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DOI-BLM-AZ-A010-2025-0003-EA**

Tuckup Allotment Grazing Permit Renewal

Mohave County, Arizona

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List of Acronyms

AGFD	Arizona Game and Fish Department
AMP	Allotment Management Plan
AUM	Animal Unit Month
BLM	Bureau of Land Management
BNIK	Baaj Nwaavjo I'tah Kukveni-Ancestral Footprints of the Grand Canyon National Monument
CFR	Code of Federal Regulations
CBW	Composition by Weight
CIA	Cumulative Impact Analysis
DFC	Desired Future Condition
DPC	Desired Plant Community
EA	Environmental Assessment
EIS	Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act
GHG	Greenhouse Gas
GMU	Game Management Unit
NEPA	National Environmental Policy Act
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
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management

CHAPTER 1

1.0 PURPOSE AND NEED

1.1 Introduction and Background

Over the last 40 years the Bureau of Land Management (BLM) has conducted evaluations of rangeland conditions on the Tuckup Allotment (see Appendix A – Tuckup Allotment Map), (formerly known as the Tuckup and little Tuweep Pastures within the Tuweep Allotment). A detailed discussion on rangeland health in the Tuckup 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 Tuckup 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 Tuckup Allotment. This analysis provides information as required by 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 or appropriate. 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) and Grand Canyon-Parashant National Monument RMP (BLM 2008b). 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 are 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 for the Tuckup Allotment in accordance with all applicable laws, regulations, and policies. Because the existing grazing permit for the allotment expired on May 15, 2019, 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 need for this action is to respond to the permittee's request to change their season of use to year-round and issue a new term grazing permit. Cattle currently graze the allotment from October 15 to May 15, each grazing period. The entire allotment is rested from May 16 to October 14 each year. The proposed action is to change the season of use from October 15 – May 15 to March 1 – February 28 (see Section 2.3 for a detailed description of the permittee's proposed action). The BLM intends to consider whether to renew the grazing permit with current terms and conditions or renew the permit with modifications (including with no active preference), in accordance with 43 CFR Part 4130.3. When issued, grazing permits must include appropriate terms and conditions designed to “achieve management and resource condition objectives for the public lands... and to ensure conformance with part 4180”.

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, the Arizona Strip Field Office RMP, and Grand Canyon-Parashant National Monument RMP. 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 both the Arizona Strip Field Office RMP and Grand Canyon-Parashant National Monument RMP. Rangelands should be achieving or making significant progress towards achieving the standards, and 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 RMPs identify 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 and Grand Canyon-Parashant National Monument. The Arizona Strip Field Office RMP¹ identified public lands within the Tuckup 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 Tuweep Allotment (including the Little Tuweep and Tuckup Pastures which are what now comprise the Tuckup Allotment), completed in 2004) determined that it was making significant progress toward meeting the applicable standards for rangeland health. It should be noted that Standard 2 does not apply in the Tuckup Allotment, as described later in this EA (Appendix B). The land health evaluation update recently completed as part of this permit renewal process identified Standards 1 and 3² 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).

¹ Since the majority of the allotment lies within the Arizona Strip Field Office, this field office oversees management of livestock grazing on the allotment, as directed in the Arizona Strip Field Office RMP.

² As described in Section 2.1.1 of this EA, Standard 2 does not apply in the Tuckup Allotment.

1.3 Grand Canyon-Parashant National Monument and Baaj Nwaavjo I'tah Kukveni-Ancestral Footprints of the Grand Canyon National Monument

A portion of the Tuckup Allotment is within Grand Canyon-Parashant National Monument (approximately 3,638 acres), and a portion (approximately 714 acres) is within Baaj Nwaavjo I'tah Kukveni-Ancestral Footprints of the Grand Canyon National Monument (BNIK), with the remaining 11,924 acres located in the Arizona Strip Field Office. Actions within Grand Canyon-Parashant National Monument and BNIK must be consistent with the protection of a wide variety of monument objects, as guided by the Presidential Proclamations which established each of these monuments – Proclamation 7265 (January 11, 2000) for Grand Canyon-Parashant and Proclamation 10606 (August 8, 2023) for BNIK. The analysis of impacts to specific resources in this EA constitutes the BLM's analysis of impacts to monument objects named in each proclamation.

1.4 Conformance with Land Use Plans

The alternatives described in Chapter 2 of this EA are in conformance with the Arizona Strip Field Office RMP and Grand Canyon-Parashant National Monument RMP, both approved January 29, 2008 (BLM 2008a and 2008b).

It should be noted that a resource management plan for BNIK has not yet been developed. Until a new RMP is developed, the lands are managed under the Interim Management of the BNIK and Arizona Strip Field Office RMP unless there is a conflict with the Proclamation. This proposed action does not violate the Proclamation, which states in part:

“Nothing in this proclamation shall be deemed to prohibit grazing pursuant to existing leases or permits within the monument, or the renewal or assignment of such leases or permits, which the BLM and Forest Service shall continue to manage pursuant to their respective laws, regulations, and policies.”

The Tuckup Allotment is classified as available for grazing under the Arizona Strip Field Office RMP. The alternatives are consistent with the following decisions contained within these plans.

Arizona Strip Field Office RMP

The following decisions are from Table 2.11 in the Arizona Strip Field Office 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.³
- **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 being less intensively managed, then utilization is set at 45%⁴.
- **MA-GM-08:** Any hay or other feed used in administering the livestock operation will be certified weed-free.

Grand Canyon-Parashant National Monument RMP

The alternatives described in Chapter 2 of this EA are in conformance and consistent with the Grand Canyon-Parashant National Monument RMP, approved January 29, 2008 (BLM 2008b).

- **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.

³ No restrictions are associated with the Tuckup Allotment.

⁴ The Tuckup Allotment is managed under a rotational grazing system and is classified as a Maintain allotment, so maximum utilization is set at 50%.

- **LA-GM-01:** On BLM-administered lands, all allotments will continue to be classified as available for grazing by livestock under the principal of multiple use and sustained yield, except where specifically noted.
- **MA-GM-03:** 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 on BLM and NPS-administered lands consistent with the appropriate enabling legislation. These guidelines address management practices at the grazing allotment management (AMP) level and are intended to maintain desirable conditions or improve undesirable rangeland.
- **MA-GM-04:** 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-05:** 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 on BLM and NPS-administered lands and Vital Signs standards on NPS-administered lands. Appropriate and timely action will be implemented to deal with those areas not meeting the standards.
- **MA-GM-06:** 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 (C), managed custodially to protect resource conditions and values; Maintain (M), managed to maintain current satisfactory resource conditions and are actively managed to ensure that the condition of resource values do not decline; and Improve (I), actively managed to improve unsatisfactory resource conditions.
- **MA-GM-08:** 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 being less intensively managed, utilization is set at 45%.
- **MA-GM-09:** Any hay or other feed used in administering the livestock operation will be certified weed free.

The alternatives would meet all of the land use plan decisions listed above. It has also been determined that the alternatives would not conflict with other decisions throughout the RMP.

1.5 Relationship to Statutes, Regulations, or Other Plans⁵

The authority to renew grazing permits is provided for in 43 CFR 4100 where the objectives of

⁵ Executive Order 14154, Unleashing American Energy (Jan. 20, 2025), and a Presidential Memorandum, Ending Illegal Discrimination and Restoring Merit-Based Opportunity (Jan. 21, 2025), require the Department to strictly adhere to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 et seq. Further, such Order and

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.

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.

Memorandum repeal Executive Orders 12898 (Feb. 11, 1994) and 14096 (Apr. 21, 2023). Because Executive Orders 12898 and 14096 have been repealed, complying with such Orders is a legal impossibility. The BLM verifies that it has complied with the requirements of NEPA, including the Department’s regulations and procedures implementing NEPA at 43 C.F.R. Part 46 and Part 516 of the Departmental Manual, consistent with the President’s January 2025 Order and Memorandum.

- 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.

1.6 Identification of Issues

Identification of issues for this EA was accomplished by considering the resources that could be affected by implementation of one of the alternatives, as well as through involvement with the public, tribes, and input from the BLM Interdisciplinary Team (see Section 5.2). Based on the results of public involvement and internal dialog regarding this action and its potential for resource impacts, the BLM identified four issues for analysis. These issues are presented below, along with the rationale for analysis.

- 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.
- 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 changing the grazing season to year-round, extending the grazing season, renewing as is, and no grazing. 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 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.⁶
- 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 original Tuckup Allotment land health evaluation was completed on June 23, 2004. 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 therefore reflect the potential of each site. The DPCs are expressed in species composition by weight (CBW).

⁶ This standard does not apply in the Tuckup Allotment. As stated in Table 3.4 of this EA, there are no wetland/riparian areas in the allotment.

The DPC objectives for the allotment have been updated during this EA process using the description of the ecological site guides for the four 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 2004 land health evaluation identified maintenance of old vegetation treatments as an issue and states “maintenance of the treatments is necessary to restore the vegetation diversity and move toward meeting the watershed and DPC objectives.” The evaluation recommended herbicide treatments to reduce sagebrush composition and release perennial grasses from competition with sagebrush. Treatments have occurred (retreatment of the historic Witches Pool and Tuckup Point treatment areas occurred in 2023), which have been successful in meeting the above stated objective. This resulted in the DPC objectives also being revised through this current land health evaluation process to be consistent with the land health evaluation recommendations.

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, having similar effects on the dominant ecosystem processes, and respond in a similar way to a syndrome of environmental factors (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 Tuckup Allotment are:

Key Area #5 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 5-20%
- Maintain the grass composition between 60-75%
- Maintain the forb composition between 0-10%

Key Area #6 (Clay Loam Upland 10-14" pz)

- Maintain the shrub/browse composition between 5-25%
- Maintain the grass composition between 50-75%
- Maintain the forb composition between 0-10%

Key Area #9 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 5-20%
- Maintain the grass composition between 65-85%
- Maintain the forb composition between 0-10%

Key Area #14 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 5-20%

- Maintain the grass composition between 60-85%
- Maintain the forb composition between 0-10%

2.2.3 Monitoring

Dry weight rank 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 dry weight rank would be completed on each key area. This monitoring is generally conducted every five years. Dry weight rank 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 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 and treat for noxious weed establishment.

2.2.4 Range Improvements

Existing range improvements will continue to be maintained. No new range improvements are proposed under any of the alternatives. 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 (see Appendix A – Tuckup Allotment Map).

2.3 Alternative A – Proposed Action (Issue New 10-Year Grazing Permit with Change in Grazing Season to Year-Round Grazing)

The Tuckup Allotment grazing permittee has requested to change their season of use to year-round. Under this alternative, a new term grazing permit would be issued reflecting that change. Specifically, under this alternative the BLM would:

- Cancel the existing grazing permit and issue a new grazing permit for the Tuckup Allotment for a period of ten years. The proposed action is to change the season of use from October 15 – May 15 to March 1 – February 28. Livestock numbers would be reduced from 161 to 75 because the longer grazing season would not allow for any flexibility to occur on the grazing rotation – once grazing is completed in one pasture, there are only two pastures left to move into, and one of those pastures was just grazed. This reduction in livestock numbers would reduce active AUMs from 1,075 to 860 (see Table 2.1), which is a 20% reduction of active AUMs authorized for the permittee. This reduction would be necessary to allow the pasture rotation outlined in Table 4.2 to occur

and ensure that maximum utilization (which is 50% for this allotment) would not be exceeded in any of the pastures.

Table 2.1 Tuckup Allotment Proposed Grazing Use under Alternative A – Proposed Action

	Kind of Livestock	Livestock Numbers	Season of Use	Active AUMs	Suspended AUMs	Public Land Acres	% Federal Land
Current	Cattle	161	10/15 – 5/15	1,075	4	16,276	95%
Proposed	Cattle	75	3/01 – 2/28	860	219	16,276	95%

- 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 Tuckup 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, drought, 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.

Monitoring, as described in Section 2.2.3, would allow the BLM to determine whether the revised grazing management system is affecting land health on the allotment. Monitoring results could then allow 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. Under this alternative, if long-term monitoring shows that there is a downward trend and that DPCs are no longer being met due to livestock grazing, then the grazing permit may revert back to its current grazing system (see Alternative C – Section 2.5).

2.3.1 Proposed Grazing System

Cattle would graze the allotment from March 1 to February 28, each grazing period. A three-pasture rotation grazing system designed to protect and enhance desirable plant succession would be implemented on the allotment. This would be done by maintaining an existing interior fence that had fallen into disrepair (and is not necessary for the current two-pasture system), thus creating a third pasture, the Upper Kent Pasture. (See Chapter 4, Table 4.2 for a detailed description of the proposed grazing system for this alternative).

2.3.2 Terms and Conditions of Grazing Permit

- The permittee must submit an actual use report (BLM Form 4130-5) within 15 days after the last day of authorized grazing.
- 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.
- A temporary range camp⁷ next to existing corrals may be authorized while the permittee works their livestock, fixes fence, or performs maintenance of existing range improvements.
- The permittee would use the advanced billing system.
- Livestock would be confined to a single pasture at a time and moved to a new pasture once the average utilization of the current pasture reaches 50%.

2.4 Alternative B – Issue New 10-Year Grazing Permit with Extended Grazing Season

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 Tuckup Allotment for a period of ten years. However, Alternative B would reissue the ten-year term grazing permit with an extension of the grazing season that would not be year-round (see Table 2.2).

Table 2.2 Tuckup Allotment Proposed Grazing Use under Alternative B

	Kind of Livestock	Livestock Numbers	Season of Use	Active AUMs	Suspended AUMs	Public Land Acres	% Federal Land
Current	Cattle	161	10/15 – 5/15	1,075	4	16,276	95%
Proposed	Cattle	125	8/14 – 5/15	1,075	4	16,276	95%

The proposed utilization level (which is 50% for this allotment), 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.

Monitoring, as described in Section 2.2.3, would allow the BLM to determine whether the revised grazing management system is affecting land health on the allotment, based upon the results of monitoring. Monitoring results could then allow 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. Under this alternative, if long-term monitoring shows that there is a downward trend and that DPCs are no longer being met due to livestock grazing, then the grazing permit may revert back to its current grazing system (see Alternative C – Section 2.5).

⁷ This would typically consist of either a trailer or tents at an existing range improvement (in an existing disturbed area), something that is easily removable. This is an existing term and condition in the current grazing permit.

2.4.1 Proposed Grazing System

Under this alternative, cattle would graze the allotment from August 14 to May 15 each grazing period. The entire allotment would be rested from May 16 to August 13 each year. A three-pasture rotation grazing system, as described in Section 2.3.1, designed to protect and enhance desirable plant succession would be implemented on the allotment. Use of the three pastures on the Tuckup Allotment would be alternated on successive years so that each pasture receives different use from the previous grazing period, and each pasture would be grazed during the dormant (winter) season once every three years (see Table 4.3 for a detailed description of the grazing system for this alternative).

2.4.2 Terms and Conditions of Grazing Permit

Terms and conditions under this alternative would be the same as those for Alternative A, with the following exceptions:

- A grazing planning meeting or call would occur before cattle are turned out to discuss the plan of grazing for that year and to ensure that their billing is reflective of that plan.
- Use of the three pastures would be alternated on successive years⁸.

2.5 Alternative C – No Action (Renew Grazing Permit with Current Terms and Conditions)

Under this alternative, a new ten-year term grazing permit would be issued under the authority of Section 402(c)(2) of FLPMA for the Tuckup Allotment, upon expiration of the existing permit, with the same terms and conditions. Specifically, under this alternative the BLM would:

- Issue a new grazing permit under the authority of Section 402(c)(2) of FLPMA for the Tuckup Allotment for a period of ten years. There would be no change in number of livestock or season of use for the allotment. Livestock grazing would occur during the season of use, and with the number of AUMs limited to the current active preference (Table 2.3).

Table 2.3 Tuckup Allotment Proposed Grazing Use under Alternative C

	Kind of Livestock	Livestock Numbers	Season of Use	Active AUMs	Suspended AUMs	Public Land Acres	% Federal Land
Current	Cattle	161	10/15 – 5/15	1075	4	16,276	95%

The proposed utilization level, 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.

⁸ The same pasture would not be grazed during the same time period for three consecutive years.

2.5.1 Proposed Grazing System

Under this alternative, cattle would continue to graze the allotment from October 15 to May 15 each grazing period, the same as on the current permit. The entire allotment would be rested from May 16 to October 14 each year. This alternative represents continued management, so a two-pasture rotation grazing system would continue to be implemented on the allotment and the Upper Kent Pasture would not be created. Use of the two pastures on the Tuckup Allotment would be alternated on successive years so that each pasture receives different use from the previous grazing period.

