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NPS PEPC 111150

Belnap and Big Spring Pipeline Allotments
Grazing Permit Renewal

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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
CFR	Code of Federal Regulations
CBW	Composition by Weight
DFC	Desired Future Condition
DPC	Desired Plant Community
DR	Decision Record
DWR	Dry Weight Rank
EA	Environmental Assessment
EIS	Environmental Impact Statement
ES	Environmental Statement
ESD	Ecological Site Description
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
GCPNM	Grand Canyon-Parashant National Monument
GMP	General Management Plan
GMU	Game Management Unit
IAT	Interdisciplinary Assessment Team
IDT	Interdisciplinary Team
LA	Land Use Allocation
LHE	Land Health Evaluation (synonymous to RLH)
MA	Management Actions
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NPS	National Park Service
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
REC	Rangeland Ecosystem Conditions
RLH	Rangeland Health
RMP	Resource Management Plan
RRT	Rangeland Resource Team
S&G	Standards and Guidelines
TGA	Taylor Grazing Act
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

This Environmental Assessment (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 Belnap and Big Spring Pipeline allotments (Appendix A, Figure 1 Vicinity Map). Livestock grazing on public lands is managed according to grazing regulations found in the Code of Federal Regulations (CFR) at 43 CFR Part 4100 and 36 CFR §2.60 – Livestock use and agriculture. This analysis provides information as required by the Bureau of Land Management (BLM) implementing regulations for the National Environmental Policy Act (NEPA), the Taylor Grazing Act (TGA), National Park Service (NPS) 2006 Management Policies, and the Federal Land Policy Management Act (FLPMA) to determine whether to authorize grazing within these allotments and whether changes to current management are necessary. This EA also serves as a tool to help the authorized officer make an informed decision that is in conformance with the Grand Canyon-Parashant National Monument (GCPNM) Resource Management Plan/General Management Plan (RMP/GMP) (BLM 2008a). The action culminates an evaluation conducted on the allotments under Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (RLH) (Appendix B) (see 3.2.3 Land Health Evaluation (LHE)). RLH is synonymous to LHE however, RLH continues to reference the BLM accepted Interpreting Indicators of Rangeland Health, Version 4 evaluation that was conducted on these two allotments (BLM 2005). Rangeland Ecosystem Conditions (REC) is a monitoring methodology employed on NPS managed lands. These plots established a baseline for future trend analysis for vegetation composition, plant and soil cover, and soil stability. This EA analysis will determine if current grazing management practices would maintain desirable conditions and continue to allow improvement of public land resources, or if changes in grazing management for the allotments are necessary.

The EA is a site-specific analysis of potential impacts that could result with the implementation of a proposed action or alternatives to the proposed action. The EA assists the BLM and NPS in project planning, ensuring compliance with the NEPA, and in making a determination as to whether any "significant" impacts could result from the analyzed actions. "Significance" is defined by NEPA and is found in regulations 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a "Finding of No Significant Impact" (FONSI). If the decision maker determines that this project has "significant" impacts following the analysis in the EA, then an EIS would be prepared for the project.

If no "significant" impacts are determined, the BLM and NPS will prepare separate FONSIs for approval. Additionally, the BLM will prepare a Decision Record (DR) in accordance with 43 CFR 4160 approving the selected alternative. A DR, including the FONSI, documents the reasons why implementation of the selected alternative would not result in "significant" environmental impacts (effects) beyond those already addressed in the RMP/GMP.

1.2 Purpose and Need

A grazing permit renewal application has been received from Superior Cattle, LLC. the current permittee, to renew the ten-year grazing permit on the Belnap Allotment (AZ04849) and Big Spring Pipeline Allotment (AZ04870). The ten-year permit would apply to both NPS and BLM managed lands within the two allotments. The need for the proposed action is for the permittee to be able to continue livestock grazing on the allotments through utilization of forage at proper use levels. The BLM and NPS will determine whether to renew the grazing permit and, if renewed, determine what modifications are needed to maintain or continue to make significant progress towards the attainment of rangeland health (Appendix C – Utilization and Monitoring Data) and the RMP/GMP (BLM 2008a).

The purpose of this EA is to process the term grazing permit on the Belnap Allotment (AZ04849) and Big Spring Pipeline Allotment (AZ04870) in accordance with all applicable laws, regulations, and policies. Belnap Allotment and the current grazing rotation, Animal Unit Months (AUMs), and season of use was analyzed and fully processed through the Belnap Allotment Grazing Permit Renewal EA, NEPA # AZ-130-2005-0015-EA. Big Spring Allotment was analyzed for current grazing rotation, AUMs, and season of use in the Big Spring Allotment Grazing Permit Renewal EA, NEPA # AZ-130-2006-0024-EA. Because the grazing permit for the Belnap Allotment expired in 2015 and Big Spring Pipeline Allotment expired in 2017, the BLM renewed the permits for a ten-year period with the same terms and conditions pursuant to Section 402(c)(2) of the FLPMA as amended by Public Law No. 113-291, pending compliance with applicable laws and regulations. This action resulted in a new permit being issued while an EA is prepared to process the permit. The purpose of this EA is for an interdisciplinary team to analyze the site-specific environmental impacts of issuing a new livestock grazing permit on resources that may be affected in the Belnap and Big Spring Pipeline allotments. 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; and ensuring that the allotments are achieving or making significant progress toward achievement of Standards for Rangeland Health and RMP/GMP objectives.

Livestock grazing is an accepted and valid use of public lands managed by the BLM, as provided for by the TGA, FLPMA, and the Public Rangelands Improvement Act (PRIA), as amended. Regulations controlling livestock grazing on public lands are found in 43 CFR 4100.0-2. Section 1.5 Conformance with Land Use Plans elaborates on the specific Management Actions authorized by the RMP/GMP and associated Record of Decisions that are applicable to grazing on NPS managed lands as well as additional specific livestock grazing guidance for both NPS and BLM administered lands. Section 1.6 Relationship to Statutes, Regulations, or Other Plans identifies the authority granted by the Proclamation creating GCPNM allowing for the continuing issuance of grazing leases. The objective of these 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".

The BLM and NPS interdisciplinary team have developed this EA for the purpose of analyzing the potential effects of livestock grazing on resources that may be affected across the allotments described in the proposed action. This approach is needed to ensure that management actions on public land conform to the appropriate land use plans, are site specific, and balance uses between different resource values. The Fundamentals of Rangeland Health (43 CFR 4180) including, watersheds, ecological condition, water quality, and Threatened & Endangered Species habitat have been analyzed (see 3.2.3 Land Health Evaluation).

Grazing occurs on allotments that are wholly on BLM managed lands, partially on BLM and NPS managed lands, or wholly on NPS managed lands. On allotments that are on partially or wholly NPS managed lands, the authority for grazing decisions is retained by NPS, with allotment management conducted by the BLM (BLM 2008a). The Big Spring Pipeline Allotment is comprised of 24 percent NPS managed lands. The Belnap Allotment has no NPS managed lands (Table 2.1 Current Land Ownership).

The majority of monitoring sites on these two allotments, in both BLM and NPS managed lands, have shown a static or increase in composition and cover of key forage species and a decrease in bare soil with a corresponding increase in live vegetation plant cover and litter since plot establishment. Two monitoring sites have shown a decrease in understory primarily due to woody plant encroachment; this is fully discussed in Chapter 3. The Key Species Grazed Class method was used to collect utilization data (Schmutz 1963). Annual utilization levels since the monitoring plots were established in both allotments has been approximately 30 percent or less, well below the 50 percent allowable level. There have been four occasions in the Big Spring Pipeline Allotment in the past decade when utilization exceeded the 50 percent threshold on a key species. The lower elevation Big Spring Pipeline pastures have utilization guidelines imposed by the Big Spring Pipeline 1994 Allotment Management Plan (AMP) of 45 percent utilization. This has been exceeded twice in the past decade. There has been one occasion in the Belnap Allotment within the past decade when the 50 percent threshold was exceeded. These times when utilization levels were exceeded are isolated cases and are not common practices of grazing management for the permittee on these two allotments.

Frequency trend monitoring data, when compared to the Ecological Site Description (ESD) for both allotments, indicates that the vegetation composition is generally in a mid-late seral state. The Desired Plant Community (DPC) for these two allotments are to manage for a mid-seral state to accommodate for a mosaic of cover and forage for both livestock and wildlife. Further discussion of utilization, long-term frequency trend monitoring, and comparisons of current to historic vegetation conditions may be found in Section 3.2.3 Land Health Evaluations.

1.3 Decision to be Made

The GCPNM's BLM Monument Manager and NPS Regional Director are the authorized officers responsible for the NEPA decisions regarding management of public lands within these allotments. Based on the results of the NEPA analysis, the authorized officers will issue a determination of the significance of the environmental effects and whether an EIS would be required. If the authorized officers determine that it is not necessary to prepare an EIS, the EA will be deemed sufficient and will provide information for the authorized officers to make an informed decision whether to renew, renew with modifications, or not renew the permit. If

renewed, the FONSI will describe which management actions, mitigation measures, and monitoring requirements would be prescribed for the Belnap and Big Spring Pipeline allotments to ensure management objectives and Standards for Rangeland Health are achieved.

The GCPNM interdisciplinary team (IDT) evaluated the application to determine whether the proposed action - providing for livestock grazing opportunities on public land while ensuring that the allotments are achieving (or progressing toward meeting) LHE and REC.

1.4 Grand Canyon-Parashant National Monument

Proposed actions within the GCPNM are designed to also ensure the long-term protection of a wide variety of biological objects and a long rich human history, as directed by Presidential Proclamation 7265. This presidential proclamation explains that GCPNM was created because of its "outstanding objects of scientific and historic interest." The analysis of impacts to specific resources constitutes the analysis of impacts to monument objects in this EA. (USGPO 2000).

1.5 Conformance with Land Use Plans

The alternatives described in Chapter 2 of this EA are in conformance and consistent with the GCPNM RMP/GMP, approved January 29, 2008 (BLM 2008a). The following management decisions includes Desired Future Conditions (DFC), Management Actions (MA), and Land Use allocations (LA) from Table 2.12 GCPNM RMP/GMP regarding management of Livestock Grazing Management (GM), and Vegetation DFC. This list of decisions is not intended to be all inclusive, but a list of the most applicable decisions found in the RMP/GMP.

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: 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.[1]

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 conditions within reasonable time frames.

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 DFC's and standards for rangeland health.

[1] No restrictions are associated with the Belnap or Big Spring Pipeline allotments.

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.[2]

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.

It has also been determined that the alternatives do not conflict with other decisions throughout the plan.

1.6 Relationship to Statutes, Regulations, or Other Plans

Numerous federal laws, regulations, and policies guide BLM and NPS management activities on public lands, with the most prominent laws being listed in this section. FLPMA (43 United States Code [U.S.C.] 1701), directs the BLM to manage public lands "in a manner that will protect the quality of scientific, scenic, historic, ecological, environmental, air and atmospheric, water resources, and archeological values." The NPS 'Organic Act' (39 Stat. 535; 54 USC 100101 et seq.) directs the NPS to manage public lands "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The BLM and NPS has prepared this EA for the Belnap and Big Spring Pipeline Allotments Grazing Permit Renewal in compliance with NEPA, FLPMA, and the Organic Act.

The statutes that govern public land rangeland management are the Taylor Grazing Act (TGA) of June 28, 1934, as amended (43 U.S.C. 315, 315a–315r); section 102 of the FLPMA of 1976 (43 U.S.C. 1740) as amended by the Public Rangelands Improvement Act (PRIA) of 1978 (43 U.S.C. 1901 *et seq.*). The authority for renewing grazing permits is provided for in 43 CFR 4100

[2] The Belnap Allotment is currently classified as an Improve "I" allotment. The Big Spring Pipeline Allotment is a Maintain "M" allotment.

where the objectives of the regulations are "...to promote healthy, sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions; to promote the orderly use, improvement and development of the public lands; to establish efficient and effective administration of grazing of public rangelands; and to provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy public rangelands" (43 CFR 4100.0-2). The NPS 'Organic Act' authorizes that "the Secretary of the Interior may, under such rules and regulations and on such terms as he may prescribe, grant the privilege to graze livestock within any national park, monument, or reservation herein referred to when in his judgment such use is not detrimental to the primary purpose for which such park, monument, or reservation was created".

The Belnap Allotment and Big Spring Pipeline Allotment are within the GCPNM (Appendix A, Figure 1). The GCPNM is responsible for grazing management of both allotments (BLM 2008a). Designation of the Monument did not, in and of itself, require modification of the current grazing practices. The presidential proclamation states that "Laws, regulations, and policies followed by the BLM in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply…" (BLM 2008a; USGPO 2000) Under the Antiquities Act, the BLM must protect objects identified in the presidential proclamation that established the national monument. Therefore, if the BLM determines that any monument objects are harmed by current management, then management (including permit terms and conditions) will be modified accordingly. The analysis of impacts to specific resources constitutes the analysis of impacts to monument objects in this EA.

The proposed action complies 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 proposed action is consistent with the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Appendix B), which were developed through a collaborative process involving the Arizona Resource Advisory Council and the BLM State Standards and Guidelines (S&G) team. The Secretary of the Interior approved the Standards and Guidelines in April 1997 (Appendix B). These Standards for Rangeland Health were incorporated into the GCPNM RMP/GMP (BLM 2008a). Standards for Rangeland Health should be achieving or making significant progress towards achieving the standards and to provide for proper nutrient cycling, hydrologic cycling, and energy flow. Guidelines direct the selection of grazing management practices and, where appropriate, livestock facilities to promote significant progress toward, or the attainment and maintenance of, the standards.

The RMP/GMP identifies resource management objectives and management actions that establish guidance for managing a broad spectrum of land uses and allocations for public lands in the GCPNM. The RMP/GMP identified public lands within the Belnap Allotment and Big Spring Pipeline Allotment as available for domestic livestock grazing (BLM 2008a). Where consistent with the goals and objectives of the RMP/GMP and Standards for Rangeland Health, allocation of forage for livestock uses and the issuance of grazing permits to qualified applicants are provided for by the TGA and FLPMA.

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 (NAGPRA) (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).

Executive Order 13186 requires the BLM and other Federal agencies to work with the United State Fish and Wildlife Service (USFWS) to provide protection for migratory birds. Implementation of the proposed action is not likely to adversely affect any species of migratory bird known or suspected to occur on the allotments. No take of any such species is anticipated**.**

The subject allotments are in Mohave County, Arizona. The proposed action is consistent with the Mohave County General Plan (adopted March 10, 1995, and most recently revised September 21, 2015). 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 proposed action and the alternatives would comply with the following laws and/or agency regulations, other plans and is consistent with applicable Federal and state laws, regulations, and plans to the maximum extent possible.

- The Antiquities Act of 1906
- Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755), as amended
- Taylor Grazing Act of 1934 (43 U.S.C. 315)
- The National Historic Preservation Act of 1966, as amended
- National Environmental Policy Act of 1969 (42 United States Code (USC) 4321 et seq)
- Clean Air Act of 1970 (42 U.S.C. 7401 et seq.)
- Endangered Species Act of 1973, as amended
- Federal Land Policy and Management Act of 1976 (43 [USC] 1707 et seq.)
- Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001–3013; 104 Stat. 3048-3058)
- Arizona Water Quality Standards, Revised Statute Title 49, Chapter II
- Wilderness Act of 1964 (16 USC 1131 et seq.)

1.7 Identification of Issues

Identification of issues for this assessment was accomplished by considering the resources that could be affected by implementation of one of the alternatives. Input from the BLM and NPS interdisciplinary team (IDT) can be found in Table 3.2 Elements/Resources of the Human Environment.

The issues identified through the scoping and IDT process are listed below:

- Livestock grazing – permit renewal is required to allow continued livestock use on these allotments.

- Soil Resources – Soil resources may be impacted by the alternatives analyzed.
- Vegetation including Special Status and Invasive, Non-native Plant Species – the potential exists for deterioration in ecological condition in the allotments if proper livestock grazing practices are not followed. Special status plant species may be impacted by a change in season of use.
- Wilderness, Proposed Wilderness and Areas Managed to Maintain Wilderness Characteristics – The Belnap and Big Spring Pipeline Allotments include two types of wildernesses including Designated Wilderness (BLM) and proposed wilderness (NPS). Renewal or continuation of the grazing permit may potentially impact wilderness.
- 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 proposed action, no action, and no grazing alternatives. The no action alternative is considered and analyzed to provide a baseline for comparing the impacts of the proposed action.

The grazing permittee submitted an application to renew the ten-year grazing permit with proposed changes. The IDT explored and evaluated different alternatives to determine whether the underlying need for the proposed action, providing for livestock grazing opportunities on public lands while ensuring that the allotments are achieving (or progressing toward meeting) rangeland health standards, would be met. This EA analyzes three alternatives:

Alternative A (Proposed Action) – Combine Belnap and Big Spring Pipeline Allotments, extend the Season of Use for the Belnap Pastures, implement a nine-pasture rotation system, and rename and renew permit for the new combined Big Spring Pipeline Allotment.

Alternative B (No Action) – Renew Permit for Belnap and Big Springs Pipeline Allotments with no changes in Season of Use or combination of allotments.

Alternative C (No Grazing) - Reissue a Ten-Year Term Permit for the Belnap and Big Spring Pipeline Allotments with Zero Authorized AUMs.

Table 2.1 Current Land Ownership

Allotment	Ownership	Acres*	AUMs	% of the Allotment
Belnap	BLM	7397	534	90
	NPS	0	0	0
	State	704	72	9
	Private	120	19	1
	Total	**8221**	**625**	**100**
Big Spring Pipeline	BLM	42186	1868	73
	NPS	13823	689	24
	State	1314	216	2
	Private	397	16	1
	Total	**57720**	**2789**	**100**

*Acreages are from the Rangeland Administration System (RAS database). There is slight difference in the acreage determinations in the Geographical Information System (GIS) which is used for most of the data analysis throughout this document.

2.2 Management Common to All Alternatives

The regulations at 43 CFR Part 10 specifically require land use authorizations, including leases and permits, to include a requirement for the holder of the authorization to notify the appropriate Federal official immediately upon the discovery of human remains and other items covered by the Native American Graves Protection and Repatriation Act (NAGPRA) (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 allotments would be managed to achieve the following objectives, as described in the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Appendix B):

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.[3]
3) Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

[3] This standard does not apply in the Belnap or Big Spring Pipeline Allotments. As stated in Table 3.1 of this EA, there are no wetland/riparian areas as cited and described in Table 3.1.

2.2.2 Monitoring and Adaptive Management

The alternatives considered in this EA include adaptive management, which provides management options that may be needed to adjust decisions and actions to meet desired conditions as determined through monitoring. Adaptive management is a decision process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. BLM and NPS resource specialists would periodically monitor the allotments over the 10-year term of the grazing permit to ensure that the fundamentals or conditions of rangeland health are being met or making significant progress towards being met, in accordance with 43 CFR 4180 (see Section 3.2.3 of this EA). Monitoring would include a combination of regular interval trend monitoring on the BLM managed lands within the allotments, long-term integrated upland vital signs monitoring on both BLM and NPS managed lands, and comparison against one-time vegetation status projects such as the USGS Rangeland Condition Assessment (Duniway 2020).

If monitoring indicates that desired conditions are not being achieved and current livestock grazing practices are causing non-attainment of resource objectives, first approach would be through modification of livestock grazing management of the allotment in cooperation with the permittee. Adaptive management allows the BLM to adjust the timing, intensity, frequency, and duration of grazing; the grazing management system; and livestock numbers temporarily or on a more long-term basis, as deemed necessary. This flexibility may be necessary due to drought conditions, fire, or flood events that may require adaptive management adjustments to be made. If a permittee disagrees with the BLM's assessment of the resource conditions or the necessary modifications, the BLM does have the authority to issue a Full Force and Effect Grazing Decision to protect resources.

2.2.3 Management Common to Alternatives A and B

The land health evaluation for these allotments did not indicate the need for new range improvements. Existing range improvements would be maintained as currently permitted. A Minimum Requirements Decision Guide (MRDG) (Appendix D) has been developed as part of this analysis. It addresses the minimum tools (i.e., hand tools or machinery) necessary to implement the alternatives as well as the impact to wilderness characteristics in designated wilderness or proposed wilderness within the two subject allotments. 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. All known existing range improvements are depicted in Appendix G, Tables G.1-G.6. Range improvements located within designated or proposed wilderness are depicted in Appendix G, Table G.7. Maps corresponding to these tables are Appendix A, Figures 8 and 9 respectively. Existing range improvements that have been authorized but may not have been inventoried or mapped would also be subject to maintenance.

With prior approval, more livestock may be grazed for a shorter period, within the authorized dates, so long as the active AUMs are not exceeded (43 CFR 4120 Grazing Management).

2.3 Alternatives

2.3.1 Alternative A – Proposed Action
Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

The proposed action was developed in cooperation with the grazing permittee.

The proposed action would combine the Belnap and Big Spring Pipeline allotments into one allotment that would then be renamed Big Spring Pipeline Allotment. The Belnap North and South pastures would become the Big Spring Pipeline Allotment North and South pastures (Appendix A, Figure 2). This would include extending the season of use from the current 12/1 – 5/15 use to year-round use in what is now the Belnap Allotment (Table 2.3). This would allow grazing rotation between nine pastures rather than the current seven. The proposal would renew the grazing permit for the Big Spring Pipeline Allotment for a period of ten years. There would be no proposed change in the total number of Animal Unit Months (AUM)[4] limited to the current active preference and suspended AUMs for either allotment (Table 2.2).

Belnap Allotment
In 2005, the permittee requested that the Belnap Allotment season of use be changed to 12/1 – 5/15 from 6/1 – 11/15. This request was analyzed in the Belnap Allotment Grazing Permit Renewal EA- NEPA # AZ-100-2005-0015-EA. This request was approved, and the season of use became 12/1-5/15.

Currently, the permittee removes most of their cattle off these allotments to private summer pastures allowing almost complete growing season rest for all pastures within these allotments. The permittee would continue to do this but is requesting to combine the two Belnap pastures, (North and South) with the Big Spring Pipeline Allotment. The permittee has requested that the season of use for the Belnap Allotment pastures be extended to year-round grazing use. This would allow the flexibility of an expanded season of use. This would allow seasonal livestock rotations between the current Belnap North and South pastures and Big Spring Pipeline Allotment. Under this proposal, the cattle and four horses currently permitted on the Belnap Allotment would continue with the flexibility of year-round use.

Big Spring Pipeline Allotment
The Big Spring Pipeline Allotment grazing permit was fully analyzed in 2006 through the NEPA process with an EA for the current year-round season of use (Big Spring Pipeline Allotment Grazing Permit Renewal EA AZ-130-2006-0024). Under this proposed action, there would not be a change in AUMs or season of use for the current seven pastures.

[4] An AUM, or Animal Unit Month, is a unit of measurement indicating how much forage is eaten by a cow/calf pair in one month. Approximately 26 lbs. of dry matter.

Table 2.2 Current Permitted Livestock Use.

Allotment Number	Allotment Name	Livestock Number and Kind	Season of Use	Percent Public Land[1]	Active AUMs	Suspended AUMs	Total AUMs (Active and Suspended)
AZ04849	Belnap	110 Cattle	12/01 – 05/15	85	516	180	696
AZ04849	Belnap	4 Horses	12/01 – 05/15	85	18	0	18
Total					534		714
AZ04870	Big Spring Pipeline	211 Cattle	03/01 – 02/28	92	2337	1429	3766
AZ04870	Big Spring Pipeline	20 Horses	03/01 – 02/28	92	220	0	220
Total					2557		3986

[1]Percent public land is based on AUMs.

