allotment. This infestation has been treated and continues to be monitored on a yearly basis. If any residual seeds germinate, they are promptly treated. Frequent inspections and monitoring will continue which will reveal any need to retreat and control as necessary. Cheatgrass is present in some areas across the Jackson Tank Allotment, although at low levels and is not out-competing native vegetation on the allotment. Cheatgrass is not on the Arizona Noxious Weed list. However it can be a very invasive non-native grass species. Research by Douglas et al. (1990) and Hunter (1991) shows that cheatgrass readily invades areas that have not been disturbed and do not have livestock influence. Young and Evans (1978) speculated that removal of livestock would actually accelerate conversion to cheatgrass because of increased fuel accumulations and more frequent wildfires. Proper range practices can help prevent the spread of undesirable plant species (Sheley 1995). Sprinkle et al (2007) found that grazing exclusion does not make vegetation more resistant to invasion by exotic annuals. Reasons for this may include: 1) grazing may result in a more diverse age classification of plants due to seed dispersal and seed implementation by grazing herbivores, and 2) grazing removes senescent plant material, and if not extreme, helps open up the plant

		basal area to increase photosynthesis and rainfall harvesting (Holechek 1981). Loeser et al. (2007) reported that moderate grazing was superior to both grazing exclusion and high-impact grazing in maintaining plant diversity and in reducing exotic plant recruitment in a semiarid Arizona grassland. It is also important to note that removal of grazing by domestic livestock does not automatically lead to disappearance of cheatgrass (Young and Clements 2007). Proper grazing use which maintains stable plant communities (as is the case in the Jackson Tank Allotment – the majority of the public lands within the allotment are in late seral, which is a very stable condition, and the allotment meets all applicable standards for rangeland health) should minimize or have no effect on the spread of invasive non-native species. The renewal of the grazing permit and continued livestock grazing are therefore not anticipated to increase the rate at which invasive species are spread throughout the area.
Wastes (hazardous or solid)	NP	No known hazardous or solid waste issues occur in this allotment, and the alternatives would not produce hazardous or solid waste. While motorized vehicles (used by the permittee for grazing management activities) involve use of petroleum products, which are classified as hazardous materials, there is nothing unique about the actions associated with the alternatives which could affect their use or risks associated with their use. No chemicals subject to reporting under Superfund Amendments and Reauthorization Act, Title III in an amount equal to or greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with any of the alternatives. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, would be used, produced, stored, transported, or disposed of in association with any of the alternatives..
Water Quality (drinking / ground)	NI	Site visits to the allotment (during rangeland health evaluations) did not indicate that current livestock use is altering water quality – no surface water within this allotment is used for domestic drinking water. Thus, no effect to water quality is expected from the alternatives.
Wetlands / Riparian Zones	NP	No wetland/riparian areas occur in the allotment.
Wild and Scenic Rivers	NP	There are no river segments within the allotment that are designated, eligible, or suitable as wild, scenic, or recreational under the Wild and Scenic Rivers Act.
Wilderness	NP	There is no designated wilderness within the Jackson Tank Allotment.
Livestock Grazing	PI	Permit renewal is required to allow continued livestock use on the allotment; this issue is therefore analyzed in detail later in this EA.
Woodland / Forestry	NI	Continued livestock use would not affect the availability of, or access to, these resources.
Vegetation	PI	Grazing has a direct impact on vegetation resulting from the practice of grazing in which livestock eat and trample plants within the allotment. This issue is therefore analyzed in detail later in this EA.
BLM or State Sensitive Plant Species	NP	There are no known BLM or state sensitive plant species within this allotment.

Wildlife (including sensitive species and migratory birds)	PI	Multiple sensitive animal species, including migratory birds, may occur within the Jackson Tank Allotment Mule deer are rare on the allotment, and would therefore not be measurably affected by livestock use. Pronghorn are the primary big game species found in the allotment. Interactions with livestock and competition for forage between pronghorn, sensitive species, and migratory birds could occur; this issue is therefore analyzed in detail later in this EA.
Soil Resources	PI	Soil impacts from grazing include decreases in soil infiltration capacity and increased compaction in trailing, loafing, and active grazing areas. This issue is therefore analyzed in detail in this EA.
Recreation	NI	The area within this allotment is within the Arizona Strip Extensive Recreation Management Area and receives custodial management for dispersed, unstructured recreation opportunities that focus only on visitor health and safety, user conflict, and resource protection issues while maintaining the area's naturalness/remoteness. The Jackson Tank Allotment is considered to have recreation values for its geology, scenic viewsheds, and history. Visitors to the allotment engage in a variety of recreation activities including horseback riding, camping, hunting, photography, bird watching, and nature study. Because the allotment is fairly close to the towns of St. George and Hurricane, Utah, day use recreation occurs and is important to local community members. The alternatives are not expected to impact the availability of recreational opportunities within this allotment.
Visual Resources	NI	The Jackson Tank Allotment is designated as Visual Resource Management (VRM) Class III, with the exception of a corridor through which the Dominguez/Escalante Historic Trail and Temple Trail pass through, which is designated VRM Class II (to protect the viewshed from these historic trails). The objective for Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The objective for Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape in these areas should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements found in the predominant natural features of the landscape. Continuing livestock grazing as proposed under the various alternatives would not affect visual resources because no new range improvements are proposed, so the existing character of the landscape would not change.
Geology / Mineral Resources / Energy Production	NI	There is no energy production on the Arizona Strip Field Office. A records search of LR2000 on April 30, 2019, found no leasable, salable or locatable authorizations and no active mining claims in the Jackson Tank Allotment. Continuing livestock grazing would not alter geological features or mineral resources. Mining activities (uranium, gypsum, and mineral materials) are occurring across the Arizona Strip, but grazing of livestock would not alter or impair the opportunities to explore for or mine these resources.
Paleontology	NI	The Potential Fossil Yield Classifications for Younger Alluvial Fan Deposits, Older Alluvial Fan Deposits and the Kaibab Formation (where the Jackson Tank Allotment is located) are low, unknown, and moderate,

		respectively. The potential for significant fossils is low. No paleontological resources are known to occur in the allotment.
Lands / Access	NI	Access to public lands would not be altered or impaired by implementation of the alternatives. No other land issues have been identified in connection with the alternatives.
Fuels / Fire Management	NI	No hazardous fuel reduction or fuels management projects are proposed for the area. Continued livestock use would not affect fire management, other than the continued reduction of some light fuels through livestock grazing.
Socio-economic Values	NI	The economic base of the Arizona Strip is mainly ranching with a few gypsum/selenite and uranium mines. Nearby communities are supported by tourism (including outdoor recreation), construction, mining activities, and light industry. The social aspect involves remote, unpopulated settings with moderate to high opportunities for solitude. Issuance of the grazing permit would allow the permittee to continue his grazing operation with some degree of predictability during the 10-year period of the term permit and would allow an historical and traditional use of the land to be maintained. The alternatives would have no overall effect on the economy of the county since other industries and tourism/recreational uses are contributing increasing amounts to the economy of the region and cattle ranching is no longer a significant contributor. Quantifiable additional or decreased economic impact to the local area would not be affected by any of the alternatives.
Wild Horses and Burros	NP	There are no wild horses or burros, or herd management areas, within the allotment.
Wilderness characteristics	NP	There are no areas managed to maintain the wilderness characteristics of naturalness, opportunities for solitude, and opportunities for primitive and unconfined recreation within this allotment.

3.4 Resources Brought Forward for Analysis

3.4.1 Livestock Grazing

A grazing permit is issued for livestock forage produced annually on the public lands and is allotted on an AUM basis. (An AUM is a unit of measurement indicating how much forage is eaten by a cow/calf pair in one month.) The BLM does not control adjacent private lands owned by permit holder(s). The livestock operator assumes grazing management responsibility with the intent to maintain or improve existing resources. Livestock are to be grazed on public lands only during the established season of use. If private land is used during different periods, it is the permittee's responsibility to keep livestock off the public land during non-grazing periods. The BLM retains the right to manage the public lands for multiple uses and to make periodic inspections to ensure that inappropriate grazing does not occur. If inappropriate grazing should occur, then the BLM would work with affected permittee to identify and prescribe actions to be taken that would return the allotment to compliance.

The allotment is categorized as a "maintain" (M) allotment. The *Arizona Strip Field Office RMP* (BLM 2008a) defines maintain allotments as those in which:

a) Present range condition is satisfactory;

b) The allotment has high or moderate resource potential and is producing near its potential (or trend is moving in that direction);
c) No serious resource-use conflicts/controversy exists;
d) Opportunities may exist for positive economic return from public investments; and
e) Present management is satisfactory.

Land ownership in the Jackson Tank Allotment consists entirely of federal land (Table 3.5). Active grazing use on the allotment is 857 AUMs, with 124 suspended non-use AUMs[11].

Table 3.5 Land Ownership

Ownership	Jackson Tank Allotment
Federal	8,013 acres
State	0 acres
Private	0 acres
Total	8,013 acres

The grazing system on the Jackson Tank Allotment is a two pasture rotation grazing system. As shown in Table 3.6, in Year 1 the West Pasture is used from September 16 – February 20. The East Pasture is available for use November 15, but it is not necessary that cattle be turned into the pasture until February. The permittee has the option to continue grazing cattle in the West Pasture until February 20, in both pastures from November 15 to February 20, or all cattle in the East Pasture starting November 15. However, the AMP outlines that (in Year 1), all livestock must use the East Pasture from February 20 until cattle are removed on June 15. In Year 2, grazing use in the two pastures is reversed. This grazing system provides rest for the entire allotment during the summer, and ensures that each pasture is grazed during a different period in successive years.

Table 3.6 Jackson Tank Grazing System

Years	West Pasture	East Pasture
1	9/16 – 2/20*	2/20 – 6/15
2	2/20 – 6/15	9/16 – 2/20**
3	Repeat Year 1	Repeat Year 1

* As described above, between November 15 and February 20, livestock can remain in this pasture, graze in both pastures, or move to the East Pasture. The West Pasture is used exclusively from 9/16 to 11/20 during Year 1, while the East Pasture is used exclusively from 2/20 to 6/15.

** As described above, between November 15 and February 20, livestock can remain in this pasture, graze in both pastures, or move to the West Pasture. The East Pasture is used exclusively from 9/16 to 11/20 during Year 2, while the West Pasture is used exclusively from 2/20 to 6/15.

Actual use within the Jackson Tank Allotment has varied between 28 percent and 107 percent[11] between 2007 and 2018. Non-use reflects seasonally dry periods, drought years or other factors.

[11] As described in Section 2.3, grazing permits issued since 1991 authorized 101 cattle and 8 horses to graze from 9/16 to 6/15 (which equals 981 AUMs), but should have authorized 857 AUMs, or 88 cattle and 8 horses, (with the remaining 124 AUMs being suspended), based upon a 1981 grazing decision.

Range Improvements

The Jackson Tank Allotment contains a number of structural range improvements (see Appendix A). These range improvements consist of fences, a catchment, a pipeline, and several reservoirs.

3.4.2 Soils

Soils within the Jackson Tank Allotment are reflective of the diversity of climate, organisms, relief (slope ranges), parent material (geology), and landscape history (time) of the project area. Geographic Information System (GIS) software (ArcMap 10.4; Environmental Systems Research Institute) was used to compile much of the background information on soils, including their factors of formation, for this EA. Interpretations of the suitability, use, and management of these soils in relation to the alternatives are derived from the Web Soil Survey for the Shivwits Area, Arizona (NRCS 2019).

Climate: As shown in Table 3.1, the Jackson Tank Allotment receives just under 10 inches of precipitation annually, on average. This relative dearth of atmospheric moisture accounts for the dry soil conditions and their taxonomic classification as "Aridisols" and "Entisols" as detailed below. Aridisols have an aridic soil moisture regime in which there is insufficient precipitation to leach soluble minerals from the soil profile (NRCS 2014). For this reason, salts and carbonate minerals such as gypsum accumulate in the soil profile and the desert vegetation adapted to grow on this soil type/precipitation regime are tolerant of these otherwise harsh conditions. The aridic soil moisture regime denotes soils that are dry in the plant rooting depth for more than 50% of the year and are "…. unsuitable for cultivation without irrigation" (NRCS 2015). The other main soil order represented in the project area are Entisols; these weakly developed soils lack distinguishing characteristics and are considered "young" soils still in the early stages of soil formation as there is not enough precipitation to move water, minerals, and clay downward through the soil profile for most of the year.

Organisms: Vegetation responsible for soil properties on the Jackson Tank Allotment are primarily the mix of native and non-native grasses, forbs, shrubs, and tree species described in further detail in the "Vegetation" section of this EA. Soils with a diverse and robust mix of root sizes (ranging from larger tree and shrub roots to smaller/finer grass and forb roots) have higher function and productivity than counterparts that lack this vegetative component. Semi-arid environments have vegetative cover that are naturally sparser relative to other ecosystems; as such, vegetative root density is inherently lower. Given this reality, soil organic matter is accordingly lower and ultimately translates to thinner topsoil (soil "A" horizon) in the analysis area. Soil organic matter has an overriding influence on many soil properties, of which erosion and compaction-resistance are no exceptions. For the Jackson Tank Allotment, soil organic matter ranges from 0.25% to 0.75% of the weight of the soil surface (A) horizon; for context, soils of the organic-rich Histosol soil order are approximately 30% organic matter by weight (NRCS 2019). This paucity of soil organic matter, coupled with low rainfall and other soil limitations such as depth to bedrock and salt content accounts for relatively low vegetation production of most of the soils (ranging from 144 to 650 pounds per acre per year) within the allotment. One exception is Map Unit 79 (Tours silt loam, 1 to 3% slopes); this deep, floodplain

deposited soil with higher fertility than the adjacent upland soils is rated at 2500 pounds of annual production for "normal" years (NRCS 2019).

Relief: Highly variable slope ranges and landforms characterize the Jackson Tank Allotment, similar to much of the Arizona Strip District. Low hills and mesas comprised of mudstones, limestones, and gypsum-bearing strata of the Moenkopi Formation and Kaibab Limestone (Harrisburg member) are found on the west side of the allotment. The area is bound to the east by Kaibab limestone and Toroweap sandstone outcrops of the Hurricane Cliffs and associated fault. In between these two bounding features are alluvial fans, stream terraces, and colluvial slopes with soils of similar heterogeneity. Soils are mapped in the "bottom" alluvial (stream, wash, terraces) area of low relief (1 to 3 percent slopes), grading towards steeper (35 to 70% slopes) hillsides and cliffs. Slope analysis conducted using 10-meter Digital Elevation Model analysis in GIS showed the mean slope of the allotment to be 15.1%, with a range of less than 1% in the valley bottoms and drainages to 200% (two feet of rise per foot of run) on cliff faces. These slope ranges affect both the distribution of slopes in terms of a relative lack of site stability for soils to develop on and the concentration of grazing on lower-sloped portions of the allotment.

Parent Material/Time: Geologic deposits of the allotment influence the distribution and properties of soils from which they form. The "Geologic Map of the Littlefield 30' x 60' Quadrangle, Mohave County, Northwestern Arizona" (Billingsley and Workman 2000) details young (Quaternary aged; 2.6 million year to 11,000 years before present) wind, water, and gravity-deposited (fan, talus, valley fill) materials that culminate in the landforms and soilscapes of the allotment. Additionally, much older Permian (Kaibab Formation) and Triassic-aged (Moenkopie Formation) gypsum-bearing sedimentary rocks underlay and contribute to the formation of large percentages of the allotment soils. Tabular and spatial summaries of this data can be found in Tables 3.7 and in Appendix A, respectively.