2.5.2 Terms and Conditions of Grazing Permit

Terms and conditions of the grazing permit would be the same as those on the current permit:

- This permit or lease may be cancelled, suspended, or modified, in whole or in part to meet the requirements of applicable laws and regulations.
- A temporary range camp will be authorized between October 15 and May 15, while the permittee works his livestock, fixing fence, and performing maintenance of existing range improvements.
- Permittee is authorized to cross federal lands with livestock along existing roads and trail routes each October and again in May.
- The route in October will be from Cane Beds to Yellowstone to the Clayhole road going south to the Tuckup Allotment, and in reverse in May.
- Other arrangements must be made for use of privately owned lands and waters, while in route.
- As provided by 43 CFR 4130.3-1(B) This permit shall be subject to cancellation, suspension, or modification for any violation of the regulations of 43 CFR Part 4100 or of any term or condition of this permit.
- The Permittee will use the Advanced Billing system.
- An actual grazing use report (Form 4130-5) must be submitted within 15 days after completing your annual grazing use.

2.6 Alternative D – No Grazing

Alternative D is to reissue a ten-year term grazing permit on the Tuckup Allotment with 0 authorized AUMs for active preference (i.e., livestock grazing would be deferred for the ten-year permit period). Thus, all 1,079 AUMs would be suspended for the ten-year permit period).

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 Tuckup Allotment. This EA also incorporates by reference the Standards for Rangeland Health and Guidelines for Grazing Administration Implementation Project: Allotment Assessment for Tuckup (BLM 2004). 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 3.5 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 discussed in Section 3.4 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 Tuckup Allotment (see Appendix A – Tuckup Allotment Map) is located in Mohave County, Arizona. The Tuckup Allotment is located in the Tuweep Valley, primarily on lands within the Arizona Strip Field Office. Portions of the allotment also lie within Grand Canyon-Parashant National Monument and BNIK.

3.2.1 Topography

The Tuckup Allotment consists of grassland valleys that are typical throughout the Tuweep Valley. Outside of Tuweep Valley the allotment consists of sage flats mixed with dense and semi dense pinyon and juniper stands that are typical throughout the area. Elevation in the allotment ranges from 5,100 to 6,300 feet.

3.2.2 Climate

The climate in the area of the allotment is characterized by low rainfall (approximately 9.8 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 Heaton Knolls rain gauge located just north of the allotment boundary. A breakdown of average precipitation by season for this rain gauge over the past 40 years is presented in Table 3.1.

Table 3.1. Heaton Knolls Average 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
Heaton Knolls	15	1.44	22	2.15	17	1.66	47	4.61	9.8

Table 3.2. Heaton Knolls Precipitation Data

Year	Fall	Winter	Spring	Summer	Total	Percent of Average
2024	0.375	2.625	1.25	1.875	6.125	63%
2023	2	2.625	2	5.5	12.13	123%
2022	0.625	1.25	0.375	2.875	5.13	52%
2021	0.0625	0.6875	1	5.875	7.63	77%
2020	2.5	2.25	2.625	0.375	7.75	79%
2019	2.5	3	3	2.5	11	112%
2018	0	1.813	1.812	5.437	9.06	92%

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 40 years has been at or above normal⁹ for 17 of those years at the Heaton Knolls rain gauge; precipitation has been below normal for 23 of those years. The highest precipitation received during that time period was in 2005 when annual precipitation was 171% of normal; the lowest was in 2002 when precipitation was 37% of normal. As shown in Table 3.2, annual precipitation since 2018 has ranged from 5.13 inches to 12.13 inches, or from 52% to 123% 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.

⁹ “At or above normal” for this analysis is considered 95% of average annual precipitation or greater.

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.

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 DPCs then become the objectives by which management actions would be measured (Section 2.2.2).

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 2001, a land health evaluation was conducted for this allotment, and an evaluation report was completed in 2004 (BLM 2004). 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 were 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.

Key areas are typically monitored every five years using pace-frequency, trend and dry weight rank protocols. Additional monitoring (pace-frequency and utilization) data has been collected since the 2004 land health evaluation was completed. Utilization monitoring was conducted at all key areas in 2014, 2015, 2019, 2020, 2021, 2022 (see Appendix B for years additional trend and dry weight rank monitoring was conducted). As shown in Table 3.3, utilization at key areas has been light.

Table 3.3. Tuckup Allotment Recent Utilization¹⁰ Percentages

Key Area	2014	2015	2019	2020	2021	2022
5	26%	31%	32%	34%	28%	23%
6	17%	13%	27%	24%	20%	19%
9	15%	24%	17%	12%	15%	27%
14	13%	29%	26%	27%	21%	24%
Average	18%	24%	26%	24%	21%	23%

The majority of the public lands within the Tuckup Allotment are in late seral, or good ecological condition. Table 3.4 lists key areas, ecological sites of key areas, and current trend status. This table summarizes the trend data presented in Appendix B.

Table 3.4. Tuckup Allotment Vegetation Characteristics

Pasture	Key Area #	Ecological Site	Trend ¹¹
Tuckup	5	Loamy Upland 10-14" pz	Upward
Little Tuweep	6	Clay Loam Upland 10-14" pz	Upward
Little Tuweep	9	Loamy Upland 10-14" pz	Upward
Tuckup	14	Loamy Upland 10-14" pz	Upward

¹⁰ Utilization is defined as the proportion or degree of *current year's forage production* that is consumed or destroyed by animals (including insects).

¹¹ See Appendix B for details on how trend was determined for each key area.

Based on analyses of the allotment monitoring data and supporting documentation contained in the land health evaluation report (BLM 2004) and the 2024 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. BLM resource specialists have considered the resources and elements of the human environment as part of the NEPA process to determine whether they would be potentially affected by any of the alternatives. These elements are identified in Table 3.5, 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 3.5. 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	<p>The Tuckup Allotment is included in an area that is unclassified for all pollutants and has been designated as Prevention of Significant Deterioration Class II. Air quality in the area is generally good. Exceptions include short-term pollution (particulate matter) resulting from vehicular traffic on unpaved roads. Fugitive dust is also generated by winds blowing across the area, coming from roads and other disturbed areas. Moving livestock can produce small amounts of fugitive dust in the short term, but this would cause negligible and localized impacts on air quality. The alternatives would therefore not impact air quality standards.</p> <p>Cattle grazing on public land (and elsewhere) eat vegetation that potentially stores carbon, and cattle do generate methane. In addition, livestock operations have the potential to generate emissions through vehicle and equipment use. The proposed action would be a negligible source of carbon dioxide (CO₂) and other greenhouse gases (GHGs). This analysis is unable to identify the specific impacts of the proposed action’s GHG emissions on the climate because there is insufficient information, and there are numerous models that produce widely divergent results. It is difficult to state with any certainty to what extent the alternatives could contribute to the larger impacts on climate. It has therefore been determined that the proposed action would have a negligible effect on local, regional, and global climate.</p>

Resource	Determination	Rationale for Determination
Areas of Critical Environmental Concern	NP	There are no Areas of Critical Environmental Concern within this grazing allotment.
Farmlands (Prime or Unique)	NP	<p>Prime farmland is described as farmland with resources available to sustain high levels of productions. In the southwest, it normally requires irrigation to make prime farmland. In general, prime farmland has a dependable water supply, favorable temperature and growing season, acceptable levels of acidity or alkalinity, and acceptable content of salt and sodium, and few or no rocks.</p> <p>Tuweep Valley at the southern end of the Tuckup Allotment used to be homesteaded and farmed. This land was sold to the BLM and has since been used a rangeland and is no longer farmed. Based on these definitions and reasons, no prime or unique farmlands exist within the Tuckup Allotment.</p>
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	NI	The alternatives are not expected to limit access to or ceremonial use of Native American sacred sites, or significantly adversely affect the physical integrity of such sacred sites – the action is a grazing permit renewal; as such, there would be no adverse impact.
Threatened, Endangered or Candidate Plant Species	NP	There are no known populations of threatened, endangered or candidate plant species in the Tuckup Allotment.
Threatened, Endangered or Candidate Animal Species	NI	<p>There are no areas within the Tuckup Allotment that lie within any critical habitat that has been designated or proposed under the Endangered Species Act.</p> <p>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.</p> <p>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 Tuckup</p>

Resource	Determination	Rationale for Determination
		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	<p>Livestock grazing has continued as an historic use of the public land in this allotment for over 100 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). A review of the cultural resources data managed by the BLM – Arizona Strip District was undertaken to determine if significant cultural resources are known to be present or if there is a likelihood that significant cultural resources may be present. Significant cultural resources are not known or suspected within the Tuckup Allotment; however, adverse impacts to those resources, should they be present, are not expected.</p> <p>New range improvement actions, including fences, water facilities, and vegetation treatments, are subject to a Class III cultural resources inventory. No new range improvements are proposed under any alternatives analyzed in this EA.</p>
Invasive, Non-native Species	NI	<p>Some Scotch thistle has occurred within the boundary of the Tuckup 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.</p> <p>Cheatgrass is present in some areas across the Tuckup 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 Clements (2007) speculated that removal of livestock would actually accelerate conversion to cheatgrass because of increased fuel accumulations and more frequent wildfires.</p> <p>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</p>

Resource	Determination	Rationale for Determination
		<p>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 Tuckup Allotment – the majority of the public lands within the allotment are in mid-seral, which is a stable condition) 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.</p>
Wastes (hazardous or solid)	NI	<p>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.</p> <p>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.</p>
Water Quality (drinking / ground)	NI	<p>There is no indication that current livestock use is altering water quality – no water within this allotment is used for domestic drinking water. Thus, no effect to water quality is expected from the alternatives.</p>
Wetlands / Riparian Zones	NP	<p>No wetland/riparian areas occur in the allotment.</p>
Wild and Scenic Rivers	NP	<p>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.</p>
Wilderness	NP	<p>There is no designated wilderness within the Tuckup Allotment.</p>
Livestock Grazing	PI	<p>Permit renewal is required to allow continued livestock use on the allotment: this issue is therefore analyzed in detail in this EA.</p>
Woodland / Forestry	NI	<p>Continued livestock use would not affect the availability of, or access to, these resources.</p>

Resource	Determination	Rationale for Determination
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 in this EA.
BLM or State Sensitive Plant Species	NP	There are no known sensitive plant species or habitat for these species in the Tuckup Allotment.
Wildlife, Including Big Game, Migratory Birds, and Sensitive Species	PI	Multiple sensitive animal species, including migratory birds, may occur within the Tuckup Allotment. Mule deer are the primary big game species known to occur throughout the allotment. Wildlife interactions with livestock and competition for forage could occur; this issue is therefore analyzed in detail in this EA.
Soil Resources	PI	Potential soil impacts from grazing include decreases in soil infiltration capacity from increased compaction in trailing, loading, and active grazing areas. This issue is therefore analyzed in detail in this EA.
Recreation	NI	This allotment has very little recreational use. The main visitor use is driving on County Roads 5 and 109 to visit Toroweap Overlook (outside of the allotment, in Grand Canyon National Park). The area may also have occasional hunting use limited by the available hunting permits issued by the state. None of these recreational uses would be affected by the alternatives addressed in this EA.
Visual Resources	NI	The portion of the allotment within Grand Canyon-Parashant National Monument is designated as Visual Resource Management (VRM) Class II; the remaining portion is VRM Class III ¹² . 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. 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. 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.

¹² As stated previously, lands within BNIK are managed under the Interim Management of the BNIK and the Arizona Strip Field Office RMP unless there is a conflict with the Proclamation. Livestock grazing would not affect visual resource because the existing character of the landscape would not change, so the alternatives would not violate the Proclamation.

Resource	Determination	Rationale for Determination
Geology / Mineral Resources / Energy Production	NI	There are no minerals or energy related authorizations in the project area. Continued livestock grazing would not alter geological features or mineral resources. Mining activities (uranium, gypsum, and mineral materials) are occurring across the Arizona Strip (although not within the Tuckup Allotment), but grazing of livestock would not alter or impair the opportunities to explore for or mine these resources.
Paleontology	NI	No paleontological resources are known in the project areas. The potential for significant fossils is low. No paleontological resources are known to occur in the allotment. Continuing livestock grazing would not affect paleontological resources.
Lands / Access	NI	No existing land use authorizations would be affected by the continuation of livestock grazing. There are no proposed land tenure actions being considered within the allotment. No other land issues have been identified in connection with the alternatives.
Fuels / Fire Management	NI	There are no Fire Management/Fuels issues in the Tuckup Allotment. Continued livestock use would not affect fire management, other than the continued reduction of some light fuels through livestock grazing.
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. Issuance of the grazing permit would allow the permittee to continue the 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.
Lands Managed to Maintain Wilderness characteristics	NP	There are no lands managed to maintain wilderness characteristics within the Tuckup Allotment.

3.4 Resources Brought Forward for Analysis

3.4.1 Livestock Grazing

A grazing permit is issued to authorize livestock to graze 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 required to sustain one cow/calf pair, or its equivalent, for one month. The BLM does not control adjacent private lands owned by permit holder. 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 livestock are grazing in compliance with the terms and conditions of the permit. If non-compliance is identified, the BLM would work with the affected permittee to identify and prescribe actions to be taken that would return the allotment to compliance.

The Tuckup 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.
- f) Other criteria appropriate to the Environmental Statement area.

Land ownership in the Tuckup Allotment consists primarily of federal land (Table 3.6). Active grazing use on the allotment is 1,075 AUMs, with 4 suspended non-use AUMs.

Table 3.6. Land Ownership

Ownership	Tuckup Allotment
Federal	16,276 acres
State	639 acres
Private	0 acres
Total	16,915 acres

The current grazing system on the Tuckup Allotment is a two-pasture rotation grazing system. As shown in Table 3.7, in Year 1 the Tuckup Pasture is grazed first. The Little Tuweep Pasture is available for use once utilization has reached 50% in the Tuckup Pasture (the timing of this can change due to fluctuating livestock numbers and precipitation). 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 3.7. Tuckup Grazing System

Years	Tuckup Pasture	Little Tuweep Pasture
1	10/15 until 50% utilization is reached, then cattle moved to Little Tuweep Pasture	Moved from Tuckup Pasture, grazed until 5/15
2	Moved from Little Tuweep Pasture, grazed until 5/15	10/15 until 50% utilization is reached, then cattle moved to Tuckup Pasture
3	Repeat Year 1	Repeat Year 1

Range Improvements

The Tuckup Allotment contains a number of structural range improvements (see Appendix A – Tuckup Allotment Map). These range improvements consist of fences, catchments, pipelines, and several reservoirs and springs. The developed water sources are:

- Coyote Spring
- Little Tuweep Reservoir
- Cantaloupe Reservoir
- Upper Kent Reservoir
- Tuweep Rim Reservoir
- Tuckup Reservoir
- Hancock Reservoir
- Tuckup Catchment
- Fox Catchment
- South Tuckup Catchment
- Fox Catchment

3.4.2 Soils

Lithology: The allotment consists of basalt flows over Kaibab limestone. Tuweep Valley is alluvial deposits of silty and gravelly soils.

Organisms: Vegetation responsible for soil properties on the Tuckup Allotment are primarily the mix of 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 allotment. Soil organic matter has an overriding influence on many soil properties, of which erosion and compaction-resistance are no exceptions.

Soil erosion and lack of understory: Some of this allotment is dominated with big sagebrush (*Artemisia tridentata wyomingensis*). The big sagebrush is invading and crowding out the grasses, shrubs and forbs in these areas. Therefore, the soils are not being stabilized or held in

place, causing much of the soil to wash away and the understory species to disappear. A brush management plan is in place that would help reduce Wyoming big sagebrush in those plant communities, helping to reduce competition with understory species and release more nutrients and moisture to the grass, forbs and shrubs remaining, and thus help attain the DPC objectives (BLM 2004).

Relief: Highly variable slope ranges and landforms characterize the Tuckup Allotment, similar to much of the Arizona Strip District. The allotment consists of basalt flows over Kaibab Limestone. Soils are mapped in the “bottom” alluvial (stream, wash, terraces) area of low relief (1 to 4 percent slopes), grading towards steeper (35 to 70% slopes) hillsides and cliffs.

Parent Material: Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic in which the soil forms. The soil surveyor uses parent material to develop a model used for soil mapping. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material (NRCS 2024). Soil map units and ecological sites for the Tuckup Allotment are shown in Table 3.8.