Table 2.3 Proposed Permitted Livestock Use.

Allotment Number	Allotment Name	Livestock Number and Kind	Season of Use	Percent Public Land[1]	Active AUMs	Suspended AUMs	Total AUMs (Active and Suspended)
AZ04849	Big Spring Pipeline (former Belnap) North and South Pastures	48 Cattle	03/01 – 02/28	85	516	180	696
AZ04849	Big Spring Pipeline (former Belnap) North and South Pastures	4 Horses	03/01 – 02/28	85	18	0	18
Total					534		714
AZ04870	Big Spring Pipeline	211 Cattle	03/01 – 02/28	92	2337	1429	3755
AZ04870	Big Spring Pipeline	20 Horses	03/01 – 02/28	92	220	0	220
Total					2557		3986

[1]Percent public land is based on AUMs.

2.3.1.1 Grazing System

Belnap Allotment

This allotment has two pastures, Belnap North and Belnap South (Appendix A, Figure 3). Although the Belnap Allotment does not have an AMP, it does have a pasture rotation schedule. From 1984 until 1996, this allotment operated under a two-pasture deferred rotation. Deferment implies that livestock are not permitted to graze a particular pasture that year until seed production is completed for key species. Key species are the species of perennial grass, forbs, or browse that the permitted livestock would consume. At that time, cattle were turned on the allotment June 1 and stayed until November 15. One pasture was grazed from June 1 through August 31 and the other was used September 1 through November 15. The time of use for each pasture was alternated each year.

Beginning in the summer of 1997, the grazing system was modified and the allotment has been grazed from December 1 through May 15. The pasture rotation schedule has continued, with one pasture grazed December through February and the other grazed March through mid-May, pasture use alternated each year. Livestock are then moved off the allotment and taken to a private pasture from June through September. The livestock use the Big Spring Allotment pastures until they are permitted back on to the Belnap Allotment in December. This rotation allows both pastures recovery time during the summer growing season.

The permittee has worked with Natural Resource Conservation Service (NRCS), BLM, and Arizona Game and Fish Department (AGFD) to develop a water catchment for both livestock and wildlife use in the Belnap South Pasture. This water is used in the South Pasture and piped to a trough in the adjoining Big Spring Pipeline – Whitmore Point Pasture. Water availability allows seasonal flexibility for livestock use in these pastures. The permittee is currently authorized to have up to 110 cows and four horses on the allotment for approximately five and a half months. The proposal would allow 48 cows and four horses year-round (see Tables 2.2 and 2.3). In a typical year, livestock return from private leased pasture in late September to early October. Currently those cattle are turned on to Big Spring Pipeline pastures. With flexibility of year-round pasture availability in the Belnap pastures, the cattle could be turned out on these pastures thus allowing additional rest for the lower Big Spring Pipeline - Whitmore Canyon pastures (see Big Spring Pipeline Allotment discussion below). The two Belnap pastures would continue with a deferred rotation. The Belnap pastures would likely be grazed from October through May with alternating rest-rotation between those two pastures as well as the current Big Spring Pipeline winter pastures. The majority of livestock forage use would occur in the dormant season, allowing growth of above and below ground biomass, as well as seed production and maturation. This scenario would likely increase the rest-rotation of the lower Whitmore Canyon winter pastures, allowing continued progress towards these pastures fully meeting S&Gs, while the Belnap Pastures (proposed Big Spring Pipeline North and South pastures) would continue to meet S&Gs (see Appendix B and C).

Big Spring Pipeline Allotment

The Big Spring Pipeline Allotment has an AMP that was implemented in 1994. This allotment has seven pastures, Lower Cole (Cold Spring), Airstrip, Lava, Chaparral, Whitmore (includes Whitmore Point), Cole Spring (aka Upper Cole), Big Spring (Appendix A, Figure 4). When the AMP was developed, a deferred rotation grazing system was established and implemented. This system was split into two units; a winter unit that is grazed from October 16 to April 15 and a summer unit which is grazed from April 16 to October 15. Within the winter unit there are four pastures operating under a four pasture, deferred-rotation schedule. Included in the winter unit is the Lower Cole (Cold Spring), Airstrip, Lava, and Chaparral pastures. Each pasture is grazed approximately 45 days during the use period. Each pasture receives spring use (March 1 – April 15) once every four years. Utilization levels in the winter pastures are set at 45 percent as per the Big Spring Pipeline AMP to minimize grazing impacts in the bottom of Whitmore Canyon. The AMP would continue to be implemented for this allotment.

The summer unit of the Big Spring Pipeline Allotment is operated as a two pastures deferred-rotation system. Whitmore Point and Cole Spring (aka Upper Cole) pastures are grazed in the summer rotation. One pasture is grazed from April 16 to July 15, the other pasture is grazed July 16 to October 15. Scheduled use periods for each pasture is switched each year to allow for rest and recovery during a portion of the growing season. There is another pasture within this allotment known as the Big Spring Pasture, however due to topography, a large lava field, and pinyon-juniper overstory with sparse understory, this pasture does not provide much grazing opportunity for livestock.

As with the Belnap pastures, most of the livestock are removed from public grazing lands from mid-May through September. This allows complete rest during the growing season for most of the pastures in both the Belnap and Big Spring Pipeline pastures each year.

2.3.1.2 Terms and Conditions of Grazing Permit

In addition to the "Mandatory Terms and Conditions" and standard language on the last page of the grazing permit, the following terms and conditions would be added to the "Other Terms and Conditions" section on the new grazing permit for the Belnap and Big Spring Pipeline Allotments. Terms and Conditions are requirements that are authorized by land use plans, AMPs (developed through the NEPA process), FLPMA, and Federal regulations (CFRs). Terms and Conditions are agreed to by the permittee during permit issuance. These "Other Terms and Conditions" would be common to both Alternatives A and B:

Allowable use on key forage species is 50% on the Belnap Allotment or pastures due to the rotational grazing systems. When 50% forage utilization is reached, livestock would be moved to another pasture or off the allotment completely (BLM 2008a). As per the Big Spring Pipeline AMP (see Appendix H; § 4120.2 Allotment management plans and resource activity plans), utilization levels would continue to be 45% for the Lower Cole (Whitmore Canyon), Airstrip, Lava, and Chaparral pastures. When 45% forage utilization is reached in these four pastures, livestock would be moved to another pasture or off the Big Spring Pipeline Allotment.

The DPC and vegetation cover objectives as listed in the LHE would be monitored to determine trends. Monitoring utilization of upland key forage plant species over time on the Belnap Allotment/pastures to ensure average utilization of key herbaceous forage species does not exceed 50% for this Allotment. The 50% utilization criteria applies to the Big Spring Pipeline Allotment except for the Lower Cole (Whitmore Canyon), Airstrip, Lava, and Chaparral pastures where once 45% average utilization is reached, livestock would be required to move to another pasture or off the allotment (BLM 2008a).

The permittee would be allowed to use an actual use billing system. This privilege may be revoked, and the permittee placed on advanced billing if payment of bills and/or actual use reports are late. An actual use grazing report (Form 4130-5) must be submitted within 15 days after completing annual grazing use (43 CFR § 4130.8-1 Payment of fees).

Associated maintenance of existing facilities and improvements relevant to the grazing operation would be required and authorized (43 CFR Part 4100).

With prior approval, more livestock may be grazed for a shorter period, within the authorized dates, so long as the active AUMs are not exceeded (43 CFR 4120 Grazing Management).

2.3.2 Alternative B – No Action
Renew Permit for Belnap and Big Springs Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

The BLM would renew the existing grazing permit for the Belnap and Big Spring Pipeline Allotments for a period of ten years with no changes. There would be no proposed change in season of use for the Belnap Allotment. Livestock grazing would occur during the current season of use for each allotment, and with the number of AUMs limited to the current active preference (Table 2.2).

2.3.3 Alternative C – No Grazing

Alternative C is to reissue a ten-year term grazing permit on the Belnap and Big Spring Pipeline Allotments with zero authorized AUMs for active preference – all AUMs would be suspended (i.e., livestock grazing would be deferred for the ten-year permit period). In ten years, the allotments would be re-evaluated. Range improvements would not be maintained by the permittee for this ten-year term.

2.3.4 Alternatives considered but not carried forward for analysis

An alternative to permanently close or retire the two subject allotments was considered. The current permittee submitted an application to renew the ten-year livestock grazing permit. The GCPNM RMP Map 2.10 pp 2-78 (BLM 2008) classifies the two subject allotments as open to grazing (see section 1.5 Conformance with Land Use Plans LA-GM-01). This alternative would not meet the purpose and need of this analysis, which is for the BLM to evaluate an application to renew the grazing permit for the two subject allotments for a ten-year term. Substantial use of the grazing permit must be made under 43 CFR §§ 4140.1(a)(2) and 4170.1-2. If this

requirement is not met, the permit may be canceled and issued to a qualified permittee that will make substantial use [5]. Therefore, this alternative was not carried forward for further analysis.

[5] U.S. Court of Appeals for the Tenth Circuit in Public Lands Council v. Babbitt, 167 F.3d 1287 (10th Cir. 1999), aff'd, 529 U.S. 728 (2000). In this decision, the court found that the Secretary of the Interior (acting through the Bureau of Land Management (BLM)) lacked the statutory authority to issue grazing permits intended exclusively for "conservation use." 167 F.3d at 1308. In 2006, the Department of the Interior promulgated a final rule at 71 FR 39402 (July 12, 2006) that removed references in 43 CFR Part 4100 to conservation use consistent with the court's ruling.

Chapter 3

3.0 Affected Environment

3.1 Introduction

This chapter describes the existing environment potentially affected by the proposed action to assist the reader in understanding the current conditions. An interdisciplinary team of resource specialists considered and analyzed the affected environment in this EA. Table 3.1 addresses the elements and resources of concern considered in the development of this EA; this table indicates whether the element or resource is not present in the project area, present but not impacted to a degree that requires detailed analysis, or present and potentially impacted. The resources identified and discussed in Section 3.4 include the relevant physical, social, and biological conditions that may be impacted with implementation of one of the alternatives and provides the baseline for comparing impacts described in Chapter 4.

3.2 General Setting

The Belnap and Big Spring Pipeline Allotments are located in northwestern Arizona approximately 60 miles south of St. George, Utah (Appendix A, Figure 1). Both allotments are situated within the southeastern portion of GCPNM. The Belnap Allotment is approximately on 90 percent BLM managed lands, with the remainder on private land and Arizona State lands. The Big Spring Pipeline Allotment is approximately on 73 percent BLM managed, 24 percent NPS managed lands, and the remainder on private land and Arizona State lands (see Table 2.1 Land Ownership). Both allotments are administered by GCPNM (BLM 2008a). The Belnap Allotment does not have an AMP while the Big Spring Pipeline Allotment does have an AMP that was completed and implemented beginning in 1994 (see Appendix H).

Belnap Allotment

Gila & Salt River Meridian, Mohave County, Arizona
T. 34 N., R. 10 W.,
various sections.
T. 35 N., R. 10 W.,
various sections.

Big Spring Pipeline Allotment

Gila & Salt River Meridian, Mohave County, Arizona
T. 32 N., R. 8 and 9 W.,
various sections.
T. 33 N., R. 8, 9, and 10 W.,
various sections.
T. 34 N., R. 8, 9, and 10 W.,
various sections.

3.2.1 Topography

The Parashant Canyon delineates the western boundaries for both allotments and the Uinkaret Mountains delineate the northern and eastern boundary of the Big Spring Pipeline Allotment. The Belnap Allotment is bounded to the north and east by Arizona State lands and privately owned lands (Appendix A, Figure 1). Additionally, the two allotments are divided by a fenced boundary. In the Belnap Allotment, elevation ranges from 4,400 feet near the Parashant Canyon to 5,500 feet on the plateaus in the center of the allotment. The Big Spring Pipeline Allotment elevation ranges from 3,500 feet in the lower parts of Whitmore Canyon to 7,800 feet at the top of Mt. Logan in the northern part of the allotment (BLM 2008a, and BLM 2022).

3.2.2 Climate

Belnap Allotment

The Belnap Allotment falls mainly in the 10 – 14-inch precipitation zone (p.z.) with most precipitation occurring during the winter (30%), see summary below or Appendix E – Historic Precipitation Reports, for complete historic data set. Precipitation generally comes as snow from December through February. Summer rains occur from June through September during most years. Temperatures average 15 - 20 degrees in the winter, with summer temperatures ranging from 95 – 100 degrees.

The rain gauge data is not complete at all stations cited for the past few years, however these stations as well as other neighboring stations show below average precipitation including extreme to exceptional drought conditions for at least half of the past ten years in this general area.

There is no rain gauge within the allotment boundaries of the Belnap Allotment, the two nearest gauges are the Alcorn and Bundyville rain gauges which are adjacent to the Belnap Allotment. The Alcorn rain gauge is located at T. 35 N., R. l0 W., sec. 30, approximately one mile north of the allotment boundary. Average long-term precipitation is 11.91 annually dating back to 1978. Approximately 13% (1.53) comes in the fall, 31% (3.68") in the winter, 16% (1.96) in the spring and 40% (4.75") in the summer.

The Bundyville gauge is located in T. 35 N., R. 9 W., sec. 19 approximately three miles northeast of the Allotment. Average long-term annual precipitation for this gauge is 11.58 dating back to 1988. Approximately 13% (l.55”) comes in the fall, 28% (3.24") in the winter, 18% (2.11") in the spring, and 40% (4.68%) in the summer.

Big Spring Pipeline Allotment

Average annual precipitation on the Big Spring Pipeline Allotment is characterized by two distinct zones. The higher elevations on the allotment are within a 10-14” precipitation zone (p.z.). The Side of Mountain rain gauge located in T. 35 N., R. 9 W., sec. 6 is the reference gauge for this p.z. This rain gauge is approximately one-half mile north of the Big Spring Pipeline Allotment boundary. Average long-term precipitation is approximately 13.15” annually, dating back to 1992. Seasonal distribution is 17% (2.22”) in the fall, 31% (4.08”) in the winter, 17% (2.18”) in spring, and 36% (4.67”) during the summer.

The lower reaches of the allotment, such as Whitmore Canyon and Cold Spring Canyon are in a 7-11" precipitation zone. The Pa's Pocket rain gauge provides reference rain fall data for this zone. It is located on the southern allotment boundary in T. 33 N., R. 9 W., sec. 26. Average long-term precipitation is approximately 10.84" annually, dating back to 1978. Approximately 17% (1.82") is distributed in the fall, 34% (3.70") in the winter, 17% (1.82") in spring, and 32% (3.50") during the summer. For detailed station data see Appendix E.

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.

The Rangeland Resource Team (RRT), Interdisciplinary Assessment Team (IAT), livestock grazing permittees, and other interested parties were invited to attend an issue scoping meeting for the Belnap Allotment on March 14, 2001. The issue scoping meeting for the Big Spring Pipeline Allotment was held on October 22, 2003 and a field visit on March 17, 2004. The two allotments were assessed under Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Appendix B).

The current methodology for LHE and determining if allotments are meeting Arizona Standards and Guides is described in Appendix B. The BLM conducted evaluations for rangeland conditions on the Belnap Allotment (AZ04849) September 30, 2002. An evaluation was conducted on the Big Spring Pipeline Allotment (AZ04870) on May 22, 2006. The IAT determined that the Belnap Allotment met applicable LHE standards. The IAT determined that the Big Spring Pipeline Allotment is making significant progress toward meeting LHE standards.

In 2022, an interdisciplinary team comprised of both BLM and NPS resource specialists conducted LHE in both allotments utilizing Interpreting Indicators of Rangeland Health, Version 4 (BLM 2005). The team conducted the evaluation on the Belnap Allotment on May 18, 2022, and on the Big Spring Pipeline Allotment on June 9, 2022. In conjunction with the field visits, the team considered existing monitoring data, specifically frequency trend monitoring plots that were established on both NPS and BLM managed lands in both allotments. These plots were established in the 1980s and are read on a five-year cycle. The data associated with these evaluations and trend monitoring are available in Appendix C (utilization and monitoring data) and Appendix F (Desired Plant Community/Ecological Site Description Comparison Tables). The trends identified in the rangeland health assessments for both allotments assessed erosion status, vegetative cover, vigor, species diversity, and location of the most palatable plants in relation to access to a grazing animal.

The land health evaluation listed DPC objectives that were developed by consulting the NRCS ecological site guides; the potential vegetation types for each ecological site are determined primarily by soil type, which is determined by parent material, time, climate, relief, and

organisms. Many factors influence changes or differences in frequency or composition of vegetation as shown in these ecological site guides. It is important to note that the ecological site guides are just that – "guides". Long-term monitoring of a site indicates what an area is capable of producing. The DPC objectives therefore reflect a combination of management objectives and the potential of each site. The DPCs are expressed in species composition by weight (CBW).

The DPC objectives for the allotment were developed using the description of the ecological site guides for the key area (Appendix F), as well as the potential of the site based upon long-term monitoring (see Appendix C). The DPCs reflect functional groups rather than specific plant species. Plant functional types are sets of plants exhibiting similar responses to environmental conditions and having similar effects on the dominant ecosystem processes (Gitay and Noble 1997). It is 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 and responses to environmental stress and disturbance (McIntyre 1999), which is more useful on an allotment scale. These DPCs provide for the habitat needs of wildlife (both forage and cover), protection for soils and hydrologic functions, and forage for livestock. DPC is examined in detail 3.4.1 Livestock Grazing – Desired Plant Community Objectives.

The LHE sites are compared to the ESDs, which represent the historic composition of these sites based on soils, elevation, and aspect. In some instances, the historic composition is not the management goal. This may be due to management for wildlife species or livestock group, or a particular seral state. In this instance, a comparison between DPC and current composition is preferred. Based on the recent LHE and long-term monitoring data, the team determined that the Belnap Allotment continues to meet LHE standards and Big Spring Pipeline Allotment continues to make significant progress toward meeting LHE standards.

3.3 Elements of Resources of the Human Environment

The BLM and NPS are required to consider many authorities when evaluating a federal action. Those elements of the human environment that are subject to the requirements specified in statute, regulation, or executive order, and must be considered in all EAs (BLM 2008b) have been considered by BLM and NPS resource specialists to determine whether they would be potentially affected by the proposed action or alternatives. These elements are identified in Table 3.1, 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 3.1 also contains other resources that have been considered in this EA. As with the elements of the human environment, if these resources were determined to be potentially affected, they were carried forward for detailed analysis.

Table 3.1 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 (including Green House Gases)	NI	The Belnap and Big Spring Pipeline allotments are 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. Although livestock congregating at waters can create fugitive dust, this dust creation is very localized and temporary. Thus, none of the alternatives would cause Class II standards to be exceeded. The alternatives would therefore not measurably impact air quality. Cattle grazing on public land (and elsewhere) eat vegetation that potentially stores carbon, and cattle do generate methane. In addition, livestock operations have the potential to generate emissions through vehicle and equipment use. The proposed action would be a minute source of carbon dioxide (CO_2) and other greenhouse gases (GHGs). This analysis is unable to identify the specific impacts of the proposed action's GHGs on climate change as the amounts involved are well within margin of error in most current climate change models. It is difficult to state with any certainty what impacts may result from GHG emissions, or to what extent the proposed action could contribute to those climate change impacts. Given the minute proportions involved, it has therefore been determined that the alternatives would have a negligible effect on local, regional, and global climate change.
Areas of Critical Environmental Concern	NI	After review of GIS and the Grand Canyon-Parashant National Monument RMP/GMP 2008, there are no Areas of Critical Environmental Concern within the Belnap and Big Spring Pipeline allotments.
BLM or State Sensitive Plant Species	PI	*Penstemon distans* is present in Big Spring Pipeline Allotment, and *Yucca baccata* (AZ Salvage restricted) is present in Belnap Allotment. This resource is further addressed in the

Resource	Determination	Rationale for Determination
		Vegetation including Special Status and Invasive, Non-native Plant Species sections in Chapters 3 and 4.
Cultural Resources	NI	The nature of the proposed action is such that no impact can be expected on cultural resources. The proposed action is two-fold and includes combining two grazing allotments into one allotment and then the renewal of the existing grazing permit. No new range improvements are proposed. Since this activity has no ground disturbance and is unlikely to adversely affect historic properties, the exemptions in Appendix D (Exempted Undertakings) of the *Arizona Statewide Conservation Vegetation and Range Management PA* apply for the proposed action. See also Appendix G: Range Management Protocol in same document.
Environmental Justice	NI	Minority, low-income populations, and disadvantaged groups may be present within the county and may use public lands in and near the allotments. The proposed action would not cause any disproportionately high and adverse effects on minority or low-income populations, individually or collectively because there are no exposure pathways by which any population would come into contact, such as chemical, biological, physical, or radiological effects.
Farmlands (Prime or Unique)	NP	Prime farmland is described as farmland with resources available to sustain elevated levels of production. 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. Based on these definitions, no prime or unique farmlands exist within the GCPNM (including the project area).
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 allotments.
Fuels / Fire Management	NI	There are no Fire Management/Fuels issues in the project area. Grazing generally reduces the fine fuel loading and many ladder fuels, which are the primary source for fire spread, as measured in Rate of Spread.
Geology / Mineral Resources / Energy Production	NI	Review of geologic minerals and potential energy productions via GIS and on foot reconnaissance reveal several underlying “lenses” of gypsum deposits, a common occurrence in the Kaibab limestone formation which makes up the bulk of the project area. The alternatives would not have any impacts on these mineral deposits nor create additional obstacles to

Resource	Determination	Rationale for Determination
		retrieve these minerals in the future. Energy production potential would remain unimpacted for future possibilities.
Invasive, Non-native Species	PI	Nine invasive, non-native plant species are known to occur in the project area, five in Belnap Allotment and seven in Big Spring Pipeline Allotment. These include the regionally widespread *Bromus tectorum* and the locally treated *Onopordum acanthium*. This resource is further addressed in the Vegetation including Special Status and Invasive, Non-native Plant Species sections in Chapters 3 and 4.
Lands / Access	NI	Access to public lands would not be altered or impaired by implementation of the alternatives. No other land issues have been identified in connection with the alternatives.
Livestock Grazing	PI	Permit renewal is required to allow continued livestock use on the allotment; this issue is therefore analyzed in detail in this EA.
Native American Religious Concerns	NI	The proposed action is not known to limit access to, or ceremonial use of, known American Indian sacred sites. As such, there would be no adverse impact.
Paleontology	NI	Recent paleontological inventories have documented abundant fossiliferous beds within the Harrisburg member of the Kaibab limestone formation, the dominate geologic strata in the proposed area. The alternatives would not damage these invertebrate fossils, nor create obstacles to access these paleontological sites.
Recreation	NI	The Belnap and Big Spring Pipeline allotments are within the Shivwits Frontier Recreation Management Zone. The allotments have values for extreme, world class, deep wildlands exploration in remote and rugged Grand Canyon country. Visitors to the allotment engage in a variety of recreation activities including sightseeing, horseback riding, hiking, camping, backpacking, canyoneering, hunting, photography, bird watching, nature study, and vehicle exploring. The alternatives are not expected to impact the availability of recreational opportunities within the project area.
Socio-economic Values	NI	The economic base of the Arizona Strip District including GCPNM is mainly ranching with a few gypsum/selenite and uranium mines (mining is outside GCPNM). Nearby communities are supported by tourism (including outdoor recreation), construction, mining activities, and light industry. The social aspect involves remote, unpopulated settings with moderate to high opportunities for solitude. The alternatives

Resource	Determination	Rationale for Determination
		would have no overall effect on the economy of the county. Quantifiable additional or decreased economic impact to the local area would not be affected by any of the alternatives.
Soil Resources	PI	Soil conditions in the proposed project area have been disturbed, mostly by cattle operations, and located within confined vicinities where cattle frequent. The continuance of grazing, along with the proposed maintenance of range improvements in both allotments, is likely to impact soils through ground disturbance and vegetation community changes typically associated with this activity. Further soil analysis in this EA is needed to assess changes in soil composition, compaction, permeability, erosion potential, and relevant cumulative effects.
Threatened, Endangered or Candidate Animal Species	NI	The California condor is the only known federally listed animal species that may occur within these allotments – condors may occasionally fly over or feed in this allotment at any time of year. California condors are federally listed as endangered and a population of these condors was reintroduced on the Arizona Strip in 1996. This population is designated as experimental non-essential under Section 10(j) of the Endangered Species Act. Condors are strictly scavengers and prefer to eat large, dead animals such as mule deer, elk, pronghorn, bighorn sheep, cattle, and horses. Condors range widely, easily covering over 100 miles in a day, and their current range includes the entire Arizona Strip. Although condors may either fly over or feed within the allotments, they have not been observed doing so. There is no evidence that rangeland health on these allotments is limiting or restricting condor population growth. Thus, no effect to this species is expected from any of the alternatives.
Threatened, Endangered or Candidate Plant Species	NP	No Threatened, Endangered or Candidate plant species are known to occur within the project area according to USFWS as of December 1, 2020.
Vegetation	PI	Grazing has a direct impact on vegetation resulting from livestock eating and trampling plants within the allotments. This issue is therefore analyzed in detail later in the EA.
Visual Resources	NI	The project area includes Visual Resource Management (VRM) Class II and Class III. Livestock grazing and infrastructure would not create significant changes to the basic elements of form, line, color, and texture found in the predominant natural features of the landscape. Therefore, the

Resource	Determination	Rationale for Determination
		alternatives are not expected to impact the various VRM class objectives.
Wastes (hazardous or solid)	NI	No known hazardous or solid waste issues occur in the allotment, and the alternatives would not produce hazardous or solid waste. While motorized vehicles (used by the permittee for grazing management activities) involve use of petroleum products, which are classified as hazardous materials, there is nothing unique about the actions associated with the alternatives which could affect their use or risks associated with their use. No chemicals subject to reporting under Superfund Amendments and Reauthorization Act, Title III in an amount equal to or greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with any of the alternatives. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, would be used, produced, stored, transported, or disposed of in association with any of the alternatives.
Water Quality (drinking / ground)	NI	Water quality in both the surface water recharge as well as the underlying aquifer would have no discernable impacts given the alternatives. Floodplains and natural drainages would be unimpeded allowing for no disruption in the current topographical drainage. Soil surfaces would still maintain their current porosity and provide recharge to the primary aquifer. Water chemistry would be unaltered given that no soluble substances would be introduced by the alternatives.
Wetlands / Riparian Zones	NI	There are three known springs within the Big Spring Pipeline Allotment. The Big Spring is a developed spring located on private land. There is some riparian area immediately around the spring development. Cold Spring is a developed spring on public land that has a small riparian area adjacent to the developed spring. Cold Spring is inaccessible to livestock and not impacted. Randall Spring is an undeveloped spring with no riparian area. There are no known springs within the Belnap Allotment.
Wild and Scenic Rivers	NI	There are no river segments within the allotments that are designated, eligible, or suitable as wild, scenic, or recreational under the Wild and Scenic Rivers Act.
Wild Horses and Burros	NP	There are no wild horses or burros, or herd management areas, within or adjacent to the Belnap and Big Spring Pipeline allotments (BLM 2008a).