Table 3.7 Geology Units of the Jackson Tank Allotment (adapted from Billingsley and Workman 2000)

USGS Map Symbol	USGS Name	% of Allotment
Pkh	Kaibab Formation, Harrisburg Member	31.3
Qay	Young alluvial fan deposits	28.8
Qf	Floodplain deposits	3.2
Qgo	Older alluvial terrace deposits	5.7
Qgy	Young alluvial terrace deposits	7.5
Qv	Valley-fill alluvial deposits	3.8
TRml	Moenkopie Fm., (lower red member; Lower Triassic)	2.2

Trmlt	Moenkopie Fm., (Timpoweap Member; Lower Triassic)	3.2
TRmv	Moenkopie Fm., (Virgin Limestone Member	7.4

Soils data shown in Table 3.8 and Appendix A were garnered from the NRCS Web Soil Survey (NRCS 2019). Soil map units for the project area are predominantly from two soil taxonomic orders: Aridisols and Entisols. Soil orders are the broadest level of soil taxonomic classification and for the purpose of this analysis will be the main differentiation between soil types. The soil orders represented reflect the low-precipitation and low vegetative cover of the Jackson Tank Allotment. These soils are low in organic matter due to a lack of biomass inputs (root and leaf decay) and soil moisture. Conversely, these soil types are high in sodium, calcium, and/or sulfur salts (carbonates and sulfates) as semi-arid conditions do not promote the leaching of these minerals down through the soil profile. Soil pH is accordingly high while fertility (nutrient levels) are low when compared to other soil orders.

Aridisols account for nearly 46% of the mapped soils for the spatial bounds of the allotment. Aridisols are found on alluvial fans, fan remnants, mesas, plateaus, alluvial terraces, and valley bottoms. Geologic parent materials include sedimentary rocks including limestone and sandstone, igneous rocks such as basalt, and wind/water deposited materials. Most of the documented Aridisols that should occur in the project area have thin topsoils, typically 1 to 3 inches thick over gypsum-rich subsoil.

Entisols comprise 54% of the mapped soil types. These young, “weakly developed” soils closely resemble the geologic strata or depositional material such as wind-blown sand from which they form (NRCS 2006). For the Jackson Tank Allotment, these are found on eroding hillsides of sedimentary rocks such as limestone, gypsiferous mudstones, sandstones, and alluvial (stream channel) deposits. Landscape instability and climatic factors combine to slow the development, and hence productivity, of these soil types.

Lithic soils are defined as those soils that feature a root-restricting layer such as bedrock at a depth of less than 50 centimeters (20 inches) from the soil surface (NRCS 2006). For the Jackson Tank Allotment, nearly one third (31.4%) of the soils are mapped as having a root-limiting layer within the depth criteria for shallow soils. This is one of the impediments to higher vegetation production for the allotment.

Table 3.8 Soil Map Unit Legend for Jackson Tank Allotment, adapted from Web Soil Survey (NRCS 2019)

Soil Map Unit Symbol	Soil Map Unit Name	% of Jackson Tank Allotment
10	Berzatic family-Rock outcrop-Goblin complex, 35-70% slopes	9.7%
22	Dutchman-McCullan complex, 1-10% slopes	13.7%

23	Goblin gravelley fine sandy loam, 15-50% slopes	3.4%
54	Moenkopie-Goblin complex, 5-50% slopes	31.3%
55	Moenkopie-Pennell-Rock outcrop complex, 10-50% slopes	10.4%
58	Nutter-Gyppocket complex, 2-20% slopes	15.2%
66	Robroost fine sandy loam, 1-3% slopes	11.5%
79	Tours silt loam, 1-3% slopes	4.7%

3.4.3 Vegetation

According to the NRCS, the dominant ecological sites on the Jackson Tank Allotment are sandy loam upland gypsic (7-11" p.z.) and gyp upland (7-11" p.z.). Small inclusions of other ecological sites occur within the allotment. There are two principal vegetative types within the allotment – grassland and desert shrub. Galleta is the predominant grass species throughout the allotment. Other grasses present include black grama, sand dropseed, and gyp grass. Indian ricegrass grows in minor amounts in the rougher areas of the allotment. The desert shrub vegetative type consists of fourwing saltbush, whitesage, winterfat, Mormon tea, sagebrush, and forb species such as globemallow and desert trumpet.

Management of the allotment is based on a selection of key species. These species are selected for their similarity to other grasses and browse species that occur in the allotment. The definition of key species is: 1) forage species of sufficient abundance and palatability to justify its use as an indicator to the *degree of use* of associated species; and 2) those species which must, because of their importance, be considered in the management program (Jacoby 1974). Key species for this allotment are:

- Browse species – Mormon tea, fourwing saltbush, and winterfat
- Warm season grasses – sand dropseed, black grama, galleta, and Indian ricegrass

Table 3.9 (below) displays the phenological development stages of the key species for the allotment.

Table 3.9 Phenological Development* of Key Species for the Jackson Tank Allotment

Key Species	Begin Growth	Flowering	Seed Ripe	Seed Dissemination
Fourwing saltbush	3/15	5/15	6/15	11/15
Winterfat	3/01	6/01 – 6/15	9/15	11/15 – 12/01
Mormon tea	4/15	5/15	7/15	10/01
Indian ricegrass	2/15	5/1 – 5/31	6/15	7/01

Sand dropseed	4/15	5/20	7/15	8/30
Black grama	5/01	8/01	9/15	10/15
Galleta	7/01	8/01 – 9/15	9/15	10/01

* Phenological development stage dates vary based upon yearly fluctuations in specific climatic conditions and elevation – these dates are only estimates

3.4.4 Wildlife, Including Big Game, Migratory Birds, and Sensitive Species

3.4.4.1 Big Game

The Jackson Tank Allotment is located in AGFD's Game Management Unit (GMU) 13B. As stated previously, pronghorn (*Antilocapra americana*) are the primary big game species found on the allotment. Pronghorn are native to the Arizona Strip, but were extirpated in the early 1900s. They were first re-introduced to the Strip in 1961 and to the general area of this allotment in 1979 when 84 head were released near Diamond Butte (located south of the Jackson Tank Allotment). There have been several subsequent releases. Although no population estimates are available specifically for this allotment, the pronghorn population trend/status for GMU 13B as of 2018 is stable, with a population estimate of 253 (AGFD 2019).

Annual fawn production varies considerably from year to year. This variation is attributed to predation, annual differences in timing and amount of precipitation and subsequent forb production – during periods of drought, poor fawn survival results in low recruitment; conversely, during normal to above normal precipitation years, fawn survival and recruitment increases (AGFD 2009).

Pronghorn typically occupy grassland/desert scrub habitats; pronghorn habitat in Unit 13B consists primarily of Great Basin grasslands with areas of sagebrush, juniper and shrub encroachment (AGFD 2009). In areas dominated by shrubs, sufficient forbs preferred by pronghorn are often lacking. This is most likely related to available precipitation. In years with adequate rainfall, sufficient forbs are produced for pronghorn. During winter months when forbs are not available, pronghorn rely on browse species for forage, such as fourwing saltbush. Some dietary overlap may occur with livestock during winter months, although the level of this overlap is not known. Habitat for pronghorn on this allotment is considered to be a mix of moderate quality (85%); low quality (3%), poor quality (10%); and unsuitable (2%).

A variety of factors are considered management concerns related to the pronghorn population in this unit, with two factors identified by AGFD as being the primary reasons (AGFD 2009). These are coyote predation on fawns and many miles of fence that do not meet game standards and restrict pronghorn movement and survival. Past livestock management practices created small pastures, resulting in a proliferation of fences in pronghorn habitat. This can restrict pronghorn movement and use of suitable habitat. The BLM, working cooperatively with AGFD, completed a fence inventory of all fences on the Arizona Strip District, and is working towards fixing the portions of fencing that have been identified as not passable for pronghorn. Coyote predation on fawns has been identified as a probable limiting factor to pronghorn recruitment, especially during drought periods when fawning cover is limited or absent.

3.4.4.2 Migratory Birds

Executive Order 13186 requires the BLM and other federal agencies to work with the USFWS to provide protection for migratory birds. These species are protected by law and it is important to maintain habitat for these species so migratory patterns are not disrupted. All migratory birds are protected under the 1918 Migratory Bird Treaty Act (16 USC 703), which prohibits the taking of any migratory birds, their parts, nests, or eggs unless specifically permitted by regulation. Additional protection is provided by the Neotropical Migratory Bird Conservation Act of 2000 (16 USC Chapter 80).

The USFWS is mandated to identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act. The USFWS *Birds of Conservation Concern 2008* (USFWS 2008) is the most recent effort to carry out this mandate. Bird species considered as Birds of Conservation Concern include nongame birds, gamebirds without hunting seasons, subsistence-hunted nongame birds in Alaska, Endangered Species Act candidates, proposed, and recently delisted species. Birds of Conservation Concern found on the Arizona Strip within the habitat types on the Jackson Tank Allotment are summarized in Table 3.10.

Table 3.10 USFWS Birds of Conservation Concern Found in the Jackson Tank Allotment.

Species	Habitat Type in the Project Area
Ferruginous Hawk	Open grassland or shrubland with isolated trees (typically juniper) for nesting. (*BLM Sensitive*)
Golden Eagle	Habitat generalist, but usually forages in open country for small mammals and carrion. Large cliff faces are used for nesting. (*BLM Sensitive*)
Peregrine Falcon	Habitat generalist, but usually associated with canyons (especially near water) where they hunt for other bird species. Cliff faces are used for nesting. (*BLM Sensitive*)
Prairie Falcon	Typically occupy drier and more open country than peregrine falcons, but there is some overlap in habitat. Cliff faces are used for nesting. Found year-round on the Arizona Strip in low numbers.
Burrowing Owl	Sparsely vegetated grassland or shrubland with existing burrows excavated by badgers, rabbits, or ground squirrels. (*BLM Sensitive*)
Bendire's Thrasher	Favors open habitat with scattered junipers, cliffrose, and sagebrush. An uncommon breeder on the Arizona Strip.
Brewer's Sparrow	Breeds in sagebrush shrublands, but can be found in a variety of open habitats and riparian areas during migration and winter. Typically only nests on the Arizona Strip during years of high precipitation, otherwise breeding occurs to the north. Fairly common in large migrating flocks in spring and fall, otherwise uncommon on the Arizona Strip.
Black-chinned Sparrow	Breeds in the chaparral habitat type within rocky canyons, especially where cliffrose is present. Fairly common on the west side of the Arizona Strip within its limited habitat type.

Several of these species are also considered BLM sensitive species, and are addressed below.

3.4.4.3 Sensitive Species

Sensitive species are usually rare within at least a portion of their range. Many are protected under certain State and/or Federal laws. Species designated as sensitive by the BLM must be native species found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either:

1. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or

2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk."

All federally-designated candidate species, proposed species, and delisted species in the 5 years following delisting are included as sensitive species. Based on occurrence records and monitoring data, the sensitive species that may occur within the Jackson Tank Allotment and that may be affected by actions included in the alternatives presented in Chapter 2 are displayed in Table 3.11.

Table 3.11 Sensitive Species Associated with the Jackson Tank Allotment

Species	Potential for Occurrence
American peregrine falcon (*Falco peregrinus*)	potential
Ferruginous hawk (*Buteo regalis*)	potential
Western burrowing owl (*Athene cunicularia hypugea*)	potential
Golden eagle (*Aquila chrysaetos*)	potential

Five additional sensitive species may also occur within the allotment. However, it has been determined by BLM resource specialists that these species would not be affected by actions proposed in this EA. These species are therefore not addressed further in this document. Table 3.12 lists the sensitive species that will not be discussed in further detail, along with the rationale for their exclusion from further analysis.

Table 3.12 Sensitive Species Excluded from Further Analysis

Species	Rationale for Excluding from Further Analysis
Allen's big-eared bat *Idionycteris phyllotis*	Roost sites such as caves and abandoned mineshafts are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. No measurable impacts (changes from the existing condition) would be expected.

Townsend's big-eared bat *Corynorhinus townsendii*	Roost sites such as caves and abandoned mineshafts are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. No measurable impacts (changes from the existing condition) would be expected.
California leaf-nosed bat *Macrotus californicus*	Roost sites such as boulder piles, caves, and abandoned mineshafts are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. This species is primarily found in Sonoran desert scrub south of the Mogollon Plateau and is unlikely to occur in the project area. No measurable impacts (changes from the existing condition) would be expected.
Greater western mastiff bat *Eumops perotis californicus*	Roost sites such as rock crevices are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. No measurable impacts (changes from the existing condition) would be expected.
Spotted bat *Euderma maculatum*	Roost sites such as crevices in cliff faces are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. No measurable impacts (changes from the existing condition) would be expected.

Peregrine falcon (*Falco peregrinus anatum*)

Habitat and Range Requirements. Peregrine falcons utilize areas that range in elevation from sea level to 9,000 feet and breed wherever sufficient prey is available near cliffs. Preferred habitat for peregrine falcons consists of steep, sheer cliffs that overlook woodlands, riparian areas, and other habitats that support a high density of prey species. Nest sites are usually associated with water. In Arizona, peregrine falcons now occur in areas that had previously been considered marginal habitat, suggesting that populations in optimal habitats are approaching saturation (AGFD 2002).

Nesting sites, also called eyries, usually consist of a shallow depression scraped into a ledge on the side of a cliff. Peregrine falcons are aerial predators that usually kill their prey in the air. Birds comprise the most common prey item, but bats are also taken (AGFD 2002).

Project Area Evaluation. Potential nesting habitat is found along the steep cliff faces adjoining the east side of the allotment along the Hurricane Cliffs. Peregrine falcons may also occur in the allotment during foraging flights.

Ferruginous hawk (*Buteo regalis*)

Habitat and Range Requirements. Ferruginous hawks are large hawks that inhabit the grasslands, deserts, and open areas of western North America – they are the largest North American hawk and are often mistaken for eagles due to their size. Ferruginous means "rusty color" and refers to the bird's colored wings and legs. During the breeding season, they prefer grasslands, sagebrush, and other arid shrub country. Nesting often occurs in isolated trees or utility poles surrounded by open areas (Olendorff 1993). Mammals generally comprise 80 to 90 percent of the prey items or biomass in the diet with birds being the next most common mass component.

Project Area Evaluation. Suitable habitat for the ferruginous hawk is present on the allotment. Although nesting habitat is available, no nest sites are known to occur within the allotment.

Burrowing owl (*Athene cunicularia hypogea*)

Habitat and Range Requirements. Burrowing owls occupy a wide variety of open habitats including grasslands, deserts, or open shrublands. Burrowing owls do not dig their own burrows and must rely on existing burrows dug by prairie dogs, ground squirrels, badgers, skunks, coyotes, and foxes but will also use manmade and other natural openings Nest-site fidelity is high and burrows are often reused for several years if not destroyed (Haug et al. 1993). Moderate grazing can have a beneficial impact on burrowing owl habitat by keeping grasses and forbs low (MacCracken et al. 1985) but the control of burrowing rodent colonies in grazed areas is believed to be a significant factor in the burrowing owl's decline (Desmond and Savidge 1996). Burrowing owls are infrequently encountered on the Arizona Strip, likely due to the lack of prairie dog or other large rodent colonies.

Project Area Evaluation. Suitable habitat for burrowing owl occurs within the allotment. Although no active burrows are known within the Jackson Tank Allotment, active burrows have been documented along the Navajo Trail Road in a neighboring allotment.

Golden eagle (*Aquila chrysaetos*)

Habitat and Range Requirements. Golden eagles are typically found in open country, prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions. Black-tailed jackrabbits and rock squirrels are the main prey species taken (Eakle and Grubb 1986). Carrion also provides an important food source, especially during the winter months. Nesting occurs on rock ledges, cliffs, or in large trees. Several alternate nests may be used by one pair and the same nests may be used in consecutive years or the pair may shift to an alternate nest site in different years. In Arizona they occur in mountainous areas and vacate desert areas after breeding. Nests were observed at elevations between 4,000 and 10,000 feet. Nests are commonly found on cliff ledges; however, ponderosa pine, junipers, and rock outcrops are also used as nest sites.

Project Area Evaluation. Potential nest sites occur along the Hurricane Cliffs east of the allotment. Golden eagles have been observed in areas adjacent to the Jackson Tank Allotment and likely utilize the entirety of the allotment for hunting and scavenging. The presence of water developments may attract small mammals, such as black-tailed jackrabbits, which are prey species for golden eagle.