Table 3.8. Major Ecological Site Descriptions of the Tuckup Allotment (adapted from Web Soil Survey 2024)

Map Unit Symbol	Map Unit Name	Component Name (percent)	Ecological Site	% of Allotment ¹³
73	Yumtheska very gravelly loam, 30 to 50 percent slopes	Yumtheska (75%)	F035xF613AZ – Limestone Hills 13-17” p.z	20.7
		Unnamed soils (25%)		
58	Showlow-Thimble complex, 1 to 15 percent slopes	Sholow (50%)	F035xF611AZ – Clay Loam Upland 13-17” p.z	18.1
		Thimble (25%)	F035xF620AZ – Basalt Upland 13-17” p.z.	
		Unnamed soils (25%)		
72	Yumtheska very gravelly loam, 4 to 20 percent slopes	Yumtheska (75%)	F035xF619AZ – Limestone Upland 13-17” p.z.	9.9
		Unnamed soils (25%)		
11		Curhollow (45%)	R035XC301AZ – Basalt Upland 10-14” p.z.	6.6

¹³ This table shows map units that have greater than or equal to 5% of the Tuckup Allotment. More map units exist within the Tuckup Allotment but are less than 5% of the total area. There are 13 additional map units that make up the remaining 27.6% of the allotment.

	Curhollow-Prieta complex, 4 to 20 percent slopes	Prieta (35%)	R035XC301AZ – Basalt Upland 10-14” p.z.	
		Unnamed soils (20%)		
71	Yumtheska-Goesling complex, 1 to 15 percent slopes	Yumtheska (60%)	F035XF619AZ – Limestone Upland 13-17” p.z.	6.4
		Goesling (25%)	F035XF619AZ –Loamy Upland 13-17” p.z.	
		Unnamed soils (15%)		
69	Wutoma-Lozinta complex, 15 to 50 percent slopes	Wutoma (60%)	F035XF609AZ – Cinder Hills 13-17” p.z. (PIED)	5.7
		Lozinta (30%)	F035XF609AZ – Cinder Hills 13-17” p.z. (PIED)	
		Unnamed soils (10%)		
60	Showlow very cobbly silty clay loam 15 to 35 percent slopes	Showlow (80%)	F035XF611AZ – Clay Loam Upland 13-17” p.z. Gravelly (PIED, JUOS)	5.0
		Unnamed soils (20%)		

Soils data shown in Table 3.8 was garnered from the NRCS Web Soil Survey (NRCS 2024).

3.4.3 Vegetation

As shown in Table 3.8, the dominant ecological sites on the Tuckup Allotment according to the NRCS are Yumtheska very gravelly loam, Limestone Hills (13-17” p.z.) and Showlow Thimble complex, Clay Loam Upland (13-17” 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. Blue grama (*Bouteloua gracilis*) is the predominant grass species throughout the allotment. Other grasses present include galleta (*Hilaria jamesii*), sand dropseed (*Sporobolus cryptandrus*), black grama (*Bouteloua eriopoda*), bottlebrush squirreltail (*Sitanion hystrix*), and western wheatgrass (*Agropyron smithii*). The desert shrub vegetative type consists of fourwing saltbush (*Atriplex canescens*), winterfat (*Krascheninnikovia lanata*)(previously *Ceratoides lanata*), Mormon tea (*Ephedra viridis*), sagebrush (*Artemisia* spp.), and forb species such as globemallow (*Sphaeralcia ambigua*) and desert trumpet (*Eriogonum inflatum*).

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 – bitterbrush (*Purshia tridentata*), fourwing saltbush, and winterfat
- Warm season grasses – sand dropseed, black grama, galleta, side-oats grama (*Bouteloua curtipendula*), and blue grama
- Cool season grasses – bottlebrush squirreltail, western wheatgrass, crested wheatgrass (*Agropyron cristatum*), and Russian wildrye (*Elymus cinereus*)

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

Table 3.9. Phenological Development* of some Key Species for the Tuckup 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
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 Tuckup Allotment is located in Arizona Game and Fish Department’s (AGFD) Game Management Unit (GMU) 13A. GMU 13A is bordered by the Hurricane Cliffs on the west, the Grand Canyon on the south, and the Kanab Creek drainage to the east. The unit contains extensive Great Basin short grass prairie, extensive pinyon-juniper woodlands, grassland pinyon-juniper association, and a ponderosa pine ecotype in the Mt. Logan and Mt. Trumbull areas.

Mule deer (*Odocoileus hemionus*)

Mule deer inhabit most of the 13A unit, with the majority of animals occupying summer range to the north in Utah and south towards Mt. Trumbull and Grand Canyon. Annual migration of mule deer has been observed in 13A. This typically occurs between approximately October-April each year. Recent telemetry studies of mule deer in 13A show that many deer winter in the Whitmore Canyon area and further south into the Grand Canyon. Deer also winter in the Kanab Creek drainage area, and occasionally 13A experiences interchange with the North Kaibab deer herd. Unit 13A also experiences interchange with the Utah mule deer herd. Mule deer tend to occupy most other areas of the unit on a year-round basis.

Unit 13A contains few perennial water sources. Natural springs do exist and many have been developed for livestock use. Kanab Creek (outside the Tuckup Allotment) provides a perennial source of water in most years, but because of its low elevation, intermittent flow, and isolation in the bottom of the canyon provides limited benefit to mule deer. Much of the water availability in

the unit is from stock tanks, livestock developments, and manmade water catchment facilities (AGFD and BLM 2019).

Mule deer occur in a wide variety of habitat types; although vegetative communities vary throughout the range of mule deer, habitat is nearly always characterized by areas of thick brush or trees interspersed with small openings. The thick brush and trees are used for escape cover whereas the small openings provide forage and feeding areas. Mule deer eat a wide variety of plants including browse, forbs and grasses. Deer are especially reliant on shrubs for forage during critical winter months and fawn production is closely tied to the abundance of succulent, green forage during the spring and summer months.

AGFD has categorized habitat characteristics for big game species within the state. Habitat categories are based on several factors such as topography, forage and cover, availability of water, and limiting factors such as prohibitive fencing. The entire Tuckup Allotment is categorized as summer habitat and yearlong habitat for mule deer. Maintaining the health of existing summer range habitats across the Arizona Strip is a management concern. Providing a full complement of browse, forb, and grass species appropriate for the area is vital to maintaining mule deer habitat (AGFD and BLM 2019). Cliffrose, sagebrush, bitterbrush, four wing saltbush, blue grama, and wheat grasses are examples of quality species available in the project area. While no population estimates are available specifically for this allotment, AGFD considers the mule deer population within the area to be sparse, with approximately 0.5-1 animal/square mile.

Pronghorn (*Antilocapra americana*)

Pronghorn typically occupy grassland/desert scrub habitats; pronghorn habitat in Unit 13A consists primarily of Great Basin grasslands with areas of sagebrush, juniper and shrub encroachment (AGFD 2011). 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.

Pronghorn distribution is widespread in Unit 13A and varies seasonally depending on weather and range conditions. Transplants of pronghorn to this GMU occurred in the 1960s through the 1980s with animals originating from Arizona, Montana, and Colorado. Generally, pronghorn are found in Antelope Valley, Clayhole Valley, and areas south of Colorado City. Since reintroduction, pronghorn populations have been cyclic in this unit, with herd numbers increasing and decreasing in a direct relationship to precipitation – during periods of drought, poor fawn survival results in low recruitment, while during normal to above normal precipitation years, fawn survival and recruitment increase.

Causes of decline in pronghorn herds across Arizona are numerous but are considered generally consistent. Paramount to the persistence of any wildlife species is presence of quality habitat. Grasslands historically dependent upon predictable fire regimes have been reduced in size by invasion of juniper and shrub species resulting from decades of fire suppression. Past livestock grazing and historic fencing practices have reduced habitat quality and created barriers that pronghorn cannot maneuver. However, a fence inventory that encompassed pronghorn

habitat across the Arizona Strip District was completed and fences that were identified as not being wildlife passable are being corrected as funding allows. Finally, persistent drought and predation have impacted pronghorn populations to varying degrees statewide. The combination of these factors has led to a reduction in habitat availability and quality, a substantial decline in fawn recruitment, and a correlated increase in efficiency of pronghorn predators (AGFD 2011).

Pronghorn habitat in the project area consists primarily of grassland communities with areas of saltbush, sagebrush, and scattered juniper. Habitat within the Tuckup Allotment is categorized as poor quality habitat for pronghorn. While no population estimates are available specifically for this allotment, AGFD considers the pronghorn population within the project area to be very sparse to low with 0.0-1.5 animals/square mile.

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). A memorandum of understanding (MOU) between the BLM and USFWS states that the BLM shall: “At the project level, evaluate the effects of the BLM’s actions on migratory birds during the NEPA process, if any, and identify where take reasonably attributable to agency actions may have a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. In such situations, BLM will implement approaches lessening such take.” (BLM and USFWS 2010).

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 2021* (USFWS 2021) 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 Tuckup Allotment are summarized in Table 3.10.

Table 3.10. USFWS Birds of Conservation Concern Associated with the Tuckup Allotment.

Species	Habitat Type in the Project Area
Broad-tailed Hummingbird	Breeds in meadows and open woodlands, especially pinyon-juniper, pine-oak, evergreen, and montane scrub, and thickets from around 5,000 to 10,500 feet elevation. Fairly common across the Arizona Strip.
Black-chinned Sparrow	Breeds in the chaparral habitat type within rocky canyons, especially where cliffrose is present. Fairly common on the Arizona Strip within its limited habitat type.
Cassin’s Finch	Small flocks sporadically occur in pinyon-juniper woodlands during the non-breeding season. Found in higher elevation habitat types such

Species	Habitat Type in the Project Area
	as ponderosa pine during the breeding season. Uncommon on the Arizona Strip.
Common Nighthawk	Favors sagebrush, grasslands, open forests, and rock outcrops where they eat insects almost exclusively and hunt primarily at dawn and dusk. Fairly common throughout the Arizona Strip.
Bendire's Thrasher	Favors open habitat with scattered junipers, cliffrose, and sagebrush. An uncommon breeder on the Arizona Strip.
Ferruginous Hawk	Open grassland or shrubland with isolated trees (typically juniper) for nesting. Found in low numbers on the Arizona Strip. This species is also designated as BLM Sensitive Species and are addressed in Section 3.4.4.3
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.
Western Burrowing Owl	Sparsely vegetated grassland or shrubland with existing burrows excavated by badgers, rabbits, or ground squirrels. This species is also designated as BLM Sensitive Species and are addressed in Section 3.4.4.3
Pinyon Jay	Considered a pinyon-juniper obligate and a year-round resident of pinyon-juniper woodlands with areas of open structure containing mixed shrubs (especially sagebrush) and grasses. Found year-round on the Arizona Strip. This species is also designated as BLM Sensitive Species and are addressed in Section 3.4.4.3

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 five years following delisting are included as sensitive species. Based on occurrence records and monitoring data, the sensitive species that may occur within the Tuckup Allotment and that may be affected by actions included in the alternatives presented in Chapter 2 are displayed in Table 3.11. Sensitive species found outside the project area were not analyzed.

Table 3.11. Sensitive Species Associated with the Tuckup Allotment

Species	Potential for Occurrence
Allen’s Big-eared Bat (<i>Idionycteris phyllotis</i>)	Potential
Townsend’s Big-eared Bat (<i>Corynorhinus townsendii</i>)	Potential
Greater Western Mastiff Bat (<i>Eumops perotis californicus</i>)	Potential
Spotted Bat (<i>Euderma maculatum</i>)	Potential
Fringed Myotis Bat (<i>Myotis thysanodes</i>)	Potential
Big Free-tailed Bat (<i>Nyctinomops macrotis</i>)	Potential
Peregrine Falcon (<i>Falco peregrinus</i>)	Potential
Golden Eagle (<i>Aquila chrysaetos</i>)	Verified
Ferruginous Hawk (<i>Buteo regalis</i>)	Potential
Western Burrowing Owl (<i>Athene cunicularia hypogea</i>)	Potential
Pinyon Jay (<i>Gymnorhinus cyanocephalus</i>)	Verified
Monarch Butterfly (<i>Danaus plexippus</i>)	Potential

Allen’s Big-eared Bat (*Idionycteris phyllotis*)

Allen’s big-eared bat usually inhabits forested areas of the mountainous southwest and is relatively common in pine-oak forested canyons and coniferous forests; however, it also may occur in non-forested, arid habitats. At most sites where this species occurs, cliffs, outcroppings, boulder piles, or lava flows are found nearby. Day roosts may include rock shelters, caves, trees and mines. Their elevational distribution ranges from 1,320 to 9,800 feet, and their main food source is small moths gleaned from surfaces or in flight (AGFD 2023a). These bats are known to use stock ponds as water and food sources but are theorized as too large-bodied to drink from water catchments (Herder 1996).

The allotment contains pockets of pinyon-juniper woodlands and semi-arid habitats that occur near cliffs, and outcroppings. Allen’s big-eared bats are found throughout the Arizona Strip and likely occupy the allotment. The presence of livestock reservoirs in the allotment may attract Allen’s big-eared bats for drinking and foraging opportunities.

Townsend’s Big-eared Bat (*Corynorhinus townsendii*)

In Arizona, summer day roosts are found in caves and mines from desert scrub up to woodlands and coniferous forests. Night roosts may often be in abandoned buildings. In winter, they hibernate in cold caves, lava tubes and mines mostly in uplands and mountains from the vicinity of the Grand Canyon to the southeastern part of the state (AGFD 2023b). These bats prefer to hang from open ceilings in caves or mines and do not use crevices.

Townsend's big-eared bats have been found throughout the Arizona Strip and likely occupy the allotment. The presence of livestock reservoirs may attract Townsend's big-eared bats for drinking and foraging opportunities.

Greater Western Mastiff Bat (*Eumops perotis californicus*)

This species is found in desert scrub near cliffs, preferring rugged rocky canyons with abundant crevices. It prefers crowding into tight crevices a foot or more deep and two inches or more wide. Colonies prefer crevices even deeper, to ten or more feet. These bats wedge themselves in the backs of cracks or crevices where they narrow down considerably. Entrances to roosting crevices are usually horizontal but facing downward which facilitates entry and exit (AGFD 2023d). They are known to forage at least 15 miles from the nearest likely roosting sites.

Greater western mastiff bats potentially occur on the allotment. Suitable roosting sites are present on the west and south side of the allotment. The presence of livestock reservoirs may attract greater western mastiff bats for drinking and foraging opportunities, especially given the long distances they travel from roost sites.

Spotted Bat (*Euderma maculatum*)

Spotted bats are found from low desert in southwestern Arizona to high desert and riparian habitats in northwestern Arizona and Utah to conifer forests in northern Arizona and other western states. They are found in desert scrub, riparian, pinyon-juniper, and montane coniferous forests at elevations up to 8,670 feet. They roost in small cracks found in cliffs and stony outcrops. They forage on large flying insects, primarily moths (AGFD 2023d).

The allotment contains pockets of pinyon-juniper woodlands as well as high cliffs and rocky outcrops which may provide suitable roosting habitat. The presence of livestock reservoirs in the allotment may attract spotted bats for drinking and foraging opportunities.

Fringed Myotis Bat (*Myotis thysanodes*)

Fringed myotis occur primarily in middle elevation habitats ranging from deserts, grasslands, and woodlands. Oak and pinyon woodlands appear to be the most commonly used vegetative association. Food habits consist mostly of small beetles (73% frequency), but moths are also taken. Observations indicated slow, highly maneuverable flight with foraging occurring in and around vegetation. These observations are consistent with their wing morphology. This bat may land to pick up prey from the ground. Fringed *Myotis* tend to roost in the open in tightly packed groups. They roost in rock crevices, caves, mines, large snags, and under exfoliating bark. Human disturbance can cause abandonment of the roost site (AGFD 2023e).

The allotment contains pockets of pinyon-juniper woodlands as well as high cliffs and rocky outcrops which may provide suitable roosting habitat. The presence of livestock reservoirs in the allotment may attract fringed myotis bats for drinking and foraging opportunities.

Big Free-tailed Bat (*Nyctinomops macrotis*)

Primarily inhabits rugged, rocky country, roosting in rock crevices (vertical or horizontal) in cliffs, caves, buildings, and occasionally tree holes. Plant associations include sage grassland; Great Basin conifer woodlands; ponderosa pine-juniper habitat; pine forest; lowland desert

scrub; riparian corridors. In Arizona, elevation ranges from 1,810 ft (Virgin Mountains) to 8,475 ft (Kaibab Plateau). Feeds almost exclusively on large moths, but occasionally on crickets, long horned grasshoppers, flying ants, stinkbugs, froghoppers and leafhoppers (AGFD 2023f).

The allotment contains pockets of pinyon-juniper woodlands as well as high cliffs and rocky outcrops which may provide suitable roosting habitat. The presence of livestock reservoirs in the allotment may attract big free-tailed bats for drinking and foraging opportunities.

Peregrine Falcon (*Falco peregrinus anatum*)

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 2022a).

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 2022a). Potential nesting habitat is found along the canyons throughout the project area.

Ferruginous Hawk (*Buteo regalis*)

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.