Resource	Determination	Rationale for Determination
BLM Designated Wilderness and NPS Proposed Wilderness	PI	The Big Spring Pipeline Allotment includes two types of wilderness; Designated Wilderness (BLM) and proposed wilderness (NPS). The permit renewal portion of the proposed action would continue to allow grazing in the Mt. Logan Wilderness. Grazing practices would continue to be monitored to ensure that no impacts to wilderness values and character occurs. The maintenance of range improvements as part of the alternatives A and B within Designated Wilderness and proposed wilderness requires an assessment of impacts through a Minimum Requirements Decision Guide (MRDG); therefore, this is analyzed in detail later in this EA.
BLM Lands with Wilderness Characteristics	NI	Portions of the Belnap and Big Spring Pipeline allotments have areas managed to maintain wilderness characteristics of naturalness, opportunities for solitude, and opportunities for primitive and unconfined recreation. The GCPNM RMP/GMP specifically allows for existing range improvement maintenance within lands with wilderness characteristics. MA-WC-03 states, "Restoration, vegetation treatments, wildlife management projects on BLM-administered lands, and other surface disturbing actions can be authorized in areas managed to maintain wilderness characteristics to achieve DFCs." MA-WC-04 states, "New projects or maintenance of existing projects that enhance wildlife habitat or other resources can be allowed, provided they can be designed to be substantially unnoticeable over time." No new range improvement projects are being proposed. Since the few current range improvements found within lands with wilderness characteristics already exist and the periodic maintenance will remain in the existing footprint and contain efforts to conceal the improvement; lands with wilderness characteristics are not expected to be affected by the alternatives.
Wildlife (including sensitive species and migratory birds)	PI	Grazing has a direct impact on wildlife habitat resulting from livestock eating and trampling plants within the allotment. This issue is therefore analyzed in detail later in this EA.
Woodland / Forestry	NI	Pinyon/juniper woodlands occur on the allotments but are not largely impacted by livestock grazing based on the lack of regular use. No forestry (timber) resources occur on these allotments.

3.4 Resources Brought Forward for Analysis

3.4.1 Livestock Grazing

The analysis area for livestock grazing is the Belnap and Big Spring Pipeline Allotments.

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

The Belnap Allotment is currently categorized as a Management Status "improve" (I) allotment. The GCPNM RMP/GMP (BLM 2008a) defines improve allotments as those in which:

- Present range condition is unsatisfactory.
- Allotments have high to moderate resource production potential and are producing at low to moderate levels.
- Serious resource-use conflicts/controversy exists.
- Opportunities exist for positive economic return from public investments.
- Present management appears unsatisfactory.
- Other criteria appropriate to the Environmental Statement (ES) area.

The improve categorization may be based on any one or several of the above cited criteria. The improve status may provide opportunities for positive economic return from public investments. The intent of management under the Improve category is to provide for enhanced opportunities to create better grazing conditions. Past investments in range improvements, including structural and vegetation treatments on this allotment recognize the production capability and return on labor and capital investments.

The Big Spring Pipeline Allotment is current categorized as an "maintain" (M) allotment. The GCPNM RMP/GMP (BLM 2008a) defines maintain allotments as those in which:

- Present range condition is satisfactory.
- Allotments have high or moderate resource potential and are producing near their potential (or trend is moving in the direction.)
- No serious resource-use conflicts/controversy exist.
- Opportunities may exist for positive economic return from public investments.
- Present management is satisfactory.
- Other criteria appropriate to the ES area.

Land ownership in the Belnap Allotment consists primarily of federal land with some State land included (Table 2.1 Land Ownership). Active grazing preference is 534 AUMs, with 180 suspended AUMs (see Section 2.3, Table 2.2). Land ownership in the Big Spring Pipeline Allotment is mostly federal land (BLM and NPS managed) with some private land included (Table 2.1 Land Ownership). Active grazing preference is 2557 AUMs, 1429 suspended AUMs (Section 2.3, Table 2.2). The current grazing system is described in Section 2.3.1 Grazing System. Belnap Allotment has two fenced pastures, with deferred rotation and alternating seasons of use. Big Spring Pipeline has winter and summer use pastures all operated under a deferred rotation grazing system. Cattle are typically removed from public land during the growing season on both allotments.

Actual Use

Actual use is submitted by the permittee annually to reflect the number of livestock, pasture rotation, and season of use for that grazing year. AUMs are calculated from the actual use reports, as well as billing for grazing on public lands. The actual use within the Belnap Allotment has ranged from 0 (non-use) – 86% of permitted use in the past decade (2012 – 2022) with an average for that period of 36%. Actual use for the Big Spring Pipeline Allotment ranged from 13 – 47% of permitted use during 2012 – 2022 with an average for that period of 30%. Non-use may reflect seasonally dry periods, drought years, or annual operation fluctuation. The permittee for the past couple of decades has been removing their livestock from public lands during the majority of the vegetation growing season. This is evident from the Actual Use submitted which date back to the mid-1980s for both allotments. Actual Use for the period when the livestock remained on the Big Spring Pipeline and Belnap allotments through the growing season is approximately 54-59% (respective, of permitted use i.e., 40+% non-use). Actual use tables can be found in Appendix C, Table C.1 Belnap Allotment Actual Use and Table C.2 Big Spring Pipeline Actual Use. The proposal to convert the Belnap Allotment to a year-round grazing allotment will likely not affect current utilization or Actual Use levels, as it is evident that the livestock will not be on either allotment during the majority of the growing season. This proposal will allow the permittee additional flexibility to better manage their livestock for the period they are on the allotments.

Utilization

Utilization is defined as the proportion of the current year's forage production that is consumed or destroyed by grazing animals (both livestock and wildlife). The Grazed-Class Method was used to collect the data (Section 4.3.4 Monitoring). Average utilization levels of key forage species for these allotments should not exceed 50% in the Belnap Allotment, and the Big Spring Pipeline summer pastures. Utilization should not exceed 45% on the Big Spring Pipeline winter pastures (see 2.3.1 for specific grazing system) (BLM 2008a). Utilization as well as compliance checks are conducted throughout the grazing season. There are two key areas in the Belnap Allotment (one in each pasture, see Appendix A, Figure 3). There are seven key areas in the Big Spring Pipeline Allotment (See Appendix A, Figure 4). Average utilization for the Belnap Allotment (1991 – 2022) ranges from no use to 42%. Utilization data by key area and year is available in Appendix C, Utilization Table C.3 and C.4 for the Belnap Allotment. Appendix C, Utilization Tables C.5 – C.10 shows utilization from 1991 - 2022 for the Big Spring Pipeline Allotment. Average utilization ranges from no use to 39%. Average utilization did not exceed 50% on any of the key areas in either allotment.

Trend

The trend of an area may be judged by noting changes in vegetation attributes such as species composition, density, cover, production, and frequency. Vegetation data is collected at different points in time on the same key area, and the results are then compared to detect change.

The trend index, which combines percent frequency of key forage species, percent litter, and percent live vegetation (basal cover) into one numerical value. Two frequency trend monitoring plots, one in the north pasture and one in the south pasture was established in the Belnap Allotment in 1982. These have been read on a 5-year cycle since that time. This data reflects the use under both current fall-spring use as well as historic summer-fall use (Appendix C Utilization and Monitoring Data). The monitoring data reveals that under both the current and historic season of use, the key grass species have responded similarly. What is evident is half of the cool season and warm season key species grasses have increased while the other half have remained static within the Belnap Allotment. One exception with the warm season grass species trend, blue grama, has decreased slightly but not in a significant amount (Appendix C and Appendix F). This decrease correlates to the steady increase in sagebrush cover in the Belnap North Pasture.

The majority of the Big Spring Pipeline trend readings exhibit a static to upward trend. The DPCs are meeting at five of the seven sites, partially meeting at key area number six, not meeting primarily due to conifer encroachment at key area number nine. With the ongoing drought, there has been a decrease in one cool season grass species at two sites. Due to this decrease, these two sites are exhibiting a downward trend. This decrease corresponds to an increase in pinyon and juniper trees at those two key areas as well, likely contributing to decrease in understory (Table 3.2).

Ecological Site Inventory

The "Dry Weight Rank" vegetative sampling method is used to determine species composition. The present composition and the potential for each key species are used to set composition objectives. The potential composition is determined by the applicable soil type and precipitation zone. These potentials are described in Ecological Site Guides provided by the NRCS.

Determination of seral stage is based on the composition of a site. The concept of seral stage is based on the concept of succession or movement of an ecological site towards a climax plant community or potential natural community (PNC). Succession continues until an event such as a major disturbance including fire, overgrazing, and other natural or manmade disturbances sets the site back to an earlier sere or state. 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.

The key areas in each allotment have been classified as to seral stage based on plant composition when compared to the site potential. Site potential is based on soils, elevation, aspect, and

climate. The most recent trend readings for Belnap Allotment occurred in 2021; for Big Spring Pipeline they occurred in 2018. Tables 3.2 and 3.3 summarizes the Ecological Site, Ecological Condition, and overall trend for each key area in the two subject allotments (see Appendix C for data tables).

Table 3.2 Belnap Allotment Updated Rangeland Health Data Summary

Key Area	Ecological Site	Ecological Condition	Overall Trend
Belnap Key Area #1 (North Pasture)	Loamy Upland 10 -14" p.z. (R035XC113AZ)	PNC seral	Static
Belnap Key Area #2 (South Pasture)	Loamy Upland 10 -14" p.z. (R035XC113AZ)	Mid-Seral	Static

Based on the most recent monitoring data collected in 2021.

Table 3.3 Big Spring Pipeline Allotment Updated Rangeland Health Data Summary

Key Area	Ecological Site	Ecological Condition	Overall Trend
Big Spring Pipeline Key Area # 4 (Whitmore Pasture)	Loamy Upland 10 -14" p.z. (R035XC113AZ)	Late Seral	Down
Big Spring Pipeline Key Area # 5 (Airstrip Pasture)	Clay Loam Upland 7-11" p.z. (R035XD414AZ)	Mid-Seral	Static
Big Spring Pipeline Key Area # 6 (Upper Cole Pasture)	Loamy Upland 10 -14" p.z. (R035XC113AZ)	Late Seral	Down
Big Spring Pipeline Key Area # 7 (Lower Cole Pasture)	Sandy Loam Upland 7-11" p.z. (R035XD414AZ)	Late Seral	Upward
Big Spring Pipeline Key Area # 9 (Big Spring Pasture)	Clay Loam Upland Gravelly 13-17" p.z. (R035XF611AZ)	Mid-Seral	Static
Big Spring Pipeline Key Area # 10 (Lava Pasture)	Sandy Loam Upland 7-11" p.z. (R035XD414AZ)	Late Seral	Upward
Big Spring Pipeline Key Area # 11 (Chaparral Pasture)	Clay Loam Upland 7-11" p.z. (R035XD421AZ)	Mid-Seral	Static

Based on the most recent monitoring data collected in 2021.

The Desired Plant Community (DPC) is covered in Section 3.4.2.3 later in this chapter. The DPC are management objectives that have been proposed in the RMP/GMP to manage for a variety of seral stages rather than just Late Seral or PNC. These objectives include increased diversity, provide forage for various wildlife and livestock, and provide for aesthetics.

3.4.1.1 Range Improvements

Both allotments contain several existing structural range improvements as shown in Appendix G Tables G.1 – G.3 for the Belnap Allotment and Tables G.4 – G.6 for the Big Spring Pipeline Allotment and as shown on Range Improvement map Appendix A, Figure 8. These range improvements consist of corrals, cattleguards, fences, reservoirs, catchments, troughs, and pipelines. No new structural range improvements are proposed for either allotment under any of the alternatives. Any new range improvements proposed in the future would be considered through a separate NEPA process. Maintenance of current range improvements would be authorized through this decision and implemented through cooperative agreements.

3.4.1.2 Desired Plant Community Objectives

Desired Plant Community (DPC) objectives were developed that would ensure the biodiversity, health, and sustainability of wildlife species indigenous to the area; protection of ecological functions (including hydrological processes); and sustainability of diverse vegetative communities. These objectives are quantified in part from resource condition objectives described in the GCPNM RMP/GMP (BLM 2008a). In addition, ecological site descriptions from the NRCS were used to determine the soil and vegetation attributes that are within the site potential for the key area. The DPC objectives for each allotment are found in Appendix F as well as the allotment LHE (BLM 2002 and BLM 2006). Plant codes referred to in this section are defined in Appendix F. The objectives take into account that the plant communities found on an ecological site are naturally variable. Composition and production vary with location, aspect, and the natural variability of the soils. Plant populations also fluctuate due to factors such as drought and wet periods. The ranges for vegetation attributes are achievable given the current state of the plant community and the ecological site potentials. It was determined that the DPC objectives identified below 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. These objectives are expressed in species composition by weight (CBW). These objectives are set according to the ecological site guide and current composition at the site based on the most recent monitoring data.

Belnap Allotment
Below is a summary with the DPC Objectives for both key areas and whether the objectives are met or not met based on the most recent monitoring data. See DPC Objectives Determination Tables, Appendix F. See Appendix A, Figure 3 for map of key area locations.

Key Areas #1 and #2 Loamy Upland 10-14”p.z. NRCS approved 2008. (This ESD replaces a former draft version ESD Loamy Upland 9-13”p.z.):

Maintain ecological condition in Late Seral to PNC through 2030 by:
- Maintaining tree composition between 2-10% through 2030.
- Maintaining shrub composition between 15-50% through 2030.
- Maintaining perennial grass composition between 50-80% through 2030.

Maintaining forb composition between 2-10% through 2030.

Rationale: These objectives have been met. The ecological condition in Key Area #1 is 86.9 %, similar to PNC, which places it in mid-PNC state. Tree composition at 12.7%, slightly above DPC objectives, may reflect natural variance within the community. Shrub composition at 18.5%, perennial grass composition is at 59.9% and perennial and annual native forbs are at 2%.

Ecological condition in Key Area #2 is 48.6%, similar to PNC, which places it in mid-seral condition. Tree composition is at 1.5%, shrub composition at 8.5% (slightly low), perennial grass composition is at 33.8% and native annual and perennial forbs are at 56%.

Based on 2021 monitoring, overall trend for North Pasture Key Area #1 is static when compared to establishment of this key area in 1982. This translates to this site being a stable mid-PNC ecological condition with similar perennial grass cover and litter cover for the past 39 years. The South Pasture Key Area #2 is at a mid-seral condition, with a slight upward trend since establishment in 1982 as well. DPC objectives for Key Area #2 for trees is met, shrubs and perennial grass are not met as they are both below objectives. This is likely due to the high percentage of native perennial and annual forb cover. This is a known state and transition model for this ESD. This is not depicted as a negative transition by NRCS but may be more attributed to soil type/inclusions and/or drought stress given deeper tap-rooted perennial forbs may have an advantage over shallower-rooted perennial grasses. DPC objectives are to maintain both sites in a mid-PNC seral condition.

Big Spring Pipeline Allotment

DPC objectives for the Big Spring Pipeline key areas were developed during the LHE process by an interdisciplinary team of resource specialists. These objectives focus on the ecological sites and their potentials, which reflect the vegetative diversity of the area. DPC objectives are expressed in figures of Composition by Weight (CBW) for key species. Composition data is collected using the Dry Weight Rank (DWR) sampling method. See DPC Objectives Determination Tables, Appendix F. See Appendix A, Figure 4 for map of key area locations.

<u>Key Area #4 – Whitmore Point Pasture (Loamy Upland 10-14")</u>

Maintain the perennial native grass composition between 20 to 40% through the year 2030 by:
- Maintaining HIJA CBW at between 5 to 15%
- Increasing SIHY CBW to between 5 to 10%
- Increasing ORHY CBW to between 1 to 5%
- Increasing BOER CBW to between 1 to 5%

Decrease shrub/tree composition between 25 to 45% through 2030 by:
- Decreasing ARTR CBW between 20 to 30%
- Maintain JUOS CBW at between 0 and 5%

Maintain forbs CBW at between 5 and 15% through 2030.
Maintain ground litter at between 15 and 30% through 2030.
Maintain basal cover at between 5 and 15% through 2030.

Rationale: The ecological site for this key area is a Loamy 10-14" precipitation zone and is within the Great Basin Ecoregion.

Sagebrush currently exceeds the 20 to 30% CBW allowable in the site guide, and while sagebrush is important for wildlife, it can often dominate a site and reduce or eliminate understory plants. On this key area, sagebrush is the only species where a decrease is warranted. Other species of shrubs and trees found at the key area provide important thermal and hiding cover for wintering mule deer and other wildlife. Juniper provides both cover and some forage for mule deer in winter.

The grass species listed individually are components of the ecological site and are recognized as key species. The DPC allows from 5 to 15 % CBW for HIJA, 1 to 5% for SIHY, 1 to 5% for ORHY, and 1 to 5% for BOER. The DPCs for perennial grasses are generally being met. In this semi-arid climate, maintaining basal cover at between 5 and 15% is being met. Even though the percentage of litter at key areas can be very dynamic, past monitoring data suggests DPC values for the litter are within the expected range for this climate. Currently litter is slightly above objectives. In general, forbs are very important for wildlife, but forb CBW varies widely depending on the season of the year, weather, and other factors.

This site when compared to the ESD site potential is 53.7 percent of PNC, which classifies the site as late seral condition. Current monitoring data suggests achievement of these DPC objectives is met for this site.

Key Area #5 - Airstrip Pasture (Clay Loam Upland 7-11")

Maintain the perennial native grass community between 50 and 70% through the year 2030 by:

Maintain HIJA CBW at between 30 and 60%
Maintain SPCR CBW at between 5 and 15%
Maintain BOER CBW at between 10 and 20%
Maintain forbs CBW to between 2-10%
Maintain EPNE CBW at between 5-10%
Maintain shrub composition at between 30-50% Maintain ground litter at between 10 and 30%
Maintain basal cover at between 2 and 10%

Rationale: Based on current monitoring data, a DPC objective for the key area has been developed. This site meets most of the DPC objectives. Black grama was not detected in the most recent trend monitoring. This could be due to sampling error. This is also a species that is more susceptible to drought stress. Litter amounts meet objectives. Live basal cover exceeds objectives.

The DPC stated for shrub components exceeds the site guide historic/potential composition. It is thought that this site has historically been dominated by perennial grasses, with scattered shrubs. This is more of what is reflected currently for this site.

With additional monitoring and data, DPC objectives may be modified to reflect the site potentials. The site is 53.5 percent of PNC, which classifies this site as late seral.

Key Area #6 - Cole Spring Pasture (Loamy Upland 10-14")

Maintain the perennial native grass community between 11 and 40% through the year 2030 by:

Increasing BOGR CBW to between 5 and 15%
Maintaining HIJA CBW at between 5 and 15%
Increasing the SIHY CBW to between 1 and 10%

Decrease shrub/tree composition to between 25 and 45% through the year 2030 by:

Decrease ARTR CBW to between 20 and 30%
Decrease JUOS CBW to between 5 and 10%

Increase forbs CBW to between 5 and 15% through the year 2030
Maintain ground litter at between 15 and 30% through the year 2030
Maintain basal cover at between 5 and 15% through the year 2030

Rationale: The ecological site for this key area is a Loamy Upland 10-14" precipitation zone and is within the Great Basin Ecoregion. The GCPNM LUP proposes the ecoregion is to be managed for a mosaic of early to late-seral vegetation communities. The site is 58.8 percent of PNC, classifying this area as late seral.

Sagebrush is approaching the upper limits of the DPC objective and exceeds the 7 to 18% CBW allowable in the site guide. Sagebrush is important for wildlife but can become dominant to the point it excludes or reduces understory perennial grasses and forbs. The DPC suggests that ARTR should have an upper limit of 30 percent CBW. This current amount of sagebrush is beginning to limit or reduce the perennial grass and forb understory. Juniper exceeds both the site guide and the DPC objectives. The grass species listed individually are components of the ecological site and are recognized as key species. The increase in both the shrub and trees at this site has caused a slight decrease in perennial grasses. Grass and forb objectives are partially met. On this key area, juniper and sagebrush reductions may be warranted to meet grass and forb DPC objectives. This would bring the site in to more of the historic balance of overstory and diverse understory. The DPC objectives are partially met for this site.