CHAPTER 4

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

The potential consequences or effects of each alternative are discussed in this chapter. Only impacts that may result from implementing the alternatives are described in this EA. If an ecological component is not discussed, it is because BLM resource specialists considered effects to the component and determined that the alternatives would have minimal or no effects (see Table 3.4). The intent of this analysis is to provide the scientific and analytical basis for the environmental consequences.

4.2 Direct and Indirect Impacts

4.2.1 Livestock Grazing

4.2.1.1 Direct and Indirect Impacts of Alternative A – Restoring Suspended AUMs

The action would affect the livestock grazing permittee on the Jackson Tank Allotment by renewing the term grazing permit. The action would issue a new ten-year term grazing permit with currently-suspended AUMs (124 AUMs) reinstated, resulting in increased grazing preference over current permitted use (a 14% increase) – a total of 981 AUMs. While this would appear to be an increase in grazing preference, the number of livestock and season of use currently authorized on the grazing permit would remain the same as on the existing permit. The action would therefore result in the ranching operation for the livestock operator continuing as it is presently, and provide some degree of stability for the permittee's livestock operation. Permit renewal would also meet the purpose and need for action identified in Chapter 1 of this EA – to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management and the Arizona Strip Field Office RMP (BLM 2008a), and respond to applications to fully process and renew permits to graze livestock on public land. Since the number of livestock grazing on the allotment and the current grazing system would remain in effect, the Jackson Tank Allotment should continue to meet all applicable standards for rangeland health.

4.2.1.2 Direct and Indirect Impacts of Alternative B - Issue New 10-Year Grazing Permits with Reduced Grazing (Actual Use)

This alternative would also affect the livestock grazing permittee on the Jackson Tank Allotment. Although a new term grazing permit would be issued, this alternative would reduce AUMs authorized for the permittee (a 20% reduction over current grazing preference, or an active preference of 687 AUMs), which would affect the permittee's livestock operations by not allowing as many livestock to graze on the allotment. The reduced AUMs would not provide as much stability for the permittee. This would thereby force the permittee to shrink his herd or pursue other options for the unpermitted livestock, such as leasing private pasture or obtaining substitute federal grazing permits on a different allotment. This could be challenging because federal permits do not become available very often and are in high demand. The Jackson Tank

Allotment currently meets all applicable standards for rangeland health; with reduced grazing, the allotment should continue to meet these standards for rangeland health.

4.2.1.3 Direct and Indirect Impacts of Alternative C- Issue New 10-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)

Under this alternative, a new ten-year term grazing permit would be issued with increased grazing preference (an increase of 57% over current permitted use, or 1,349 total active AUMs). Similar to Alternative A, this alternative would result in continued viable ranching operations for the livestock operator, and provide increased stability for the permittee's livestock operation – increased preference would allow the permittee to increase the size of his herd. Permit renewal would meet the purpose and need for action identified in Chapter 1 of this EA – to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, and respond to applications to fully process and renew permits to graze livestock on public land.

4.2.1.4 Direct and Indirect Impacts of Alternative D – No Grazing)

This alternative would drastically affect the livestock grazing permittee on the Jackson Tank Allotment by not authorizing any active preference under the new term grazing permit. The action would cancel the current level of livestock grazing numbers authorized. This would not provide current or future use, or stability for the permittee's livestock operation because he would not be authorized to use the allotment. Losing grazing privileges on this allotment could put the permittee out of business because he would be forced to seek alternate arrangements for his herd, such as leasing private pasture or obtaining substitute federal grazing permits on a different allotment (which, as described in Section 4.2.1.2 could be challenging). This alternative would not meet the purpose and need for action identified in Chapter 1 of this EA – to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, and respond to applications to fully process and renew permits to graze livestock on public land. (See Section 3.2.3 for a discussion on the current vegetative condition on the allotment, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management.)

4.2.1.5 Direct and Indirect Impacts of Alternative E – No Action (Renew Grazing Permit With Current Terms and Conditions)

The no action alternative would affect the livestock grazing permittee on the Jackson Tank Allotment by renewing the term grazing permit. This alternative would maintain the current permitted preference for the allotment (857 AUMs) for an additional ten years, which would result in the livestock operator continuing to operate on the allotment, and provide some degree of stability for the permittee's livestock operation. While this would appear to be a continuation of the current grazing level on the allotment (since active preference would remain the same as on the existing permit), the ***number*** of authorized livestock would be reduced from the existing permit (from 101 cattle/8 horses to 88 cattle/8 horses). This would cause the permittee to shrink his herd or pursue other options for the unpermitted livestock, such as leasing private pasture or obtaining substitute federal grazing permits on a different allotment, as described above in Section 4.2.1.2.

Permit renewal would meet the purpose and need for action identified in Chapter 1 of this EA – to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, and to respond to applications to fully process and renew permits to graze livestock on public land. The Jackson Tank Allotment currently meets all applicable standards for rangeland health; with reduced grazing, the allotment should continue to meet these standards for rangeland health.

4.2.2 Soils

A full review of the varied impacts to soils from domestic grazing is beyond the scope of this analysis. Similarly, highly detailed, ground-truthed soils analysis on existing direct and indirect effects from grazing is not practicable given staffing constraints and the scope/scale of grazing on BLM lands of the Arizona Strip. For this reason, impacts to soils are evaluated from the criteria of: 1) soil properties that confer resiliency and/or susceptibility to impacts from the alternatives; 2) vegetative health as a proxy for soil health; and 3) review of the land health evaluation and current vegetation monitoring data. Soil properties that are important to maintaining healthy vegetation and hydrologic function for grazing by domesticated animals and wildlife include (but are not limited to) permeability, erosion rates, and properly functioning riparian soils. These functions are codified in the Arizona Standards for Rangeland Health (BLM 1997) and incorporated by reference from the BLM Arizona Strip Field Office RMP.

Livestock grazing can increase soil compaction in trailing, watering, and mineral supplement areas. The Jackson Tank Allotment was deemed to be meeting applicable standards for rangeland health in the land health evaluation (BLM 2010). As described in Section 3.2.3, current monitoring data indicates that the allotment is still meeting the applicable standards for rangeland health. If vegetative health is used as a proxy for soil health, areas that are meeting the previously described standards for rangeland health should have soils that have similarly favorable trends with regard to productivity. In addition, the 50% utilization threshold would help promote conditions that maintain or improve soil health and productivity.

From the standpoint of soil infiltration/permeability and erosion rates, 12% of the soils mapped for the Jackson Tank Allotment have inherent resiliency to grazing impacts that owe to the skeletal (> 35% rock fragment content by volume) nature of the soils documented in the soil maps and associated legend tables in Appendix A. Rocky soils are less prone to erosion as rock fragments serve to “armor” the soil from wind and water erosion. Rock fragments and coarser soil particles also are more permeable, meaning that water is able to infiltrate through the soil profile faster relative to finer (clay and silt-rich) soils. Soils within the footprint of the allotment that are rocky/coarse-textured have a degree of natural resiliency to erosion and compaction. Conversely, soils with steeply-sloping, fine-textured and/or gypsum-laden profiles are less resilient when it comes to land uses such as grazing. Poor ground cover and lateral gully cutting along Hurricane Wash (along the northeast side of allotment) was noted in the land health evaluation. However, it was also noted that the wash showed some signs of healing in the bottom with vegetation established in it, and that the upland vegetation was satisfactory (BLM 2010).

The relative dearth of soil organic matter in the soils mapped for the allotment does render these soils less productive and to some degree more susceptible to compaction and erosion. Several

soil map units (10, 23, 54, and 55) are less suited to grazing for a number of reasons including higher susceptibility to soil compaction and erosion, chemical properties that hamper vegetation growth, and greater landscape instability. These soil types are mapped on nearly 50% of the allotment. Lower range production (150 to 650 pounds per acre on normal year; NRCS 2019) and more deleterious effects to soils are likely when these soils are subject to human or bovine disturbance. Grazing utilization is likely not high on these areas due to the higher slopes and lower vegetation productivity, but trailing impacts may occur.

The season of use for the allotment coincides with a period of the year (winter) when soil moisture levels are often at their highest. This can exacerbate grazing-related soil impacts in the form of compaction, reduced infiltration, and decreased soil organic matter inputs. Laboratory-measured (quantitative) bulk density tests for compaction as part of the land health evaluation process showed that for the aforementioned Tours (Map Unit 79) soil along Hurricane Wash, grazing-induced compaction (higher bulk density and lower soil porosity) was thought to stem primarily from historical grazing (BLM 2010). This data, as summarized in Table 4.1 below, shows the comparison between grazed (JT-1) and ungrazed (JT-2) soils for the Tours soils in Map Unit 79. These soils have been subject to over 100 years of trampling. While most of this compaction "likely occurred during the first decades of heavy use … [it] would be maintained by winter and early spring use when the soils are wettest to depth and are most vulnerable to compaction" (BLM 2010). Barren soil/bare shrub interspaces were noted, and vegetation was documented to be annual invasives such as Russian thistle (*Salsola tragus*).

Table 4.1 Land Health Evaluation Soil Compaction Data

Soil Sample	Location	Normal Bulk Density (g/cm^3)	Sample Bulk Density (g/cm^3)	Root Restricting Bulk Density (g/cm^3)	Increase in Bulk Density (%)	Decrease in Porosity (%)
JT-1 (Tours; 0-4" depth)	T39N R10W Sec 02 NENE	1.15	1.58	1.50	37.4	28.6
JT-1 (4-7")	1st level stream terrace	1.15	1.55	1.50	34.8	26.7
JT-1 (10-12")	1st level stream terrace	1.15	1.32	1.50	14.8	11.3
JT-2 (4-7")	2nd level stream terrace	1.15	1.09	1.5	-5.2	+ 4.1

4.2.2.1 Direct and Indirect Impacts of Alternative A – Restoring Suspended AUMs

Under this alternative, the livestock grazing permittee on the Jackson Tank Allotment would be affected by renewing the term grazing permit for 10 years, with an administrative reinstatement of 124 AUMs that was determined to be an administrative error on the grazing permit. The total number of livestock authorized would not change, but this action would correct a decades-old administrative error and authorize the 101 cattle and 8 horses that have been permitted since 1991. Soils would be subjected to varying levels of impacts previously described, but would

likely continue to meet applicable land health standards (i.e., soils and vegetation) since current grazing management practices would continue.

4.2.2.2 Direct and Indirect Impacts of Alternative B - Issue New 10-Year Grazing Permits with Reduced Grazing (Actual Use)

Under this alternative, livestock grazing would occur on the Jackson Tank Allotment with the same rotational grazing system and season of use as is currently authorized. The AUMs would be reduced on the allotment to actual use levels averaged over the past 49 years for the new 10 year term permit, which would be a 20% reduction from the current active preference. This level of reduced use would result in additional foliage remaining on vegetation, and would lessen direct impacts to soil resources including less trampling and compaction, particularly around developed water resources. The protective canopy formed by vegetation reduces the impact of rain drops on the soil surface, thereby decreasing the breakdown of soil aggregates. It also slows the velocity of runoff from rainfall and snowmelt, reducing soil loss due to sheet and rill erosion (NRCS 2015). The allotment would therefore be expected to continue to meet applicable land health standards.

4.2.2.3 Direct and Indirect Impacts of Alternative C- Issue New 10-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)

Under this alternative, a new ten-year term grazing permit would be issued, with an increase of 57% over current permitted use. Direct and indirect effects to soils under Alternative C would be similar to those described under Alternative A. However, the 57% increase in stocking levels for the allotment would likely result in more soil erosion, compaction and hydrologic impairment. This would be of particular concern in areas that are less resilient to grazing impacts and those which have not recovered from historic damage due to higher-intensity grazing. A 57% increase in permitted AUMs would represent a shift towards the higher grazing levels that are widely recognized as having caused historic soil degradation, as discussed above. There would likely be more soil degradation in the form of compaction and erosion in addition to those impacts that are likely from historic grazing. From a soils perspective, this alternative may not result in the continued attainment of land health standards.

4.2.2.4 Direct and Indirect Impacts of Alternative D – No Grazing

The effects to soil resources from the cessation of grazing by livestock would be variable. Commonly-associated effects to soils from grazing (namely compaction and reductions in vegetative cover) would cease. Vegetation, which provides a protective canopy for soils, would have the most rest and recovery as compared to the other alternatives. Abiotic (time, freeze-thaw) and biotic processes (i.e. root growth, soil organic matter accumulation) would help attenuate some grazing impacts where they occur. The extent of soil recovery in the form of improved infiltration capacity (soil permeability) and erosion rates would be hard to quantify on a landscape scale. However, removing all livestock from the allotment may result in surface compaction being reduced over time, which would increase infiltration rates, root space, available water holding capacity, and aeration. The physical condition of the surface layers of the soil would slowly improve. A gradual decrease in water runoff in areas near stock waters would likely be realized based on a lack of livestock use, resulting in greater soil infiltration. This alternative would likely have the greatest beneficial impacts to soils of all the alternatives.

4.2.2.5 Direct and Indirect Impacts of Alternative E – No Action (Renew Grazing Permit With Current Terms and Conditions)

Impacts under this alternative would be similar to those described for Alternative B (which proposed a 20% reduction in active preference), except that the new permit would correct the administrative error concerning number of authorized livestock. The active preference would remain at 857 AUMs, with 124 suspended AUMs, but the number of livestock would be corrected to 96 (88 cattle/8 horses) for the grazing season – versus the 109 (101 cattle/8 horses) on the existing permit – for a 13% reduction in number of animals authorized to graze. This level of reduced use would result in slightly more foliage remaining on vegetation, and would lessen direct impacts to soil resources including less trampling and compaction. The allotment would be expected to continue to meet land health standards under this alternative.

4.2.3 Vegetation

4.2.3.1 Direct and Indirect Impacts of Alternative A – Restoring Suspended AUMs

Plants live in ecosystems full of herbivores that range from small insects to large grazing animals. Losing leaves or stems to herbivores is a common event in the life of a rangeland plant. For rangeland plants to remain healthy and productive, enough vegetation must remain after grazing so that plants can photosynthesize and manufacture energy to produce more leaves, stems, and seeds. Plants also need to produce and store energy as starches and sugars in roots and crowns to successfully start the next season of growth. Only when too much of the plant is removed does the plant suffer in a way that yields lasting detrimental effects. Substantial damage to rangeland plants generally only occurs under repeated and heavy grazing.

The impact of grazing on plant growth depends greatly on when the grazing occurs during the growing season and at what stage of the plant's life cycle. Plants are generally less damaged by grazing early in the season when time, soil moisture, and nutrients needed for regrowth are abundant. Plants are most likely to be damaged by grazing when the plant is beginning to produce flowers and seeds. At this time, the plant has high energy demands to produce seeds, complete growth for the season, and store energy to get through the dormant season. Plus, this generally occurs at the peak of summer when the environment is hot and dry and not favorable for regrowth. Once the plant produces seeds and turns brown (i.e., begins to senesce and becomes dormant), it is no longer sensitive to grazing. At this time, the leaves are not photosynthesizing and are no longer being used by the plant (University of Idaho 2011).

Livestock can directly affect vegetation by reducing plant vigor, decreasing or eliminating desirable forage species, increasing soil instability and erosion, reducing water quantity and quality, and causing loss of, or injury to, individual plants from trampling, particularly near water developments. Long-term changes in vegetation may result if livestock use consistently exceeds established allocations, or drought or other environmental factors reduce range carrying capacity. Improper grazing practices (such as excessive utilization which removes vegetative cover) may lead to soil compaction, reduced infiltration rates, increased runoff and erosion, and declines in watershed condition. Grazing impacts on vegetation are mitigated by timing of use, adjustment of stocking rates, limiting utilization rates, and conformance with the Arizona Standards for Rangeland Health and Guidelines for Grazing Management (BLM 1997). The current grazing

system on this allotment has been developed to minimize adverse effects to vegetation by alternating use on each pasture from one year to the next and providing complete rest for the allotment each summer. This system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years, and gives warm season grasses (which are the primary grass species present on the allotment) rest every year since all cattle are removed from the allotment by June 15.