In Arizona, the open scrublands and woodlands, grasslands, and semidesert grasslands are the favored breeding areas of ferruginous hawks. They typically avoid high elevation (found within 3,000 – 6,000 feet), forest interior, and narrow canyons. Hunting areas are open grasslands, preferably areas containing low hills or short trees, which serve as perches. Their primary prey source consists of rabbits, ground squirrels, and pocket gophers. Populations and reproduction can fluctuate with the availability of prey items (AGFD 2022b).

Ferruginous hawks may use open areas within the project area, especially during the winter when they are fairly common. Nesting habitat is available throughout the project area, especially in areas where lone trees are located among wide areas of open country.

Western Burrowing Owl (*Athene cunicularia hypugea*)

Burrowing owls occupy a wide variety of open habitats including grasslands, deserts, or open shrubland. 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 fabricated and other natural openings. Nest-site fidelity is high, and burrows are often reused for several years if not destroyed. Burrowing owls are opportunistic feeders, taking both invertebrates and vertebrates. In Arizona, they feed primarily on large insects and small mammals, as well as fish, reptiles, amphibians, birds, and even prickly pear cactus seeds. Foraging microhabitat typically consists of shortgrass, mowed or overgrazed pastures (AGFD 2022c).

Burrowing owls are infrequently encountered on the Arizona Strip likely due to the lack of prairie dog or other large rodent colonies. Potential burrowing owl habitat is located within the Tuckup Allotment, primarily in areas containing open habitat.

Golden Eagle (*Aquila chrysaetos*)

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. 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 although ponderosa pine, junipers, and rock outcrops are also used as nest sites. The nesting pair may have several alternate nests and may use the same nests in consecutive years or shift to an alternate nest used in different years (AGFD 2022d).

Golden eagles are carnivores that feeds mainly on small mammals such as rabbits and ground squirrels. They also eat insects, snakes, birds, juvenile ungulates, and carrion. Golden eagles forage over a large area. They hunt while soaring from their perch, commonly hunting in the early morning and early evening (AGFD 2022d). Potential nesting habitat is found along the canyons throughout the project area. The project area may also provide foraging habitat for this species.

Pinyon Jay (*Gymnorhinus cyanocephalus*)

The pinyon jay is a medium-sized corvid that inhabits much of the intermountain west and is particularly associated with pinyon-juniper ecosystems. The pinyon jay is of conservation concern due to steep declines in populations throughout its range (Somershoe et al. 2020). Boone et al. (2018) concluded that over the last 50 years, “the pinyon jay may have experienced a larger and more persistent decline than any other broadly distributed land bird in the interior West.” In August 2023 the U.S. Fish and Wildlife Service announced a positive 90-day finding on the petition to list pinyon jays as threatened or endangered under the Endangered Species Act. Listing status is currently under review.

Pinyon jays are highly social birds that nest communally and form large flocks that may number into the hundreds. Pinyon jays harvest seeds of pinyon pine, and to a lesser extent ponderosa and limber pine, during the fall and cache these seeds for use in late winter and early spring when other food sources are scarce (Balda and Bateman 1971). Spatial memory is highly developed in pinyon jays and cache relocation is efficient and reliable (Stotz and Balda 1995). Seeds that are not relocated and consumed will often germinate and contribute to pinyon pine regeneration. In addition to consuming pinyon and other pine nuts, pinyon jays also forage extensively for insects in the shrub and grass understory (Balda 2002).

Preferred habitat includes mosaics of pinyon-juniper woodlands. Pinyon jays prefer woodlands with pockets of large, mature, seed-producing pinyon pines and relatively open woodland structure with mixed shrubs (especially sagebrush) and grasses, to provide a variety of habitats for different life cycle activities (i.e., nesting, foraging, caching, and roosting) (Johnson et al. 2018; Johnson and Sadoti 2019). Across their geographic range, pinyon jays inhabit varying elevations and latitudes with diverse woodland structures, dominant tree species, and landscape characteristics, and home range attributes may vary substantially from region to region. Home ranges are large, typically 8,645 acres to 15,800 acres (Balda 2002; Johnson et. al. 2017) and

unlike traditionally territorial species, their nests are spatially clumped in nesting colonies that can cover 141 acres or more (Johnson et al. 2018). Pinyon jays place nests in roughly equal proportions in pinyon and juniper trees and usually select trees that are taller and larger in diameter when compared to random plots (Johnson et al. 2015). Pinyon jays additionally have high nest site fidelity and will return to the same nesting colony location every year (Marzluff and Balda 1992).

Pinyon-juniper forests in the southwestern United States have undergone substantial changes throughout history due to long term climate effects, fire, and land management. Woodland expansion attributed to fire suppression and increased grazing, as well as subsequent woodland reduction in response to expansion into former grasslands have significantly altered pinyon jay habitat over the decades (Kyllo 2016). In addition to management, pinyon die-off caused by severe drought and increased insect infestations linked to changes in the climate are likely impacting pinyon jay habitat (Wiggins 2005).

Pockets of pinyon-juniper woodlands are found in the Tuckup Allotment, with widespread pinyon-juniper woodlands found adjacent to the allotment. Pinyon jays have been found throughout the area. Surveys for pinyon jays throughout the state of Arizona are ongoing through a multi-year collaborative effort between BLM Arizona Strip, Arizona Game and Fish Department, Great Basin Bird Observatory and Kaibab National Forest. This effort primarily focuses on presence-absence surveys, utilizing the Data Standards and Protocols established by the Pinyon Jay Working Group. This protocol employs a plot-based survey that only considers a bird “present” if they are observed using habitat within the plot (e.g., foraging, caching, roosting, and nesting), excluding flyover observations. Plots measuring 2.5 x 2.5 km are surveyed up to 3 times between March 1 and May 30.

Monarch Butterfly (*Danaus plexippus*)

Monarch butterflies breed throughout the United States, absent only from the forests of the Pacific Northwest. Breeding densities are highest from the east coast to the Great Plains, with typically low densities in the western states. Migration corridors are found east of the Rocky Mountains, in the Great Basin, and within California. Wintering areas are located along the California coast and in Mexico (Jepsen et al. 2015). Over the past 20 years a 90% decline in wintering monarchs has been detected in Mexico along with a 50% decline noted in California, leading to a petition for listing under the ESA. Currently, the monarch is designated as a candidate species under the ESA and will be reviewed annually by the USFWS until a listing decision is made.

Monarch larvae feed exclusively on 27 species of milkweed which can be found in a variety of habitats such as rangelands, agricultural areas, riparian zones, wetlands, deserts, and woodlands. In the western U.S. the two most important larval food sources are narrow-leaved milkweed (*Asclepias fascicularis*) and showy milkweed (*A. speciosa*). Adult monarchs forage on a wide variety of flowering plants for nectar during migration periods (Brower et al. 2006).

Monarchs may breed in low numbers throughout the Arizona Strip, although documentation is lacking. Several different milkweed species are present throughout the Arizona Strip, including showy milkweed. Migrating monarchs have been observed on the Arizona Strip in the fall in areas outside of those analyzed in this EA.

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 3.5). 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 (Issue New 10-Year Grazing Permit with Change in Grazing Season to Year-Round Grazing)

This alternative would directly affect livestock grazing on the Tuckup Allotment by renewing the ten-year term grazing permit with new terms and conditions. The season of use would change from October 15 – May 15 to yearlong (March 1 – February 28). This would provide added stability for the permittee's livestock operation because the herd would remain on the allotment year-round, so alternate arrangements would not have to be provided for the herd during months when they are not on the allotment, such as is currently the case. 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, Arizona Strip Field Office RMP (BLM 2008a) and the Grand Canyon-Parashant National Monument RMP (BLM 2008b), and respond to applications to fully process and issue new permits to graze livestock on public land.

The longer grazing season provided under this alternative would require that livestock numbers be reduced to allow a pasture rotation to occur within the allotment and ensure that vegetative health would not be affected due to grazing during the growing season. The number of livestock would be reduced from 161 to 75. This would reduce active AUMs from 1,075 to 860 (see Table 2.1), a 20% reduction. This reduction of AUMs would be necessary to allow a pasture rotation to occur within the allotment and ensure that vegetative health would not be affected due to grazing during the growing season. Maximum utilization would remain at 50%. The Tuckup Allotment currently meets all applicable standards for rangeland health. However, the grazing system proposed in this alternative does not allow for flexibility in the grazing rotation to help protect vegetative resources. Due to grazing year-round on a three-pasture rotation, the same pasture would be grazed during the same season in consecutive years. This would likely be detrimental to vegetative resources, particularly in the pastures that are grazed during the spring and summer (see discussion of impacts to vegetation in Section 4.2.3.1).

The proposed grazing rotation would not allow any pasture to be rested in any year (see Table 4.1). Due to this being a three-pasture rotation, livestock would likely be in the same pasture at the same general time each year. This would not allow for any flexibility to occur in the grazing rotation, because once grazing is completed in one pasture, there are only two pastures left to move into, and one of those pastures was just grazed. This would lead to the same pasture in the allotment to consistently be grazed the same time each year. Even with a reduction in livestock numbers, this could lead to a change in plant composition in the first and third pastures (Tuweep and Upper Kent) due to grazing occurring during the growing season of the cool season and/or warm season grasses. Over time, this could affect land health in the allotment.

Table 4.1. Proposed Grazing Rotation for the Tuckup Allotment – Alternative A

Years	Tuweep Pasture	Tuckup Pasture	Upper Kent Pasture
1	<i>Summer/Winter grazing (7/2-11/1)</i>	<i>Winter/Early Spring grazing (11/1-2/28)</i>	<i>Early Spring/Summer Grazing (3/1-7/1)</i>
2	<i>Summer/Winter grazing (7/2-11/1)</i>	<i>Winter/Early Spring grazing (11/1-2/28)</i>	<i>Early Spring/Summer Grazing (3/1-7/1)</i>
3	<i>Summer/Winter grazing (7/2-11/1)</i>	<i>Winter/Early Spring grazing (11/1-2/28)</i>	<i>Early Spring/Summer Grazing (3/1-7/1)</i>
4	Repeat	Repeat	Repeat

4.2.1.2 Direct and Indirect Impacts of Alternative B - Issue New 10-Year Grazing Permit with Extended Grazing Season

This alternative 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, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management, the Arizona Strip Field Office RMP (BLM 2008a) and the Grand Canyon-Parashant National Monument RMP (BLM 2008b), while responding to applications to fully process and renew permits to graze livestock on public land. While this alternative does not include the request to change the season of use to yearlong, it does extend the season of use, and results in a fully processed grazing permit.

This alternative would affect the livestock grazing permittee on the Tuckup Allotment by renewing the term grazing permit with no change in active preference (1,075 AUMs) from the current permit 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. However, the season of use would change from October 15 – May 15 to August 14 – May 15 (see Table 4.2). Due to the longer grazing season, livestock numbers would be reduced from 161 to 125, with total AUMs remaining the same. This alternative would result in a continued viable ranching operation and provide some degree of stability for the permittee. The extended season of use would provide added stability for the permittee’s livestock operation from the current situation because the herd would remain on the allotment an additional two months. However, alternate arrangements for the herd, such as leasing private pasture or

obtaining substitute federal grazing permits on a different allotment, would still need to be provided for the herd during months when they are not on the allotment.

The extended season of use proposed in this alternative would also allow for flexibility to the grazing rotation. No grazing would occur on the allotment from May 16 – August 13. This grazing system would allow each pasture to be grazed during the dormant (winter) season once every three years. The same pasture would not be grazed during the same period of the year in consecutive years. Only one pasture would be grazed at a time. As previously stated, the allotment currently meets all applicable standards for rangeland health; by implementing a deferred rest rotation grazing system and reducing the livestock numbers, the allotment should continue to meet these standards for rangeland health. (See discussion of impacts to vegetation in Section 4.2.3.2.)

Table 4.2. Proposed Grazing Rotation for the Tuckup Allotment – Alternative B¹⁴

Years	Tuweep Pasture	Tuckup Pasture	Upper Kent Pasture
1	<i>Late summer/Early winter grazing (8/14-11/01)</i>	<i>Winter grazing (11/01-3/01)</i>	<i>Early Spring Grazing (3/01-5/15)</i>
2	<i>Winter grazing (11/01-1/15)</i>	<i>Winter/Early Spring Grazing (1/15-5/15)</i>	<i>Late summer/Early winter grazing (8/14-11/01)</i>
3	<i>Early Spring Grazing (3/01-5/15)</i>	<i>Late summer/Winter grazing (8/14-12/15)</i>	<i>Winter grazing (12/15-3/01)</i>
4	Repeat Year 1	Repeat Year 1	Repeat Year 1

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

The no action alternative would affect the livestock grazing permittee on the Tuckup Allotment by renewing the term grazing permit. This alternative would maintain the current permitted preference for the allotment (1,075 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. 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, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management, the Arizona Strip Field Office RMP (BLM 2008a) and the Grand Canyon-Parashant National Monument RMP (BLM 2008b), and respond to applications to fully process and renew permits to graze livestock on public land. While this alternative does not include the request to change the season of use to yearlong, it does result in a fully processed grazing permit. The Tuckup Allotment currently meets all applicable standards for rangeland health. Since the number of livestock grazing on the allotment and the current grazing system would remain in effect, livestock grazing should not

¹⁴ This grazing rotation is for illustrative purposes only – actual pasture rotations could vary from year to year, depending on resource conditions, to ensure the allotment continues to meet land health standards. However, the requirements that each pasture be grazed during the dormant (winter) season once every three years and the same pasture not being grazed during the same period of the year in consecutive years would still apply.

affect the ability of the allotment to continue to meet these standards for rangeland health (see discussion of impacts to vegetation in Section 4.2.3.3).

Table 4.3 Proposed Grazing Rotation for the Tuckup Allotment – Alternative C

Years	Tuweep Pasture	Tuckup Pasture
1	<i>Late summer/winter grazing (10/15-1/15)</i>	<i>Winter/ Spring (1/16-5/15)</i>
2	<i>Winter/ Spring (1/16-5/15)</i>	<i>Late summer/winter grazing (10/15-1/15)</i>
3	Repeat Year 1	Repeat Year 1

4.2.1.4 Direct and Indirect Impacts of Alternative D – No Grazing

This alternative would drastically affect the livestock grazing permittee on the Tuckup Allotment by not authorizing any active AUMs under the new term grazing permit. All of the 1,079 AUMs would be suspended (i.e., livestock grazing would be deferred for the ten year permit period). In ten years, the allotment would be re-evaluated. This would not provide current use, or stability for the permittee’s livestock operation because they would not be authorized to use the allotment. The permittee may go out of business because they would be forced to seek alternate arrangements for their herd, such as leasing private pasture or obtaining substitute federal grazing permits on a different allotment, which could be challenging because federal permits do not become available very often and are in high demand.

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, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management, the Arizona Strip Field Office RMP (BLM 2008a) and the Grand Canyon-Parashant National Monument RMP (BLM 2008b), and respond to applications to fully process and renew permits to graze livestock on public land. The Tuckup Allotment currently meets all applicable standards for rangeland health – current monitoring data does not suggest that removing livestock from the allotment is needed to meet rangeland health standards. (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.)

4.2.2 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 (BLM 2008a).

Livestock grazing can increase soil compaction in trailing, watering, and mineral supplement areas. The Tuckup Allotment was deemed to be meeting applicable standards for rangeland health in the land health evaluation (BLM 2004). As described in Section 3.2, current monitoring data indicates that the allotment is still meeting the applicable standards for rangeland health. Since 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.

Soils are rated based on their susceptibility to compaction from the operation of ground-based equipment for planting, harvesting, and site preparation activities when soils are moist. Soil compaction is the process in which soil particles are pressed together more closely than in the original state. Typically, the soil must be moist to be compacted because the mineral grains must slide together. Compaction reduces the abundance mostly of large pores in the soil by damaging the structure of the soil. This produces several effects that are unwanted in agricultural soils since large pores are most effective at transmitting water and air through the soil. Compaction also increases the soil strength which can limit root penetration and growth. The ability of soil to hold water is adversely affected by compaction since the large pores hold water. The degree of compaction of a soil is measured by its bulk density, which is the mass per unit volume, generally expressed in grams per cubic centimeter (NRCS 2024).

Compacted soils are less favorable for good plant growth because of high soil bulk density and hardness, reduced pore space, and poor aeration and drainage. Root penetration and growth is decreased in compacted soils because the hardness or strength of these soils prevents the expansion of roots. Supplies of air, water, and nutrients that roots need are also less favorable when compaction decreases soil porosity and drainage (NRCS 2024). Compaction rating of soils in the Tuckup Allotment are presented in Table 4.4 below.

Interpretation ratings are based on soil properties in the upper 12 inches of the profile. Factors considered are soil texture, soil organic matter content, soil structure, rock fragment content, and the existing bulk density. Each of these is thought to contribute to resisting the susceptibility of a soil to compaction when present. Organic matter in the soil provides resistance to compaction and the resilience to ameliorate the effects with time. Soil structure adds strength as discrete aggregates and it is the aggregates that are deformed or destroyed by compactive forces, thus strong soil structure lowers the susceptibility to compaction. Similarly, rock fragments in the soil can bridge and provide a framework to resist compaction. Finally, if a soil is already fairly dense, causing further compaction is more difficult (NRCS 2024).