In this semi-arid climate, maintaining basal cover at between 5 and 15% is realistic under normal weather conditions. In general forbs are very important for wildlife, but the forb CBW varies widely depending on the season of the year, weather, and other factors.

Current monitoring data suggests achievement of these DPC objectives is attainable and within the potential of the site.

Key Area #7 – Lower Cold Spring Pasture, (Sandy Loam Upland 7-11" final 2008, this ESD replaced the draft Gypsum Fan 7-11"p.z.)

Maintain the perennial native grass community between 60 and 85% through the year 2030 by:

Maintain HIJA CBW at between 30 and 45%
Maintain the SPCR CBW to between 30 and 40%
Maintain shrub/tree composition to between 15 and 25% through the year 2030:
Increase forbs CBW to between 1 and 15% through the year 2030
Maintain ground litter at between 7 and 40% through the year 2030
Maintain basal cover at between 2 and 15% through the year 2030

Rationale: Based on past and current monitoring data, DPC objectives for the key area have been developed and are being met. This site meets the perennial grass and shrub objectives. Various forbs are known to this site, but an increase would be necessary to meet objectives. The recent reading of this trend was in late fall. It is likely that the forbs were undetected or unidentified at that time. Basal cover and litter amounts meet objectives. This site is 56.1 percent of PNC classifying this site as late seral.

Key Area #8 – Canyon Bottom; Airstrip Pasture (Auxiliary to Key Area #5)

Rationale: No composition data exists as this is an auxiliary key area. This key area is in the same pasture as key area number 5 but on a different ESD site, and this key area is on the same ESD site, but in a different pasture, as key area #10. Refer to those key areas for DPC objectives and status.

Key Area #9 - Big Spring Pasture, (Clay Loam Upland Gravelly 13-17")

Increase the perennial native grass community between 1 and 10% through the year 2030 by:
Increase SIHY CBW at between 1 and 5%
Decrease shrub/tree composition to between 50 and 70% through the year 2030
Maintain forbs CBW to between 15 and 30% through the year 2030
Maintain ground litter at between 18 and 25% through the year 2030
Maintain basal cover at between 9 and 20% through the year 2030

Rationale: This key area is in an old chaining which has regrown with fairly thick tree and shrub cover. This site has a high percentage of volcanic rock that restricts the site to primarily woody species. Very little perennial grass has occurred at this site dating back to 1982 establishment of this plot. In the fall and spring, this is a transition area for mule deer moving between their summer and winter ranges. Live basal vegetation cover is a representation of density of live stems (trees). With large woody vegetation, this number is lower, as reflected on this site. Litter is exceeded as well, likely due to the large woody vegetation and the length of time it takes for this to break down. This site partially meets DPC objectives. This site is 30.15 percent of PNC and is classified as mid-seral state.

Key Area #10 - Lava Pasture, (Sandy Loam Upland 7-11" with inclusions of Sandy Upland Gypsics 7-11" (see Key Area #7 above)

Maintain the perennial native grass community between 50 and 85% through the year 2030 by:

Maintain BOER CBW to between 55 and 70%
Maintain SPCR CBW at between 5 and 15%
Maintain HIJA CBW to between 2 and 10%
Maintain shrub composition to between 10 and 20% through the year 2030
Increase forbs CBW to between 1 and 15% through the year 2030
Maintain ground litter at between 5 and 25% through the year 2030
Maintain basal cover at between 10 and 35% through the year 2030

Rationale: The CBW of perennial grass exceeds the DPC objective, but not within the desired composition. The DPC for this site was developed as a draft while the land use plan was being developed. It is likely that with additional monitoring, the DPC's for this site will be adjusted to reflect the site guide or historic potential of this site. This site meets the DPC objectives for litter and live basal vegetation. DPC objectives are partially met for this site. This site is 62.9 percent of PNC classifying this site as late seral.

Key Area #11 – Chaparral Pasture, (Clay Loam Upland 7-11")

Maintain the perennial native grass community between 45 and 75% through the year 2030 by:
Maintain HIJA CBW at between 2 and 10%
Maintain SPCR CBW at between 2 and 10%
Maintain the BOER CBW at between 5 and 15%
Maintain forbs CBW to between 2-10%
Maintain shrub composition at between 20 to 50%
Maintain ground litter at between 2 and 15%
Maintain basal cover at between 1 and 10%

Rationale: This key area is located on NPS administered land within the Grand Canyon-Parashant National Monument. This DPC was developed as a draft with the development of the Land Use Plan. Live basal vegetation and litter amounts meet DPC objectives. Perennial grass DPC objectives are met or exceeded. Overall DPC shrub objectives are met. Species specific shrub objectives may need adjustment. With additional monitoring, DPC objectives will be adjusted to reflect the site objectives and the historic potential of this site. This site is 41.5 percent of PNC for this site guide places this site at mid-seral.

3.4.2 Soil Resources

The project area is mostly located over three soil types spanning an elevated landscape consisting of gentle sloping hillsides and steep ravines ranging from 5-70 degree slopes, to abrupt limestone sandstone ridges and outcrops, at its lowest extent. The proposed action area is located in a semi-arid landscape ranging from 10-14 inches of annual precipitation, with a mean elevation of ~4,900ft.

Barx fine sandy loam soil comprises 12 percent of the project area. It is found on gentle slopes and shallow ravines. This soil has a combination of sand, silt, and clay particles, with the sand particles being the largest and the clay particles being the smallest. The term "fine" refers to the

relative proportion of silt and clay particles in the soil, which gives the soil a relatively smooth texture. The parent material for the Barx loam soil originates from a mix of carbonate and shale alluvial. This unit is somewhat shallow, extending to 60 inches in depth, with multiple soil horizons alternated between clay and loam. Carbonates are not evident as this soil unit parent material is the lower member of the Moenkopi geologic unit, largely comprised of silt and sandstone members.

The next main soil type, at 28% of the project area, is Mellenthin gravelly loam, a shallow soil extending to 30 inches subsurface, with three well defined soil horizons. Gravelly loam is a type of soil that contains a mixture of sand, silt, and clay particles, as well as a significant amount of gravel. Gravel is defined as any rock fragments that are larger than 2 millimeters (0.08 inches) in diameter. These rock fragments can range in size from small pebbles to larger stones and boulders. Mellenthin gravelly loam soil is well-drained with good aeration and water-holding capacity. The gravel particles within the Mellenthin soil provide some additional armor to precipitation runoff drainage helping to prevent soil erosion. This unit is mostly found along the steeper slope sections of the project area, bottoming out to the underling Kaibab-Toroweep limestone bedrock. Soil consistency is best described as devoid of moisture, uncompacted, and easily handled. The soil resilience is considerable, largely due to the presence of carbonate gravel at the upper to lower horizons, allowing for resistance to physical weathering. However, along artificial surfaces such as road surfaces, where this naturally occurring horizon is absent, deep gullies and ruts emerge as erosion process accelerate on the underlying unprotected lesser gravel loam.

Lastly, the majority soil type is the Mellenthin-Strych complex, a unit of varying gravely loamy soil types, totaling 52% of the project area. Within the Mellenthin soil varieties, best described as shallow (27 inches depth to bedrock), very gravelly loam, with low permeability of water flow. Interbedded into this unit are the Stych soil varieties, which are typically twice as deep (60 inches), varying from very gravelly loam to very gravelly clay. This unit is comprised from the Moenkopi parent materials such as sandstone and limestone via alluvial and eolian deposition.

Overall, these shallow soils found in the project area are largely gravely loam at the surface, providing good drainage, before transitioning into more clay rich versions in the lower horizons. These shallow soil units stem from lower members of the Moenkopi geologic unit, which exemplifies the absence of calcium carbonate and lack of effervescences. The intermixed gravel is mostly from alluvial and colluvial remnants. Soil resilience is observed to be ample, given the abundant gravel content, surface composition, and adequate drainage.

Currently, soil erosion patterns typically present themselves in small rills to small gullies, which frequently flank or stem from roadside surfaces. These erosion features do not extend more than 10 meters (33 feet) from the disturbed soil road surfaces, attributed to the plentiful small to medium gravel content creating an armored topsoil surface. Overall, this soil erosion pattern is confined to disturbed surfaces such as roadway shoulders, and nearby cattle structures such as corrals and troughs.

3.4.3 Vegetation Including Special Status and Invasive, Non-Native Plant Species

Vegetation within the allotments falls broadly under the Mojave Transition and Colorado Plateau floristic provinces. In particular, Whitmore Canyon in Big Spring Pipeline Allotment exhibits large areas on slopes dominated by Mojave Transition shrubs such as *Ephedra* spp. (Mormon tea). Higher elevation plateaus in both allotments form a patchy transitional landscape with *Juniperus osteosperma* (juniper), *Pinus edulis* (two-needle pinyon) and *Artemisia tridentata* (sagebrush) woodlands and savannas. The eastern edge of Big Spring Pipeline Allotment also hosts a juniper and pinyon transition to *Pinus ponderosa* (ponderosa pine) woodlands.

The current zonation of dominant shrub or tree areas roughly corresponds to the expected ESD polygons available from USDA Soil Survey (2021) (Appendix A, Figure 10). Variations exist due in part to drought, invasive non-native plant species (Section 3.4.2.3), previous vegetation treatments and wildfire (Section 3.4.2.1).

In general, the 2022 monitoring found a much lower species diversity than the best-case scenario based on ESDs, though this could be an artifact. Many of the anticipated species for a particular ESD in the allotments were each expected to compose 0-4% of the vegetative ecosystem (Appendix C and F), as such measured species diversity on these sites may simply represent a large number of anticipated species occurring at the 0% (or non-occurring) end of their expected range. Sampling in small areas, such as key areas, can easily miss minor individual species, hence the emphasis on key species and their monitoring in Pace Frequency Trend Monitoring (BLM 1999b) and Desired Plant Community Objectives. Each allotment's more specific vegetative key species and generalized cover status and goals, crossing between the different dominant woody vegetation zones, are found in the Desired Plant Community Objectives discussion (Section 3.4.1 Desired Plant Community (DPC) Objectives developed during this evaluation process) and in Appendices C and F.

Alternately, or perhaps synergistically, several years of extreme to exceptional drought have inhibited the ability of seeds to germinate or plants to produce seeds. In some cases, apparent die off of woody shrubs and trees was observed in 2022, particularly in areas where ground water would be expected to accumulate in the bottom of slopes and valleys. The return of at least a partial typical monsoon in late 2022 may have ameliorated this condition as anecdotal evidence nearby saw a "green-up" of many woody plants thought to be dead.

3.4.3.1 Historic Vegetation Treatments

Both allotments have a history of vegetation treatments including chaining, mechanical treatments, prescribed burns, and chemical treatments (Table 3.4 - Table 3.6).

Table 3.4 Belnap Allotment – Historic Vegetation Treatments and Wildfire History (see map Appendix A Figure 5)

Treatment Name	Treatment Type	Treatment Date	Acres
Belnap Veg Treatment	Herbicide	1/1/2000	1343
E Bundy D Control	Herbicide	1/1/1963	8

Table 3.5 Big Spring Pipeline Allotment – Historic Vegetation Treatments (see map Appendix A Figure 6)

Treatment Name	Treatment Type	Treatment Date	Acres
Big Spring Juniper	Mechanical	1/1/1960	910
Big Spring Juniper	Mechanical	1/1/1960	834
Big Spring Juniper	Mechanical	1/1/1960	428
Big Spring Juniper	Mechanical	1/1/1960	81
Big Spring Juniper	Mechanical	1/1/1960	170
Slide Wildfires for Resource Benefit	Wildfire for Resource Benefit	5/23/2019	23

3.4.3.2 Wildfire History 1980 – 2020

A history of recorded wildfires in the Big Spring Pipeline Allotments has influenced the current vegetation conditions (Appendix A, Figure 7). The Big Spring Pipeline Allotment is about 57,770 GIS acres of that about 775 GIS acres have burned 1980 – 2020. Approximately 1% of the allotment has been burned by wildfires (Table 3.6, map Appendix A Figure 6). Dating back to 1980, there are no recorded wildfires in the Belnap Allotment.

Table 3.6 Big Spring Pipeline Allotment Historic Wildfires (see map Appendix A, Figure 7)

Fire Name	Fire Year	Acres
Slide	2019	23
Mt. Emma	2015	399
Whitney Pt	2006	64
Emma	2002	35
Petty	1998	4
Mt. Emma	1999	206
Columbus	1988	44

3.4.3.3 Invasive Plant Species

Nine species of invasive, non-native plants[6] have been detected and recorded in the Belnap and Big Spring Pipeline allotments since 1974 through trend monitoring land health evaluation site visits, and staff observations while traversing or otherwise working in the area (Table 3.7). While other invasive non-native plant species may occur in the project area, they have not yet been recorded[7]. Four species have only initially been detected in the last year. *Bromus* spp. (*rubens* and *tectorum*), red brome and cheatgrass respectively, and *Onopordum acanthium,*

[6] Invasive non-native plant species are defined as "Non-native (or alien) to the ecosystem under consideration; and, whose introduction causes or is likely to cause economic or environmental harm or harm to human health" (Executive Order 13112). In the context of the EA, non-native is defined as not native to North America and invasive is defined as able to establish on many sites, grow quickly, and spread to the point of disrupting plant communities or ecosystems" (NRCS n.d.)

[7] According to the GCPNM present and potentially present invasive non-native plant species list developed by staff and the NPS Mojave Desert Inventory and Monitoring Network, approximately 45 species or genera may occur on GCPNM. Most are identified in the Invasive Plant Guide for National Parks in the Mojave Desert Network (NPS 2015) made available to staff.

Scotch thistle, have been detected for over twenty years, and, in the case of *B. rubens*, over forty years in the allotments. However, these species are not consistently detected during each trend monitoring event at the same location, or even within the allotment. *O. acanthium* is primarily associated with road disturbance corridors within the allotments. Localized herbicide application over the last several years has reduced the occurrence of this invasive plant.

Table 3.7 Invasive Plant Species Found within the Belnap and Big Spring Pipeline Allotments.

Invasive Plant Species	Detection Method	Location	Year Detected
Bromus rubens (red brome)	Trend monitoring, LHE site visit, Road project site visit	Big Spring Pipeline: Whitmore Point Pasture, Airport Pasture, Lava Pasture	1974, 2003, 2013, 2022
Bromus tectorum (cheatgrass)	Trend monitoring, Road project site visit	Belnap: South Pasture. Big Spring Pipeline: Cole Pasture	1997, 2011, 2022
Erodium cicutarium (redstem storksbill)	Trend monitoring, LHE site visit, Road project site visit	Belnap: South Pasture. Big Spring Pipeline Whitmore Point Pasture, Airport Pasture, Cole Pasture, Big Spring Pasture, Lava Pasture, Chaparral Pasture	2008, 2013, 2018, 2022
Onopordum acanthium (Scotch thistle)	LHE site visit, Road project site visit, staff observation	Belnap: North Pasture, South Pasture. Big Spring Pipeline Whitmore Point Pasture, Cole Pasture	2004, 2012, 2022
Salsola spp. (Russian thistle)	Trend monitoring, LHE site visit, Road project site visit	Belnap: North Pasture, South Pasture. Big Spring Pipeline: Airport Pasture, Cole Pasture, Lava Pasture	1990, 1997, 2007, 2008, 2013, 2016, 2022
Sisymbrium irio (London rocket)	Road project site visit	Big Spring Pipeline: Airport Pasture	2022
Marrubium vulgare (horehound)	LHE site visit	Belnap: North Pasture.	2022
Schismus spp. (Mediterranean grass)	LHE site visit	Big Spring Pipeline: Lava Pasture	2022
Draba cuneifolia (wedgeleaf)	LHE site visit	Big Spring Pipeline: Lava Pasture	2022

A persistent, and regularly observed invasive, non-native plant, *Salsola* spp., or Russian thistle, is also associated with road corridors in the allotments and in the region. *Salsola* dominates the valley bottom in the upper reaches of Whitmore Canyon along Road 1045, likely as a response to historic grazing levels and sandy soils that prevent the reestablishment of deep-rooted grasses and shrubs. Unfortunately, it is increasingly resistant to herbicides (UCANR 2008, Barrosos

2017). At this time, *Salsola* is treated during spot roadside herbicide treatments and no large-scale treatments have been planned.

3.4.3.4 Special Status Plants

Three species of special status plants are known to occur within the project area. One, Mount Trumbull beardtongue or *Penstemon distans*, is a BLM and Arizona Species of Concern (AGFD 2019). It occurs in several distinct populations in Big Spring Pipeline Allotment. The other two species are not BLM Special Status Plants, but they are considered special status by the State of Arizona (AGFD 2019, AAC 2016). Both species may only be collected with a state permit and are listed as salvage restricted (Table 3.8). Whipple cholla (*Cylindropuntia whipplei* or *Opuntia whipplei var. whipplei*) occurs in Big Spring Pipeline Allotment. It is commonly encountered during trend monitoring in three pastures. *Yucca baccata* (banana yucca) occurs in both allotments. *Y. baccata* is common enough in the two allotments that is it regularly included in several key area's species lists developed during trend monitoring.

Table 3.8 Special status plant species and general location (based on LHE evaluations and trend monitoring)

Species	Status	Belnap Allotment Pasture	Big Spring Pipeline Allotment Pasture
Penstemon distans (Mount Trumbull beardtongue)	BLM and Arizona Species of Concern	none	Cole Spring, Cole, Whitmore Point
Cylindropuntia (Opuntia) whipplei (var. *whipplei*) (Whipple cholla)	Arizona Salvage Restricted	none	Big Spring, Cole, Whitmore Point
Yucca baccata (banana yucca)	Arizona Salvage Restricted	North, South	Chaparral, Big Spring, Cole Spring, Airport, Whitmore Point

3.4.4 Designated and Proposed Wilderness

The Belnap Allotment does not contain or border any designated or proposed wilderness.

The Big Spring Pipeline Allotment includes 14,733 acres within the Mt. Logan Wilderness area on BLM managed land and 11,597 acres of proposed wilderness on NPS managed land, cumulatively approximately 46% of the allotment and 40% of the project area.

Mt. Logan Wilderness area was created in 1984 as part of the Arizona Wilderness Act of 1984. Wilderness boundaries included avoidance of roads and much of the existing infrastructure within the wilderness. Mt. Logan's Wilderness Management Plan (1990) includes provisions for the expected human uses include camping, hiking, grazing, research, and other primitive forms of recreation. Grazing and grazing infrastructure were included in the plan as the area was actively grazed by livestock prior to the wilderness designation and not all grazing infrastructure was excluded from the wilderness area. Provisions within the

plan allow for primarily non-mechanized maintenance of grazing infrastructure but also allow for a minimum tool decision-making process for Wilderness Act 4(c) activities.

All proposed wilderness within the project area is on NPS managed lands and subject to NPS Management Policies 2006 (NPS 2006) and Director's Order #41, Wilderness Stewardship (2013). These lands do not have a wilderness management plan; management is guided by NPS policy, the GCPNM RMP/GMP, and the original draft wilderness proposal. In the Draft Wilderness Proposal (NPS 1979), primary contemporary human uses that were compatible with a wilderness designation included hunting, grazing, camping, hiking, rockhounding, and nature study. The area was noted to have several roads that would be maintained or expanded to facilitate recreational and grazing access and would be contiguous with Proposed Wilderness units in Grand Canyon National Park. Aspects of the 1979 document were incorporated into the Monument's EIS (2007) and RMP/GMP (2008a) include the "diversity of recreational activities in a remote and primitive area", "pinyon-juniper and ponderosa pine forests and a [wide] variety of wildlife, and "spectacular views of the Grand Canyon".

The term "wilderness character" was first referenced in the 1964 Wilderness Act. The Act states that federal agencies are responsible for preserving the wilderness character of wilderness areas. Impacts to designated and proposed wilderness were evaluated using the interagency wilderness character framework (BLM 2012). The qualities of wilderness incorporated in the descriptions of the proposed and designated wilderness include solitude, primitive and unconfined recreation, naturalness, and their untrammeled and undeveloped wilderness characteristics.

Both areas incorporate grazing infrastructure from previous and current grazing operations and historic structures associated with ranching and homesteading activities. The developments associated with ranching and homesteading are part of the baseline wilderness character of these areas. Some of the prehistoric and historic developments are "other features of scientific, educational, scenic, or historical value" within the context of wilderness character. These features embody centuries-old relationships of humans to the environment and allow modern people to explore rich cultural and historical connections to the land.

Proposed actions within a designated wilderness area or a proposed wilderness area must be reviewed using the minimum requirements framework. A Minimum Requirements Decision Guide (MRDG) has been developed as part of this analysis. It addresses the minimum tools necessary to implement the alternatives as well as the impact to wilderness characteristics in designated wilderness or proposed wilderness within the Big Springs Pipeline Allotment.

Existing range improvements within the two subject allotments are maintained where currently permitted. This includes existing range improvements located within Designated Wilderness and proposed wilderness areas (see Appendix G, Table G.7 and Appendix A, Figure 8).

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

3.4.5.1 Big Game

Game Management Unit 13B is famous for producing large antlered "trophy" class mule deer bucks. The mule deer population is managed under alternative management guidelines which focus on the harvest of older age class, mature bucks. Mule deer exist at low densities throughout the unit in all habitat types and good numbers of deer can typically be found in the higher elevations, generally over 4,000 feet (AGFD & BLM 2015).

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. Deer eat a wide variety of plants including browse, forbs and grasses. Deer are especially reliant on shrubs for forage during critical winter months. 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 allotments together are categorized by AGFD as 41% yearlong habitat, 37% winter crucial habitat, 14% summer crucial habitat, and 8% summer habitat for mule deer.

Pronghorn are native to the Arizona Strip, but were extirpated in the early 1900s. They were first re-introduced to the Strip in 1961 and to the area of this allotment in 1979 when 84 head were released near Diamond Butte. There have been several subsequent releases.

The pronghorn population in Game Management Unit 13B appears stable to slightly increasing. Annual fawn production varies considerably from year to year. This variation is attributed to predation, annual differences in timing and amount of precipitation and subsequent forb production. Because there is some natural interchange between the 13A and the 13B pronghorn herds, AGFD has periodically conducted supplemental releases of pronghorn in 13B to increase numbers and to provide more genetic diversity.

A variety of factors are considered management concerns related to the pronghorn population in this unit, with three factors identified by AGFD as being the primary reasons (AGFD 2015). First, water is a limited resource in the area, with few year-round waters available for use. Pronghorn rely heavily on livestock waters; recent dry summers have shown that these waters are dry for most of the summer months, especially during fawning periods. Second, many miles of fence do not meet game standards and restrict pronghorn movement and survival (Autenrieth, et al. 2006), although the BLM is working cooperatively with AGFD to remedy this. Third, coyote predation on fawns has been identified as a probable limiting factor to pronghorn recruitment, especially during drought periods when fawning cover is limited or absent. Only approximately 4,870 acres of pronghorn habitat occurs in the allotments, mostly in the Belnap Allotment.

Habitat for pronghorn on the allotments mostly consists of poor-quality habitat and a small amount of low-quality habitat.

3.4.5.2 Migratory Birds

The Migratory Bird Treaty Act of 1918 protects against the take of migratory birds, their nests, and eggs, except as permitted. An 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 for the Birds of Conservation Concern include nongame birds, gamebirds without hunting seasons, subsistence-hunted nongame birds in Alaska, ESA candidate, proposed, and recently delisted species. Birds of Conservation Concern found on the Arizona Strip within the habitat types of the allotments are summarized in Table 3.9.

Table 3.9 USFWS Birds of Conservation Concern Likely Present in the Allotments.