Table 4.2 Vegetation Effects from Jackson Tank Allotment Grazing System

Years	West Pasture	East Pasture
1	***Late summer/winter grazing (9/16-2/20) –*** allows cool season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	***Late Winter/spring grazing (2/20-6/15)*** – allows seed on fourwing saltbush to mature before grazing; provides for seed trampling; defers use during the growing season for warm season plants and allows them to grow and set seed (for increased vigor) each year.
2	***Late Winter/spring grazing (2/20-6/15)*** – allows seed on fourwing saltbush to mature before grazing; provides for seed trampling; defers use during the growing season for warm season plants and allows them to grow and set seed (for increased vigor) each year.	***Late summer/winter grazing (9/16-2/20) –*** allows cool season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.
3	Repeat Year 1	Repeat Year 1

As shown in Tables 3.6 and 4.2, use of the allotment would be rotated between the pastures each year so that both pastures are grazed during a different season over the 2-year rotation cycle: late summer/winter (dormant season) one year, then late winter (dormant season)/spring the following year. Late winter/spring grazing defers use during the growing season for warm season plants, while late summer/winter grazing defers use during the growing season for cool season plants. Although grazing would occur during plant growth every other year for cool season plants in this rotation, it would not occur every year, allowing periodic rest to replenish root reserves before they are grazed again. In addition, grazing would not occur during the growing season for warm season plants at all (unless growth starts "early" due to local climatic conditions) – this grazing system would maintain plant vigor and therefore vegetative condition. In addition, utilization in each pasture has been light in recent years (see Table 3.2), which leaves ample foliage on palatable plants to produce and store carbohydrates.

Much of the grazing period on the Jackson Tank Allotment is during the non-growing (or dormant) season. Grazing vegetation during the dormant season allows plants to fix carbon, reproduce, and set seed as the growing season progresses into the summer. Dormant season grazing would have neutral to negligible effects on plant communities because plants would be able to fix a significant amount of carbon prior to biomass removal and would be able to set seed. Perennial grasses would have increased capability to produce seed because grazing would occur after they have produced much of their above-ground biomass. Overall plant vigor would be maintained by dormant season grazing (because plants would be grazed only after senesce (the plant growth phase from full maturity to death or dormancy). After the grasses go dormant they are affected little by grazing (University of Idaho 2011).

Range plants evolved to withstand grazing and can withstand a heavy grazing event if done in the right season and if plants are given enough time to recover after grazing. Thus, plants can withstand removal of a part of their current year's growth and still achieve normal growth the following year. Most rangeland grasses and forbs can have 40-50% of their leaves and stems removed every year and still remain healthy and productive. In general, light use is considered less than 40%, moderate 40-65%, and heavy greater than 65% of biomass removed. The season during which the grazing occurs, and periodic rest from grazing, are very important (University of Idaho 2011). Properly managed livestock grazing is designed to cause minimal impacts to rangeland resources. The rotation grazing system developed for this allotment provides for the physiological needs of the key species – the scheduled graze and rest periods benefit key species and other vegetation by increasing plant vigor, aiding in seed dissemination, and providing periodic rest during critical growing periods (Trlica 2013).

When considering effects of grazing on shrub species, one must look at the amount of usage of current year's growth – these include the leaves and young stems that are important for photo-synthesis. The current year's growth of shrubs is the most digestible part of the plant and is the portion generally removed by browsing animals such as deer and goats. The buds are especially important to protect from grazing because they will be the source of new stems and leaves for continued growth after grazing. In winter, shrubs survive by using energy compounds (i.e., starches and sugars) stored in the stems. Thus, although the shrub is dormant, it is important to watch browsing of these stems. An indicator of "overgrazing" of shrubs is moderate or heavy hedging (i.e., growth of lateral stems just below a grazed point) and a lack of new or juvenile plants (University of Idaho 2011). Table 3.2 shows recent utilization on shrubs, based on current year's growth by weight, during the grazing season. As shown, utilization has been well below the allowed 50% at both key areas.

As described in Chapter 3 of this EA, current monitoring indicates that trend at both key areas is up. The current grazing rotation schedule gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years. It also gives warm season plants (which are the dominant species on the allotment) growing season rest every year. This grazing system is working, as shown by: 1) trend at the key areas being up; 2) the ecological site condition being late seral (or good); and 3) utilization levels remaining light.

Allotment monitoring data also indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. One factor in making this determination was the assessment that DPC objectives for vegetation components at the key areas (as presented in Section 2.2.2 of this EA) are being met on the Jackson Tank Allotment. It should be noted that, as previously described, the DPC objectives for this allotment were developed by consulting the NRCS ecological site guides. Many factors influence the composition of vegetation as shown in these NRCS ecological site guides, and the site guides are just that – they are "guides". Long-term monitoring of a site indicates what a particular area is capable of producing – monitoring of the key areas on Jackson Tank Allotment indicates that the sites are not capable of producing the shrub composition that the ecological site guide calls for. The DPC objectives therefore reflect the potential of each site.

Since the same management regime has been in place for many years, it is expected that livestock grazing proposed under this alternative would minimally affect vegetation, and ecological condition would be maintained (the key areas are in late seral stage, which is a very stable condition). Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, changes to the grazing use would be made (as described in Section 2.3 of this EA). However, current monitoring data does not indicate that any changes to grazing management are necessary.

4.2.3.2 Direct and Indirect Impacts of Alternative B – Issue New 10-Year Grazing Permits with Reduced Grazing (Actual Use)

Under this alternative, grazing would be authorized for the Jackson Tank Allotment with the same grazing system as that described for Alternative A (see Table 3.6). Since the seasons of use for both of the pastures would be the same as for Alternative A, impacts to vegetation would be similar to those described for Alternative A (see Table 4.2). However, fewer livestock would be authorized under this alternative (687 AUMs vs. 857), so grazing intensity under this alternative would be less. Thus, additional foliage would remain on palatable plants (both grasses and shrubs) within the allotment, which would maximize their herbage producing ability (Holecheck et al. 1999).

As described in Section 3.2.3, allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. Livestock grazing as proposed under this alternative would minimally affect vegetation, and overall plant vigor would be maintained. Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, and livestock grazing is a causal factor, changes to the grazing use would be made (as described in Section 2.3 of this EA).

4.2.3.3 Direct and Indirect Impacts of Alternative C – Issue New 10-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)

Under this alternative, grazing would be authorized for the Jackson Tank Allotment, with the same grazing system as that described for Alternative A (see Table 3.6). Since the seasons of use for both pastures would be the same as for Alternative A, impacts to vegetation would be similar to those described for Alternative A (see Table 4.2). However, more livestock would be authorized under this alternative (1,349 vs. 857), so grazing intensity under this alternative would be greater; although maximum utilization would not exceed 50% (as prescribed in the RMP), it is likely that the increased number of AUMs would result in 50% utilization occurring every year, unlike the current condition where utilization generally averages 30% or less. Thus, while utilization would still be in the "moderate" category, less total foliage would remain on palatable plants (both grasses and shrubs) within the allotment. This alternative has the potential to have the greatest impacts on vegetation. However, as described in Section 4.2.3.1 above, most rangeland grasses and forbs can have 40-50% of their leaves and stems removed every year and still remain healthy and productive.

As described in Section 3.2.3, allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. Livestock grazing as

proposed under this alternative is not anticipated to significantly affect vegetation (due to not exceeding 50% utilization, and also due to alternating season of use in both pastures over a 2-year rotation cycle to provide periodic rest for vegetation); it is therefore expected that overall plant vigor would be maintained. Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, and livestock grazing is a causal factor, changes to the grazing use would be made (as described in Section 2.3 of this EA).

4.2.3.4 Direct and Indirect Impacts of Alternative D – No Grazing

Under this alternative, no livestock grazing would occur so plants would only be minimally grazed by wildlife. Vegetation would therefore have the most rest and recovery as compared to the other alternatives. Although the allotment is already meeting all applicable standards for rangeland health, plant communities would still benefit from rest. Because no livestock grazing would occur, plants would remain ungrazed or minimally grazed (by wildlife) each year. All plant species would benefit from no grazing. This alternative would therefore result in the least grazing on vegetation, meaning the plants would have the maximum amount of energy compounds in their stems for survival and reproduction.

4.2.3.5 Direct and Indirect Impacts of Alternative E – No Action (Renew Grazing Permit with Current Terms and Conditions)

Under Alternative E, grazing would be authorized with the same season of use, pasture rotation, and maximum utilization level (see Sections 2.6 and 4.2.1.5). The active preference (stocking level) would remain the same as on the current permit (see Table 2.5), although the number of livestock permitted would be reduced (to correct the administrative error on the existing permit). Impacts to vegetation under this alternative would be similar to those described under Alternative B. Since the same management regime has been in place for many years, it is expected that livestock grazing proposed under this alternative would minimally affect vegetation, and ecological condition would be maintained (trend at the key areas is up, and vegetation is in late seral stage, which is a very stable condition).

4.2.4 Wildlife, Including Big Game, Migratory Birds, and Sensitive Species.

Herbaceous vegetation provides forage and concealment cover for wildlife species, particularly during the spring breeding period when calving, fawning, nesting, and rearing of young occurs. Livestock grazing reduces the height and amount of herbaceous vegetation. The presence of livestock and the movement of livestock between areas of use could result in the direct disturbance or displacement of some wildlife from preferred habitats and nesting/birthing sites. Both the disturbance and displacement of wildlife and the reduction of herbaceous forage and cover could limit the productivity and reproductive success of some species. However, the livestock grazing proposed in Alternatives A, B, C and E would alternate season of use between the two pastures so that each pasture is grazed during a different season over the 2-year rotation cycle, which would help maintain vegetative condition, and therefore wildlife habitat components (see “Vegetation” section above).

4.2.4.1 Direct and Indirect Impacts of Alternative A – Restoring Suspended AUMs

Big Game

Cattle and horses are the primary domestic livestock species sharing rangelands with pronghorn on the Arizona Strip, and about 99% of pronghorn roam rangelands with livestock at some time during the year (Yoakum and O'Gara 1990). Although those animals have coexisted with pronghorn for centuries, there can be specific situations that are cause for concern. The abundance of forbs and grasses during late gestation and early lactation is a major factor in pronghorn fawn survival. Reduced availability of that forage component due to consumption by livestock can result in reduced carrying capacity for pronghorn. On rangelands in good ecological condition, however, competition for forage is not generally a significant factor. In areas dominated by grasses, cattle can have a positive effect on pronghorn by removing the grasses and increasing the availability of forbs and shrubs preferred by pronghorn. The presence of domestic livestock on pronghorn fawning areas has been shown to displace does to less suitable habitat during this critical time (McNay and O'Gara 1982).

As described in Chapter 3, pronghorn are the primary big game species present on the Jackson Tank Allotment, and the pronghorn population trend/status for GMU 13B is stable (AGFD 2019). The allotment consists primarily of moderate quality habitat (85%), with a small amount of low quality (3%), poor quality (10%), and unsuitable (2%) habitat for this species. While the presence of livestock and the trailing of livestock between use areas could displace does during fawning, this potential for displacement would not occur every year due to the rotational grazing system in place. In addition, pronghorn densities in this allotment are low given that they utilize the entire valley, so few does would be potentially affected.

Both key areas in the allotment are within "moderate quality" pronghorn habitat. The Arizona Strip Field Office RMP includes a forage objective of at least 20% grasses and forbs, and 20% palatable shrub species in pronghorn habitat, where consistent with site potential. The key areas within the Jackson Tank Allotment currently have the forage compositions listed in Table 4.3.

Table 4.3 Forage Compositions in Pronghorn Habitat

Key Area	Grass Composition	Forb Composition	Grass/Forb Objective Met (Y/N)	Palatable Shrubs	Objective Met (Y/N)
Key Area #1	95%	1%	**Y**	2%	**N**
Key Area #2	99%	6%	**Y**	0%	**N**

As shown in the table, the RMP forage objective for grass/forbs is met at both key areas, while the shrub objective is not met at either key area. It is important to note that the Jackson Tank Allotment occurs within a perennial grassland and, as demonstrated by the DPC objectives developed for this allotment (which were determined by consulting the appropriate ecological site guides, and considering over 30 years of vegetation monitoring data), it is likely not within the capability of these sites to produce such a high percent of shrubs. However, observations of other

areas in this allotment indicate that there may be a greater percentage of shrubs in number and height outside of the key areas and in different soil types.

Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health, including meeting the DPC objectives for vegetation components at the key areas. Table 4.3 also demonstrates that RMP forage objectives for pronghorn are currently being met at the key areas to the extent possible (i.e., within the capability of the site). Competition for forage between livestock and pronghorn should be minimal since the same management regime has been in place for many years and it is therefore expected that livestock grazing proposed under this alternative would minimally affect vegetation (i.e., habitat for pronghorn), and ecological condition of that habitat would be maintained (see Section 4.2.3.1). Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, changes to the grazing use would be made (as described in Section 2.3 of this EA). However, current monitoring data does not indicate that any changes to grazing management are necessary. Alternative A would therefore not affect meeting habitat (i.e., forage) objectives for pronghorn.

Migratory Birds

Properly managed livestock grazing is designed to cause minimal impacts to rangeland resources, including wildlife habitat. As described previously, allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. One factor in making this determination was the assessment that DPC objectives for vegetation components at the key areas are being met on the Jackson Tank Allotment. Migratory birds may be impacted by minor forage competition from livestock. However, managing this allotment to achieve DPC objectives and implementation of the proposed utilization levels would result in maintaining the ecological condition of the allotment (see "Vegetation" discussion above) and maintain habitat components for migratory birds. In addition, alternating the season of use for both pastures would provide periodic rest for vegetation to help maintain plant vigor. Implementation of this alternative is therefore unlikely to impact any species of migratory bird known or suspected to occur on the allotment. No take of any migratory bird species is anticipated.

Sensitive Species

<u>Peregrine falcon, golden eagle</u>

Nesting sites for peregrine falcons or golden eagles would not be impacted by livestock within the allotment because these sites are located on ledges in cliff faces that are inaccessible to livestock. Prey species for peregrine falcons, such as mourning doves, generally do well in human altered environments including grazed areas. Habitat for golden eagle prey species, such as black-tailed jackrabbits, could be adversely impacted if overutilization occurs. Average utilization over the past 26 readings has been 27.6% (Table 3.2) which is well below the allowable 50%, although utilization could be up to 50%. The effects of moderate grazing (defined as 40-65%) can be negligible to slightly beneficial for many prey species (Olendorff 1993). Vegetation in the allotment is sufficient to provide food and shelter requirements for populations of prey species for the peregrine falcon. Prey habitat for these species would be minimally affected because grazing under this alternative alternates season of use for both pastures to provide periodic rest for the plant

communities (see "Vegetation" discussion above). Managing the allotment to achieve DPC objectives and implementation of the proposed utilization level would result in maintaining or improving the ecological condition of the allotment. Disturbance to nest sites from livestock management operations is unlikely given the remote and inaccessible locations these species choose for nesting. Implementation of this alternative is not likely to impact peregrine falcon or golden eagle habitat or nesting success.

Ferruginous hawk

Nesting sites and habitat for ferruginous hawk prey species have the potential to be impacted by livestock grazing within the allotment. Isolated nest trees used by this species could be impacted through rubbing of the trunk and girdling the trees through abrasion, or by damaging the root system from congregations of cattle seeking shade. The likelihood of this occurring in the Jackson Tank Allotment is minimal since the trees where nests would occur are larger in girth and would not be readily affected by an animal rubbing against them (Olendorff 1993 acknowledged that this situation is not prevalent with pinyon pine or juniper trees), and no documented nests occur within the allotment. Habitat for prey species, such as black-tailed jackrabbits, could be adversely impacted if overutilization occurs. However, the effects of moderate grazing can be negligible to slightly beneficial for many prey species (Olendorff 1993). Vegetation in the allotment is sufficient to provide food and shelter requirements for populations of prey species for the ferruginous hawk. Managing the allotment to achieve DPC objectives and implementation of the proposed utilization level would result in maintaining or improving the ecological condition of the allotment. Ferruginous hawks are sensitive to disturbance near the nest site. However, no nesting has been documented in this allotment so impacts to nesting are unlikely and would not lead to a trend toward listing.