Table 4.4. Soil Susceptibility to Compaction – Summary by Rating Value – Tuckup Allotment, adapted from Web Soil Survey (NRCS 2024) –

Rating	Acres in AOI*	Percent of AOI*
Medium	13,836.1	81.8%
High	1,212.1	7.2%
Low	1,085.7	6.4%
Null or Not Rated	774.5	4.6%

* AOI = Area of Interest (NRCS 2024)

Definitions of the ratings (NRCS 2024):

Low – The potential for compaction is insignificant. This soil is able to support standard equipment with minimal compaction. The soil is moisture insensitive, exhibiting only small changes in density with changing moisture content.

Medium – The potential for compaction is significant. The growth rate of seedlings may be reduced following compaction. After the initial compaction (i.e., the first equipment pass), this soil is able to support standard equipment with only minimal increases in soil density. The soil is intermediate between moisture insensitive and moisture sensitive.

High – The potential for compaction is significant. The growth rate of seedlings will be reduced following compaction. After initial compaction, this soil is still able to support standard equipment, but will continue to compact with each subsequent pass. The soil is moisture sensitive, exhibiting large changes in density with changing moisture content.

Interpretations of the suitability, use, and management of these soils in relation to the alternatives are derived from the Web Soil Survey for the Tuckup Allotment, Arizona (NRCS 2024).

4.2.2.1 Direct and Indirect Impacts of Alternative A – Proposed Action (Issue New 10-Year Grazing Permit with Changes in Grazing Season to Year-Round Grazing)

Under this alternative, livestock grazing would occur on the Tuckup Allotment year-round, but active AUMs would be reduced by 20% (from 1,075 to 860) for the new 10-year term permit. This level of reduced use would result in less direct impacts to soil resources including less trampling and compaction, particularly around developed water resources. However, the grazing system proposed in this alternative does not allow for flexibility in the grazing rotation to help protect vegetative resources. Due to grazing year-round on a three-pasture rotation, the same pasture would be grazed during the same season in consecutive years. This would likely be detrimental to vegetative resources, particularly in the pastures that are grazed during the spring and summer, due to the plant community shifting toward a warm season grass and shrub community. Should vegetative resources be affected, the canopy formed by vegetation to reduce impacts to the soil surface from rain and or wind, thereby decreasing the breakdown of soil aggregates, would also be affected. This could affect the allotment continuing to meet land health Standard 1. Monitoring of the allotment would continue as described in Section 2.2.3 – 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 2.2.3 of this EA).

4.2.2.2 Direct and Indirect Impacts of Alternative B - Issue New 10-Year Grazing Permit with Extended Grazing Season

Under this alternative, the season of use would change from October 15 – May 15 to August 14 – May 15. Due to the longer grazing season, livestock numbers would be reduced from 161 to 125, with total AUMs remaining the same, and a deferred rest rotation grazing system would be implemented. This proposed grazing system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15. This would result in foliage remaining on vegetation during the warmer season, allowing vegetation to complete growth for the season to produce seeds for future reproductive needs and store energy to get through the dormant season (see discussion of impacts to vegetation in Section 4.2.3.2). The canopy formed by vegetation would reduce impacts to the soil surface from rain and or wind thereby decreasing the breakdown of soil aggregates. Because of this it is expected that soil conditions in the allotment would be maintained, and the allotment would continue to meet land health Standard 1. Monitoring of the allotment would continue as described in Section 2.2.3, and if that 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.

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

Under this alternative, the active preference would remain at 1,075 AUMs. Maintenance of the current level of livestock grazing would retain the status quo for the previously described impacts to soils from grazing. The driving and resisting forces of soil properties as they related to grazing use would continue in the absence of other factors such as climatic events or wildfire. Current level of impacts to soils would be maintained and no changes in soil conditions are anticipated. Monitoring of the allotment would continue as described in Section 2.2.3, and if that 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.

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.

4.2.3 Vegetation

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).

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 photosynthesis. 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 3.3 shows recent utilization on vegetation within the allotment, including shrubs, based on current year's growth by weight, during the grazing season. As shown, utilization has been well below the allowed 50% at all key areas.

As described in Chapter 3 of this EA, current monitoring indicates that trend at all four 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 are being met on the Tuckup 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 Tuckup 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.

4.2.3.1 Direct and Indirect Impacts of Alternative A – Proposed Action (Issue New 10-Year Grazing Permit with Changes in Grazing Season to Year-Round Grazing)

Under this alternative, livestock grazing would occur on the Tuckup Allotment year-round, but active AUMs would be reduced by 20% (from 1,075 to 860) for the new 10-year term permit. The grazing rotation that would occur is shown in Table 4.5.

Table 4.5 Vegetation Effects from Alternative A Grazing System

Years	Tuweep Pasture	Tuckup Pasture	Upper Kent Pasture
1	<i>Summer/Winter grazing (7/2-11/1)</i> – Allows cool season plants the opportunity to complete growth (to replenish root reserves) and set seed (for increased vigor); some warm season grazing.	<i>Winter/Early Spring grazing (11/1-2/28)</i> – Allows cool season and warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	<i>Early Spring/Summer Grazing (3/1-7/1)</i> – Does not give cool season or warm season grasses the opportunity to complete growth (to replenish root reserves) and set seed, allowing for seedling establishment.
2	<i>Summer/Winter grazing (7/2-11/1)</i> – Allows cool season plants the opportunity to complete growth (to replenish root reserves) and set seed (for increased vigor); some warm season grazing.	<i>Winter/Early Spring grazing (11/1-2/28)</i> – Allows cool season and warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	<i>Early Spring/Summer Grazing (3/1-7/1)</i> – Does not give cool season or warm season grasses the opportunity to complete growth (to replenish root reserves) and set seed, allowing for seedling establishment.
3	<i>Summer/Winter grazing (7/2-11/1)</i> – Allows cool season plants the opportunity to complete growth (to replenish root reserves) set seed (for increased vigor); some warm season grazing.	<i>Winter/Early Spring grazing (11/1-2/28)</i> – Allows cool season and warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	<i>Early Spring/Summer Grazing (3/1-7/1)</i> – Does not give cool season or warm season grasses the opportunity to complete growth (to replenish root reserves) and set seed, allowing for seedling establishment.
4	Repeat Year 1	Repeat Year 1	Repeat Year 1

The grazing system proposed in this alternative does not allow for flexibility in the grazing rotation to help protect vegetative resources. Due to grazing year-round on a three-pasture rotation, the same pasture would be grazed during the same season in consecutive years. No pasture would be grazed only during the dormant season – each pasture would be grazed at some point of the growing season. This would likely be detrimental to vegetative resources, particularly in the pastures that are grazed during the spring and summer, as these grasses would not be able to replenish the seed bank and root reserves. Even with a reduction in livestock numbers and utilization not exceeding 50% in any of the pastures, the plant community composition would likely shift toward a warm season grass and shrub community in the pasture that is continually grazed during the spring, and shift toward a cool season grass and shrub community in the pasture that is continually grazed during the summer, likely resulting in these areas no longer meeting DPC objectives. Monitoring of the allotment would continue – if that 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 2.2.3 of this EA).

4.2.3.2 Direct and Indirect Impacts of Alternative B – Issue New 10-Year Grazing Permits with Extended Grazing Season

This proposed grazing system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15.

Table 4.6 Vegetation Effects from Alternative B Grazing System

Years	Tuweep Pasture	Tuckup Pasture	Upper Kent Pasture
1	Late summer/Fall grazing (8/14-11/01) – Allows cool season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	Winter grazing (11/01-3/01) – Allows warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	Spring Grazing (3/01-5/15) – 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	Winter grazing (11/01-1/15) – Allows warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	Winter/Spring Grazing (1/15-5/15) – 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/Fall grazing (8/14-11/01) – Allows cool season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.
3	Spring Grazing (3/01-5/15) – 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 (8/14-12/15) – Allows cool season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	Winter grazing (12/15-3/01) – Allows warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.
4	Repeat Year 1	Repeat Year 1	Repeat Year 1

As shown in Table 4.6, use of the allotment would be rotated between the pastures each year so that all pastures are grazed during a different season over the 3-year rotation cycle: late summer/early winter one year, winter (dormant season) the next year, then early spring the third year. Winter grazing defers use during the growing season for all plants. 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. Late summer/fall/winter grazing defers use during the growing season for cool season plants (unless growth starts “early” due to local climatic conditions). Spring grazing defers use during the growing season for warm

season plants. The three pasture grazing system proposed in this alternative would allow one pasture complete rest from warm and cool season grazing each year, and allow a two year rest from either cool or warm season grazing. This allows cool season and warm season plants to be grazed only one time every three years, compared to every other year under current management. This grazing system would maintain plant vigor and therefore vegetative condition. Monitoring of the allotment would continue – if that 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 2.2.3 of this EA).

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

Under this alternative, grazing would be authorized with the same season of use and active preference as the current permit. The current grazing system on this allotment has been developed to minimize adverse effects to vegetation by 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 rest every year since all cattle are removed from the allotment by May 15.

Table 4.7 Vegetation Effects from No Action Alternative (Current Tuckup Allotment Grazing System)

Years	Tuweep Pasture	Tuckup Pasture
1	<i>Fall/winter grazing (10/15-1/15)</i> – Allows cool and warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment.	<i>Winter/ Spring (1/16-5/15)</i> – Allows warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment. Also allowing seed on fourwing saltbush to mature before grazing.
2	<i>Winter/ Spring (1/16-5/15)</i> – Allows warm season plants the opportunity to complete growth (to replenish root reserves) and set seed; allows seedling establishment. Also allowing seed on fourwing saltbush to mature before grazing.	<i>Fall/winter grazing (10/15-1/15)</i> – Allows cool and warm 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 Table 4.7, use of the allotment would be rotated between the two pastures each year so that the pastures are grazed during a different season each year: fall/winter (dormant season) one year, then winter (dormant season)/spring the following year. Winter/spring grazing defers use during the growing season for warm season plants, while fall/winter grazing defers use during the growing season for all plants. 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 has 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).

Under this alternative, grazing would occur during cool season plant growth every other year. Since cool season grazing would not occur every year, there would be periodic rest to replenish root reserves before cool season plants are grazed again. In addition, grazing typically would not occur during the growing season for warm season plants, unless growth starts “early” due to local climatic conditions – this grazing system would maintain plant vigor and therefore vegetative condition. In addition, maximum utilization on vegetation is 50% of current year’s growth, although as shown in Table 3.3, utilization in each pasture has been light in recent years, which leaves ample foliage on palatable plants to produce and store carbohydrates.

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 that 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 2.5.3 of this EA). However, current monitoring data does not indicate that any changes to grazing management are necessary.

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. While the allotment is meeting the 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. Vegetation would likely continue a static or upward trend on the allotment. Ungrazed plants may seed more than currently, increasing the seedbank and increasing the rate at which the allotments trend increases. This reproductive increase, however, would be highly dependent on climatic condition influencing the adult plant’s development and health. This alternative would 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.

4.2.4 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. However, properly managed livestock grazing is designed to cause minimal impacts to rangeland resources, including wildlife habitat. 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, nesting/birthing sites, or water sources. 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.

4.2.4.1 Direct and Indirect Impacts of Alternative A – Proposed Action (Issue New 10-Year Grazing Permit with Changes in Grazing Season to Year-Round Grazing)

Under this alternative, the season of use would change from October 15 – May 15 to year-round (March 1 – February 28), with a 20% reduction of AUMs to account for no grazing rotation (the same pastures would be used during the same season each year) and grazing during the vegetative growing season. This alternative would reduce the total number of cattle permitted from 161 to 75.

Big Game

Mule Deer

Mule deer are likely to be present on the allotment throughout the entire year, which would overlap with the season of use proposed in this alternative, with potential for increased competition of forage between livestock and mule deer. Mule deer present in the Tuckup Allotment currently exist with no competition for summer forage besides wildlife (i.e., pronghorn). This alternative would introduce livestock to the area during the summer months and competition between livestock and mule deer would then occur on a yearlong basis. Fawn production is closely tied to the abundance of succulent, green forage during the spring and summer months and mule deer are especially reliant on shrubs for forage during critical winter months. Providing a full complement of browse, forb, and grass species is vital to maintaining mule deer habitat (AGFD and BLM 2019). Cliffrose, sagebrush, bitterbrush, four wing saltbush, blue grama, and wheat grasses are examples of quality species available in the project area.

When considering effects of grazing on shrub species, and the potential for competition between wildlife and livestock, one must look at the amount of usage of current year's growth – these include the leaves and young stems that are important for photosynthesis. 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. 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 3.3 shows recent overall utilization on key species at the key areas, based on current year's growth by weight, during the grazing season. As shown, utilization has been well below the allowed 50% at the key areas. Monitoring in 2022 showed that utilization on browse species was 20% at Key Area #5, 24% at Key Area #6, 27% at Key Area #9, and 24% at Key Area #5, which is categorized as "light," indicating that competition between wildlife and livestock for these species should be minimal.

Under this alternative, the same pasture would be grazed during the same season each year due to the lack of an additional pasture for a rest-rotation grazing system. As discussed in Section 4.2.3.1, even with a reduction in livestock numbers and utilization not exceeding 50% in any of the pastures, this would likely be detrimental to vegetative resources, particularly in the pastures used during the growing season. This could lead to a change in the plant community composition (a shift toward a warm season grass and shrub community in the pasture that is continually grazed during the spring, and a shift toward a cool season grass and shrub

community in the pasture that is continually grazed during the summer). This could potentially impact habitat components for mule deer occupying the allotment, although composition of browse species would likely not be affected. Impacts to mule deer habitat would likely be minimal.

The presence of livestock and the trailing of livestock between use areas could also result in the direct disturbance or displacement of some mule deer from preferred habitats and/or water sources within the allotment. This alternative has the greatest potential to impact mule deer and fawn survival through an increase in competition for forage and water sources and potential changes in plant composition. However, AGFD considers the mule deer population within the area to be sparse, with 0.5-1 animals/square mile, so potential for such impacts may be minimal. Additionally, 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 2.3.3 of this EA).

Pronghorn

Cattle and horses are the primary domestic livestock species sharing rangelands with pronghorn on the Arizona Strip. Although these animals have coexisted with pronghorn for centuries, there can be specific situations that are cause for concern. These interactions may be direct (i.e., diet overlap or competition for forage/water) or indirect (i.e., management practices for livestock affect habitat selection by pronghorn). Diet overlap with livestock in general is based on rangeland conditions being in good health, and when rangeland conditions deteriorate, competition for remaining forage intensifies (Jones et al. 2023). In addition, indirect competition may occur in areas where habitat quality is decreased through soil compaction and increased erosion (Eldridge, et al. 2020).

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. Under this alternative the same pasture would be grazed during the same season for consecutive years. This can be detrimental to vegetative resources, particularly in the pastures that are grazed during the growing season. This could lead to a change in the plant community composition (a shift toward a warm season grass and shrub community in the pasture that is continually grazed during the spring, and a shift toward a cool season grass and shrub community in the pasture that is continually grazed during the summer). This could potentially impact habitat components for pronghorn occupying the allotment. This alternative has the greatest potential to impact pronghorn and fawn survival. However, this area is categorized as “poor quality” habitat and few pronghorn are anticipated to be present.

The presence of domestic livestock on pronghorn fawning areas has been shown to displace does to less suitable habitat during this critical time (May 1 – June 30) (McNay and O’Gara 1982). The presence of livestock and the trailing of livestock between use areas could displace does during fawning. However, pronghorn densities in this allotment are low to very sparse and given that they utilize the entire valley, few does would be potentially affected if present within the Tuckup Allotment.

Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. 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 2.3.3 of this EA). Implementation of this alternative may have minor impacts to pronghorn. However, competition for forage between livestock and pronghorn should be minimal.

Migratory Birds

Migratory birds may be impacted by minor forage competition from livestock. Under this alternative, the same pasture would be grazed during the same season each year due to the lack of an additional pasture for a rest-rotation grazing system. As discussed in Section 4.2.3.1, even with a reduction in livestock numbers and utilization not exceeding 50% in any of the pastures, this would likely be detrimental to vegetative resources, particularly in the pastures used during the growing season. This could lead to a change in the plant community composition (a shift toward a warm season grass and shrub community in the pasture that is continually grazed during the spring, and a shift toward a cool season grass and shrub community in the pasture that is continually grazed during the summer). This could potentially impact habitat components for migratory birds occupying the allotment. This alternative has the greatest potential to impact migratory birds.