Species	Habitat Type in the Project Area
Cassin's Finch	Small flocks sporadically occur in pinyon-juniper woodlands during the non-breeding season. Found in higher elevation habitat types such as ponderosa pine during the breeding season. Uncommon on the Arizona Strip.
Black-chinned Sparrow	Breeds in the chaparral habitat type within rocky canyons, especially where tall shrubs are present. Fairly common on the west side of the Arizona Strip within its habitat type.
Broad-tailed Hummingbird	This species uses open woodlands, especially pine, pine-oak, and pinyon-juniper. Fairly common across the Arizona Strip within its habitat type.
Clark's Nutcracker	Habitat includes open coniferous forest, forest edges, and clearings. Fairly common across the Arizona Strip within its habitat type.
Flammulated Owl	In the Colorado Plateau they are found mostly in ponderosa pine and sometimes in pinyon-juniper woodlands. Uncommon on the Arizona Strip.
Long-eared Owl	This species needs dense wooded areas for roosting and nesting that are near open areas for hunting. Nests in the tree nests of other birds and squirrels. Uncommon on the Arizona Strip.
Grace's Warbler	Breeds in ponderosa pine woodlands. Fairly common across the Arizona Strip within its habitat type.
Virginia's Warbler	Breeds in arid montane woodlands, oak thickets, pinyon-juniper, coniferous scrub, chaparral. Nests on ground among dead leaves, or

Species	Habitat Type in the Project Area
	in small depression under cover of bush, tufts of grass, etc. Fairly common across the Arizona Strip within its habitat type.
Burrowing Owl	This species is also designated as a BLM Sensitive Species and is addressed in Section 3.4.4.3
Pinyon Jay	This species is also designated as a BLM Sensitive Species and is addressed in Section 3.4.4.3

3.4.5.3 Sensitive Animal Species

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

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

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

All federally designated candidate species, proposed species, and delisted species in the 5 years following delisting are included as BLM sensitive species. Based on occurrence records and monitoring data, the sensitive species that may occur within the allotments and that may be affected by actions proposed in one of the alternatives presented in Chapter 2 are displayed in Table 3.10. No Threatened or Endangered species are documented in the project area. The only candidate or proposed T&E species potentially occurring in the project area is the monarch butterfly.

Table 3.10 Sensitive Species Potential within the Allotments

Species	Potential for Occurrence
American Peregrine Falcon (*Falco peregrinus*)	Verified
Golden Eagle (*Aquila chrysaetos*)	Verified
Ferruginous Hawk (*Buteo regalis*)	Potential
Northern Goshawk (*Accipiter gentilis*)	Verified
Western Burrowing Owl (*Athene cunicularia hypugea*)	Potential
Pinyon Jay (*Gymnorhinus cyanocephalus*)	Verified
Monarch Butterfly (*Danaus plexippus*)	Potential

Four additional sensitive species may also occur within the allotments. However, it has been determined by BLM wildlife biologists that these species would not be affected by actions proposed in this EA. These species are therefore not addressed further in this document. Table 3.11 lists the sensitive species that will not be discussed in further detail, along with the rationale for their exclusion from further analysis.

Table 3.11 Sensitive Species Excluded from Further Analysis

Species	Rationale for Excluding from Further Analysis
Allen's big-eared bat *Idionycteris phyllotis*	Roost sites such as caves and abandoned mineshafts are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. No measurable impacts (changes from the existing condition) would be expected.
Townsend's big-eared bat *Corynorhinus townsendii*	Roost sites such as caves and abandoned mineshafts are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. No measurable impacts (changes from the existing condition) would be expected.
Greater western mastiff bat *Eumops perotis californicus*	Roost sites such as rock crevices are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. No measurable impacts (changes from the existing condition) would be expected.
Spotted bat *Euderma maculatum*	Roost sites such as crevices in cliff faces are inaccessible to livestock and impacts from grazing would not alter prey species (insects) populations or distribution. No measurable impacts (changes from the existing condition) would be expected.

Peregrine falcon (*Falco peregrinus*)
Peregrine falcons utilize areas that range in elevation from 400 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 2022).

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 2022).

Potential nesting habitat is found along the steep cliff faces of Whitmore and Parashant Canyons. Peregrine falcons may nest and forage within the allotments.

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. During the breeding season, they prefer grasslands, sagebrush, and other arid shrub country. Nesting often occurs in isolated trees or utility poles surrounded by open areas (Olendorff 1993). Mammals generally comprise 80 to 90 percent of the prey items or biomass in the diet with birds being the next most common mass component.

Suitable habitat for the ferruginous hawk is present on both allotments. Although nesting habitat is available, no nest sites are known to occur within the allotments.

Northern Goshawk (*Accipiter gentilis*)
In Arizona, northern goshawks are found in coniferous forests in the northern, north central, and eastern parts of the state at elevations ranging between 4,750 to 9,120 feet (AGFD 2003). Goshawks in montane areas may winter on or near their home ranges or descend to lower elevations in woodlands, riparian areas, or scrublands (Reynolds et al. 1992). Northern goshawks generally nest in stands of mature trees with a home range of up to 6,000 acres which includes a nest area of 30 acres, a post-fledgling family area of 420 acres (also considered the defended territory), and a foraging area of 5,400 acres (Reynolds et al. 1992). On the Arizona Strip, goshawks most frequently occupy ponderosa pine forests. Their nest sites are typically located on northerly slopes with canopy cover of 50% or greater (Reynolds et al. 1992). Goshawks are opportunistic hunters that prey on a variety of birds and small mammals. Their main prey habitat attributes include snags, downed logs, woody debris, large trees, openings, and herbaceous and woody understories.

While ponderosa pine stands may be preferred, nests have been documented in pinyon-juniper woodlands with high canopy cover on the Dixie National Forest in Utah (Johansson et al. 1994) and in northwestern Colorado (Slater and Smith 2010).

The allotment contains enough ponderosa pine habitat to potentially support nesting territories. The allotment also contains pinyon-juniper woodlands which may contain suitable nest sites for goshawks as well as components desirable for foraging or winter use.

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

Suitable habitat for the burrowing owl is present on the allotments. Although nesting habitat is available, no nest sites are known to occur within the allotments. No formal surveys have been conducted in the project area.

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

Potential nest sites occur along the cliff faces of Whitmore and Parashant Canyons. Eagles likely utilize the allotments for hunting and scavenging. The presence of water developments may attract small mammals, such as black-tailed jackrabbits, which are prey species for golden eagle.

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. 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 & Bateman 1971). Caches are often located in areas that receive little snow, such as under pine and juniper tree crowns or on south slopes where snow melts early, allowing the caches to be accessible during late winter and early spring (Wiggins 2005). Spatial memory is highly developed in pinyon jays and cache relocation is efficient and reliable (Stotz & Balda 1995). Seeds that are not relocated and consumed will often germinate and contribute to pinyon pine regeneration.

Pinyon jay habitat preferences include mosaics of large tracts of pinyon-juniper woodlands especially those areas that contain large, mature, seed-producing pinyon pines, and relatively open structure with mixed shrubs (especially sagebrush) and grasses (Latta et al. 1999). One nesting colony of pinyon jays typically requires an area of about 230 acres for nesting and about 5,120 acres for total home range (Balda & Bateman 1971).

Open-structure pinyon-juniper woodlands are found in the allotments and likely support foraging opportunities for pinyon jays.

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 Endangered Species Act. The USFWS found that the species warranted listing as an endangered or threatened species under the Act, but that listing was precluded by higher priority listing actions (USFWS 2022).

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 within the allotments, although documentation is lacking. Migrating monarchs have been observed on the Arizona Strip in the fall in areas outside of the allotments.

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. The intent of this analysis is to provide the scientific and analytical basis for the environmental consequences.

Impacts are defined as modifications to the existing condition of the environment and/or probable future condition that would be brought about by implementation of one of the alternatives. Impacts can be direct or indirect; direct impacts are those effects that are caused by the action or alternative and occur at the same time and place, while indirect effects are those effects that are caused by or would result from an alternative and are later in time but that are still reasonably certain to occur. Cumulative effects are generally assessed using the environmental impacts of past, present, or reasonably foreseeable future actions within the project areas.

4.2 Direct and Indirect Impacts

4.2.1 Livestock Grazing

The impact analysis area for livestock grazing is the Belnap and Big Spring Pipeline Allotments.

4.2.1.1 Direct and Indirect Impacts of Alternative A – Proposed Action Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

The Proposed Action would directly affect the grazing permittee on the Belnap and Big Spring Pipeline Allotments by renewing the ten-year term grazing permit with new terms and conditions. The action would issue a new term grazing permit that would combine the Belnap and Big Spring Pipeline Allotments into one Big Spring Pipeline Allotment with year-round grazing use. This would create a nine-pasture rotation. When 45% forage utilization is reached in the Whitmore Canyon winter unit pastures (the Lower Cole (Cold Spring), Airstrip, Lava, and Chaparral pastures), or 50% in the remaining summer use pastures, including the North and South pastures (previously Belnap North and South pastures), livestock will be moved to another pasture or off the allotment completely. There would be no change in the total number of AUMs authorized. The current active AUMs for each allotment (see Table 2.2 Alternative B) would be combined as were the suspended AUMs for each allotment (see Table 2.3 Alternative A). The proposed action would allow flexibility with a nine-pasture rotation. The former Belnap North

and South pastures would be used in conjunction with the current seven Big Spring Pipeline pastures. This would allow greater rest specifically for the Big Spring Pipeline winter unit pastures (the Lower Cole (Cold Spring), Airstrip, Lava, and Chaparral pastures). The majority of the livestock are currently removed from the Big Spring Pipeline Allotment, and likely would be in the newly created North and South pastures (current Belnap pastures), for the growing season. This practice will continue and allows total rest during the growing season for all pastures. This allows vegetation on the allotment to mature, produce seed, and disseminate seed with only grazing pressures from wildlife from mid-May through September in most years.

These changes would improve long-term livestock management on the combined allotment. Permit renewal would provide some degree of stability for the permittee's livestock operation. Permit renewal would also meet the purpose and need for action identified in Chapter 1 of this EA – to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management (Appendix B) and the GCPNM RMP/GMP (BLM 2008a), and respond to applications to fully process and renew permits to graze livestock on public land.

Based on recent monitoring (Appendix C and F) the Belnap Allotment continues to meet LHE standards, and Big Spring Pipeline Allotment continues to make progress toward meeting the LHE standards (Section 3.2.3 Land Health Evaluation). Grazing authorized under Alternative A, the combined allotment would be expected to continue making progress toward meeting the standards for rangeland health.

4.2.1.2 Direct and Indirect Impacts of Alternative B – No Action Renew Permit for Belnap and Big Spring Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

The No Action alternative would affect the livestock grazing permittee on the Belnap and Big Spring Pipeline Allotments by renewing the ten-year term grazing permit with no changes. This action would maintain the current level of livestock grazing authorized for the permittee for ten years, which would result in a continued viable ranching operation for the livestock operator and provide some degree of stability for the permittee's livestock operation (Table 2.2). The No Action alternative would leave the two allotments separate. The season of use for each allotment would not change, it would remain different for each allotment (Table 2.2). Allowable use on key forage species would remain at 45% for Big Spring Pipeline winter unit pastures; 50% for the remaining Big Spring Pipeline pastures and Belnap Allotment pastures. There would be no change in the current terms and conditions. Permit renewal would partially meet the purpose and need for action identified in Chapter 1– to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, and to respond to the application to fully process and renew the permit to graze livestock on public land. However, this alternative would not provide the permittee with the flexibility and improved operation management as they have requested.

Based on recent monitoring (Appendix C and F) the Belnap Allotment continues to meet LHE S&Gs and Big Spring Pipeline Allotment continues to make progress toward meeting the LHE

S&Gs (Section 3.2.3 Land Health Evaluation). Grazing authorized under Alternative B, with no changes, the separate allotments are expected to continue the trend of meeting or making progress toward meeting the standards for rangeland health.

4.2.1.3 Direct and Indirect Impacts of Alternative C- No Grazing Reissue a Ten-Year Term Permit for the Belnap and Big Spring Pipeline Allotments with Zero Authorized AUMs

This alternative would negatively affect the livestock grazing permittee on the Belnap and Big Spring Pipeline Allotments by not authorizing any active preference under the term grazing permits. The action would cancel the current level of livestock grazing numbers and season of use authorized. This would not provide current or future use, stability, and compatibility for the permittee's livestock operation because they would not be authorized to use the allotment. This would force them to seek alternate arrangements for their herds, such as leasing private pasture or obtaining federal grazing permits on a different allotment which would be challenging, and potentially economically not feasible. It would most likely put this livestock operation out of business.

This alternative would not meet the purpose and need for action identified in Chapter 1– 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 (Appendix B), as well as the GCPNM RMP/GMP (BLM 2008a), and the need to respond to applications to fully process and renew permits to graze livestock on public land.

4.2.2 Soil Resources

4.2.2.1 Direct and Indirect Impacts of Alternative A – Proposed Action Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

The proposed action would continue grazing operations at their current capacities but potentially differing times of year. Direct impacts would include continued presence of cattle and human activity which would promote short duration soil compaction on less frequented portions of the allotment, while more evident soil compaction on the more frequented areas such as around watering infrastructure and cattle foraging corridors. Soil erosion patterns which are presently bound to disturbed surfaces would not enlarge from their present locations.

Indirect impacts of the proposed alternative would be minimal given the abundant gravel in the soils serving as an "armor" to compaction and erosion. However, some upper horizon soil loss is anticipated due to ruts and gullies in limited areas created by frequent livestock presence. This may result in increased soil depositions, as sediment transport from these ruts and gullies to beyond the project area. These fluvial, sorted, sediment dispositions would be susceptible to wind driven erosion and further seasonal fluvial erosion.

4.2.2.2 Direct and Indirect Impacts of Alternative B Renew Permit for Belnap and Big Spring Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

The No Action alternative would leave the allotments and the project area under its current grazing operations with no changes to its boundaries or timing.

Direct impacts, which are presently observable, would be largely soil compaction in areas where cattle congregate frequently.

Indirect impacts include continued erosion in localized areas where activity is most frequent, creating a modified deposition of sediments outside the project area (down slope). Overall, these effects would remain the same between Alternative A and Alternative B.

4.2.2.3 Direct and Indirect Impacts of Alternative C- No Grazing Reissue a Ten-Year Term Permit for the Belnap and Big Spring Pipeline Allotments with Zero Authorized AUMs

Direct impacts resulting from no grazing in the proposed project area would reduce the presence of human activity, vehicle usage, and soil compaction due to hoof motion. Ongoing use of existing road surfaces from alternate uses such as recreation, staff, and general transit, would continue to produce direct localized erosion features (gullies & ruts) due to the compact road surfaces increasing precipitation run-off, resulting in sediment transport of adjacent upper soil horizons, revealing the highly erodible lower soil horizons.

Indirect impacts of no grazing would result with decreasing soil compaction over time, mostly where cattle would have frequented in confined areas. This would indirectly increase native vegetation growth which would then benefit some topsoil retention and erosion abatement. However, the bulk of erosional features stem from the existing access road surfaces and would remain a common feature in all proposed alternatives. Therefore, impacts from roads would be the same between alternatives A, B, and C.

4.2.3 Vegetation Including Special Status and Invasive, Non-Native Plant Species

4.2.3.1 Direct and Indirect Impacts of Alternative A – Proposed Action Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

Alternative A effectively changes only one aspect of previous grazing effects on vegetation: season of use on the Belnap Allotment. Shifting the season of use while adding no AUMs is a minor impact at most on the Belnap Allotment. It may have some beneficial impacts by allowing use to synchronize better with changing climate-related vegetation considerations such

as timing of monsoons and other water events, and timing of seeding and flowering (ex. Zimmer 2022).

The permittee on the Big Spring Pipeline Allotment currently rests the pastures using a deferred rotation to allow growth and persistence of key forage species. Expanding the pasture rotation would temporally "space out" the use of a particular pasture, increasing the number and potentially the length of rest periods from livestock grazing. As stated in Section 2.3.1.1, this would allow continued progress towards these pastures fully meeting LHE standards, while the Belnap Pastures (proposed Big Spring Pipeline North and South pastures) would continue to meet LHE standards.

An additional potential benefit to changing the season of use on the Belnap Allotment while retaining the current AUMs is the potential for a decrease in the actual number of cattle on the allotment at any one time (Tables 2.2 and 2.3). If this does indeed occur, the potential for the effects of large groups of cattle to create and widen trails would decrease, allowing for an increase in soil stability and, indirectly, a greater potential of seed germination and plants to reach maturity.

Special status species are not expected to be negatively impacted by Alternative A. Both *Y. baccata* and *C. whipplei* are common and persistent within the currently grazed Big Spring Pipeline Allotment, as is *C. whipplei* in Belnap Allotment. Continued grazing at current AUMs and expanded season of use should not change this. *P. distans* persists in Big Spring Pipeline Allotment under the current year-round season of use, there is potential of increased population size in pastures that may have longer rest rotations.

Effectively, there are no other impacts different than what is described in Section 4.2.2.2 - Direct and Indirect Impacts of Alternative B – Renew Permit for Belnap and Big Spring Pipeline Allotments with No Changes in Season of Use or Combination of Allotments. Please refer to that section for the remaining direct and indirect impact analysis of Alternative A.

4.2.3.2 Direct and Indirect Impacts of Alternative B
Renew Permit for Belnap and Big Spring Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

Under this alternative, the impacts of grazing on vegetation seen during the previous grazing permit would continue for an additional 10 years. The Big Spring Pipeline Allotment most likely would continue to show a static or downward trend until the drought abates while the Belnap Allotment would continue in a static or upward trend, depending on pasture, toward attaining the prescribed DPCs. Any large-scale changes in vegetation would be through wildfire or vegetation treatments, neither of which are proposed as part of the grazing permit application.

Both allotments have largely the same vegetation types. Some minor variations exist over a small area, but the vegetation in this area would respond seasonally similarly to the rest of the vegetation within the allotments.

As in Alternative A, special status species are not expected to be negatively impacted. Both *Y. baccata* and *C. whipplei* would continue to be common and persistent within Big Spring Pipeline Allotment and *C. whipplei* in Belnap Allotment. Continued grazing at current AUMs and expanded season of use should not change this. *P. distans* persists in Big Spring Pipeline Allotment under the current year-round season of use.

Invasive plant management on GCPNM works with the permittees to allow for the treatment of spatially confined non-native plants such as Scotch thistle. Under Alternative B, this would not change. Widespread non-native plants such as *Bromus* spp. would continue occurring across the allotments. Given the local dominance of this plant in multiple areas, it is expected to continue spreading into areas where it has not yet been detected, regardless of the use of the allotment by cattle. Monitoring for new invasive plant populations is ongoing at GCPNM and treatment is part of existing BLM Arizona Strip District and NPS policy.

4.2.3.3 Direct and Indirect Impacts of Alternative C- No Grazing Reissue a Ten-Year Term Permit for the Belnap and Big Spring Pipeline Allotments with Zero Authorized AUMs

Under this alternative, the grazing permit would be withdrawn for 10 years. Vegetation would likely continue a static or upward trend toward DPC objectives on the Big Spring Pipeline Allotment, once drought abates, and a static or upward trend on the Belnap Allotment, depending on pasture. Shifts in species dominance would be determined primarily through climatic conditions and past landscape disturbance.

It is unknown if Alternative C would have a beneficial impact on vegetation, including special status species. Numerous studies have found positive effects, negative effects and no effects when managed grazing was removed. Positive outcomes appear to be based on current vegetative community characteristics, history of the area and the presence and density of invasive non-native plant species (Davies 2014). Locally, 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.

Alternative C would have a negligible impact on invasive species. As was noted in Section 4.2.2.2, invasive plant management is ongoing and would not be curtailed by this alternative. Removal of grazing would not change in any significant way the occurrence or distribution of invasive non-native plants in the allotments.

4.2.4 Designated and Proposed Wilderness

4.2.4.1 Direct and Indirect Impacts of Alternative A – Proposed Action Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

Under this alternative, the untrammeled, undeveloped, natural and opportunities for solitude qualities of the wilderness areas within the Big Spring Pipeline allotment would be negatively affected. Untrammeled, natural, and other features of value would see a positive effect on the quality. Trammeling from cattle grazing and the use of grazing infrastructure by cattle would continue, however, effects of trammeling, including cattle trails and visible vegetation use by grazers, would be less concentrated due to a shift in grazing rotation between nine pastures rather than the current seven and would be a positive effect. The presence and maintenance of grazing infrastructure directly negatively affect the undeveloped quality of wilderness character and would not change from the current conditions. The natural quality would be negatively affected during maintenance of grazing infrastructure but would be positively affected by shifting the grazing pasture rotation and locally decreasing grazing pressure effects on vegetation. Solitude would be negatively affected for those who were unaware of preexisting grazing in the area and who may be surprised to see signs of human use in wilderness. Opportunities for primitive and unconfined recreation would not be affects under this alternative. Other features of value, in this case the direction in the RMP/GMP and GCPNM proclamation to administer grazing on GCPNM, would be positively affected by continued grazing and the maintenance of grazing infrastructure.

The impacts of these effects, based on the minimum tool necessary analyzed in the MRDG (Appendix D), are all direct impacts. Use of motor vehicles and/or motorized equipment to maintain range improvements are relatively short term and highly localized as the work would only occur on previous established grazing infrastructure within the Big Spring Pipeline Allotment. As such, their impacts are minimal on the undeveloped, natural and solitude wilderness qualities. Impacts on trammeling and naturalness are beneficial to vegetation abundance and growth by decreasing grazing pressure, though the magnitude of change is difficult to quantify. Longer term impacts are related to the continuation of grazing and the presence of grazing infrastructure. Both conditions were expected to persist in the Mt. Logan Wilderness Management Plan and the NPS Draft Wilderness Proposal, making these impacts acceptable, with minimum tools analysis for any motorized or mechanical equipment used to continue and maintain cattle grazing.

4.2.4.2 Direct and Indirect Impacts of Alternative B
Renew Permit for Belnap and Big Spring Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

For Alternative B, impacts would be the same as the proposed action in Alternative A except for the impacts on untrammeled and natural wilderness qualities. Trammeling under this alternative would continue at the same intensity as the current situation. Vegetation would not have longer rest periods as proposed in Alternative A, rest would be the same as the current grazing permit describes. The beneficial impacts on trammeling and naturalness would not occur under this alternative.

For all other impacts, see section 4.2.3.1.

4.2.4.3 Direct and Indirect Impacts of Alternative C- No Grazing Reissue a Ten-Year Term Permit for the Belnap and Big Spring Pipeline Allotments with Zero Authorized AUMs

Alternative C would allocate zero grazing use during a ten-year permit; however, it does not propose to remove range improvements necessary for grazing administration as further analysis ten years from now may authorize a ten-year grazing permit. Solitude and opportunities for primitive and unconfined recreation would be unchanged from current conditions. All other wilderness character effects would change from current conditions. Trammeling and undeveloped qualities would continue to be negatively affected. Naturalness would be positively affected. Other features of value would be negatively affected.

The intensity of impacts on wilderness character under this alternative would change from current conditions. New trammeling from active cattle grazing would cease, however the visible effects of cattle trails and use of grazing infrastructure would persist until weathering and vegetation obscure trails and cattle gathering locations. Grazing infrastructure would remain, but not be maintained, continuing to impact the undeveloped quality. Naturalness would be impacted by allowing the native vegetation to grow without grazing pressure. Other features of value would be directly impacted by not adhering to the direction in the RMP/GMP regarding grazing management as discussed in the GCPNM proclamation.