Burrowing owl

Nesting burrows for burrowing owls could potentially be impacted by livestock within the allotment through trampling. However, burrowing owls prefer open country with sparse vegetation and can do well in moderately to heavily grazed areas. Occupied burrows in adjacent allotments frequently have cows nearby during monitoring visits (Langston, personal obs.). Prey species are numerous in the allotment and include small mammals, insects, reptiles, and amphibians. Vegetation in the allotment is sufficient to provide food and shelter requirements for populations of prey species for the burrowing owl. Managing the allotment to achieve DPC objectives and implementation of the proposed utilization level would result in maintaining or improving the ecological condition of the allotment. Disturbance to nest sites from livestock management operations would be minimal because this species is known to tolerate moderate levels of disturbance. Implementation of this alternative is not likely to impact burrowing owl habitat or nesting success in the allotment.

4.2.4.2 Direct and Indirect Impacts of Alternative B – Issue New 10-Year Grazing Permits with Reduced Grazing (Actual Use)

Big Game

Under this alternative, grazing would be authorized with the same grazing system as that described for Alternative A (see Table 3.6). While the presence of livestock and the trailing of

livestock between use areas could displace does during fawning, this potential for displacement would not occur every year due to the rotational grazing system in place. In addition, pronghorn densities in the allotment are low so few does would be potentially affected. Since the season of use for the pastures would be the same as for Alternative A, impacts to vegetation (i.e., habitat) would be similar to those described for Alternative A (see Table 4.2). However, fewer livestock would be authorized under this alternative (687 vs. 857, or a 20% decrease) so grazing intensity under this alternative would be less. Thus, additional foliage would remain on palatable plants (grasses, forbs, and shrubs) within the allotment as compared to Alternative A.

As described in Section 3.2.3, allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. Livestock grazing as proposed under this alternative would minimally affect vegetation. Decreased livestock grazing would result in overall plant vigor being maintained; composition of grasses would remain high and continue to meet RMP forage objectives grasses/forbs within pronghorn habitat; as described in Section 4.2.4.1, the allotment occurs within a perennial grassland and, as demonstrated by the DPC objectives developed for this allotment (which were determined by consulting the appropriate ecological site guides), it is likely not within the capability of these sites to produce a high percent of shrubs. It has therefore been determined that this alternative would result in minimal competition for forage between livestock and pronghorn. Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, and livestock grazing is a causal factor, changes to the grazing use would be made (as described in Section 2.3). Implementation of this alternative is not likely to impact pronghorn within the allotment.

Migratory Birds

Impacts under this alternative would be similar to those described for Alternative A except that fewer (20% less) livestock would be authorized to graze on the allotment. Decreased grazing would result in overall plant vigor being maintained and additional foliage would remain on vegetation to provide necessary forage and shelter habitat components for migratory birds. Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. One factor in making this determination was the assessment that DPC objectives for vegetation components at the key areas are being met on the Jackson Tank Allotment. Managing this allotment to achieve DPC objectives and implementation of the proposed rotational grazing system would help ensure that habitat components for migratory birds are maintained. Implementation of this alternative is therefore unlikely to impact any species of migratory bird known or suspected to occur on the allotment, and no take of any migratory bird species is anticipated.

Sensitive Species

<u>Peregrine falcon, ferruginous hawk, burrowing owl, golden eagle</u>

Impacts under this alternative would be similar to those described for Alternative A except that fewer (20% less) livestock would be authorized to graze on the allotment. Vegetation in the allotment is currently sufficient to provide food and shelter requirements for populations of prey species (small mammals, birds, and rabbits) for these birds, although plants would likely benefit from decreased grazing pressure. Allotment monitoring data indicates that resource conditions

on the allotment currently meet all applicable standards for rangeland health. Managing the allotment to achieve DPC objectives and implementation of the proposed rotational grazing system would result in maintaining the ecological condition of the allotment (see "Vegetation" discussion above). Nesting sites and habitat for peregrine falcons and golden eagles would not be impacted by livestock within the allotment because these species select sites that are inaccessible to livestock. Minor disturbance at ferruginous hawk and burrowing owl nest sites, as described for Alternative A (see Section 4.2.4.1), could occur but with reduced potential due to reduced grazing. Therefore, implementation of this alternative is not likely to impact BLM sensitive species within the allotment, and would not lead to a trend toward listing.

4.2.4.3 Direct and Indirect Impacts of Alternative C – Issue New 10-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)

Big Game

Under this alternative, grazing would be authorized for the Jackson Tank Allotment, with the same grazing system as that described for Alternative A (see Table 3.6). While the presence of livestock and the trailing of livestock between use areas could displace does during fawning, this potential for displacement would not occur every year due to the rotational grazing system in place. In addition, pronghorn densities in this area are low so few does would be potentially affected. Since the seasons of use for the pastures would be the same as for Alternative A, impacts to vegetation communities (i.e., habitat for pronghorn) would be similar to those described for Alternative A. However, more livestock would be authorized under this alternative (1,349 vs. 857), so grazing intensity under this alternative would be greater, although maximum utilization would not exceed 50%. Thus, while utilization would still be in the "moderate" category, it is likely that less total foliage would remain on palatable plants (grasses, forbs, and shrubs) within the allotment because the 50% limit could be reached every year, unlike the current condition where utilization generally averages 30% or less. Although most rangeland grasses and forbs can have 40-50% of their leaves and stems removed every year and still remain healthy and productive, this alternative has the greatest potential to result in competition for forage between livestock and pronghorn.

As described in Section 3.2.3, allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. Livestock grazing as proposed under this alternative is not anticipated to significantly affect vegetation (due to not exceeding 50% utilization, and also due to alternating season of use in both pastures over a 2-year rotation cycle to provide periodic rest for vegetation). In addition, since the allotment occurs within a perennial grassland (and it is likely not within the capability of the sites to produce a high percent of shrubs), it is expected that composition of forage plants (as presented in Table 4.3) would be maintained. Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, and livestock grazing is a causal factor, changes to the grazing use would be made (as described in Section 2.3).

Migratory Birds

Impacts under this alternative would be similar to those described for Alternative A except that additional (55% more) livestock would be authorized to graze on the allotment so grazing intensity

would be greater, although maximum utilization would not exceed 50%. Thus, while utilization would still be in the "moderate" category, less total foliage would remain on vegetation to provide necessary forage and shelter habitat components for migratory birds, as described above. Although most rangeland grasses and forbs can have 40-50% of their leaves and stems removed every year and still remain healthy and productive, this alternative has the greatest potential to impact migratory birds. Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. One factor in making this determination was the assessment that DPC objectives for vegetation components at the key areas are being met on the Jackson Tank Allotment. Managing this allotment to achieve DPC objectives and implementation of the proposed rotational grazing system would help ensure that habitat components for migratory birds are maintained. Implementation of this alternative is therefore unlikely to impact any species of migratory bird known or suspected to occur on the allotment, and no take of any migratory bird species is anticipated.

Sensitive Species

Peregrine falcon, ferruginous hawk, burrowing owl, golden eagle

Impacts under this alternative would be similar to those described for Alternative A except that additional (55% more) livestock would be authorized to graze on the allotment so grazing intensity would be greater, although maximum utilization would not exceed 50%. Thus, while utilization would still be in the "moderate" category, less total foliage would remain on vegetation to provide food and shelter requirements for populations of prey species (small mammals, birds, and rabbits) for these birds, as described above. Although most rangeland grasses and forbs can have 40-50% of their leaves and stems removed every year and still remain healthy and productive, this alternative has the greatest potential to impact sensitive species.

Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. Livestock grazing as proposed under this alternative is not anticipated to significantly affect vegetation (due to not exceeding 50% utilization, and also due to alternating season of use in the pastures over a 2-year rotation cycle to provide periodic rest for vegetation); it is therefore expected that overall plant vigor, and thus food and shelter requirements for populations of prey species, would be maintained. Implementation of this alternative should not significantly impact any sensitive species known or suspected to occur on the allotment, and would not lead to a trend toward listing.

4.2.4.4 Direct and Indirect Impacts of Alternative D – No Grazing

Big Game

Under this alternative, no livestock grazing would occur so plants would only be minimally grazed (by wildlife). Vegetation would therefore have the most rest and recovery as compared to the other alternatives – although the allotment is already meeting all applicable standards for rangeland health, plant communities would still benefit from rest. Since this alternative would result in the least grazing on vegetation, plants would have the maximum amount of energy compounds in their stems for survival and reproduction; plant communities would continue to provide sufficient forage for pronghorn, and the RMP forage objective for grasses/forbs for pronghorn would continue to be met at both key areas (due to the capability of the sites, it is

likely not within the capability of the sites to produce a high percent of shrubs). In addition, since no livestock would be present on the allotment, no potential for displacement of does during fawning would occur.

Migratory Birds

Under this alternative, vegetation would have the most rest and recovery as compared to the other alternatives. Although the allotment is meeting all applicable standards for rangeland health, plant communities would still benefit from rest. Because no livestock grazing would occur, plants would remain ungrazed or minimally grazed (by wildlife) each year. Grasses would continue to fix a significant amount of carbon, produce seed, and set seed; shrubs would have the maximum amount of energy compounds in their stems for survival over the winter dormant season. Vegetation in the allotment would therefore continue to provide sufficient food and shelter requirements for migratory birds. In addition, nesting sites for migratory birds would not be impacted by livestock within the allotment. No take of any migratory bird species would be anticipated from implementation of this alternative.

Sensitive Species

Under this alternative, vegetation would have the most rest and recovery as compared to the other alternatives. Although the allotment is meeting all applicable standards for rangeland health, plant communities (which provide habitat components for prey species) would still benefit from rest. Because no livestock grazing would occur, plants would remain ungrazed or minimally grazed (by wildlife) each year. Grasses would continue to fix a significant amount of carbon, produce seed, and set seed; shrubs would have the maximum amount of energy compounds in their stems for survival over the winter dormant season. Vegetation in the allotment would continue to be sufficient to provide food and shelter requirements for populations of prey species (small mammals, birds, and rabbits) for these birds.

4.2.4.5 Direct and Indirect Impacts of Alternative E – No Action (Renew Grazing Permit with Current Terms and Conditions)

Big Game

Under this alternative, grazing would be authorized with the same grazing system as that described for Alternative A (see Table 3.6). While the presence of livestock and the trailing of livestock between use areas could displace does during fawning, this potential for displacement would not occur every year due to the rotational grazing system in place. In addition, pronghorn densities in the allotment are low so few does would be potentially affected. Since the season of use for the pastures would be the same as for Alternative A, impacts to vegetation (i.e., habitat) would be similar to those described for Alternative A (see Table 4.2). However, fewer livestock would be authorized under this alternative (857 vs. 981, or a 13% decrease compared to Alternative A) so grazing intensity under this alternative would be less. Thus, additional foliage would remain on palatable plants (grasses, forbs, and shrubs) within the allotment.

As described in Section 3.2.3, allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. Livestock grazing as proposed under this alternative would minimally affect vegetation. Decreased livestock grazing

would result in overall plant vigor being maintained; composition of grasses would remain high and continue to meet RMP forage objectives grasses/forbs within pronghorn habitat; as described in Section 4.2.4.1, the allotment occurs within a perennial grassland and, as demonstrated by the DPC objectives developed for this allotment (which were determined by consulting the appropriate ecological site guides), it is likely not within the capability of these sites to produce a high percent of shrubs. It has therefore been determined that this alternative would result in minimal competition for forage between livestock and pronghorn. Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, and livestock grazing is a causal factor, changes to the grazing use would be made (as described in Section 2.3). Implementation of this alternative is not likely to impact pronghorn within the allotment.

Migratory Birds

Impacts under this alternative would be similar to those described for Alternative A except that fewer (13% less) livestock would be authorized to graze on the allotment. Decreased grazing would result in overall plant vigor being maintained and additional foliage would remain on vegetation to provide necessary forage and shelter habitat components for migratory birds. Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. One factor in making this determination was the assessment that DPC objectives for vegetation components at the key areas are being met on the Jackson Tank Allotment. Managing this allotment to achieve DPC objectives and implementation of the proposed rotational grazing system would help ensure that habitat components for migratory birds are maintained. Implementation of this alternative is therefore unlikely to impact any species of migratory bird known or suspected to occur on the allotment, and no take of any migratory bird species is anticipated.

Sensitive Species

<u>Peregrine falcon, ferruginous hawk, burrowing owl, golden eagle</u>

Impacts under this alternative would be similar to those described for Alternative A except that fewer (13% less) livestock would be authorized to graze on the allotment. Vegetation in the allotment is currently sufficient to provide food and shelter requirements for populations of prey species (small mammals, birds, and rabbits) for these birds, although plants would likely benefit from decreased grazing pressure. Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. Managing the allotment to achieve DPC objectives and implementation of the proposed rotational grazing system would result in maintaining the ecological condition of the allotment (see "Vegetation" discussion above). Nesting sites and habitat for peregrine falcons and golden eagles would not be impacted by livestock within the allotment because these species select sites that are inaccessible to livestock. Minor disturbance at ferruginous hawk and burrowing owl nest sites, as described under Alternative A, could potentially occur but with slightly reduced potential due to reduced livestock numbers. Therefore, implementation of this alternative is not likely to impact BLM sensitive species within the allotment, and would not lead to a trend toward listing.

4.3 Cumulative Impacts

"Cumulative impacts" are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable actions regardless of what agency or person undertakes such other actions. This EA is intended to qualify and quantify the impacts to the environment that result from the incremental impact of the alternatives when added to other past, present, and reasonably foreseeable future actions. These impacts can result from individually minor but collectively important actions taking place over a period of time. Specific actions that have occurred, are occurring, or are likely to occur in the reasonably foreseeable future include:

- ***Livestock grazing*** – Livestock grazing in the region has evolved and changed considerably since it began in the 1860s and is one factor that has created the current environment – livestock grazing has occurred in the area for 150+ years. The Jackson Tank Allotment and the adjacent BLM-administered land are active grazing allotments. Each of these allotments is managed under a grazing system that is documented and described in an AMP. Cumulative impacts to livestock grazing are discussed in Section 4.3.1.
- ***Recreation*** – Recreation activities occurring throughout the allotment and adjacent areas involve a broad spectrum of pursuits ranging from dispersed and casual recreation to organized, BLM-permitted group uses. Typical recreation in the region includes off-highway vehicle (OHV) driving, scenic driving, hunting, hiking, wildlife viewing, horseback riding, camping, backpacking, mountain biking, geocaching, picnicking, night-sky viewing, and photography. The Arizona Strip is known for its large-scale undeveloped areas and remoteness, which provide an array of recreational opportunities for users who wish to experience primitive and undeveloped recreation, as well as those seeking more organized or packaged recreation experiences.
- ***Mining and Mineral Resources*** – Public lands within and adjacent to the Jackson Tank Allotment are open to mineral development. The primary economic mineral resources in the area are salable minerals (consisting primarily of sand, stone and gravel but also clay), gypsum, and uranium. The potential for gravel is high. Several existing mineral material pits occur in the area.

4.3.1 Cumulative Impacts to Livestock Grazing

Livestock grazing in the region has evolved and changed considerably since it began in the 1860s and is one factor that has created the current environment. At the turn of the century, large herds of livestock grazed on unreserved public domain in uncontrolled open range. Eventually, the range was stocked beyond its capacity, causing changes in plant, soil, and water relationships. Some speculate that the changes were permanent and irreversible, turning plant communities from grass and herbaceous species to brush and trees. Protective vegetative cover was reduced, and more runoff brought erosion, rills, and gullies. In response to these problems, livestock grazing reform began in 1934 with the passage of the Taylor Grazing Act. Subsequent laws, regulations, and policy changes have resulted in adjustments in livestock numbers, season-of-use changes, and other management changes. Given the past experiences with livestock impacts on public land resources, as well as the cumulative impacts that could occur on the larger ecosystem from grazing on various public and private lands in the region, management of

livestock grazing is an important factor in ensuring the protection of public land resources. Past, present, and reasonably foreseeable actions within the analysis area would continue to influence range resources, watershed conditions and trends. The impact of actions such as voluntary livestock reductions during dry periods and implementation of a grazing system have improved range conditions. The net result has been greater species diversity, improved plant vigor, and increased ground cover from grasses and forbs.