Sensitive Species

Bats

Utilization on vegetation by livestock may impact resources for insect populations which in turn provide food for bats. Due to grazing year-round on a three-pasture rotation, the same pasture would be grazed during the same season for consecutive years. This could lead to a change in plant composition (a shift toward a warm season grass and shrub community in the pasture that is continually grazed during the spring, and a shift toward a cool season grass and shrub community in the pasture that is continually grazed during the summer) and could potentially impact habitat components for insect populations. This alternative has the greatest potential to impact bats.

Livestock grazing would not affect roost sites or hibernacula since these sites tend to be inaccessible to livestock. Range improvements, such as water sources, provide water that is important for bat populations. Implementation of this alternative is therefore unlikely to measurably impact roost sites or hibernacula for any sensitive bat species known or suspected to occur within the allotment.

Peregrine Falcon and Golden Eagle

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 10 years has been 22.6% (Table 3.3) which is well below the allowable 50%, although utilization could be up to 50%.

This alternative has the greatest potential to impact peregrine falcons and golden eagles as livestock grazing under this alternative could lead to a change in plant composition, as discussed in Section 4.2.3.1 (a shift toward a warm season grass and shrub community in the pasture that is continually grazed during the spring, and a shift toward a cool season grass and shrub community in the pasture that is continually grazed during the summer). However, vegetation in the allotment is sufficient to provide food and shelter requirements for populations of prey species for the peregrine falcon and golden eagle. Prey habitat for these species would be minimally affected. 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. Ferruginous hawks are sensitive to disturbance near the nest site. 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. However, no nesting has been documented in this allotment so impacts to nesting are unlikely.

Habitat for prey species, such as black-tailed jackrabbits, could be adversely impacted if overutilization occurs. However, average utilization over the past 10 years has been 22.6% (Table 3.3) which is well below the allowable 50%. With a reduction in livestock numbers under this alternative, this “light” utilization is expected to continue. This alternative has the greatest potential to impact ferruginous hawks as livestock grazing under this alternative could lead to a change in plant composition (a shift toward a warm season grass and shrub community in the pasture that is continually grazed during the spring, and a shift toward a cool season grass and shrub community in the pasture that is continually grazed during the summer) and could potentially impact habitat components for prey species. 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 2.3.3).

Burrowing Owl

Nesting burrows for burrowing owls could potentially be impacted by livestock within the allotment through trampling. Disturbance to nest sites from livestock management operations may occur but this species is known to tolerate moderate levels of human disturbance (Klute et al. 2003). Prey species are numerous in the allotment and include small mammals, insects, and reptiles. Habitat for prey species could be adversely impacted if overutilization occurs. However, average utilization over the past 10 years has been 22.6% (Table 3.3) which is well below the allowable 50%.

This alternative has the greatest potential to impact burrowing owls as livestock grazing under this alternative could also lead to a change in plant compositions (a shift toward a warm season grass and shrub community in the pasture that is continually grazed during the spring, and a shift toward a cool season grass and shrub community in the pasture that is continually grazed during the summer) and could potentially impact habitat components for prey species. 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 2.3.3).

Implementation of grazing under this alternative would result in relatively minor impacts to burrowing owl habitat or potential nesting success in the allotment.

Pinyon Jay

Pinyon jays have been observed within the Tuckup Allotment, although observations have been flyovers and they have not been documented utilizing the allotment for their life cycle activities (i.e., foraging, caching, nesting, roosting). Pinyon jays have been documented utilizing areas outside of the Tuckup Allotment that contain more widespread pinyon juniper woodlands (GBBO 2022). Some minor, short-term disturbance from livestock and livestock management operations may impact nesting pinyon jays. However, nesting within this allotment is unlikely due to the lack of extensive pinyon juniper woodlands. Pinyon jays also prefer to nest in trees within dense pinyon-juniper forest which typically has less forage available for livestock. Livestock grazing on the allotment is not likely to impact pinyon jay nesting.

Pinyon jays may forage, cache seeds, and use range improvements, such as water sources, in the Tuckup Allotment. Pinyon jays rely heavily on pinyon nuts as a food source which are not consumed by livestock. When caching pinyon seeds, for consumption during winter and spring months, pinyon jays will tend to utilize lower density persistent pinyon juniper woodlands, wooded shrublands, and pinyon-juniper savannas for caching pinyon nuts (Miller et al. 2008). Presence of cattle year-round could potentially cause disruption to caching activities, although this disturbance would be relatively minor and temporary in nature.

Pinyon jays may also forage extensively for insects in the shrub and grass understory (Balda 2002). Utilization on vegetation by livestock may impact resources for insect populations. Due to grazing year-round on a three-pasture rotation, the same pasture would be grazed during the same season for consecutive years. This could lead to a change in plant compositions, as described above, and could potentially impact habitat components for insect populations. Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health. 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 2.3.3). Implementation of grazing under this alternative would therefore result in relatively minor impacts to pinyon jays and their habitat in the Tuckup Allotment.

Monarch Butterfly

Livestock grazing can alter the structure, diversity, and growth pattern of vegetation, which can affect the associated insect community. Grazing during a time when flowers are already scarce may result in insufficient forage for the monarch butterfly. When carefully managed however, grazing can provide an important management tool for habitat valuable to monarchs such as grasslands and shrublands by maintaining the open herbaceous- or shrub-dominated plant communities (Vanbergen et al. 2014). Fall and winter grazing have the least impact on

pollinators, including monarchs, as most plants and pollinators are the least active in November and December (The Xerces Society 2018).

This alternative has the greatest potential to impact monarch butterflies as livestock grazing under this alternative would occur year-round and could lead to a change in plant compositions, as described above. This could potentially impact habitat components for the monarch butterfly and other pollinators, although managing for no more than 50% utilization of current year's growth by livestock would help maintain these habitat components. 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 2.3.3). Implementation of grazing under this alternative would therefore result in relatively minor impacts to monarch butterflies and their habitat in the Tuckup Allotment.

4.2.4.2 Direct and Indirect Impacts of Alternative B – Issue New 10-Year Grazing Permits with Extended Grazing Season

The livestock grazing management practices proposed under this alternative would be similar to those proposed for Alternative A except that the season of use would be from August 14 to May 15 (with no grazing during the summer, May 16 to August 13), an extension of two months from the current grazing permit.

Big Game

Mule Deer

Impacts to mule deer under this alternative would be similar to those described for Alternative A except that no grazing would occur from May 16 to August 13 (the summer growing season). This system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15 (see Section 4.2.3.2).

Mule deer are likely to be present on the allotment throughout the entire year which would overlap with the season of use proposed in this alternative, with potential for increased competition of forage between livestock and mule deer. This alternative would extend the grazing season and introduce livestock to the area for two additional months, although no grazing would occur during the summer growing season, which would result in minimal competition for forage between livestock and mule deer. Browse species are particularly important forage for mule deer. As stated in Section 4.2.4.1, monitoring in 2022 showed that utilization on browse species was 20% at Key Area #5, 24% at Key Area #6, 27% at Key Area #9, and 24% at Key Area #5, which is categorized as “light,” indicating that competition between wildlife and livestock for these species should be minimal.

The presence of livestock and the trailing of livestock between use areas could also result in the direct disturbance or displacement of some mule deer from preferred habitats and/or water sources within the allotment. While there is the potential for competition between livestock and mule deer for water sources, the mule deer population within the project area is considered by AGFD to be sparse so potential for impacts from this alternative are expected to be minimal.

Additionally, 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 2.4.3 of this EA).

Pronghorn

Impacts to pronghorn under this alternative would be similar to those described for Alternative A except that no grazing would occur from May 16 to August 13 (the summer growing season). This system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15 (see Section 4.2.3.2). Thus, additional foliage would remain on palatable plants (grasses, forbs, and shrubs) under this alternative as compared to Alternative A.

While the presence of livestock and the trailing of livestock between use areas could displace does during fawning, this potential for displacement would be minimal as pronghorn fawning typically occurs May 1 – June 31. In addition, pronghorn densities in the allotment are low so few does would be potentially affected. 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 the season of use would be from August 14 to May 15, with no grazing during the summer (May 16 to August 13). This system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15. Competition for forage should therefore be minimal.

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 Tuckup 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

Bats

Impacts under this alternative would be similar to those described for Alternative A, except that the season of use would be from August 14 to May 15, with no grazing during the summer (May 16 to August 13). This system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15.

Utilization on vegetation by livestock may impact resources for insect populations which in turn provide food for bats but with reduced potential, as compared to Alternative A, due to a shorter season of use. In addition, maximum utilization of 50% would continue to be implemented. Properly managed livestock grazing is designed to cause minimal impacts to rangeland resources, including vegetation. Livestock grazing would not affect roost sites or hibernacula since these sites tend to be inaccessible to livestock. Range improvements, such as water sources, provide water that is important for bat populations. Implementation of this alternative is therefore unlikely to measurably impact any sensitive bat species known or suspected to occur within the allotment.

Peregrine Falcon, Ferruginous Hawk, Burrowing Owl, and Golden Eagle

Impacts under this alternative would be similar to those described for Alternative A except that the season of use would be from August 14 to May 15, with no grazing during the summer (May 16 to August 13). This system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15.

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. 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, could occur but with reduced potential, as compared to Alternative A due to a shorter grazing season. 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.

Pinyon Jay

Impacts under this alternative would be similar to those described for Alternative A except that the season of use would be from August 14 to May 15, with no grazing during the summer (May 16 to August 13). Some minor, short-term disturbance from livestock and livestock management operations may impact nesting pinyon jays. However, nesting within this allotment is unlikely due to the lack of extensive pinyon juniper woodlands. Pinyon jays also prefer to nest in trees within dense pinyon-juniper forest which typically has less forage available for livestock. Livestock grazing on the allotment is not likely to impact pinyon jay nesting.

Pinyon jays may forage, cache seeds, and use range improvements, such as water sources, in the Tuckup Allotment. Pinyon jays rely heavily on pinyon nuts as a food source which are not consumed by livestock. When caching pinyon seeds, for consumption during winter and spring months, pinyon jays will tend to utilize lower density persistent pinyon juniper woodlands, wooded shrublands, and pinyon-juniper savannas for caching pinyon nuts (Miller et al. 2008). Presence of cattle could potentially cause disruption to caching activities; however, this disturbance would be relatively minor and temporary in nature.

Pinyon jays may also forage extensively for insects in the shrub and grass understory (Balda 2002). Utilization on vegetation by livestock may impact resources for insect populations. Vegetation in the allotment is currently sufficient to provide food and shelter requirements for insect populations, although this area would be grazed for an additional two months, as compared to the current system in place, and introduces added grazing pressure. However, maximum utilization would remain 50%, and this alternative would give cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15. Impacts to insect populations is therefore not likely.

Allotment monitoring data indicates that resource conditions on the allotment currently meet all applicable standards for rangeland health (see Section 3.2.3). Some minor, short-term disturbance from livestock management operations may impact pinyon jays as described for Alternative A but with reduced potential, as compared to Alternative A, due to a shorter season of use. Implementation of this alternative is not likely to impact pinyon jay habitat or nesting success.

Monarch Butterfly

Impacts under this alternative would be similar to those described for Alternative A except that the season of use would be from August 14 to May 15, with no grazing during the summer (May 16 to August 13). This system gives cool season plants the opportunity to complete growth and mature without grazing pressure on alternate years and gives warm season grasses rest every year since all cattle are removed from the allotment by May 15. Fall and winter grazing have the least impact on pollinators, including monarchs, as most plants and pollinators are the least active in November and December (The Xerces Society 2018). 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. Implementation of grazing under this alternative would result in relatively minor impacts to monarch butterflies and their habitat but with reduced potential, as compared to Alternative A, due to a shorter season of use.

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

Under this alternative there is no proposed change in number of livestock or season of use for the allotment. Cattle would continue to graze the allotment from October 15 to May 15 each grazing period. The entire allotment is rested from May 16 to October 14 each year.

Big Game (Mule Deer and Pronghorn)

Under this alternative, grazing would be authorized for the Tuckup Allotment, with no change in number of livestock or season of use from that currently authorized. Impacts for big game (i.e., mule deer and pronghorn) under this alternative would be similar to those described for Alternative A and Alternative B except that the season of use would remain from October 15 to May 15. The current grazing system on this allotment has been developed to minimize adverse effects to vegetation by 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 rest every year since all cattle are removed from the allotment by May 15.

Competition for forage and water sources between livestock and big game should be minimal since the same grazing management regime has been in place for many years. It is therefore expected that livestock grazing proposed under this alternative would minimally affect vegetation (i.e., habitat for big game), and ecological condition of that habitat 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, changes to the grazing use would be made (as described in Section 2.5.3 of this EA). However, current monitoring data does not indicate that any changes to grazing management are necessary (see Section 3.2.3). Implementation of this alternative is therefore unlikely to impact big game species or their habitat.

Migratory Birds

Impacts to migratory birds under this alternative would be similar to those described for Alternative A and Alternative B except that the season of use would remain from October 15 to May 15. The current grazing system on this allotment has been developed to minimize adverse effects to vegetation by 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 rest every year since all cattle are removed from the allotment by May 15.

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. Vegetation in the allotment, under this alternative, would continue to provide sufficient food and shelter requirements for migratory birds – utilization on key species in the allotment has been light in recent years, as shown in Table 3.3. 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

Impacts for sensitive species under this alternative would be similar to those described for Alternative A and Alternative B except that the season of use would remain from October 15 to May 15. The current grazing system on this allotment has been developed to minimize adverse effects to vegetation by 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 rest every year since all cattle are removed from the allotment by May 15.

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. Vegetation in the allotment under this alternative would continue to provide sufficient food and shelter requirements for sensitive species and their prey species (insects, small mammals, birds, and rabbits) – utilization on key species in the allotment has been light in recent years, as shown in

Table 3.3. 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

Under this alternative, no livestock grazing would occur on the Tuckup Allotment so plants would only be minimally grazed (by wildlife). Vegetation would therefore have the most rest and recovery as compared to the other alternatives. Impacts to wildlife would therefore primarily be beneficial in the form of increased vegetation for forage and cover and no disturbance from livestock operations. However, removal of grazing could also involve not maintaining or even the removal of range improvements. Removing range improvements could result in temporary disturbance to wildlife from human activity but could also result in less water available to wildlife.

Big Game (Mule Deer and Pronghorn)

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 mule deer and pronghorn. 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 (insects, small mammals, birds, and rabbits) for sensitive species.

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. There are other uses and activities occurring on the lands within and adjacent to the project area, including livestock grazing, vegetation treatments, and recreation. 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 Tuckup Allotment and the adjacent BLM-administered land are active grazing allotments. Each of these allotments is managed under a grazing system. Cumulative impacts to livestock grazing are discussed in Section 4.3.1.
- **Historic Vegetation Treatments** – Vegetation treatments within the Tuckup Allotment targeting sagebrush reduction date back to the 1960s. There have been two herbicide treatments for vegetation control within the allotment. A summary of these historic vegetation treatments is presented in Table 4.8. The primary objective of these treatments was to decrease the density of sagebrush and/or juniper, and allow for the increase in density, diversity, and vigor of the native and desirable understory plant species (i.e., grasses and forbs).

Table 4.8. Historic Vegetation Treatments – Tuckup Allotment

Project Name	Location	Treatment Acres	Original Treatment Date	Retreatment Date
Witches Pool	Tuweep Pasture	367	1996	2023
Tuckup Point	Tuckup Pasture	1,705	1960	2023
Total of All Documented Historic Treatments: 2,072				

The Witches Pool treatment was originally implemented in 1996 and was a chemical (spike) treatment. The Tuckup Point treatment was originally implemented in 1960 and was a mechanical (chaining) treatment. Both areas were reanalyzed in the 2013 Uinkaret Mountains Landscape Restoration Project EA and approved for retreatment. These retreatments occurred in 2023 and were both chemical (spike) treatments.

- **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.

4.3.1 Cumulative Impacts to Livestock Grazing

The cumulative impact analysis (CIA) area for livestock grazing is the 16,915-acre Tuckup Allotment. The allotment contains 639 acres of State land and 16,276 acres of Federal land.

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 Tuckup 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 below.

Construction of range improvements including water catchments and associated infrastructure, creation of stock ponds, installation of cattleguards, and maintenance of existing fences and water developments have occurred over the life of the recent permit, as well as developments dating back to early livestock grazing in the Tuckup and surrounding allotments. Some of these developments are installed to reduce conflict with other resource uses, such as cattleguards installed as a result of recreation users leaving gates open. Water developments have been a particular priority during recent droughts. These developments have impacts, and obvious benefits to livestock. Vegetation treatments have impacted livestock grazing with short-term disruption and displacement, but have resulted in long-term creation of additional forage. Vegetation treatments have also been noted as reducing catastrophic fires. This is due to reduction in heavy fuel loads and creating what is thought to be more of an historic fuel load.