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

4.2.5.1 Direct and Indirect Impacts of Alternative A – Proposed Action Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

Herbaceous vegetation provides forage and concealment cover for wildlife species, particularly during the spring breeding period when fawning, nesting, and rearing of young occurs. Livestock grazing reduces the height and amount of herbaceous vegetation. The presence of livestock and the movement of livestock between areas of use could result in the direct disturbance or displacement of some wildlife from preferred habitats, 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. However, the livestock grazing proposed in Alternative A allows the permittee to use the two allotments together rotating the cattle through the pastures of both allotments. This gives the ability to rest pastures or allotments from year to year. Using seasonal deferment and rest-rotation, vegetation would continue a static to upward trend, and therefore wildlife habitat components would be maintained or improved. This alternative proposes a longer season of use for the Belnap Allotment. Since the current season of use already includes the primary growing season for vegetation and the primary reproductive periods for most wildlife this change (expanded season of use) would minimally impact wildlife.

Big Game

Mule deer
The presence of livestock and the trailing of livestock between use areas could displace small numbers of mule deer from preferred habitats and/or water sources. However, given that deer on the allotments are likely habituated to the presence of livestock, this displacement would only be temporary.

Properly managed livestock grazing is designed to cause minimal impacts to rangeland resources. Rotating the season of use among pastures would provide periodic rest for vegetation to help maintain plant vigor. The current livestock management regime on the allotment has been in place for many years; it is therefore expected that livestock grazing proposed under this alternative would minimally affect habitat for mule deer. Since utilization on vegetation is limited to 50% on the allotments, competition for forage between livestock and deer should be minimal.

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

Pronghorn distribution in Unit 13B occurs primarily within the Belnap Allotment. The Belnap Allotment consists of poor-quality habitat for this species, with very low densities of pronghorn occurring within the allotment. While the presence of livestock and the trailing of livestock between use areas could displace does during fawning, pronghorn densities in this area are low so few does would be potentially affected. In addition, this potential for displacement would occur infrequently due to the rotational grazing system in place (see section 2.3.1 Alternative A - Proposed Action and 2.3.1.1 Grazing System Belnap Allotment).

Migratory Birds
The current livestock management regime on these allotments has been in place for many years; it is therefore expected that livestock grazing proposed under this alternative would minimally affect habitat for migratory birds. Since utilization on vegetation is limited to 50% on the allotments, competition for forage between livestock and seed-eating migratory birds should be minimal and there is good grasses and palatable shrubs composition, leaving adequate resources for insect prey populations.

Sensitive Species

Peregrine Falcon and Golden Eagle
Nesting sites for peregrine falcons or golden eagles would not be impacted by livestock within the allotments 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. However, the effects of moderate grazing (such as that proposed under this alternative) can be negligible to slightly beneficial for many prey species (Olendorff 1993). Vegetation in the allotments is sufficient to provide food and shelter requirements for populations of prey species. Habitat for prey species would be minimally affected because grazing under this alternative provides periodic rest for the plant communities. 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 allotments. Isolated nest trees used by this species could be impacted through rubbing of the trunk or by damaging the root system from congregations of cattle seeking shade; however, the likelihood of damaging these nest trees is minimal. Habitat for prey species, such as black-tailed jackrabbits, could be adversely impacted if overutilization occurs. However, the effects of moderate grazing (such as proposed under this alternative) can be negligible to slightly beneficial for many prey species (Olendorff 1993). Vegetation in the allotments is sufficient to provide food and shelter requirements for populations of prey species for the ferruginous hawk. Ferruginous hawks are sensitive to human disturbance near the nest site; however, no documented nests occur within the allotments so disturbance at nest sites would be sporadic and would not lead to a trend toward listing.

Northern Goshawk
Properly managed grazing has not been identified as having potential adverse impacts on the northern goshawk or its prey base (Kennedy 2003). Continued utilization below 50% would not measurably impact the variety of bird and mammal species that goshawks prey upon.

Burrowing owl
Nesting burrows for burrowing owls could potentially be impacted by livestock within the allotments through trampling. However, burrowing owls prefer open country with sparse vegetation and often do well in moderately grazed areas.

Prey species are numerous in the allotments and include small mammals, insects, and reptiles. Vegetation in the allotments is sufficient to provide food and shelter requirements for populations of prey species. 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). Implementation of grazing under this alternative would result in relatively minor impacts to burrowing owl habitat or potential nesting success in the allotments.

Pinyon Jay
While the potential effects of livestock grazing on pinyon jays are unclear, the policy of removing pinyon-juniper woodlands to promote grazing has resulted in habitat loss in several southwestern states (Wiggins 2005). However, no pinyon-juniper removals are proposed under this alternative, therefore impacts to nesting areas, tree canopy, or food sources would be negligible and similar to those described above for migratory birds.

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. Recommended grazing BMPs (USDA 2015) for monarch butterflies and other pollinators include:

- Protect the current season's growth in grazed areas by striving to retain at least 50% of the annual vegetative growth on all plants.
- Minimize livestock concentrations in one area by rotating livestock grazing timing and location to help maintain open, herbaceous plant communities that are capable of supporting a wide diversity of butterflies and other pollinators.

These actions are incorporated into the proposed grazing systems for the allotments under this alternative. Implementation of grazing under this alternative would therefore result in relatively minor impacts to monarch butterflies and their habitat in the allotments.

4.2.5.2 Direct and Indirect Impacts of Alternative B – No Action Renew Permit for Belnap and Big Springs Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

Direct and indirect effects under this alternative would be similar to those described under Alternative A for big game, migratory birds, or sensitive species. Impacts described under Alternative A related to changes in the season of use would not occur under this alternative.

4.2.5.3 Direct and Indirect Impacts of Alternative C – No Grazing Reissue a Ten-Year Term Permit for the Belnap and Big Spring Pipeline Allotments with Zero Authorized AUMs

Under this alternative, no livestock grazing would occur so plants would only be minimally grazed (by wildlife) and vegetative structure would remain intact. Vegetation would therefore have the most rest and recovery as compared to the Proposed Action. 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, and plant communities would continue to provide sufficient forage for mule deer, prey species, and habitat components for migratory birds. In addition, since no livestock would be present on the allotments, no potential for displacement of wildlife from preferred habitats and/or water sources would occur. Existing

livestock water improvements would not be maintained and would deteriorate over time, leaving fewer water sources available to wildlife within the allotments.

4.3 Cumulative Impacts

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

4.3.1 Cumulative Impacts to Livestock Grazing

The cumulative impact analysis area for livestock grazing is the Belnap and Big Spring Pipeline allotments.

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 runoffs 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 drought conditions have continued and

have resulted in voluntary livestock reductions (including the current permittee and the two subject allotments) on most allotments throughout the Arizona Strip up to and including 2022. Similar fluctuations in livestock numbers would likely occur in the future.

The effects on livestock grazing in the Belnap and Big Spring Pipeline allotments have been analyzed under the "Direct and Indirect Effects" section 4.2.1 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.

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 in the life of the recent permit as well as developments dating back to early livestock grazing in these allotments. Some of these developments are installed to reduce conflict with other resource uses i.e., cattleguards and recreation use. Water developments have been a particular priority during recent droughts. Dating back to the 1994 AMP, dependable water has been cited as lacking on these allotments. Planning and funding often delay the construction of these developments. These developments have impacts, and obvious benefits to livestock, however water developments are cited by AGFD as beneficial to both game and non-game wildlife species on the Arizona Strip District. Vegetation treatments on neighboring allotments have impacted wildlife with short term disruption and displacement, but long-term creation of more available forage for both wildlife and livestock. Vegetation treatments have been noted by ASDO fuels specialists as reducing catastrophic fires. This is due to reduction in heavy fuel loads creating what is thought to be more of a historic fuel load and ecological site. Proposed developments are analyzed through the NEPA process and both positive and negative effects are quantified as much as possible. The public is encouraged to participate through scoping and comments to help improve resource management.

Grazing permits on public lands originated with passage of TGA. TGA also set the requirements for transferring a permit to a qualified entity. Transfers have occurred since first issued and will likely continue. Transfers are often conducted to pass a permit to a younger family member, or for economic reasons. When a transfer occurs, there are no changes to permitted season of use, AUMs, or terms and conditions. As there are no changes to the livestock grazing, transfers may have personal economic effect to the individual parties, but no change to livestock management on the ground.

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. Consultation with AGFD in regard to renewal of livestock grazing permits did not identify any issues directly related to livestock grazing beyond those already discussed above. It is therefore anticipated that none of the alternatives would result in cumulative impacts to livestock grazing when added to other past, present, and reasonably foreseeable activities in the area.

4.3.2 Cumulative Impacts to Soil Resources

The cumulative impact area of analysis for soil resources issues consists of the general project area and adjacent areas within a 10 kilometer (6 mile) radius outside the project area boundaries as this vicinity encompasses pertinent watersheds, parent material (outcrop of underlying bedrock and alluvial sources) for soils, and relevant vegetation cover. The temporal scope of analysis extends 20 years into the future. This temporal scope was chosen as 20 years is a reasonable time frame when considering foreseeable actions as soil resources in the project area will succumb to natural erosion, seismic events, recreation usage, grazing activities, and sudden flash flood events.

Past and Present Actions

Past and present actions include recreation activities such as seasonal hunting, camping, and OHV use, along with the currently bounded grazing allotments with typical cattle based operations to include barb-wire fencing, plowing and seeding of both native and non-native plants, installation of water catchment features (stock pond and apron), and corral structures. These past and ongoing grazing practices have created direct impacts with soil compaction in the vicinity of cattle structures to include stock ponds, catchment and troughs, corrals and fencelines - largely due to cattle hoof weight on soil surfaces, infrequent large transport vehicles for cattle, and repetitive cattle usage along foraging corridors. As distance increases away from structures and places of frequent use, soil compaction becomes non-present, maintaining a natural occurring density.

Indirect impacts of these areas of increased soil compaction creates less available soil moisture to sustain native plants, thereby less presence of fine to medium roots, which promotes increase soil erosion.

Soil erosion is also accelerated in the project area by placement of road surfaces serving access for administrative, recreation, and grazing activities. These road surfaces leave the underlying soil horizons exposed to physical weathering, evident with the gullies, and head cutting erosion features stemming from the roadsides in various locations within the proposed project area.

Reasonably Foreseeable Actions

As stated, the proposed action seeks to continue cattle operations. The soil conditions would remain the same as no new structures would be constructed, and cattle foraging behavior would be non-repetitive, and likely to be intermittent/opportunistic in nature. Existing soil compaction would continue at the established structures creating avenues for ruts and gullies to form. Most impacts would occur as soil erosion accelerates in dry washes adjacent to access road surfaces.

When comparing Alternative A to Alternative B, the outcome would be similar. Continued cattle operations would not further reduce soil quality in either Alterative A or Alternative B. Limited soil compaction would continue to be present due to the presence of cattle, existing roads, and human activity. Limited soil erosion would continue due to physical weathering and disturbed soil surfaces.

Furthermore, Alternative C would likely result in reduced soil compaction and potential increases in vegetation within compacted areas over 10 years of time, given natural processes such as freeze-thaw cycles. Existing roads and road impacts would continue to occur as administrative and recreational usage of the roads would not cease. Most evident would be the persistence of small soil erosional patterns (small rills and gutters) adjacent to the roadway shoulders. These outcomes are expected to continue regardless of grazing operations.

4.3.3 Cumulative Impacts to Vegetation Including Special Status and Invasive, Non-Native Plant Species

The cumulative impact analysis area is the Belnap and Big Spring Pipeline allotments plus a 1-mile-deep zone around the allotment boundaries. The buffer zone for analysis is based on continuity of vegetation types found within the allotments with areas immediately adjacent and contiguous with the project area and on any potential direct impacts from projects within these same areas.

The three alternatives considered in this document represent a negligible impact on the vegetation community and composition both within the Belnap and Big Spring Pipeline allotments and the surrounding cumulative impact analysis area. The primary impacts, in decreasing importance to vegetation, are climatic variability, previous overgrazing prior to the managed grazing system currently in use by the BLM ASDO, vegetation treatments, wildfires and recreation. Each of these, other than recreation, has been discussed previously in this document. Recreation's role on impacts to vegetation primarily rest in the continued transmittal of invasive plant propagules from non-local source populations to along roadsides in the allotments. It is reasonable to speculate travel through an area known to be heavily infested with species such as *Salsola* near the Utah-Arizona border has continually introduced the thistle to Big Spring Pipeline Allotment, as visitors to the popular Whitmore Overlook must traverse the allotment to reach the overlook. A 10-year grazing permit, or the denial of the permit, would not be included on the primary impact list. Stipulations within the permit provide a mechanism to keep grazing from adversely interacting with climatic variability, such as drought, that could negatively impact the vegetative community. Similarly, the permit is written to prevent overgrazing. No prescribed fire treatments have been proposed for this area in the reasonably foreseeable future.

The three alternatives considered would have a negligible negative impact on the three special status species. While Alternative A may have a localized positive impact, it would not alter the overall species viability or distribution.

Invasive plant management within the analysis area is ongoing. Alternatives A and B 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. Since there are no known novel invasive plants within the

allotments, nothing proposed within this document would change the invasive plant species known in the cumulative impact analysis area.

4.3.4 Cumulative Impacts to Designated and Proposed Wilderness.

The cumulative impact analysis area for proposed and designated wilderness areas is the Belnap and Big Spring Pipeline Allotments.

Increases in visitation, particularly Off Highway Vehicle (OHV) use, may impact perceived solitude through increased noise, especially near the cherry stem road that divides the north and south sections of the Mt Logan Wilderness area.

It is anticipated that further increases in visitation may have incremental cumulative impacts to proposed and designated wilderness characteristics, however, none of these impacts are anticipated to be significant.

4.3.5 Cumulative Impacts to Wildlife

The cumulative impact analysis area for wildlife species is the Belnap and Big Spring Pipeline Allotments plus a three-mile buffer zone around the allotment boundaries to account for individuals whose home ranges extend beyond the boundaries of the allotments. Actions that contribute cumulatively to the overall disturbance to wildlife and wildlife habitat include livestock grazing, recreation activities, and wildfire.

Past livestock grazing resulted in the degradation of wildlife habitat from overgrazing and the introduction of invasive plant species. 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 continues in the analysis area and is managed such that ecological condition of the area is good and all land health standards are being met or are progressing toward being met.

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

Wildfire could play a large role in the quality of habitat in the analysis area. Burned areas are slow to recover and the disturbance often results in an increase in non-native annual grasses. These non-native plants are often the fine fuels that carry the fire making burned areas more likely to burn again in the future.

It is anticipated that the Proposed Action would continue to have incremental cumulative impacts to wildlife, particularly when added to other past, present, and reasonably foreseeable activities in the area. However, none of these impacts are anticipated to be significant.

4.4 Monitoring

Long Term

Long term monitoring studies are scheduled to be read by BLM Arizona Strip District Office (ASDO) monitoring team at all key areas every five years (see Appendix A, Figures 3 and 4 for the location of key areas). Frequency, cover, and composition data are collected using the pace frequency and dry-weight-rank (DWR) methods to measure achievement of standards for rangeland health and detect changes in resource conditions. This data is also used to determine whether the allotment is meeting the DCP Objectives established for each key area. DWR method of data collection would be used to monitor species composition. In addition, Pace Frequency and Step-Point studies would be used at each key area to detect changes of individual species and vegetative cover, which indicates a trend and status of basal and foliar cover. The DWR and pace frequency study methods are described in *Sampling Vegetation Attributes*, Interagency Technical Reference 1734-4 (BLM 1999b). Long term studies of sagebrush dominated areas within both allotments are planned to be read every five years as part of the NPS Mojave Desert Inventory and Monitoring Network integrated uplands protocol (NPS Vital Signs). While exact plot locations have not yet been selected, the monitoring will include species composition (including invasive non-native plant species), vegetation density and soil characteristics along transects and within each unfenced hectare study plot.

Short Term

Livestock use on key forage plants is determined annually 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). All monitoring data would be used to evaluate current management of the allotments and assist the BLM in making management decisions that help achieve vegetation objectives. Other information to be collected and compiled is precipitation, actual use, etc. All monitoring data would be used to evaluate current management and assist BLM in making management decisions that helps achieve vegetation objectives on the allotment.

Annual allotment compliance would be included in monitoring of this allotment. Compliance monitoring would assure terms and conditions of the permit are being met. Compliance checks would also monitor any special conditions or mitigation included in Cooperative Agreements, Section 4 Permits, or other grazing regulations.

The monitoring addressed above is sufficient to identify changes in vegetation because of livestock grazing activities. In addition to those methods described, there are efforts in place to inventory for noxious weed establishment, as well as monitor treated areas for treatment effectiveness. Known weed sites would be retreated as needed.

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

The Rangeland Resource Team (RRT), Interdisciplinary Assessment Team (IAT), livestock grazing permittees and other interested parties were invited to attend an issue scoping meeting for the Belnap Allotment on March 14, 2001. The issue scoping meeting for the Big Spring Pipeline Allotment was held on October 22, 2003, and a field visit on March 17, 2004. The two allotments were assessed under the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (S&Gs) (Appendix B).

Public comments regarding the Belnap S&G were received and consideration given to these prior to signing the final Belnap Allotment S&G in September 2002. No comments were received regarding the final Big Spring Pipeline S&G, signed May 2006. As the LHE and S&G and associated public involvement is considered a step in the process of the term grazing permit issuance, these comments are summarized with the BLM response as follows.

One comment suggested a lower utilization level than the current 50% utilization level. This utilization level has been fully analyzed in the GCPNM RMP/GMP (BLM, 2008a) and remains the accepted level for allotments that have a pasture rotation. Lower utilization levels may be implemented on allotments or pastures without a rotation system, or due to presence of Special Status or T&E species, or other guidance from an AMP. One comment addressed pronghorn antelope habitat in the Belnap Allotment. The Belnap Allotment is not considered pronghorn habitat by the BLM or the AGFD. One comment did not support mechanical or chemical treatment for weed infestations. Mechanical treatment including hand tools may be effective at control or irradicating individual weeds or small infestations. Mechanical treatment is not a typical method for large weed infestations unless part of a vegetation treatment proposal that would likely include seeding. All herbicides used in the treatment of weeds are BLM approved through a Bureau wide EIS and the ASDO weed EA. Both documents included consultation with USFWS for affect and mitigation for T&E species. Pesticide Use Proposals (PUP) approve all herbicide use on the ASDO. A PUP defines specific herbicides, amounts, acreage, and presence of Special Status or T&E species or other special considerations within proposed treatment areas.

A 15-Day Public Scoping Comment period was posted on the BLM's ePlanning and the NPS PEPC on February 27, 2023. Ten scoping comment letters were received, those comments and responses are in Appendix I.

5.3 Tribal Consultation

The BLM and NPS consults with federally recognized tribes before making decisions or undertaking activities that will influence federally recognized tribes, their assets, rights, services,

or programs. GCPNM initially contacted the tribes listed below as part of the Public Scoping process discussed in the section above.

Formal Tribal consultation was initiated on March 28, 2023. No Tribal response has been received as of May15, 2023.

Tribal entities consulted with include:

- Chemehuevi Indian Tribe
- Colorado River Indian Tribe
- Havasupai Indian Tribe
- Hualapai Indian Tribe
- Kaibab Band of Paiute Indians
- Las Vegas Paiute Tribe
- Moapa Band of Paiute Indians
- Navajo Nation
- Paiute Indian Tribe of Utah
- San Juan Southern Paiute Tribe
- The Hopi Tribe
- The Pueblo of Zuni

5.4 List of Preparers and Reviewers

Table 5.1 List of BLM and NPS Preparers/Reviewers

Name	Title	Resources
Brandon Boshell	Monument Manager	Authorizing Officer
Ben Roberts	Monument Superintendent	Authorizing Officer
Michael Cutler	Rangeland Management Specialist	Project Lead, Grazing Administration/Vegetation
Gloria Benson	Tribal Liaison	Native American Religious Concerns
Amber Hughes	Planning & Environmental Coordinator	NEPA Compliance
Eathan McIntyre	Physical Scientist	Soil/Water/Air/Geology
Amanda Sparks	Lands and Realty Specialist	Lands/Realty
Jeff Young	Wildlife Biologist	Special Status Animals, Wildlife
Jennifer Fox	Ecologist	Vegetation/Special Status Plants, Invasive, Non-Native Species
Greg Page	Outdoor Recreation Planner	Wilderness, Recreation, Visual Resources
David Van Alfen	Archaeologist	Cultural Resources
Sarah Page	Archaeologist	Cultural Resources for ASFO
Cody Goff	Fire & Fuels	Fire & Fuels
Jannice Cutler	Rangeland Management Specialist	Wild Horses and Burros
Ken Shurtz	Environmental Protection Specialist	Wastes (Hazardous or Solids)
Erik Frenzel	Regional Wilderness Coordinator	Editing

Name	Title	Resources
Rachel Wolstenholme	Regional Wildlife Biologist	Editing
Brent Johnson	Vegetation Ecologist/Regional IPM Coordinator	Editing
Danette Woo	Regional Environmental Coordinator	Editing

Table 5.2 Non-BLM Agency Reviewers

Name	Title	Agency/Organization
Tim Shurtliff	Field Supervisor	Arizona Game and Fish Department
Hannah Griscom	Arizona Game & Fish	Habitat Evaluation and Lands Program Manager
Martina Dawley	Hualapai Tribe	Senior Archaeologist
Daniel Bulletts	Kaibab Paiute Tribe	Environmental Program Director

CHAPTER 6

6.0 References

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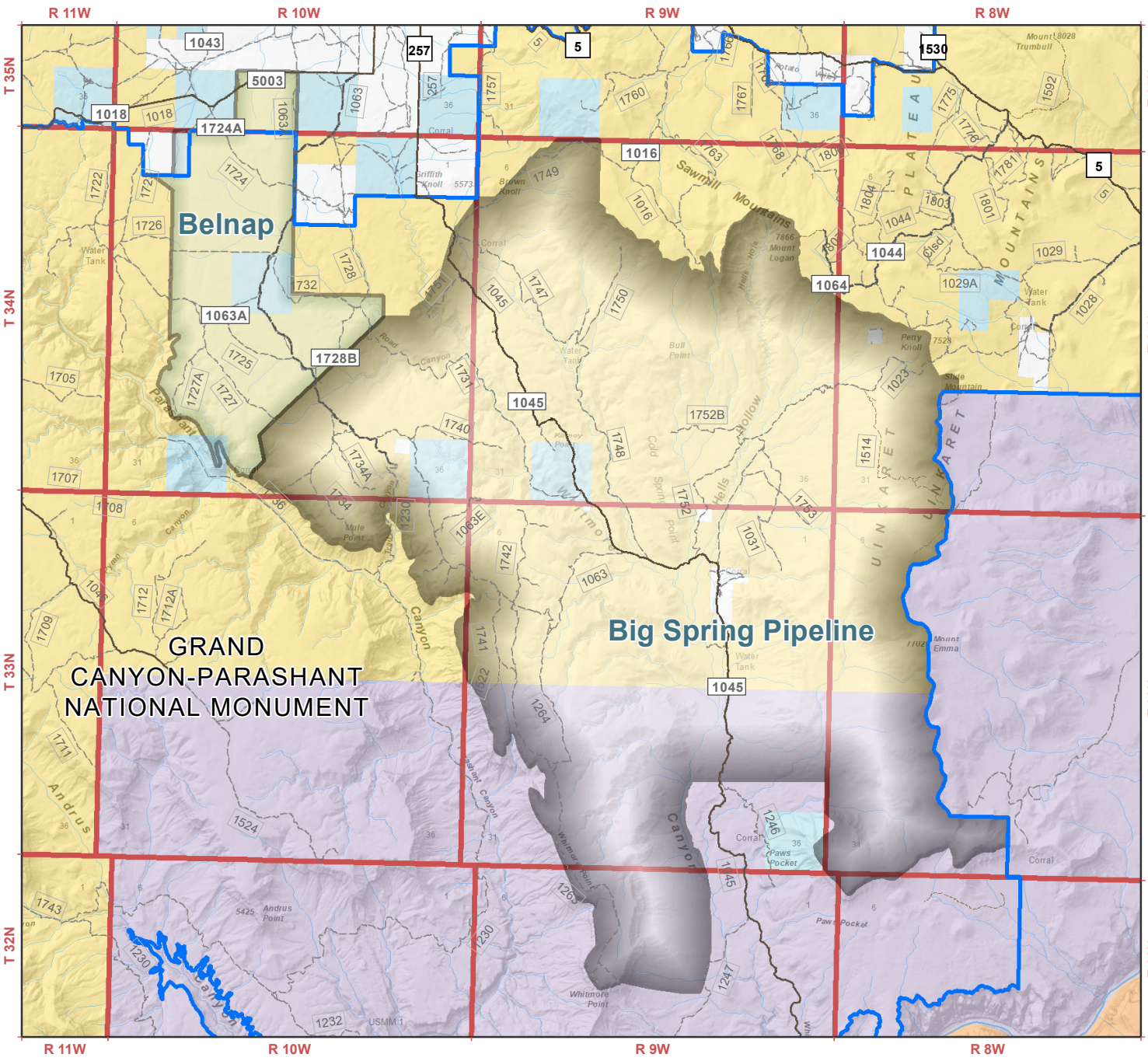
Figure 1 - Belnap and Big Spring Pipeline Allotment Vicinity Map