In the long-term, as the population of the surrounding area increases (which would increase the use of public lands), conflicts between livestock grazing and these other uses could arise. Resolving conflicts may require adjustments and/or restrictions placed on livestock grazing management. Other factors also influence livestock grazing operations, such as climatic and market fluctuations. A six-year drought in the region occurred between 1998 and 2004, which dramatically affected livestock grazing operations on the Arizona Strip, resulting in virtually all cattle being pulled from the public lands in 2004. Similar fluctuations in livestock numbers would likely occur in the future.

The effects on livestock grazing in the Jackson Tank Allotment have been analyzed under the "Direct and Indirect Effects" section of this chapter. In addition to livestock grazing, there are a wide variety of uses and activities occurring on the lands within and adjacent to the allotment, as described above. Since livestock grazing occurs throughout the area and on adjacent private lands, it is reasonable to assume that impacts similar to those identified earlier in this chapter would occur elsewhere in the area. Another action not mentioned above that may affect livestock grazing is listing a species as threatened or endangered under the Endangered Species Act, including designating critical habitat. Making areas unavailable for livestock grazing, placing restrictions on season of use, reducing access, or applying other restrictions meant to protect special status species may impact livestock grazing operations through the loss of forage, increased difficulty of access, increased costs of operation, and reduced livestock numbers (BLM 2007). While several species have recently been added to the endangered and threatened species list and had critical habitat designated (including Fickeisen plains cactus, Gierisch mallow, and yellow-billed cuckoo), none of these species are known to occur within the Jackson Tank Allotment. It is therefore anticipated that none of the alternatives would result in cumulative impacts to livestock grazing when added to other past, present, and reasonably foreseeable activities in the area.

4.3.2 Cumulative Impacts to Soils

The cumulative impact analysis (CIA) area for soils is the 36,897-acre HUC-8 Fort Pierce Wash watershed. This watershed covers the spatial boundaries of the grazing allotment and has similar environmental conditions and land use/management activities to those of the EA. Actions that contribute cumulatively to the overall condition of soils for the CIA are livestock grazing, recreational activities, residential and commercial development, mining activities, energy and water-use infrastructure, and wildfire.

Soils in the CIA formed under conditions in the last 10,000 years (post-glaciation) that had no vehicles or domesticated grazing animals to impact them. Population growth, grazing, and infrastructure developments over the past 150 years have resulted in soil disturbance on hundreds of thousands of acres at and near homesteads, communities, roads, utility corridors, and waters

across the Arizona Strip. Ground and surface water use/withdrawal has cumulative impacts on soils as they can "dewater" portions of the landscape, rendering soils drier, less productive, and more vulnerable to all forms of erosion. Continued population growth and the resulting growth in vehicle and OHV use and visitation in the region would continue to add to the acreage of soil disturbance. Cyclical drought and annually higher air temperatures could reduce overall vegetative cover, making soils more susceptible to erosion. Wildfire would continue to make soils more susceptible to erosion and conversion of the vegetation to types that are less conducive to soil health and productivity. Continuing to monitor soils and to implement the Arizona Standards for Rangeland Health should help ensure that soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and ecological site. With adaptive management that responds to grazing-related issues as they arise (outside of the 10-year time frame for permit renewal), cumulative effects to soil resources can be reduced. No impacts to soils have been identified that would be significant.

4.3.3 Cumulative Impacts to Vegetation

Vegetation on the Arizona Strip has gone through significant changes since the 1860s due to historic land use practices and the introduction of non-native species. Livestock grazing would continue across the area on BLM-administered lands. The land health evaluation and permit renewal processes would help ensure grazing practices are conducted in a manner to maintain or improve the ecological health of the area. Rangeland management practices would act to prevent and control the spread of invasive plant species, maintain diverse and natural plant communities, improve wildlife habitat, reduce erosion, and improve water quality. The objectives developed to manage for healthy rangelands have a goal of keeping the entire ecosystem healthy and productive in order to ensure that it yields both usable products and intrinsic values.

The area in and adjacent to the Jackson Tank Allotment is open to locatable mineral claims including brecca pipe minerals and bentonite. Gypsum mining in the region, as well as use of mineral material sites in the area, would cumulatively affect vegetation through the loss of vegetation, higher rates of erosion and sedimentation in drainages/waterways, increased deposition of dust on vegetation adjacent to roadways (i.e., haul routes), and introduction and spread of invasive plants. Reclamation activities would counter some of the reduction in vegetative cover, and preventative measures to inhibit the spread of invasive species could curtail infestation by species such as Scotch thistle.

The effects of livestock grazing on vegetation in the Jackson Tank Allotment have been analyzed under the "Direct and Indirect Effects" section of this chapter. Past, present, and reasonably foreseeable actions within the analysis area would continue to affect this resource, as described above. However, continuing to monitor plant communities and to implement the Arizona Standards for Rangeland Health should help ensure the long-term health of rangeland resources, including vegetation. Given the fact that the allotment currently meets all applicable standards for rangeland health (which takes into account all uses of public rangelands, not just livestock grazing), and none of the alternatives are anticipated to change that determination, it is anticipated that the alternatives would not result in cumulative impacts to vegetation resources when added to other past, present, and reasonably foreseeable activities in the area.

4.3.4 Cumulative Impacts to Wildlife

The cumulative impact analysis area for wildlife species is Jackson Tank Allotment and adjacent lands within three miles. Actions that contribute cumulatively to the overall disturbance to wildlife and wildlife habitat include mineral development and various dispersed recreational activities. Mineral development has led to reduction of habitat quality and physical disturbance in a variety of habitats. Mining-related activities in the area of the Jackson Tank Allotment primarily include use of mineral material sites. Mineral development has led to reduction of habitat quality and physical disturbance in a variety of habitats.

Grazing occurs throughout the analysis area on numerous allotments with similar effects as those outlined in the direct and indirect impacts sections of this chapter. Utilization is limited to 50% on all allotments with a rotational grazing system (or 45% on allotments without a rotational grazing system or within desert tortoise habitat), providing for enough forage resources for wildlife populations to persist throughout the analysis area.

Recreational pursuits, particularly OHV use, have caused disturbance to most all species and their habitats. With the increase in local populations has come a dramatic increase in the level of OHV use, resulting in increased disturbance, injury, and mortality to wildlife, particularly ground dwelling species with low mobility. Transportation corridors exist through the habitat of virtually all species found within the analysis area. Impacts vary by species and by the location, level of use, and speed of travel over the road.

The effects of livestock grazing on wildlife within the Jackson Tank Allotment have been analyzed under the "Direct and Indirect Effects" section of this chapter. In addition to livestock grazing, there are a wide variety of uses and activities occurring on the lands within and adjacent to the allotment, as described above. This additive impact may affect wildlife habitat or corridors and the greater ecosystems by altering vegetation associations. These systems and the health of the region as a whole are important for the survival of many native species. Consultation with AGFD in regard to renewal of the livestock grazing permit did not identify any issues directly related to livestock grazing beyond those already discussed above. Given the fact that the allotment currently meets all applicable standards for rangeland health (which takes into account all uses of public rangelands, not just livestock grazing), and none of the alternatives are anticipated to change that determination, it is anticipated that the alternatives would not result in significant cumulative impacts to wildlife when added to other past, present, and reasonably foreseeable activities in the area.

4.3.5 Monitoring

Dry weight ranking studies would be used to measure attainment of the key area DPC objectives. In addition, pace frequency studies would be used at each key area to detect changes of individual species which determines a trend or change in vegetation composition. Pace frequency and DWR would be completed on each key area. DWR and pace frequency study methodologies are described in Sampling Vegetation Attributes, Interagency Technical Reference 1734-4 (BLM 1999b).

Livestock use on forage plants is determined by conducting grazing utilization studies using the Grazed-Class Method as described in the Utilization Studies and Residual Measurements Interagency Technical Reference 1734-3 (BLM 1999a). In addition, pastures are visited as a part of allotment supervision and compliance, ensuring that livestock are leaving pastures/the allotment when required and/or when utilization limits are reached. Utilization studies would be completed by the BLM when livestock are removed from the pasture. Study data would be compiled each year. Other information to be collected and compiled includes precipitation and actual use. All monitoring data would be used to evaluate current management of the allotment and assist the BLM in making management decisions that help achieve vegetation objectives.

The monitoring addressed above and in Chapter 2 is sufficient to identify changes in vegetation as a result of livestock grazing activities. In addition to those methods described, there are efforts in place to inventory for noxious weed establishment.

CHAPTER 5

5.0 CONSULTATION AND COORDINATION

5.1 Introduction

This section summarizes the process used to involve individuals, organizations, and government agencies in the preparation of this EA.

5.2 Summary of Public Participation

Public involvement for the Jackson Tank Allotment permit renewal process began with a scoping meeting for the allotment's land health evaluation on October 27, 2004, followed by a field visit on November 17, 2004. The evaluation was conducted by an interdisciplinary assessment team of BLM resource specialists assisted by the Rangeland Resources Team appointed by the Arizona Resource Advisory Council. A draft evaluation was sent out for public review and comment to individuals, groups, and agencies. The BLM completed an evaluation of rangeland health conditions on the allotment on August 20, 2010. This EA reflects the analysis of the proposed grazing permit renewal on the Jackson Tank Allotment.

A preliminary EA was posted on the BLM ePlanning web page on July 11, 2019 for review; a notice of public comment period letter was sent to those persons and groups listed on the Arizona Strip interested publics mailing list notifying them of the availability of the EA for a 30-day review and comment period. All comments received during development of the EA are summarized in Appendix C along with a response to each comment.

5.3 List of Preparers and Reviewers

Table 5.1 List of BLM Preparers/Reviewers

Name	Title	Responsible for the Following Program(s)
Gloria Benson	Tribal Liaison	Native American Religious Concerns
Brandon Boshell	Monument Manager/Assistant Field Manager	Project Oversight
Lorraine Christian	Arizona Strip Field Manager	Project Oversight
Amber Hughes	Planning & Environmental Coordinator	NEPA Compliance
Rody Cox	Geologist	Geology, Minerals
Amanda Sparks	Assistant Field Manager	Lands/Realty
Shawn Langston (transferred)	Wildlife Biologist	Special Status Animals, Wildlife
Jace Lambeth	Rangeland Management Specialist	Special Status Plants
Jon Jasper	Outdoor Recreation Planner	Wilderness, Recreation, Visual Resources
Sarah Page	Archaeologist	Cultural Resources
Justin Reeve	Range Management Specialist	Vegetation, Grazing Administration, Invasive, Non-Native Species
John Sims	Supervisory Law Enforcement	Law Enforcement
Brian McMullen	Soil Scientist	Soils, Water, Air

CHAPTER 6

6.0 REFERENCES

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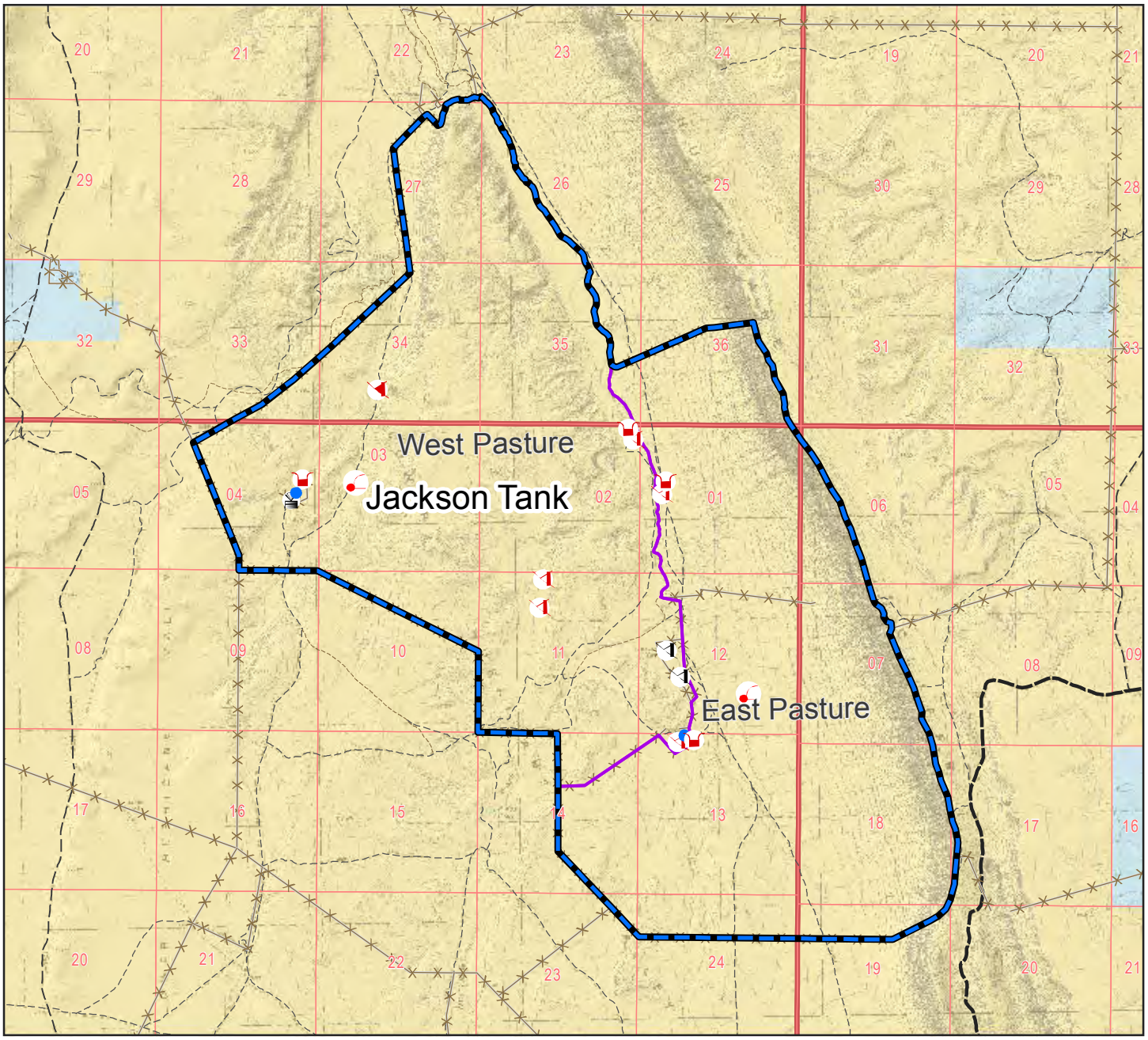
CHAPTER 7

7.0 APPENDICES

APPENDIX A – Maps
Allotment Location
Map Geology Map
Soils Map

Jackson Tank Allotment
NEPA Number DOI-BLM-AZ-A010-2019-00XX-EA
Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



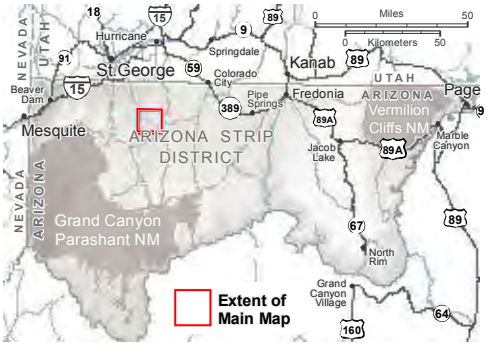
- Jacson Tank Grazing Allotment
- Fenced Reservoir
- Livestock Catchment
- Livestock Trough
- Unfenced Reservoir
- Water Storage Tank
- Grazing Pasture
- Fence
- Key Area

Surface Management Agency
- Bureau of Land Management
- State
- PLSS Township
- PLSS Section

Arizona Strip Routes
- Primary Road Unpaved
- Secondary Road Unpaved
- Tertiary Road Unpaved
- Single Track