The effects on livestock grazing in the Tuckup 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, 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 ESA, 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 Tuckup 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.

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. This additive impact may affect wildlife habitat or corridors and the greater ecosystems by altering vegetation associations or decreasing water quality. These systems and the health of the region as a whole are important for the survival of many native species.

4.3.2 Cumulative Impacts to Soils

The 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.

Historic chemical vegetation treatments minimally affect soil resources directly. Short-term indirect effects could include reduced soil infiltration, increased erosion and sedimentation, and increased soil surface temperatures until understory species (grasses and forbs) re-establish. Once they do, plant diversity and community structure (frequency and composition) should increase, resulting in long-term benefits to soils. The indirect effect of vegetation removal or reduction in canopy cover also temporarily affects soils by altering how vegetation intercepts rainfall, slows overland flow, and helps stabilize soils. These impacts would be realized until regrowth or revegetation takes place, usually in two to three growing seasons. The benefits over 3 to 10 years of reducing overstory vegetation cover and stimulating growth of understory vegetation (i.e., grasses and forbs) would increase soil stability in the treatment areas, improving soil nutrient cycling and soil fertility.

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 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

The CIA area for vegetation is the same as that described for soils, 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 vegetation for the CIA are livestock grazing, recreational activities, residential and commercial development, mining activities, energy and water-use infrastructure, and wildfire.

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.

Invasive plant management within the analysis area is ongoing. Alternatives A, B and C generally aid in this effort because casual observations of invasive non-native plants by existing permittees can be a valuable tool in reducing and removing these undesirable plants from the landscape. Removal of grazing would impair this tool, instead relying primarily on staff. Ultimately, none of the alternatives would seriously adversely affect invasive plant management or greatly aid the dispersal of invasive plants.

Historic chemical vegetation treatments caused target and some non-target species to experience direct, short-term impacts, depending on the application rate. As described in Section 4.3.3 (above), short-term indirect effects could include reduced soil infiltration, increased erosion and sedimentation, and increased soil surface temperatures (which affect vegetation) until understory species (grasses and forbs) re-establish. Once they do, plant diversity and community structure (frequency and composition) should increase, resulting in long-term benefits to vegetation. Chemical treatments are also effective at providing a diverse age class in sagebrush communities.

The effects of livestock grazing on vegetation in the Tuckup 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), it is not anticipated that any of the alternatives would result in significant 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 Tuckup Allotment and adjacent lands within three miles. Actions that contribute cumulatively to the overall disturbance to wildlife and wildlife habitat include livestock grazing, vegetation treatments, various dispersed recreational activities, and climate change.

Past livestock grazing resulted in the degradation of wildlife habitat from overgrazing and the introduction of invasive plant species. As stated in Section 4.3.1, livestock grazing in the region has evolved and changed considerably since the 1860s. At the turn of the previous century, large herds of livestock grazed in uncontrolled open range, causing changes in plant, soil, and water relationships. In response, livestock grazing reform began in 1934 with 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. 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 (including the Tuckup Allotment), providing for enough forage resources for wildlife populations to persist throughout the analysis area. Livestock grazing is managed such that ecological condition of the area is maintained and all rangeland health standards are being met or are progressing towards being met.

Vegetation manipulation has occurred in the area since at least the 1960s. Areas in the surrounding vicinity, originally part of Dixie National Forest, were initially managed for timber harvest and cattle operations. In 1908, to the south, and the southeastern end of the Toroweap Valley, the area was designated Grand Canyon National Park, managed for no grazing and minimal vegetation manipulation. Vegetation treatments now focus on minimizing invasive plants, reducing heavy fuel loads, and maintaining a healthy diverse vegetative community while providing adequate forage for cattle and wildlife alike. Vegetation treatments are ongoing throughout the area, including those listed in Table 4.8 that occurred within the Tuckup Allotment. A recent review by Bombaci and Pejchar (2016) reported that although woodland thinning had non-significant impacts to most wildlife species, the majority of detected negative responses involved woodland birds. The cumulative effects of woodland treatments on pinyon jays, especially at the landscape scale, have not been studied (Somershoe 2020). However, treatment planning has become more nuanced, and considers ecological site potential, phases of woodland succession, ecosystem resilience to treatments (disturbance), resistance to invasive plants (Miller et al. 2014), as well as location of nesting sites which are excluded from treatment to protect breeding birds.

Recreational pursuits, particularly off-highway vehicle (OHV) use, have caused disturbance to most all wildlife 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.

There are projected increases in temperature and progressing desertification of semiarid regions. Longer drought periods increase the potential for degradation of southwestern grasslands and shrub encroachment. Combined selection pressures of herbivory and progressing aridity are predicted to result in plant communities being less responsive to grazing (Belesky & Malinowski 2016) and could adversely affect wildlife and their habitat. Invasive plant species are already a problem in southwestern grasslands and their spread will continue with projected increases in temperature and desertification. However, invasive plant management within the analysis area is ongoing. Pinyon-juniper woodlands, adjacent to the Tuckup Allotment, are widespread. Various climate models predict distributional changes of pinyon-juniper woodlands (Rondeau et al. 2017) and widespread pinyon and juniper mortality across the southwestern United States (McDowell et al. 2016). Indirect impacts could include increased incidence and severity of fires (Miller et al. 2019) and insect outbreaks (Meddens et al. 2015). This could lead to impacts to wildlife, including migratory bird species, associated with pinyon-juniper woodlands. Although most of the predicted effects of increased temperatures and increases in desertification on pinyon-juniper woodlands are negative, the severity will likely vary regionally, and the overall impacts to pinyon jays and other woodland bird species, remain to be further explored (Somershoe et al. 2020).

The effects of livestock grazing on wildlife within the Tuckup 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 wildlife species. 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.

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 Tuckup Allotment permit renewal process began with a scoping meeting for the allotment's land health evaluation on March 14, 2001, followed by a field visit on August 29, 2001. 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 June 23, 2004. This EA reflects the analysis of the proposed grazing permit renewal on the Tuckup Allotment.

A preliminary EA was posted on the BLM National NEPA Register for a 30-day public review and comment period. In addition, 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 review and comment. A total of four comment submissions were received (see Appendix B for comment responses).

5.3 List of Preparers and Reviewers

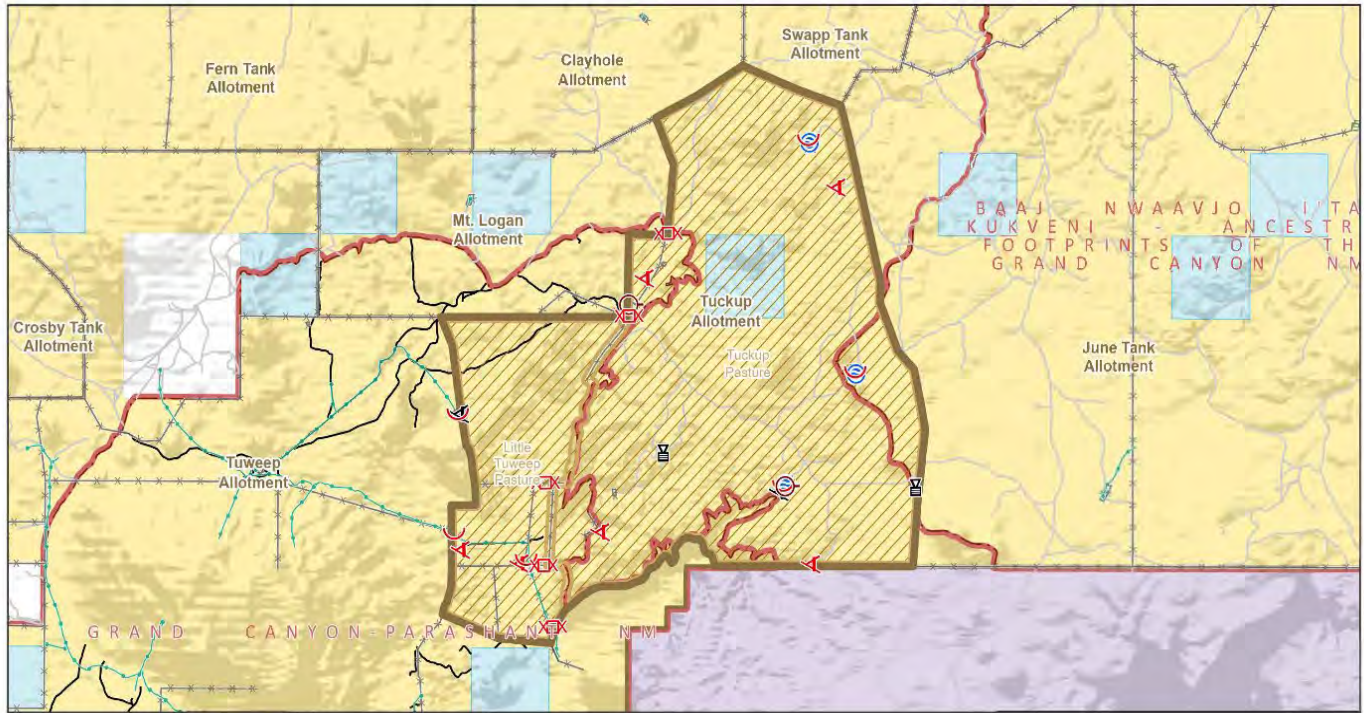
Table 5.1. List of BLM Preparers/Reviewers

Name	Title	Responsible for the Following Program(s)
Gloria Benson	Tribal Liaison	Native American Religious Concerns
Lorraine Christian	Arizona Strip Field Manager	Project Oversight, Authorizing Official
Lee Kirk	Planning & Environmental Coordinator	NEPA Compliance
Rody Cox	Geologist	Geology, Minerals
Kendra Thomas	Realty Specialist	Lands/Realty
Stephanie Grischkowsky	Wildlife Biologist	Special Status Animals, Wildlife, Riparian
Jace Lambeth	Rangeland Management Specialist	Special Status Plants
Jon Jasper	Outdoor Recreation Planner	Wilderness, Recreation, Visual Resources
Greg Page	Outdoor Recreation Planner Grand Canyon Parashant National Monument	Wilderness, Recreation, Visual Resources
Sarah Page	Archaeologist	Cultural Resources
Tyson Blackner	Range Management Specialist (Project Lead)	Vegetation, Grazing Administration, Invasive, Non-Native Species, Soils, Drought/Water Availability
John Sims	Supervisory Law Enforcement	Law Enforcement

APPENDIX A – Tuckup Allotment Map



DOI-BLM-AZ-A010-2025-0003-EA-Grazing Permit Renewal for the Tuckup Allotment
 Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



- | | | | |
|------------------------------|---|-------------------------------|---------------------------|
| Catchments | Trough | Unassessed and Non-BLM Routes | Grazing Allotment |
| Unfenced Detention Reservoir | Corrals and Loading Chutes Not Portable | Fence (Unspecified) | Bureau of Land Management |
| Fenced Detention Reservoir | Cattleguard (Unspecified) | Exclosures, Enclosures | National Park Service |
| Supplemental Storage Tank | Primitive Road | Pipeline | State |
| | Non-Motorized Trail | Tuckup Pastures | Private |



Map Produced by BLM Arizona Strip District
 File: TuckupPermsRenewal.aprx
 Coordinate System: NAD 1983 UTM Zone 12N
 Reference System: U.S. PLSS GSRB&M
 Scale: 1:110,000 at 8.5x11 page output
 Date: 5/22/2024



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.

APPENDIX B – Land Health Evaluation Update for the Tuckup Allotment - #00097

The Tuckup Allotment land health evaluation was completed on June 23, 2004. That evaluation determined resource conditions on what is now the Tuckup Allotment were making significant progress toward meeting the applicable standards for rangeland health. This update constitutes a re-evaluation of the 2004 assessment determination by considering and analyzing new monitoring data.

After the 2004 allotment land health evaluation was completed, the Tuckup Pasture was split from the Tuweep Allotment and is part of what is now the Tuckup Allotment. Nixon Spring and Coyote Spring pastures analyzed in the 2004 land health evaluation remained in the Tuweep Allotment, so Standard 2 (Riparian and Wetland areas) does not apply to the Tuckup Allotment.

Desired Plant Community (DPC) Objectives

The desired plant community (DPC) objectives developed for the allotment during the 2004 land health evaluation process were reviewed to determine whether they are still valid. That evaluation stated that:

Desired Plant Community (DPC) Key Area #5 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 20-35 percent through 2030.
- Maintain the grass composition between 50-70 percent through 2030.
- Maintain the forb composition between 1-10 percent through 2030.

Desired Plant Community (DPC) Key Area #6 (Clay Loam Upland 10-14" pz)

- Maintain the shrub/browse composition between 20-35 percent through 2030.
- Maintain the grass composition between 40-65 percent through 2030.
- Maintain the forb composition between 1-10 percent through 2030.

Desired Plant Community (DPC) Key Area #9 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 20-40 percent through 2030.
- Maintain the grass composition between 45-70 percent through 2030.
- Maintain the forb composition between 1-10 percent through 2030.

Desired Plant Community (DPC) Key Area #14 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 25-40 percent through 2030.
- Maintain the grass composition between 50-70 percent through 2030.
- Maintain the forb composition between 0-10 percent through 2030.

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, having similar effects on the dominant ecosystem processes, and respond in a similar way to a syndrome of environmental factors (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.

The DPC objectives for the allotment have been updated using the description of the ecological site guides for the four 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 2004 land health evaluation identified maintenance of old vegetation treatments as an issue and states “maintenance of the treatments is necessary to restore the vegetation diversity and move toward meeting the watershed and DPC objectives.” The evaluation recommended herbicide treatments to reduce sagebrush composition and release perennial grasses from competition with sagebrush. Treatments have occurred (retreatment of the historic Witches Pool and Tuckup Point treatment areas occurred in 2023), which have been successful in meeting the above stated objective. This resulted in the DPC objectives also being revised through this current land health evaluation process to be consistent with the land health evaluation recommendations.

These DPCs provide for the habitat needs (both forage and cover) of wildlife, protection for soils and hydrologic functions, and forage for livestock. The revised DPCs for the Tuckup Allotment are:

Desired Plant Community (DPC) Key Area #5 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 5-20 percent through 2030.
- Maintain the grass composition between 60-75 percent through 2030.
- Maintain the forb composition between 0-10 percent through 2030.

Desired Plant Community (DPC) Key Area #6 (Clay Loam Upland 10-14" pz)

- Maintain the shrub/browse composition between 5-25 percent through 2030.
- Maintain the grass composition between 50-75 percent through 2030.
- Maintain the forb composition between 0-10 percent through 2030.

Desired Plant Community (DPC) Key Area #9 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 5-20 percent through 2030.
- Maintain the grass composition between 65-85 percent through 2030.
- Maintain the forb composition between 0-10 percent through 2030.

Desired Plant Community (DPC) Key Area #14 (Loamy Upland 10-14" pz)

- Maintain the shrub/browse composition between 5-20 percent through 2030.
- Maintain the grass composition between 60-85 percent through 2030.
- Maintain the forb composition between 0-10 percent through 2030.

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 mule deer and pronghorn); protection of ecological functions (including hydrological processes); and sustainability of diverse vegetative communities. As stated above, 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. 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 since 2004 is intended to supplement the data presented in the 2004 assessment. The key areas have been read for pace-frequency, trend and dry weight rank. This new monitoring data is summarized below. Key species monitored for this allotment are shown below.

Key Species for Tuckup Allotment

- *Grasses:* black grama, western wheatgrass, crested wheatgrass, Russian wildrye, galleta grass, bottlebrush squirreltail, blue grama, sand dropseed, side-oats grama
- *Browse:* sagebrush, fourwing saltbush, winterfat, bitterbrush

Tables B-1 through B-4 list all trend monitoring data collected in this allotment, beginning in 1981. The percent of key species at the Key Area #5 increased from 86% in 1981 to 87% in 2020, and litter increased from 32% in 1981 to 53% in 2020 (see Table B-1). (It should be noted that 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%.) Based on the summation of frequency data for all three components (key species, live vegetation cover, and litter), trend is up at Key Area #5.

The percent of key species at Key Area #14 increased from 106% in 1982 to 123% in 2020, and litter increased from 28% to 56% (see Table B-2). Based on the summation of frequency data for all three components (key species, live vegetation cover, and litter), trend is up at Key Area #14.

The percent of key species at the Key Area #6 increased from 65% in 1982 to 168% in 2023, and litter increased from 35% to 53% (see Table B-3). Based on the summation of frequency data for all three components (key species, live vegetation cover, and litter), trend is up at Key Area #6.

The percent of key species at the Key Area #9 increased from 106% in 1982 to 146% in 2023, and litter increased from 33% to 47% (see Table B-4). Based on the summation of frequency data for all three components (key species, live vegetation cover, and litter), trend is up at Key Area #9.