NEPA Project DOI-BLM-AZ-A030-2023-0002-EA

Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument



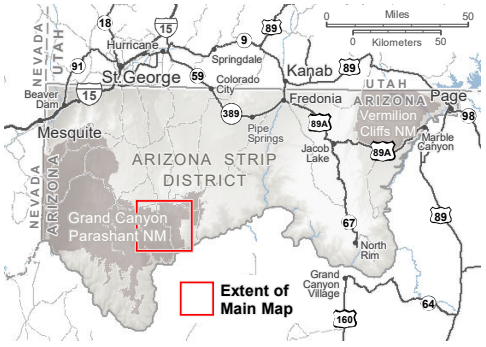
Belnap Allotment
Big Spring Pipeline Allotment
BLM National Monument

Surface Management Agency

Bureau of Land Management
National Park Service
Indian Reservation
State
Private

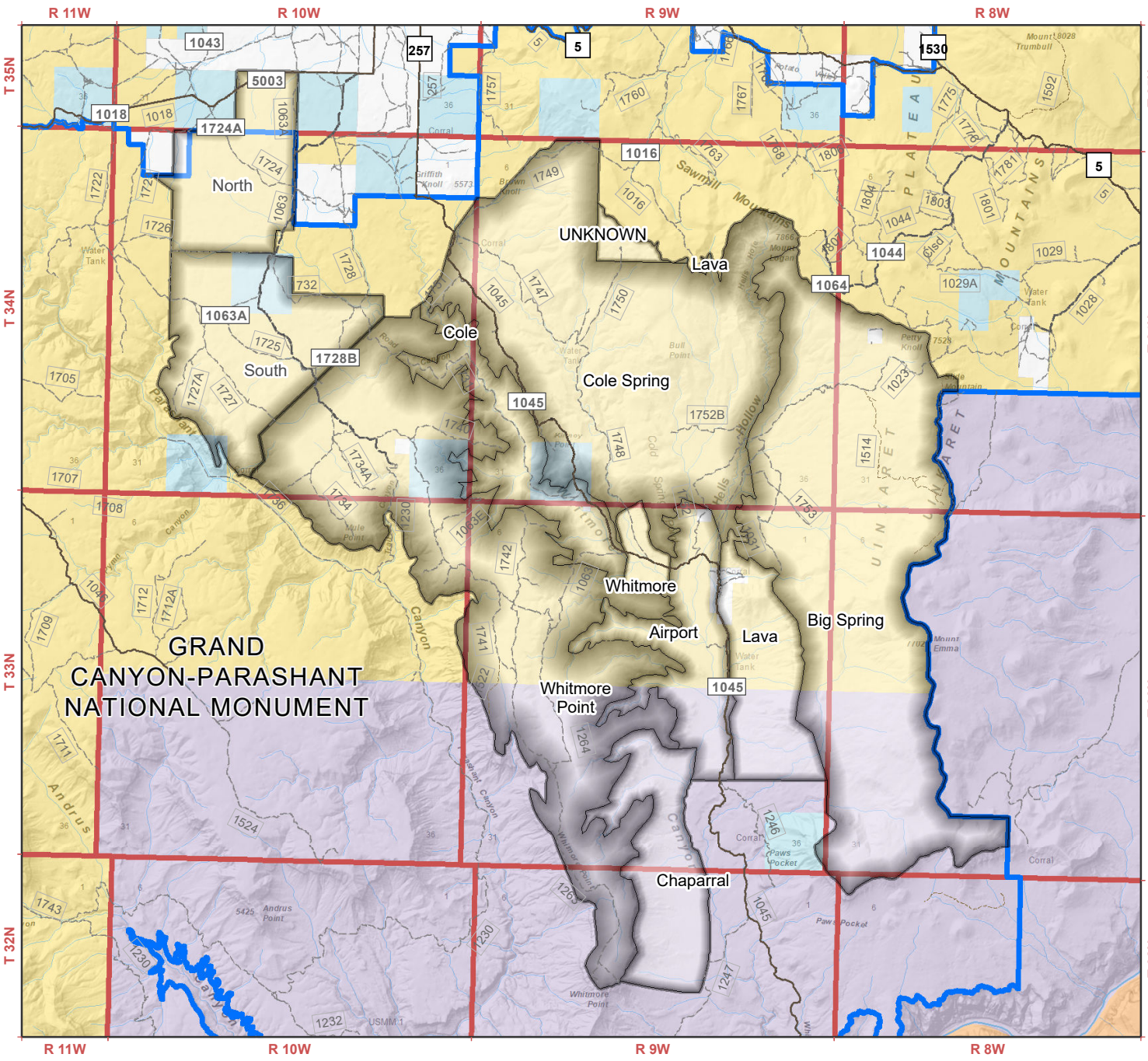
0 0.5 1 2 3 4 5 6 7 8 9 Miles
0 0.5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Kilometers

Map Produced by BLM Arizona Strip District
File: V2-Belnap_Big_Spring_Pipeline_vacinity.mxd
Coordinate System: NAD 1983 UTM Zone 12N
Reference System: U.S. PLSS GSRB&M
Scale: 1:155,740 at 8.5x11 page output
Date: 3/31/2023



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.

Figure 2 - Big Spring Pipeline Proposed Pastures (Combined Allotments)
NEPA Project DOI-BLM-AZ-A030-2023-0002-EA
Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument



Big Spring Pipeline Proposed Pastures

BLM National Monument

Surface Management Agency

- Bureau of Land Management
- National Park Service
- Indian Reservation
- State
- Private

0 0.5 1 2 3 4 5 6 7 8 9 Miles

0 0.5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Kilometers

Map Produced by BLM Arizona Strip District
File: V2-Belnap_Big_Spring_Pipeline_Proposed_Pastures.mxd
Coordinate System: NAD 1983 UTM Zone 12N
Reference System: U.S. PLSS GSRB&M
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Date: 3/31/2023

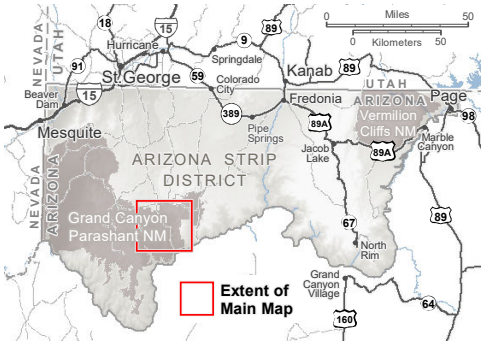

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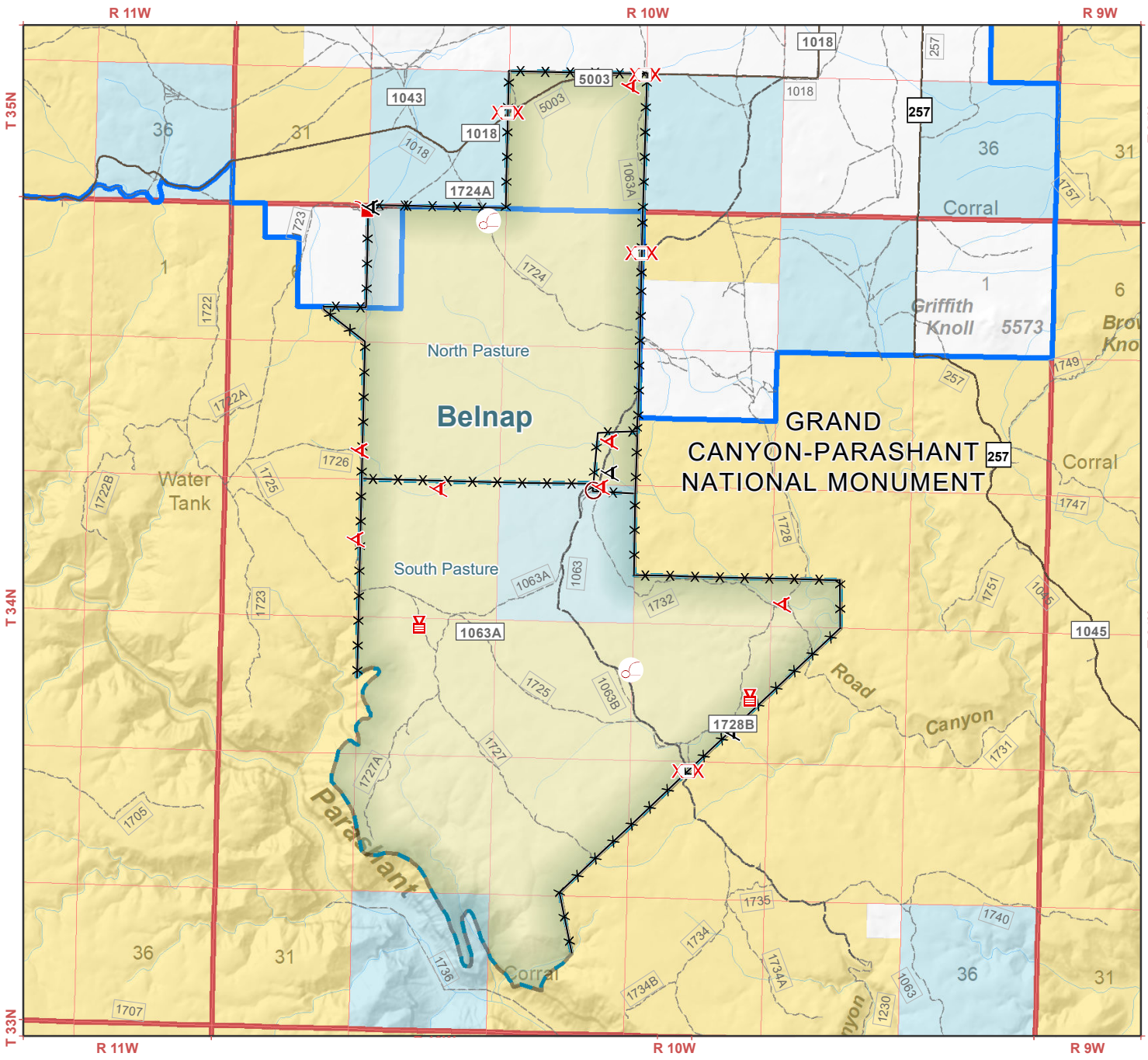
Figure 3 - Belnap Allotment Pastures with Existing Range Improvements
NEPA Project DOI-BLM-AZ-A030-2023-0002-EA
Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument



Key Areas
Belnap Allotment

Range Development Point Improvement Type
- Catchments (includes artificial watersheds, guzzlers, wildlife drinker)
- Unfenced Detention Reservoir
- Fenced Detention Reservoir
- Corrals and Loading Chutes Not Portable
- Cattleguard (Unspecified)

Range Development Line Improvement Type
- Fence (Unspecified)
- Pipeline

Belnap_Pastures
BLM National Monument

Surface Management Agency
- Bureau of Land Management
- State
- Private

0 0.5 1 2 3 4 Miles
0 0.5 1 2 3 4 5 6 Kilometers

Map Produced by BLM Arizona Strip District
File: V2-Belnap_Allotment_Pastures.mxd
Coordinate System: NAD 1983 UTM Zone 12N
Reference System: U.S. PLSS GSRB&M
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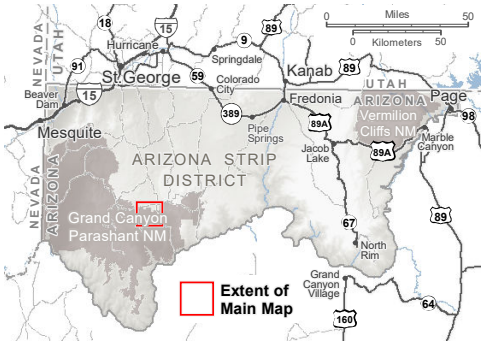

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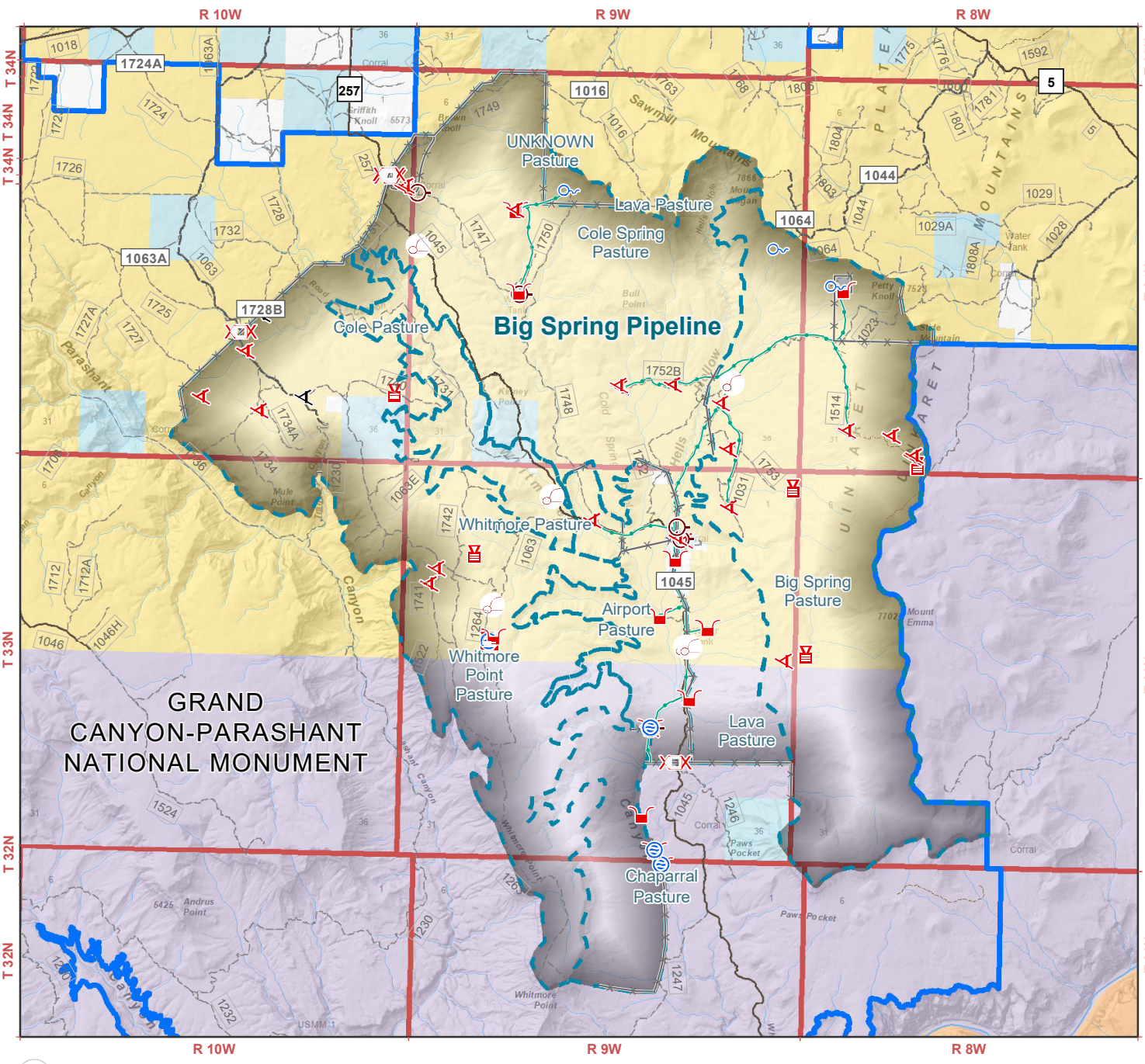
Figure 4 - Big Spring Pipeline Allotment Pastures with Existing Range Improvements
NEPA Project DOI-BLM-AZ-A030-2023-0002-EA
Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument



Key Areas
Big Spring Pipeline Allotment

Range Development Point
Improvement Type
- Catchments (includes artificial watersheds, guzzlers, wildlife drinker)
- Spring
- Unfenced Detention Reservoir
- Fenced Detention Reservoir
- Supplemental Storage Tank
- Trough
- Corrals and Loading Chutes Not Portable
- Cattleguard (Unspecified)

Range Development Line
Improvement Type
- Fence (Unspecified)
- Pipeline

- Big Spring Pipeline Pastures
- BLM National Monument

Surface Management
- Bureau of Land Management
- National Park Service
- Indian Reservation
- State
- Private

0 0.5 1 2 3 4 5 6 7 8 Miles
0 0.5 1 2 3 4 5 6 7 8 9 10 11 12 Kilometers

Map Produced by BLM Arizona Strip District
File: V2-Big_Spring_Pipeline_Pastures.mxd
Coordinate System: NAD 1983 UTM Zone 12N
Reference System: U.S. PLSS GSRB&M
Scale: 1:144,131 at 8.5x11 page output
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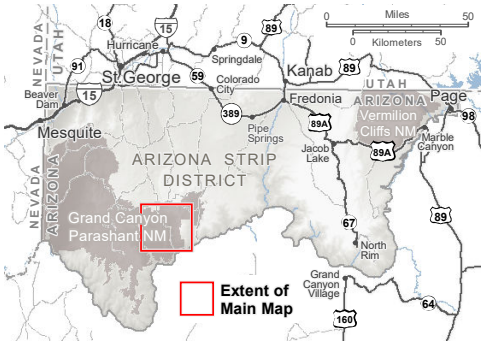

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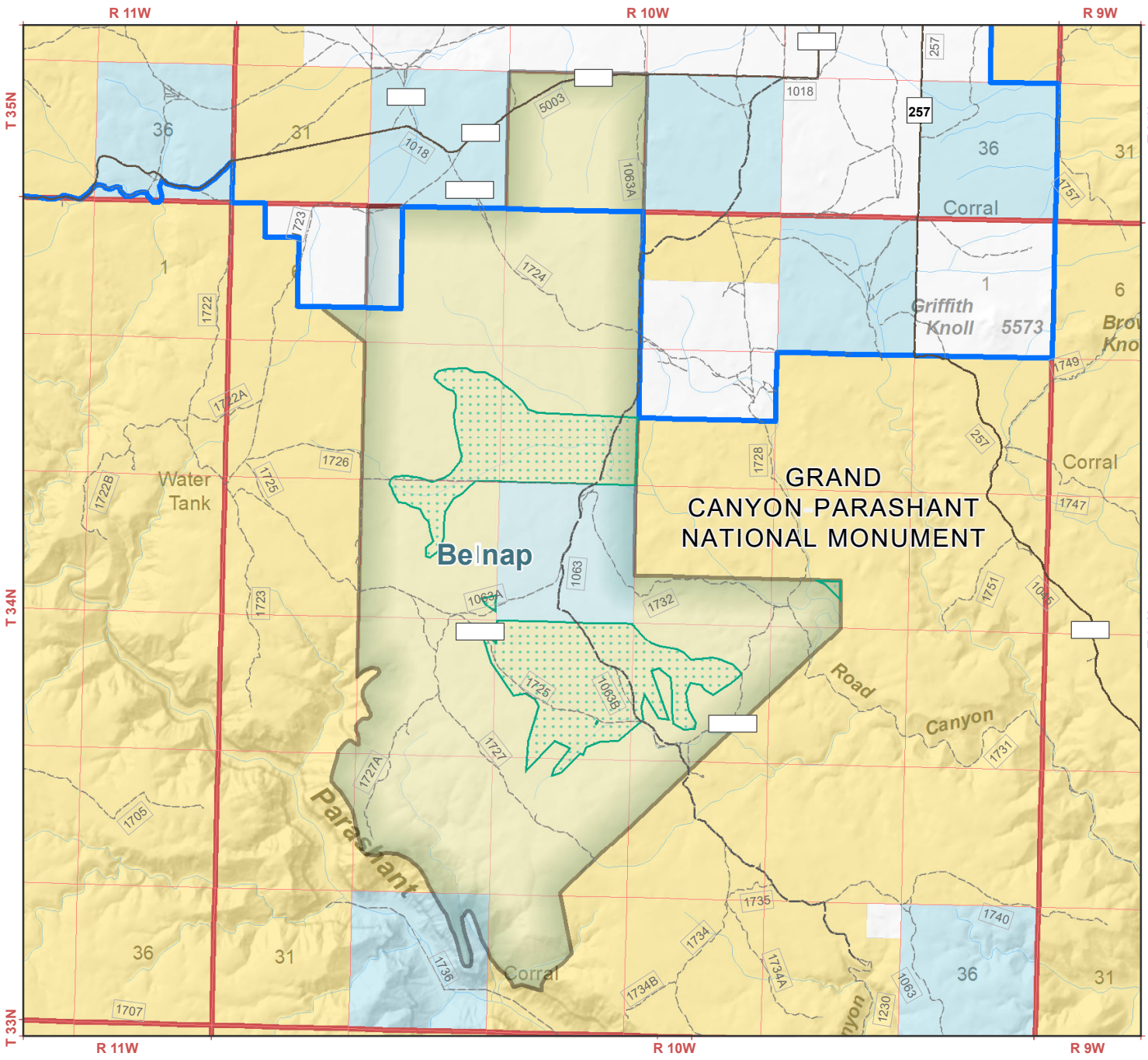
Figure 5 - Belnap Allotment Historic Vegetation Treatments
NEPA Project DOI-BLM-AZ-A030-2023-0002-EA
Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument



Chemical Treatments
Belnap Allotment
BLM National Monument

Surface Management Agency
Bureau of Land Management
State
Private

0 0.5 4 Miles
0 0 5 4 6 Kilometers

Map Produced by BLM Arizona Strip District
File: V2-Belnap_Allotment_veg_tmts.mxd
Coordinate System: NAD 1983 UTM Zone 12N
Reference System: U.S. PLSS GSRB&M
Scale: 1:68,754 at 8.5x11 page output
Date: 3/31/2023