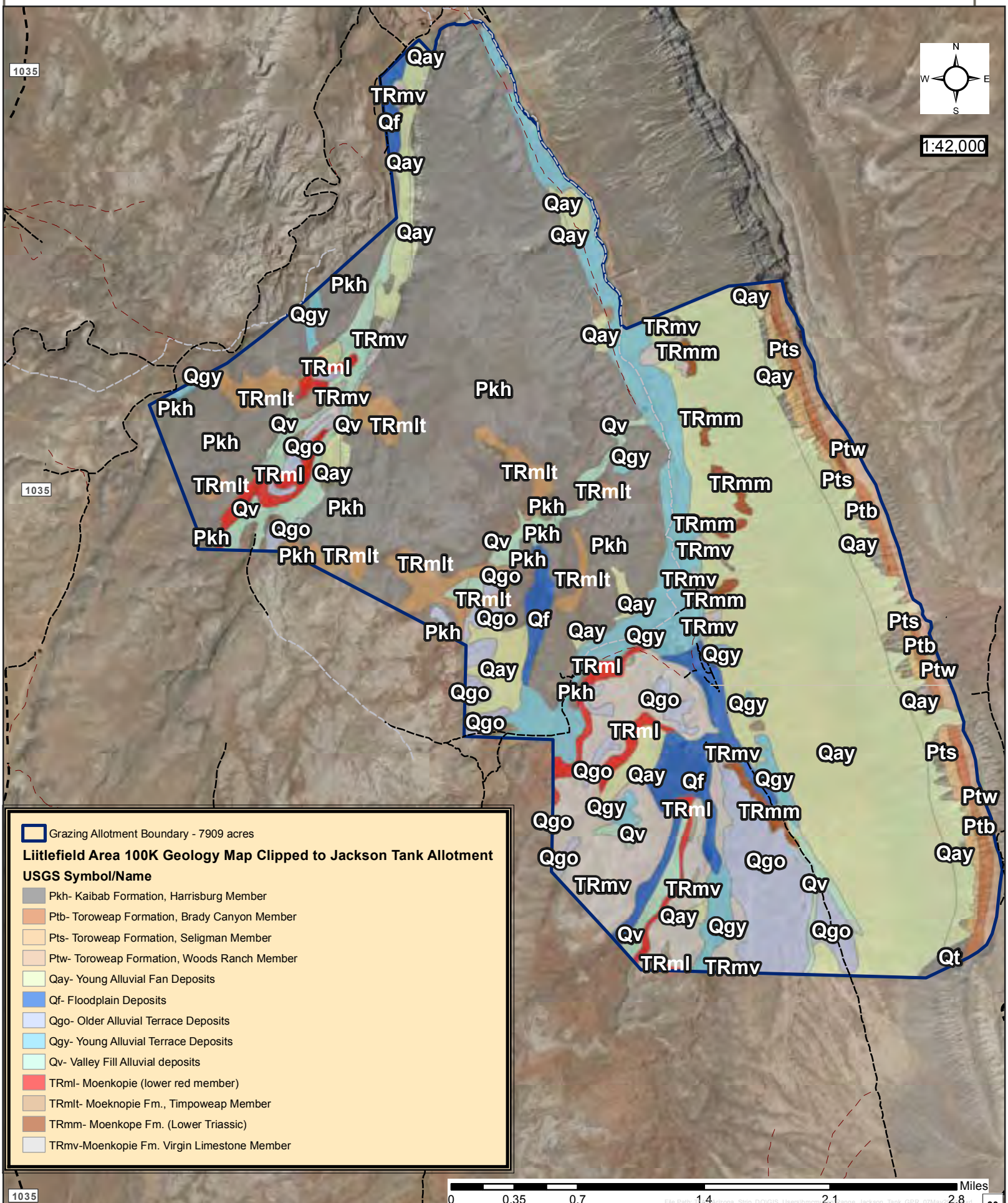
0 0.5 1 2 3 Miles
0 0.5 1 2 3 4 Kilometers

Map Produced by BLM Arizona Strip District
File: Jackson_Tank_Allot_GPT_2019.mxd
Coordinate System: NAD 1983 UTM Zone 12N
Reference System: U.S. PLSS GSRB&M
Scale: 1:60,000 at 8.5x11 page output
User: jreeve
Date: 11/13/2019



No warranty is made by the Bureau of Land Management (BLM) regarding the accuracy or completeness of this map. This map is representational and is to be used as intended by the BLM. Map data compiled from various sources. This map and the data from which it was derived are not binding on the BLM and may be revised at any time.

GEOLOGY MAP - Jackson Tank Grazing Permit Renewal
DOI BLM AZ-A010-201900020 EA



SOIL MAP - Jackson Tank Grazing Permit Renewal
DOI BLM AZ-A010-2019-00020 EA

APPENDIX B – Land Health Evaluation Update for the Jackson Tank Allotment - #4830

The Jackson Tank Allotment land health evaluation was completed on August 20, 2010. That evaluation determined all applicable standards for rangeland health on the allotment were being met. This update constitutes a re-evaluation of the 2010 assessment determination by considering and analyzing new monitoring data.

DPC Objectives

The DPC objectives for the allotment have been updated using the description of the ecological site guides for the two key areas. The DPCs have also been updated and revised to reflect functional groups rather than specific plant species. Plant functional types are sets of plants exhibiting similar responses to environmental conditions and having similar effects on the dominant ecosystem processes (Gitay and Noble 1997). It is very difficult to manage large areas (such as a grazing allotment) for specific species because variations within such a large area can be quite dramatic (even within a single ecological site). By contrast, managing by functional groups allows range managers to study patterns of vegetation responses from plant groups that have similar life history strategies and responses to environmental stress and disturbance (McIntyre 1999), which is more useful on the allotment scale.

The revised DPCs for the Jackson Tank Allotment are:

Key Area #1 – West Pasture (Gyp Upland 7-11" p.z.)
- Maintain the perennial grass composition between 60-70%.
- Maintain the shrub/browse composition between 1-10%.
- Maintain the forb composition between 1-10%.

Key Area #2 – East Pasture (Sandy Loam Upland 7-11" p.z.)
- Maintain the perennial grass composition between 60-85%.
- Maintain the shrub/browse composition between 1-10%.
- Maintain the forb composition between 1-10%.

Rationale for these objectives: DPC objectives were developed that would ensure the biodiversity, health, and sustainability of wildlife species indigenous to this area (such as pronghorn); protection of ecological functions (including hydrological processes); and sustainability of diverse vegetative communities. These objectives are set according to the ecological site guides (developed by the NRCS) – to determine what was within the site potential for each key area – and the current composition at each site. Both key areas are located in a different ecological site representative of the allotment, although both are considered perennial grasslands, and are therefore not capable of producing a high shrub composition. The objectives were created with a "range" to account for fluctuations in plant populations due to factors such as drought and wet periods; this range also represents an achievable percentage given the ecological site guide potentials. It was determined that the DPC objectives identified above would result in healthy and diverse plant communities, which in turn would provide for the habitat needs (both forage and cover) of wildlife, protection for soils and hydrologic functions, and forage for

livestock. While DPCs were established for forbs, it should be noted that their composition is highly variable and is influenced by spring and summer precipitation.

Monitoring

Trend monitoring data collected in 2018 is intended to supplement existing data presented in the 2010 assessment. This new monitoring data is summarized below.

Both of the key areas were read for pace-frequency, trend and dry weight rank (DWR). The frequency at Key Area #1 increased from 39% in 1981 to 119%[12] in 2018. Live vegetative cover increased from 0% to 10%, while litter increased from 17% to 32%. Based on frequency data, trend is upward at Key Area #1. The frequency of key species at Key Area #2 increased from 146% in 1984 to 169% in 2018. Live vegetative cover increased from 7% to 9%, while litter decreased from 36% to 23%. Total score for all components used to calculate trend for Key Area #2 was 189 in 1984, and 201 in 2018. Based on frequency data, trend is upward at Key Area #2.

Observations and data collected for Jackson Tank Allotment indicate that the rotation grazing system has resulted in widely dispersed grazing with good rest and recovery periods. Both pastures have good water availability to provide good distribution throughout the allotment. Utilization at all key areas has been light (see Table 3.2. earlier in this EA).

The Jackson Tank Allotment would be managed to achieve the DPC objectives listed above. As shown in Table B-1 and B-2, this allotment evaluation update lists and evaluates achievement of the allotment's DPC objectives.

Table B-1. Desired Plant Community Objectives Determination - Key Area #1 – West Pasture Ecological site: Gyp Upland 7-11" p.z.

Plant Group (or Ground Cover)	Current Composition	Desired Plant Composition	Objective Met or Not Met
Perennial Grass	95%	60-70%	Met (exceeds)
Galleta	44%		
Sand dropseed	51%		
Shrubs / Browse	2%	1-10%	Met
Fourwing saltbush	2%		
Forbs	1%	1-10%	Met

Table B-2. Desired Plant Community Objectives Determination - Standard 1 (Upland Sites) - Key Area #2 – East Pasture Ecological site: Sandy Loam Upland 7-11" p.z.

Plant Group (or Ground Cover)	Current Composition	Desired Plant Composition	Objective Met or Not Met
Perennial Grass	98%	60-85%	Met (exceeds)

[12] When referring to frequency monitoring results, the total number represents a combined percentage of many key species, relative to the number of quadrats (200), so can therefore exceed 100%.

Galleta	54%		
Sand dropseed	44%		
Shrubs / Browse	1%	1-10%	Met
Snakeweed	1%		
Opuntia	Trace		
Forbs	Trace	1-10%	Not Met

Standard 1 (Upland Sites)

If Standard 1 is achieved, the health of the rangelands is not at risk (i.e., the rangelands do not show signs of accelerated soil erosion by wind or water).

If Standard 1 is not achieved, the health of the ecological site is at risk because of clear evidence of soil loss and hydrological function. Ground cover and signs of erosion are surrogate measures for hydrologic function, nutrient cycles, and energy flow. At risk rangelands show evidence of soil movement and there is clear evidence of soil degradation and transport of nutrients, water, and organic matter off the site.

X Meeting the Standard at Key Areas 1 and 2.

Rationale:

The watershed units currently are in satisfactory erosion condition but susceptible to wind and water erosion following disturbance. In addition, these soils have a low productivity rate, can be susceptible to compaction, and are moderately alkaline due to the slight leaching of salts (see Section 3.4.2 of this EA).

Ground cover was measured at all both key areas; plants, litter, and rock are present in pattern, kind, and amount sufficient to prevent accelerated erosion. At Key Area #1 the ground cover increased from the base year. Ground cover at Key Area 2 is slightly downward from the base year of 1982 but is trending upward from the drought of the early 2000s. Ecological status data indicates both key areas are in late seral stage. The determination for both key areas is that they are functioning properly and meeting Standard #1.

Standard 2 (Riparian-Wetland Sites)

There are no riparian/wetland areas on federal lands within the Jackson Tank Allotment.

Standard 3 (Desired Resource Conditions)

If Standard 3 is achieved, ecological sites contain productive and diverse communities of native species, resulting in proper ecosystem function. Under Standard 3, when DPC objectives for wildlife habitat are being achieved, the site is producing desirable forage, cover and soil protection. For wildlife this means “healthy” rangeland should provide the necessary food and cover to sustain the species.

If Standard 3 is not achieved, the soil conditions and ecosystem function described in Standard 1 are at risk and may not be providing forage and habitat for special status wildlife species.

X Meeting the Standard at Key Areas 1 and 2

Rationale:

The plant composition was such that it met the DPC objectives except for the forbs in Key Area 2. Forbs did not grow well in 2018 when it was last monitored as there was very little to no precipitation that spring. It is important to note that growth of forbs is quite variable, dependent on timing and amounts of precipitation (i.e., during normal or wet years, sufficient forbs would be present).

The relative criteria for meeting standards, and indicators of rangeland health, resulted in a recommendation that the area was fully meeting Standard #3. Both key areas have a good mix of perennial grasses, shrubs/browse and forbs, consistent with site potential, due to the natural variation that occurs across each ecological site. Based on the complete ecological site inventory, the BLM interdisciplinary team determined that the Jackson Tank Allotment is meeting Standard #3.

Summary:

After considering all available data, the interdisciplinary assessment team (composed of various resource specialists – including rangeland management specialists, wildlife biologist, and soil scientist) is recommending that the Jackson Tank Allotment meets all applicable standards for rangeland health.

Appendix C – EA Comments and Responses

Comments on Preliminary EA			
Comment No.	**Commenter Name**	**Comment**	**Response**
001	Sierra Club	We have some concerns regarding the Animal Unit Months (AUMs) that are being proposed. Since an error in the AUM permitting process was detected and the permit holder exceeded the authorized AUMs by 13% for 28 years, this brings into question the accuracy and consistency of the Bureau of Land Management (BLM) monitoring of rangeland health relative to actual AUMs. The BLM monitoring must be inadequate if it has taken this long to discover that the allotment has substantionally exceeded the AUMs. We suspect that little to no monitoring by the BLM occurred to reach the conclusion that an increase in AUMs is justifiable. If that is the case, how can we have confidence that this livestock grazing is sustainable?	Prior to 1981 the grazing preference for the Jackson Tank Allotment was 981 AUMs. In 1981 a decision was made to move 124 AUMs to suspended based on the prior 5 year actual use being 747 AUMs. This decision was pending restoration of the rangelands (BLM 1981). The restoration appears to have occurred because in 1991 a grazing permit was issued that authorized 101 cattle and 8 horses with a season of use of September 16 –June 15, which totals 978 AUMs. However, the allotment summery section of the permit still listed active AUMs as 857, with 124 suspended AUMs, which does not correspond to the authorized number of livestock and season of use. This permit has been renewed two times since, the most recent in 2016 under the authority of Section 402(c)(2) of FLPMA. The permittee has been grazing the number of livestock (101 cattle and 8 horses), during the season of use, authorized under these permits (since 1991). The BLM is unclear why commenter questions "the accuracy and consistency of … BLM monitoring of rangeland health relative to actual AUMs." Vegetation monitoring (frequency/trend and composition) is used to help determine whether land health standards are being met, and this monitoring is conducted by clearly prescribed methods outlined in agency technical references (see Section 4.3.5). Vegetation monitoring on this allotment is conducted on a regular schedule – trend and composition monitoring has taken place at the two key areas on average every five years starting in the early 1980s. Utilization has been read most years in both pastures since 1970 and has never been near 50%. In the last six years it has

			averaged 28%. Permitted AUMs do not affect how and when monitoring is conducted.
002	Sierra Club	We also have questions about the use of the term "suspended" in this clause "with the remaining 124 AUMs being suspended." How were AUMs suspended if the permittee used the entire allotment of 981 AUMs? Overall, the explanations for AUM calculations, in section 2, are not clear. Please clarify.	See response to Comment No. 001
003	Sierra Club	Monitoring on a decadal basis to make informed management decisions is too long of an interval. We highly recommend permitting at five-year intervals and including seasonal data collections for accurate monitoring. Basing this 2019 Environmental Assessment (EA) on data collected in 2004, with a report released in 2010, does not provide confidence in the Desired Plant Community (DPC) objectives that were altered 10 years ago. BLM needs to establish dates for its monitoring so adaptive management decisions can be made with consistent data. Twice yearly, immediately before grazing starts and immediately after grazing ends, would determine direct grazing impacts. Some state forestry and Forest Service units already use these intervals (Section 4.7)	The BLM does not conduct monitoring "on a decadal basis" – see response to Comment No. 001. In accordance with direction contained within the regulations at 43 CFR 4130.2(d), "The term of grazing permits or leases authorizing livestock grazing on the public lands and other lands under the administration of the [BLM] shall be 10 years", with some limited exceptions that do not apply in the case of the permit under consideration in this EA. Please note that the analysis in this EA is not based on data collected in 2004 – more recent monitoring data has been collected, and the land health evaluation has recently been updated (see Appendix B).
004	Sierra Club	A map that depicted Key Area #1 and #2 would be useful in understanding locations relative to water tanks and feeding areas. Were these monitoring plots randomly selected for accurate and statically sound conclusions? If not, changes must be made to monitoring protocols to address site selection bias.	Attempting to monitor 100% of any given rangeland is not practical. Instead, representative study sites are selected based on their ability to represent range conditions over much larger areas (University of Arizona 2010). Evaluation sites, or key areas as defined in Technical Reference 1734-4 (BLM 1999b), are indicator areas that are able to reflect what is happening on a larger area as a result of on-the-ground management actions. A key area should be a representative sample of a large stratum, such as a pasture or grazing allotment, which is the case with Jackson Tank Allotment. Locating a key area near a water source, or far from a water source

			where utilization seldom occurs, would not meet the criteria of representative of range conditions over a larger area. The Jackson Tank Allotment key areas were selected in the 1960s, based on the criteria described above, and have provided "accurate and statistically sound" data. The key areas have been added to the allotment location map included in Appendix A.
005	Sierra Club	There are 15 pronghorn buck permits available for 2019 in Game Management Unit 13b. We could not locate any statement that indicated populations of pronghorn are stable at 253 in the AZGF 2019 reference (pages 27-28). The statement that during drought conditions coyote predation of pronghorn fawns increases indicates that AUM numbers should be reduced during droughts in order to ensure there is adequate cover for fawns. (Section 3.4.4.1)	The citation for the referenced text (on pronghorn population stability) can be found in Section 6.0 of this EA – "13B Hunt Recommendations (AGFD 2019)." Please note that the alternatives include measures to reduce grazing during drought – see Section 2.3.3.
006	Sierra Club	By far climate change is the most critical aspect governing rangeland management and AUM determination. This EA used the past 25 years for depicting climate trends, however it would be more appropriate to just use the past 10 to 15 years, since 2002 (driest) and 2005 (wettest) on record. The 2006 National Integrated Drought Information System (NIDIS Act), was established to provide agencies, like the BLM, a better understanding of when to rest or reduce livestock (Catlin, et al. 2011). However, rangeland managers have not used these Palmer Drought Severity Index (PDSI) data to adjust livestock numbers (Catlin, et al. 2011). Catlin et al., also reported that drought would increase over time. PDSI for Arizona indicates that there were only four periods that were not in drought from 2000 to 2019. Also the duration of non-drought periods is getting smaller. Annual average maximum and minimum temperatures are also rising,	As shown in the actual use data in Table 2.3, the permittee in coordination with the BLM has reduced the number of cattle grazing during periods of drought, never allowing over 50% utilization, thus maintaining ecological condition of vegetation communities on the allotment. This type of adaptive management has allowed the vegetation to continue on an upward trend. It is important to note that the BLM has existing measures in place to reduce grazing during drought (see Section 2.3.3). Monitoring is conducted regularly on the allotment (see response to Comment No. 003), which would indicate whether vegetation conditions are being affected by grazing or other factors. This monitoring is conducted regardless of climatic conditions.