Table B-1. Tuckup Allotment Trend Data – Key Area #5 (Tuckup Pasture)

Year	% Key Species	Live Vegetation	Litter	Total	Trend
1981	86	9	32	127	Trend is up when compared to base line.
1986	77	3	40	120	
1989	70	3	44	117	
1998	81	2	41	124	
2005	54	2	43	99	
2010	73	5	41	119	
2015	97	4	36	137	
2020	87	1	53	141	

Table B-2. Tuckup Allotment Trend Data – Key Area #14 (Tuckup Pasture)

Year	% Key Species	Live Vegetation	Litter	Total	Trend
1982	106	8	28	142	Trend is up when compared to base line.
1986	127	8	51	186	
1989	117	8	51	176	
1998	112	9	47	168	
2005	103	14	30	147	
2010	129	22	39	190	
2015	124	12	51	187	
2020	123	10	56	189	

Table B-3. Tuckup Allotment Trend Data – Key Area #6 (Little Tuweep Pasture)

Year	% Key Species	Live Vegetation	Litter	Total	Trend
1982	65	4	35	104	Trend is up when compared to base line.
1984	62	4	38	104	
1987	50	3	42	95	
1997	51	3	42	96	
2007	68	5	34	107	
2012	77	6	41	124	
2017	126	5	47	178	
2023	168	21	53	242	

Table B-4. Tuckup Allotment Trend Data – Key Area #9 (Little Tuweep Pasture)

Year	% Key Species	Live Vegetation	Litter	Total	Trend
1982	106	9	33	148	Trend is up when compared to base line.
1984	101	13	33	147	
1987	191	7	30	228	
1996	184	6	33	223	
1997	106	6	43	155	
1998	112	9	47	168	
2007	107	19	31	157	
2012	127	7	41	175	
2017	126	7	40	173	
2023	146	15	47	208	

Observations and data collected for Tuckup 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 3.3. earlier in this EA).

The Tuckup Allotment would be managed to achieve the DPC objectives listed above. This allotment evaluation update lists and evaluates achievement of the allotment’s revised DPC objectives (revised in this evaluation update), which are shown in Tables B-5 through B-8.

Figure 1 shows the long-term vegetation trend lines from the Rangeland Analysis Platform for the Tuckup Allotment. Key things to note is bare ground has a downward trend line while annual and perennial forbs and grasses have an upward trend between 1986 and 2022.

Table B-5. Desired Plant Community Objectives Determination – Key Area #5 (Tuckup Pasture), Ecological site: Loamy Upland 10-14” p.z.

Plant Group (or Ground Cover)	Current Composition	Desired Plant Composition	Objective Met or Not Met
<i>Perennial Grass</i>	65	60-75%	Met
<i>Shrubs / Browse</i>	34	5-20%	Met (exceeds)
<i>Forbs</i>	1	0-10%	Met

Table B-6. Desired Plant Community Objectives Determination – Key Area #14 (Tuckup Pasture), Ecological site: Loamy Upland 10-14” p.z.

Plant Group (or Ground Cover)	Current Composition	Desired Plant Composition	Objective Met or Not Met
<i>Perennial Grass</i>	89	60-85%	Met (exceeds)
<i>Shrubs / Browse</i>	9	5-20%	Met
<i>Forbs</i>	1	0-10%	Met

Table B-7. Desired Plant Community Objectives Determination – Key Area #6 (Little Tuweep Pasture), Ecological site: Clay Loam Upland 10-14” p.z.

Plant Group (or Ground Cover)	Current Composition	Desired Plant Composition	Objective Met or Not Met
<i>Perennial Grass</i>	76	50-75%	Met (exceeds)
<i>Shrubs / Browse</i>	23	5-25%	Met
<i>Forbs</i>	1	0-10%	Met

Table B-8. Desired Plant Community Objectives Determination – Key Area #9 (Little Tuweep Pasture), Ecological site: Loamy Upland 10-14” p.z.

Plant Group (or Ground Cover)	Current Composition	Desired Plant Composition	Objective Met or Not Met
<i>Perennial Grass</i>	80	65-85%	Met
<i>Shrubs / Browse</i>	14	5-20%	Met
<i>Forbs</i>	6	0-10%	Met

Table B-9 summarizes “new” utilization data (collected since the 2004 land health evaluation report was completed); Table B-10 lists actual use for the allotment since 2018.

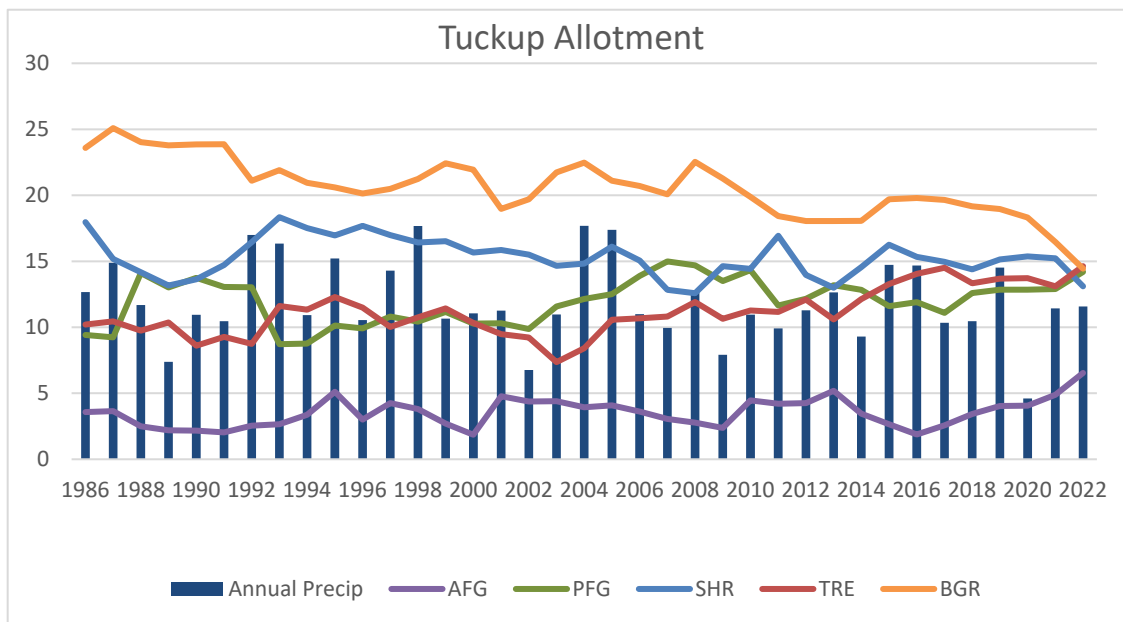
Table B-9. Utilization – Tuckup Allotment

Key Area	2014	2015	2019	2020	2021	2022
5	26%	31%	32%	34%	28%	23%
6	17%	13%	27%	24%	20%	19%
9	15%	24%	17%	12%	15%	27%
14	13%	29%	26%	27%	21%	24%
Average	18%	24%	26%	24%	21%	23%

Table B-10. Actual Use – Tuckup Allotment

Year	Actual Use (AUMs)	Permitted use (AUMs)	Percent Use
2018	398	1,075	37%
2019	300	1,075	28%
2020	468	1,075	44%
2021	341	1,075	32%
2022	355	1,075	33%
2023	694	1,075	65%
2024	333	1,075	31%
Average	413	1,075	38%

Figure 1. This figure represents the overall trend for the Tuckup Allotment between 1986 and 2022, pulled from the Rangeland Analysis Platform.



AFG = Annual forbs and grasses
 PFG = Perennial forbs and grasses
 SHR = Shrub cover
 TRE = Tree cover
 BGR = Bare ground

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 all four key areas.

Rationale:

Criteria for meeting Standard 1 include ground cover in the form of plants, litter, and rock are present in pattern, kind, and amount sufficient to prevent accelerated erosion. At Key Area #5, ground cover increased from 42% to 58% and the trend is upward. Key Area 6 ground cover increased from 44% to 80% and the trend is upward. Key Area 9 ground cover increased from

49% to 76% and the trend is upward. Key Area 14 ground cover increased from 38% to 68% and the trend is upward. The determination for all four 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 Tuckup 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 all four Key Areas

Rationale:

The BLM determined that the allotment is meeting Standard #3 for rangeland health. The plant composition was such that it is meeting DPC objectives.

The interdisciplinary assessment team (composed of various resource specialists – including rangeland management specialists, wildlife biologist, and soil scientist) determined that the Tuckup Allotment is ecologically stable and functional based on the vegetation communities and soil conditions throughout the allotment. The relative criteria for meeting standards, and indicators of rangeland health, therefore resulted in a recommendation that the area was meeting Standard #3. The key areas have a good mix of perennial grasses, shrubs/browse and forbs, and the natural variation that occurs across the ecological site. In addition, long-term monitoring has shown that the key areas are capable of producing a good grass and shrub composition. Based on the complete ecological site inventory the group agreed that Tuckup Allotment is meeting Standard #3.

Summary:

After considering all available data, the interdisciplinary assessment team is recommending that the Tuckup Allotment meets all applicable standards for rangeland health.

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APPENDIX D – Response to Public Comments

Comment No.	Commenter	Comment	Response
01	Western Watersheds Project, et al.	The expansion of livestock grazing within a National Monument for the convenience of the permittee is not sufficient justification, nor can we find "permittee's convenience" listed as a legal reason for making changes to livestock grazing authorizations.	The BLM's NEPA Handbook describes a "proposed action" as "a proposal for the BLM to authorize, recommend, or implement an action to address a clear purpose and need, and may be generated internally or externally." Alternative A in this EA is the proposed action because it is the action requested by the grazing permittee. The BLM is responding to that request.
02	Western Watersheds Project, et al.	Given that the allotment range health is acceptable (described as "good ecological condition") and the trend is upward, we don't understand why the BLM is proposing to expand livestock grazing in this area to include a period of time when vegetation is growing, which would cause more damage to vegetation. Utilization has been measured at below 30% since 2014.	See response to Comment No. 01.
03	Western Watersheds Project, et al.	The vegetation in the monument is a Monument Object that must be protected. This proposed change would change livestock grazing from outside the majority of the growing season (only allowed from Oct. 15-May15) to yearlong. This would overlap with the key growing, flowering, and seed ripening season for vegetation and this is an unacceptable new impact to Monument Objects. The flowering of the vegetation listed in the EA begins on May 15th with most seed dissemination completed by October 15th. The BLM should not change the season of use for this allotment.	<p>As stated in Proclamation 10606 that established BNIK, "Nothing in this proclamation shall be deemed to prohibit grazing pursuant to existing leases or permits within the monument, or the renewal or assignment of such leases or permits, which the BLM and Forest Service shall continue to manage pursuant to their respective laws, regulations, and policies." As described in Section 1.4 of the EA, until an RMP is developed for BNIK, the lands are managed under the Interim Management of the BNIK and Arizona Strip Field Office RMP unless there is a conflict with the Proclamation. The proposed action does not violate the Proclamation, and the Tuckup Allotment is classified as available for grazing under the Arizona Strip Field Office RMP. The alternatives described in Chapter 2 of the EA are in conformance and consistent with this RMP.</p> <p>A portion of the allotment is also within Grand Canyon-Parashant National Monument. As demonstrated in Section 1.4 of the EA, the alternatives described in Chapter 2 of the EA are also in conformance with the Grand Canyon-Parashant National Monument RMP. The purpose of the EA process is to help the deciding official make an informed</p>

			decision that is based on the understanding of environmental consequences on resources, including monument objects.
04	Western Watersheds Project, et al.	Changing the season of use for this allotment will not only impact vegetative reproduction, it will have a significant negative impact on the prey species for BLM listed sensitive species including golden eagles, western burrowing owls, ferruginous hawks, and monarch butterfly, which is highly dependent on flowing species which will be trampled by livestock use during their flowering season. Unfortunately, a reduction in the number of AUMs does not mitigate the impacts of year-long grazing.	Comment noted. Chapter 4 (Environmental Consequences) of the EA fully analyzes impacts to resources (including vegetation and wildlife) from the proposed action and alternatives.
05	Western Watersheds Project, et al.	Notably, only Alternatives C and D allow cool season plants the opportunity to complete growth and mature and gives warm season grasses rest. The BLM should reject Alternatives A and B and we recommend the selection of Alternative D, which would best protect Monument Objects and does indeed meet the purpose and need for the project.	Comment noted.
06	Jeff Burgess	Your environmental assessment (EA) states that a land health evaluation (LHE) to assess this allotment's compliance with the 1997 Arizona BLM Standards for Rangeland Health and Guidelines for Grazing Administration (S&Gs) was completed in 2004. However, this LHE isn't included as one of this project's documents, and I can't find any record that this LHE was ever publicly released.	When the original land health evaluation (LHE) was completed, the Tuckup Allotment was part of the Tuweep Allotment. Due to this, the Tuckup Allotment does not have a separate LHE, but the assessment of land health for the pastures within this allotment was completed part of the Tuweep LHE, completed in 2004 and released to the public at that time. The Tuweep LHE is not an appendix to this EA, but it has been uploaded to the BLM National NEPA Register site for this project.
07	Jeff Burgess	The EA states that after the 2004 LHE was completed, the configuration of the allotment was changed so that it now contains different areas of land. Appendix B of the EA attempts to address this by providing an "update" for the 2004 LHE, but it's confusing because it relies on the original LHE. Please the provide public with a copy of the original. the only other public document I could find for the Tuckup allotment was a decision notice issued in April 2019 that transferred the allotment's permittee from LF Legacy LLC to One Cowboy Stand LLC.	See response to Comment No. 06. In addition, please note that the Tuckup Allotment monitoring sites (Key Areas 5, 6, 9, and 14) are the same sites that were monitored in the Tuweep LHE (Key areas 5, 6, 9, and 14 in that LHE).
08	Jeff Burgess	Your proposed action, Alternative A, would increase the grazing season to yearlong, but reduce the active AUMs to 860 and increase the suspended AUMs to 219, for the same total of 1,079. The EA explains that this 20% reduction in	Management of the allotment is based on trend and Desired Plant Community Objectives (DPCs). As shown in the LHE update (Appendix B), DPCs are being met and there is an upward trend. There is no data to suggest that there should

		<p>active AUMs to 75 head yearlong would be necessary to ensure compliance the allotment’s 50% maximum utilization limit. But Table B-10 in the EA shows the recent actual use of the allotment has only averaged 38% of the authorized numbers, for an average actual use of only 413 AUMs. This means your proposal to authorize 860 active AUMs is more than twice the recent actual use of the allotment. In other words, your proposal would allow grazing by real cattle to increase in this area, during a period of prolonged drought. That makes no sense. I suggest that you should decrease the proposed active authorized use to the recent average actual use.</p>	<p>be a decrease in active AUMs. Active use is the maximum number of AUMs that are permitted regardless of drought or above average precipitation.</p> <p>Additionally, utilization is limited to 50% of the current year’s growth. As stated in Section 2.3 of the 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, drought, 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.</p>
09	Anonymous	<p>Please support and implement Alternative D for no future livestock grazing. Grazing is harmful to public resources and BLM is too lenient in preventing this harm. Thank you.</p>	<p>Comment noted.</p>
10	Grand Canyon National Park	<p>Our comments reflect our interest in seeing the rangeland health surrounding GRCA be maintained at the greatest ecological condition and complement our management objectives for the Tuweep area. As such, we believe Alternative B, Issue New 10-year Grazing Permit with Extended Grazing Season, would meet the purpose and need for action identified in Chapter 1 of the EA. Alternative B would provide for livestock grazing opportunities on public lands, and by implementing a deferred rest rotation grazing system and reducing the livestock numbers, the allotment would continue to meet the standards for rangeland health (Section 4.2.1.2). This alternative would extend the season of use by two months, increasing the stability for the permittee’s livestock operation from the current situation,</p>	<p>Comment noted.</p>

		<p>while continuing to meet the desired plant community (DPC) objectives and ecological conditions as outlined in the Affected Environment and Environmental Consequences of the EA, 4.2.1.3.</p> <p>In contrast to Alternative B, Alternative A (proposed action) does not allow for flexibility in grazing rotation, and therefore, vegetative resources would not be protected. Section 4.2.1.1 states “Due to grazing year-round on a three-pasture rotation, the same pasture would be grazed during the same season in consecutive years. This would likely be detrimental to vegetative resources, particularly in the pastures that are grazed during the spring and summer”. Over time, this will negatively affect the land health resulting in areas no longer meeting DPC objectives and eventually non-compliance with the Fundamentals of Rangeland Health. We are of the opinion Alternative B would fulfill [the] goals of the RMP and provide a balance allowing the permittee’s livestock operation more stability on the allotment while also maintaining healthy ecological conditions across the landscape more so than Alternative A.</p>	
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