		particularly in the past decade (NOAA-National Center for Environmental Information).	
007	Sierra Club	We recommend alternative D, no grazing. Recent publications regarding cattle grazing in terms of climate change, require swift adaptive management protocols to maintain rangeland ecosystem health (Ripple et. 2014). Also the location of the Jackson Tank Allotment makes it impractical from a greenhouse gas standpoint (Figure 1). Grazing, feed, water, and transportation, should be considered. See the 20 factors all termed - life cycle assessment, considered by Rotz et.al (2019). This modeling determined a lack of sustainability for the beef industry with regards to the climate crisis, suggesting land managers need to be aware of the global implications of their actions.	See response to Comment No. 006. In addition, please note that EA Table 3.4 includes a discussion on climate change and greenhouse gas emissions. In summary, it is difficult to state with any certainty what impacts may result from greenhouse gas emissions, or to what extent the alternatives could contribute to climate change impacts. The BLM therefore determined that the alternatives would have a negligible effect on local, regional, and global climate change. Please also note that cumulative impacts (from actions that have occurred, are occurring, or are likely to occur in the reasonably foreseeable future) to potentially impacted resources are addressed in Section 4.3 of this EA.
008	Sierra Club	Considering the Jackson Tank Allotment is in a remote and semi-arid region, the economic sustainability of this venture is questionable for the permit holder and the ability of the land to sustain continued disruptive livestock grazing is also questionable.	The EA thoroughly analyzed impacts to resources (including vegetation, soils, and wildlife) and to livestock grazing from the proposed grazing permit renewal – see Table 3.4 and Chapter 4). Table 3.4 also addressed socioeconomics from the alternatives. Please note that based on analyses of the allotment monitoring data and supporting documentation contained in the land health evaluation report (BLM 2010) and the 2019 evaluation update (Appendix B), including achievement of DPC objectives, resource conditions on the allotment meet all applicable standards for rangeland health.
009	Sierra Club	Rangeland management fundamentals such as the “traditional 50% utilization” rule used by the BLM is no longer appropriate when you consider the climate crisis, as well as the impacts of invasive plants (Torell, Lee, and Steele. 2019). As of 2014 there were 1.4 billion cattle world-wide and livestock are responsible for approximately 14.5% of all anthropogenic greenhouse gas	See response to Comment Nos. 007 and 008.

		emissions (7.1 of 49 Gt CO2e yr–1) (Ripple, et al.,2014).	
010	Sierra Club	It is time for the BLM to seriously consider the overall negative impacts of cattle including the loss of biodiversity through forest loss, land use intensification creating soil erosion, demise of large predators, and resource competition with wildlife.	See response to Comment No. 008.
011	Sierra Club	It is time for you to acknowledge that livestock grazing is not sustainable on these lands and that the no grazing alternative should be selected.	Comment noted. Please see response to Comment No. 008.
012	Sierra Club	In conclusion, after more than 150 years, grazing the Jackson Tank allotment is simply not a justifiable use of this land.	Comment noted. Please see response to Comment No. 008.
013	De-Mar Limited	After a careful review of the EA for the Jackson Tank Allotment, it appears that all of the experts in their various disciplines have done a very thorough job in assessing the condition of said allotment. As near as we could ascertain, they have all concurred that grazing is not having a negative impact on the various areas of their specific expertise. Their summary statement concluded, "After considering all available data, the interdisciplinary assessment team (composed of various resource specialists – including rangeland management specialists, wildlife biologist, and soil scientist) is recommending that the Jackson Tank Allotment meets all applicable standards for rangeland health." (EA p.) It should be recognized that under the multiple use concept of FLIPMA, grazing is commonly accepted as an appropriate and beneficial use of rangeland as long as the proper grazing methods and practices are employed that lend to the improvement of the desirable plant communities, protect against erosion, enhance wildlife and preserve archeological and historical sites. Grazing should also be done in tandem with competing recreational,	Comment noted. The EA thoroughly analyzed impacts to resources and livestock grazing from the proposed grazing permit renewal alternatives – see EA Chapter 4.

		hunting, mining, lumbering and other economic activities. The survival of the cattle industry is dependent upon being able to keep the ever growing operational costs at a minimum while maximizing productivity. Like all businesses, survival is a function of cost effectiveness and efficiency. Numbers always impact the bottom line. Without the optimum number of AUMs made available, the financial viability of the Jackson Tank Allotment comes into question.	
014	De-Mar Limited	Alternative A corrects a 1980 clerical error by the BLM, restoring 124 AUMs from non- use status to active status, which raises the misstated 857 AUMs to the correct number of 981 AUMs.	Comment noted
015	De-Mar Limited	While Alternative A corrects the perpetuated mistake (and is much appreciated), righting a wrong only brings it back to the original number without reflecting an increase. This EA, however, not only justifies this alternative but it also identifies another alternative that would be more appropriate.	Comment noted
016	De-Mar Limited	Alternative B reduces the number of active AUMs to the historical use level and would unnecessarily convert 294 AUMs to non- use status. The problem with this logic is that it is not a defensible action. Inasmuch as all of the studies justify an increase of AUMs, a 294 reduction of AUMs would appear to be a purely arbitrary and capricious decision in favor of those who oppose grazing as a legitimate use of natural resources.	NEPA and its implementing regulations require that an agency rigorously explore and objectively evaluate a reasonable range of alternatives. Reasonable alternatives are those that meet the purpose of and need for action and that are feasible to implement, taking into consideration regulatory, technical, economic, environmental, and other factors. Livestock grazing is not the only issue to be taken into consideration in an environmental analysis.
017	De-Mar Limited	The full story of historical use needs to include a lot of associated factors such as: a) Did it rain enough to catch enough water to last the full grazing season that would allow for the permitted AUMs to be consumed? b) Was the timing of the rain such that it brought enough grass to provide for full stocking levels? c) Was there a complete drought with no rain whatsoever like	The BLM concurs that there are many reasons why a permittee would not run their fully allotted AUMs besides range conditions.

		in 2002-2003? d) Did the permittees have any unexpected health constraints that complicated their ability to fully stock their permit as in our case where our father and managing partner was slowed down by cancer and subsequently passed away? e) Were there unexpected economic constraints associated with the downturn in the economy like what happened from 2008-2012 that impacted the permittee's ability to reach full stocking capacity? Etc. The failed logic of Alternative B makes no sense, is definitely not fair, and is far from being defensible.	
018	De-Mar Limited	Alternative C is justified by the BLM's own analysis as stated in the following sections of the EA: • Section 3.2.3 – the land health evaluation completed for the Jackson Tank Allotment (completed in 2010 and updated in 2019) identified that resource conditions on the allotment meet all applicable standards for rangeland health. • Section 1.3 of the EA states that this alternative (as are all the others) in conformance with the Arizona Strip Field Office RMP. • Section 1.4 states that this alternative (as well as all the others) complies with all applicable statutes, regulations, executive orders, and other plans, including the Fundamentals of Rangeland Health (43 CFR 4180.1) and Arizona's Standards and Guidelines. Since Alternative C satisfies the necessary criteria in all of the above Acts, Regulations, Executive Orders, Land Plans and Policies, it therefore becomes a justifiable choice.	Comment noted.
019	De-Mar Limited	A concern was raised on p. 37 suggesting that an increase in AUMs could possibly add to soil erosion. While that may be something to take	The BLM concurs that water infiltration into the soils is beneficial to ecological function, and is influenced by many things. Soil compaction can occur from

		into account, please remember that water infiltration into the soil is influenced by many things. While it is true that overgrazing can add to soil compaction, therefore decreasing infiltration, and increasing runoff, it is also true that proper grazing can enhance water infiltration. A Bulletin from the Natural Resources Conservation Service dated February 2016, under Grazing Management and Soil Health p. 2 states, "Rangeland health is characterized by the functioning of both the soil and the plant communities. The capacity of the soil to function affects ecological processes, including the capture, storage, and the redistribution of water; the growth of plants; and the cycling of plant nutrients. For example**, increased physical crusting** decreases the infiltration capacity of the soil and thus the amount of water available to plants. As the availability of water decreases, plant production declines, some plant species may disappear, and the less desirable species may increase…" The crusting here is in reference to soil crusting that takes place over time on undisturbed soil. Dr. Bounds from SUU in the past has taught that the hoof action from proper concentration of cattle can be very beneficial in breaking up the soil crust, much like tilling the ground is critical to farming. Hoof action can create softer soil facilitating seed placement. It also increases water infiltration, aids in moisture retention by creating mini hoof sized reservoirs which enhance seed germination, creates a healthier plant, all the while adding to the Desired Plant Community. It should be noted that the BLM concurs with that logic, when the EA states that the Jackson Tank Allotment is meeting all applicable standards for rangeland health. As stated in the EA, "If vegetative health is used as a proxy for soil health,	livestock even if "overgrazing" does not occur, depending on conditions such as soil moisture and characteristics of a particular soil type. Soil compaction is, by definition, an increase in bulk density. When any compaction source (including hooves) makes contact with the soil surface, pressure is exerted and compaction can occur. Soils are more likely to be affected (i.e., compaction is more likely to occur) when soils are wet than when dry. In addition, the fine textured soils that occur in this allotment are highly susceptible to compaction. When hoof action can be beneficial is when it is used to incorporate organic matter into soil (such as seed). Regarding crusting, the soil types in this allotment are more susceptible to chemical (salt/gypsum) crusts than physical crusting, although both can occur. The EA analysis does not state that the 50% utilization "improves soil health and productivity." Rather it states that not exceeding the 50% threshold would leave enough residual vegetation to provide protection for soils, which would help maintain or improve soil health.

		areas that are meeting the previously described standards for rangeland health should have soils that have similarly favorable trends with regard to productivity. **In addition, the 50% utilization threshold would help promote conditions that maintain or improve soil health and productivity**." Inasmuch as a 50% utilization threshold improves soil health and productivity, and our stocking levels have not achieved a 50% utilization threshold, it would only seem logical that an increase in AUMs would not only improve soil health and productivity, but it would accelerate and expedite it. It would be a win win for the BLM as well as for the permittee.	
020	De-Mar Limited	Additionally, please consider the following that would justify an increase in AUMs: 1. We have made a number of specific improvements to our allotment since 1980. a. We have added three storage tanks totaling approximately 300,000 gallons. b. We have run a water line and added a trough on the north end of the West Pasture. c. We have run a water line and added a trough on the north end of the East Pasture. d. We have upgraded the West Trough. e. We have upgraded and replaced the North East Trough. f. We have cleaned and lined our big "Bessie" pond which is our main water source. g. We have repaired numerous sink holes on both the Bessie Pond and the Jackson Tank. h. We have re-tarped the catch pad for our catchment in the West Pasture. 2. We have kept water in the troughs so it has been available for antelope.	Comment noted. The BLM appreciates the permittee's coordination, cooperation, and willingness to work with the BLM on managing public lands and resources within the Jackson Tank Allotment.

		3. The bottom wire of our fences have been restrung with antelope friendly smooth wire 4. We have consistently worked with our BLM Range Conservation Officer to rotate our pastures at the appropriate time, insuring that we have always left more than 50% of the forage. 5. We have under-stocked our allotment or removed our cattle when the feed has been sparse. 6. We have worked closely with the BLM in trying to control the spread of Scotch Thistle. 7. We are continually repairing pasture and water lot fences. 8. Comparison of the 1981 to 2018 pictures from the BLM file show a marked improvement in the carrying capacity of the allotment. 9. Recent pictures of the allotment in 2018 show how good our rangeland looks when we have a reasonable amount of precipitation.	
021	De-Mar Limited	It also appears that the overall trend of the allotment has been getting better. The BLM files contain a survey done in 1983 compared to one done in 2018. In the West Pasture, there were 90 hits with the grazing measuring device in 1983 while there were 218 hits at the same site in 2018. There were 296 hits on the East Pasture in 1984 with 339 hits in 2018. One can see that things are moving in the right direction. According to the BLM's own studies and evaluations referenced in this EA, Alternative C seems to be the most appropriate of the five alternatives that are listed.	Comment noted.
022	De-Mar Limited	In light of BLMs own multiple use guidelines, Alternative D (no grazing) doesn't deserve consideration.	Comment noted. See response to Comment No. 016.
023	De-Mar Limited	In reference to Alternative E (No Action – Renew Grazing Permit with Current Terms and Conditions), if we are not going to use the information gained by all of the man hours and resources put into the studies and evaluations associated with this EA,	Comment noted. See response to Comment No. 016. The BLM does use all available information in its decision making process.

		we are derelict in our duties. Why would we not want to use the information gained to make the best decision for the land, the permittees, and the BLM. Status quo is clearly not the best choice because better alternatives are available.	
024	De-Mar Limited	While there could be an argument made for each of the five alternatives listed, there is clearly only one, Alternative C, that appears to be the most rational in relationship to the overall productivity of the 8,013 acres addressed in this study. Inasmuch as this extensive EA has shown that the basic criteria for each discipline has been met and in most cases exceeded, there is no defensible reason why the most productive alternative should not be chosen. On page 41, the EA suggests a 77% increase would be needed to get to the optimum 50% utilization level, bringing the total AUMs to 1523. While we agree there should be an increase, we feel that 77% increase is too aggressive for this allotment at this time, however, with continued progress, it may be a possibility in the future.	Please note that there was an error in the description of Alternative C – the AUMs proposed under that alternative should have been 1,325 rather than 1,523. The 77% referenced on page 41 was also an error, and should have been "a 55% increase." Both of these errors have been corrected.
025	De-Mar Limited	We feel that the EA justifies an increase of active AUMs. We would propose Alternative C as the best option, knowing that if we ever got to 50% utilization, we would be moving our cattle anyway. A decision that shows no increase would bring into question whether the decision was factually based or simply arbitrary and capricious. We trust you will make an intelligent wise decision.	Comment noted.