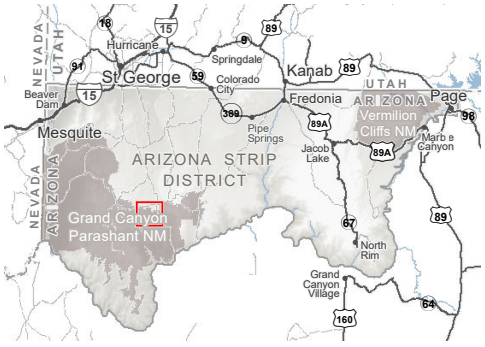


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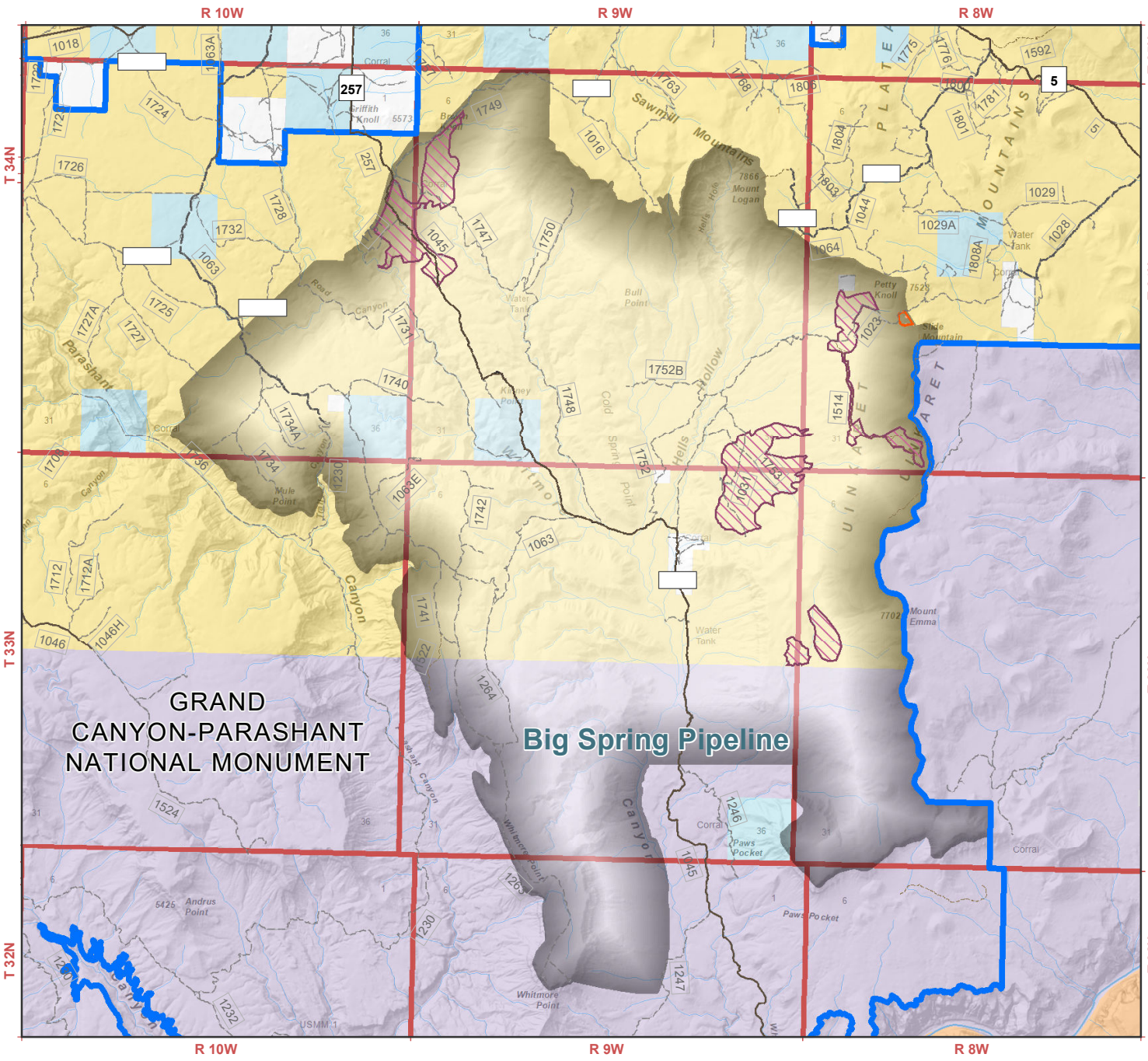
Figure 6 - Big Spring Pipeline Allotment Historic Vegetation Treatments
NEPA Project DOI-BLM-AZ-A030-2023-0002-EA
Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument



- Big Spring Pipeline Allotment
- Big Spring Pipeline Prescribed Burns
- Big Spring Pipeline Mechanical Treatments
- BLM National Monument

Surface Management Agency
- Bureau of Land Management
- National Park Service
- Indian Reservation
- State
- Private

0 0.5 4 6 8 Miles
0 0.5 4 6 8 9 10 11 12 Kilometers

Map Produced by BLM Arizona Strip District
File: V2-Big_Spr_Allotment_veg_tmts.mxd
Coordinate System: NAD 1983 UTM Zone 12N
Reference System: U.S. PLSS GSRB&M
Scale: 1:144,131 at 8.5x11 page output
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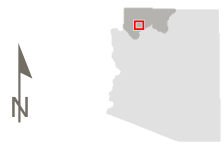

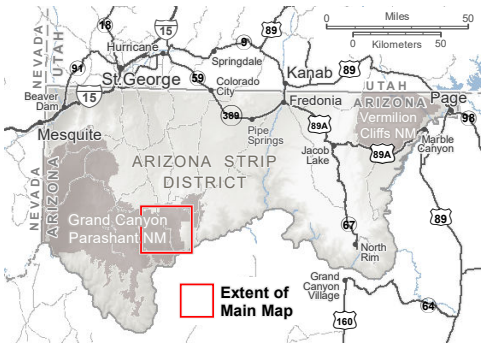

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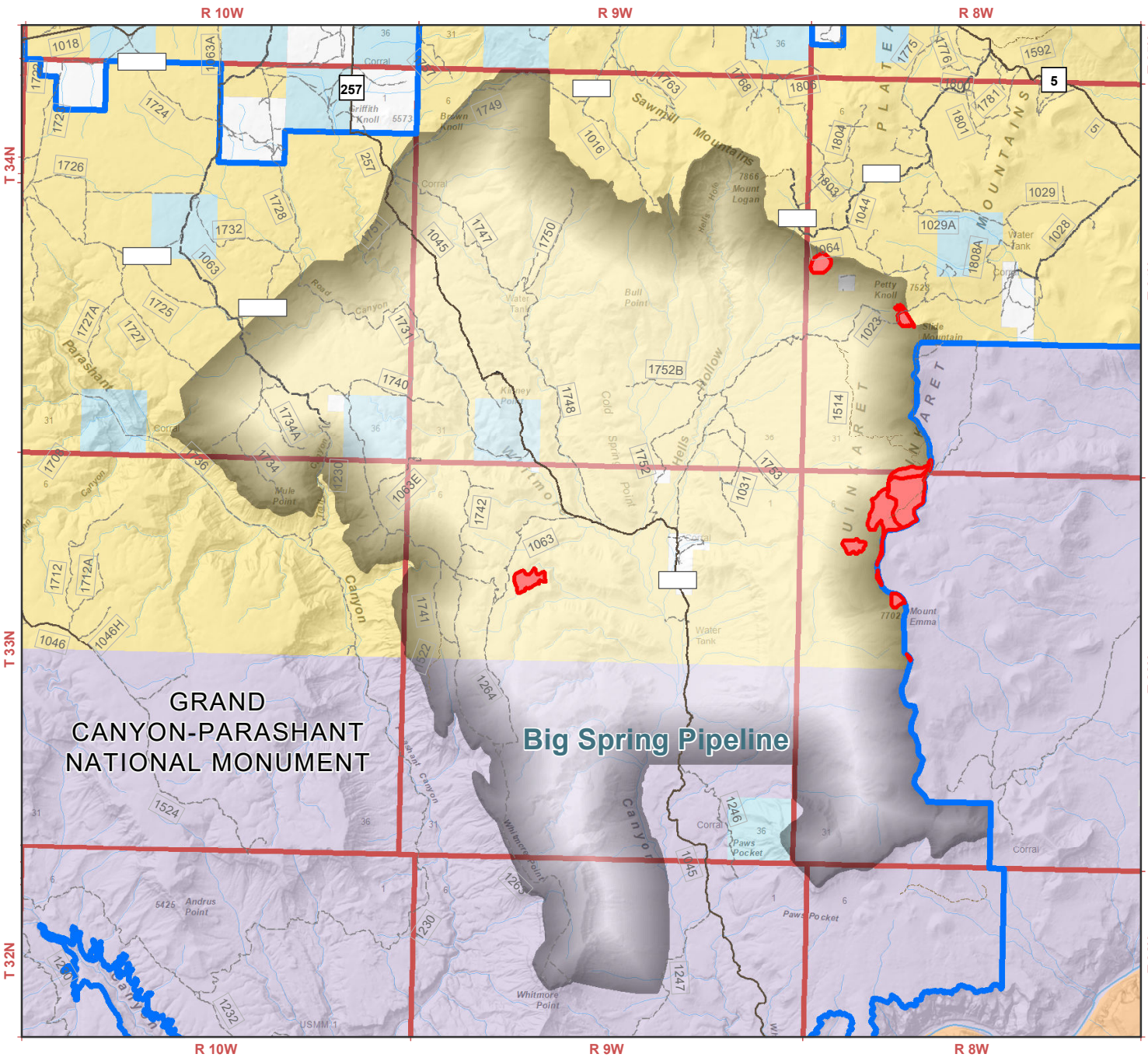
Figure 7 - Big Spring Pipeline Allotment Historic Wildfires
NEPA Project DOI-BLM-AZ-A030-2023-0002-EA
Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument



Map Produced by BLM Arizona Strip District
File: V2-Big_Spr_Allotment_Hist_Wildfires.mxd
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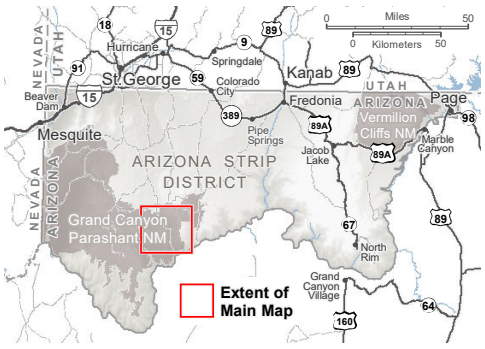

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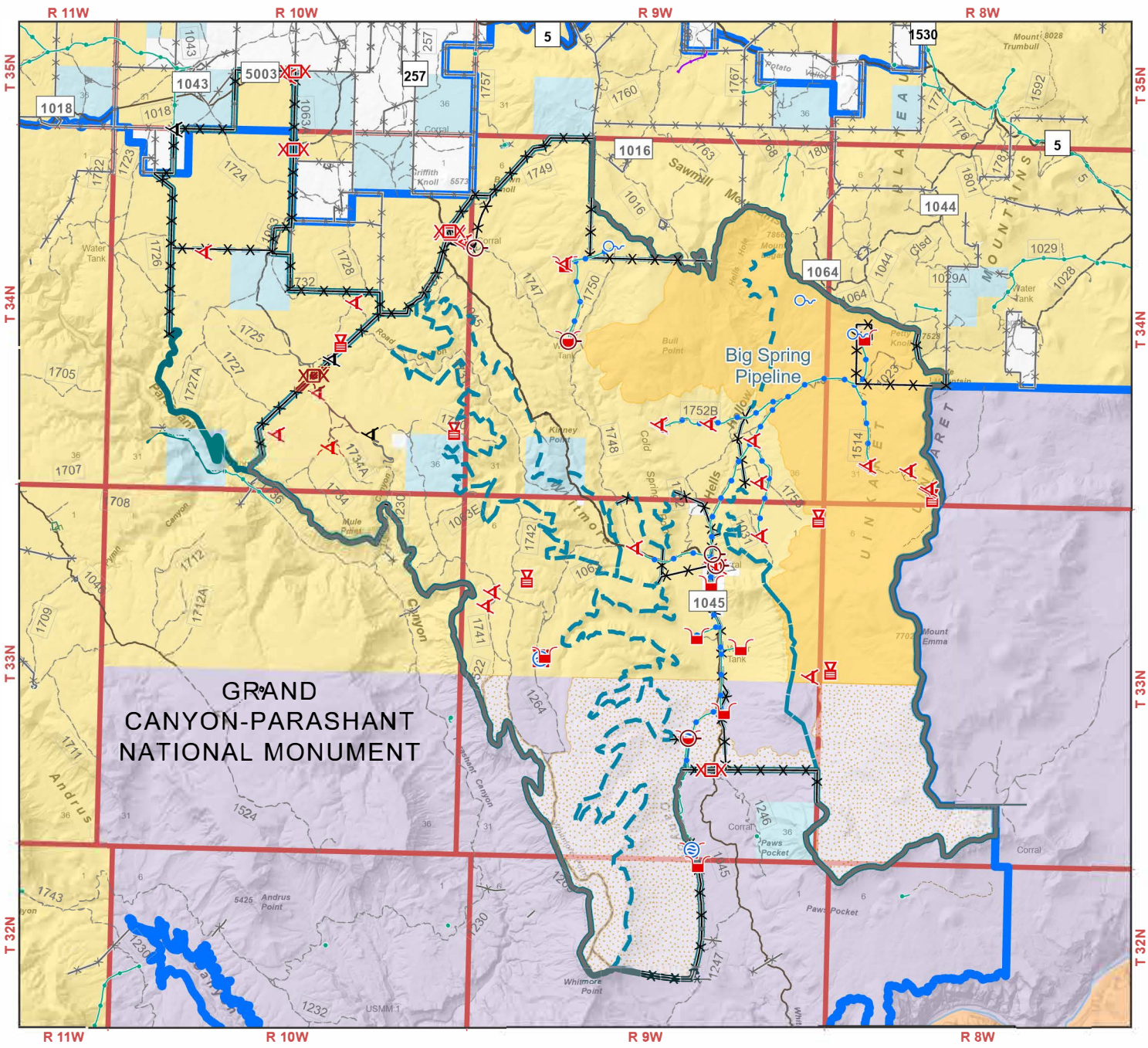
Figure 8 - Belnap and Big Spring Pipeline Existing Range Improvements.

NEPA Project DOI-BLM-AZ-A030-2023-0002-EA

Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument

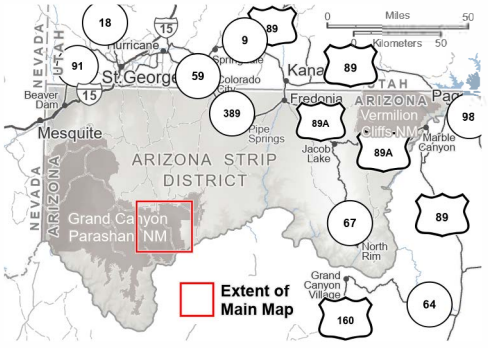


- Unfenced Detention Reservoir
- Trough
- Catchments (includes artificial watersheds, guzzlers, wildlife drinker)
- Cattleguard (Unspecified)
- Corrals and Loading Chutes Not Portable
- Supplemental Storage Tank
- Spring
- Fenced Detention Reservoir
- Fence (Unspecified)
- Pipeline
- Big Spring Pastures
- Big Spring Pipeline Allotment
- BLM Wilderness Area
- Belnap_Allot
- Belnap_Pastures

0 0.5 1 2 3 4 5 6 7 8 9 Miles

0 0.5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Kilometers

Map Produced by BLM Arizona Strip District
File: Belnap and Big Spring EA.mxd
Coordinate System:
Reference System: U.S. PLSS GSRB&M
Scale: 1: at 8.5x11 page output
Date: 4/11/2023



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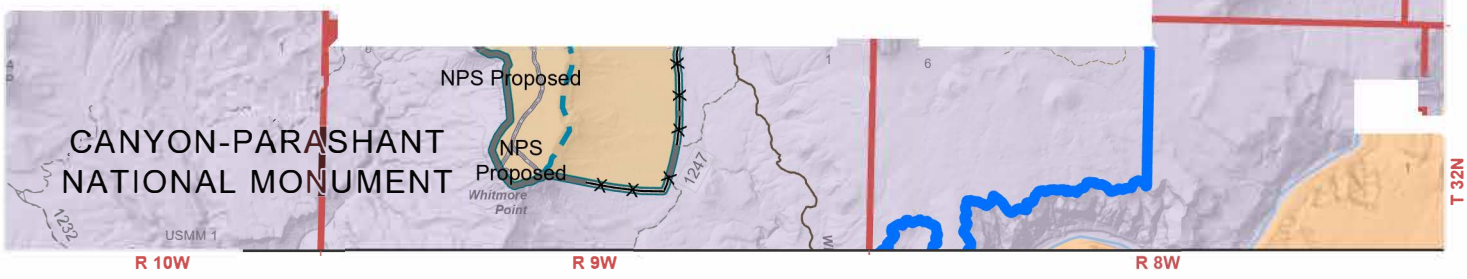

Improvement Type

- Catchments (includes artificial watersheds, guzzlers, wildlife drinker)
- Spring
- Unfenced Detention Reservoir
- Trough
- Supplemental Storage Tank
- Big Spring Pastures
- Big Spring Pipeline Allotment
- NPS Proposed Wilderness
- BLM Wilderness Area

0 0.5 1 2 3 4 5 6 7 Miles

0 0.5 1 2 3 4 5 6 7 8 9 10 11 Kilometers

Map Produced by BLM Arizona Strip District
File: Belnap and Big Spring EA.mxd
Coordinate System:
Reference System: U.S. PLSS GSRB&M
Scale: 1: at 8.5x11 page output
Date: 4/18/2023

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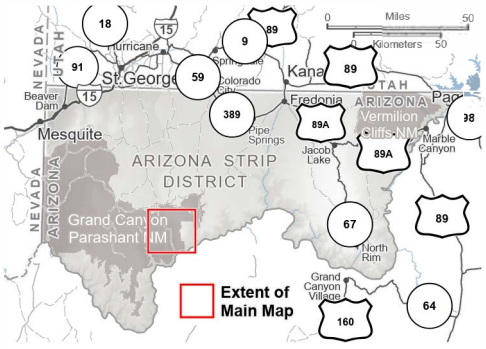
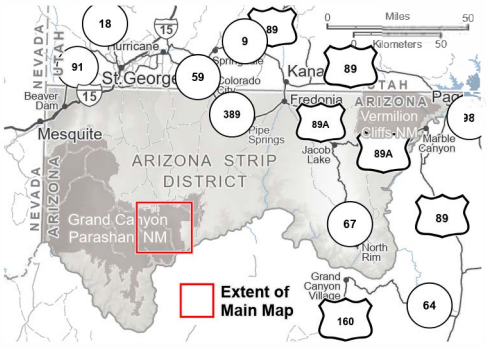


Limy Slopes 6-10" Shallow
Loamy Terrace 17-25" (PIPO)
Loamy Upland 10-14"
Sandy Wash 6-10"
Sedimentary Cliffs 10-14"
Loamy Wash 10-14"

0 0.5 1 2 3 4 5 6 7 8 9 Miles

0 0.5 1 2 3 4 5 6 7 8 9 10 11 12 13 Kilometers

Map Produced by BLM Arizona Strip District
File: Belnap and Big Spring EA.mxd
Coordinate System:
Reference System: U.S. PLSS GSRB&M
Scale: 1: at 8.5x11 page output
Date: 4/18/2023



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Appendix B – Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (BLM 1997).

INTRODUCTION

The Department of the Interior's final rule for Grazing Administration, issued on February 22, 1995, and effective August 21, 1995, requires that Bureau of Land Management (BLM) State Directors develop State or regional standards and guidelines for grazing administration in consultation with BLM Resource Advisory Councils (RAC), other agencies and the public. The final rule provides that fallback standards and guidelines be implemented, if State standards and guidelines are not developed by February 12, 1997. Arizona Standards and Guidelines and the final rule apply to grazing administration on public lands as indicated by the following quotation from the Federal Register, Volume 60, Number 35, page 9955.

> "The fundamentals of rangeland health, guiding principles for standards and the fallback standards address ecological components that are affected by all uses of public rangelands, not just livestock grazing. However, the scope of this final rule, and therefore the fundamentals of rangeland health of §4180.1, and the standards and guidelines to be made effective under §4180.2, are limited to grazing administration."

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

With the commitment of BLM to ecosystem and interdisciplinary resource management, the standards for rangeland health as developed in this current process will be incorporated into management goals and objectives. The standards and guidelines for rangeland health for grazing administration, however, are not the only considerations in resolving resource issues.

The following quotations from the Federal Register, Vol. 60, No. 35, page 9956, February 22, 1995, describe the purpose of standards and guidelines and their implementation:

> "The guiding principles for standards and guidelines require that State or regional standards and guidelines address the basic components of healthy rangelands. The Department believes that by implementing grazing-related actions that are consistent with the fundamentals of §4180.1 and the guiding principles of §4180.2, the long-term health of public rangelands can be ensured.
>
> "Standards and guidelines will be implemented through terms and conditions of grazing permits, leases, and other authorizations, grazing-related portions of activity plans (including Allotment Management Plans), and through range improvement-related activities.

"The Department anticipates that in most cases the standards and guidelines themselves will not be terms and conditions of various authorizations but that the terms and conditions will reflect the standards and guidelines.

"The Department intends that assessments and corrective actions will be undertaken in priority order as determined by BLM.

"The Department will use a variety of data including monitoring records, assessments, and knowledge of the locale to assist in making the "significant progress" determination. It is anticipated that in many cases it will take numerous grazing seasons to determine direction and magnitude of trend. However, actions will be taken to establish significant progress toward conformance as soon as sufficient data are available to make informed changes in grazing practices."

FUNDAMENTALS AND DEFINITION OF RANGELAND HEALTH

The Grazing Administration Regulations, at §4180.1 (43 Code of Federal Regulation [CFR] 4180.1), Federal Register Vol. 60, No. 35, pg. 9970, direct that the authorized officer ensures that the following conditions of rangeland health exist:

(a) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

(c) Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives such as meeting wildlife needs.

(d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This Committee defined Rangeland Health ". . .as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." This

committee emphasized ". . .the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The Committee also recommended that "The determination of whether a rangeland is healthy, at risk, or unhealthy should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

Standards describe conditions necessary to encourage proper functioning of ecological processes on specific ecological sites. An ecological site is the logical and practical ecosystem unit upon which to base an interpretation of rangeland health. Ecological site is defined as:

". . . a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management" (Journal of Range Management, 48:279, 1995). Ecological sites result from the interaction of climate, soils, and landform (slope, topographic position). The importance of this concept is that the "health" of different kinds of rangeland must be judged by standards specific to the potential of the ecological site. Acceptable erosion rates, water quality, productivity of plants and animals, and other features are different on each ecological site.

Since there is wide variation of ecological sites in Arizona, standards and guidelines covering these sites must be general. To make standards and guidelines too specific would reduce the ability of BLM and interested publics to select specific objectives, monitoring strategies, and grazing permit terms and conditions appropriate to specific land forms.

Ecological sites have the potential to support several different plant communities. Existing communities are the result of the combination of historical and recent uses and natural events. Management actions may be used to modify plant communities on a site. The desired plant community for a site is defined as follows: "Of the several plant communities that may occupy a site, the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum." (Journal of Range Management, 48:279, 1995.)

Fundamentals (a) and (b) define physical and biological components of rangeland health and are consistent with the definition of rangeland health as defined by the Committee on Rangeland Classification, Board on Agriculture, National Research Council, as discussed in the paragraph above. These fundamentals provide the basis for sustainable rangelands.

Fundamentals (c) and (d) emphasize compliance with existing laws and regulation and, therefore, define social and political components of rangeland health. Compliance with Fundamentals (c) and (d) is accomplished by managing to attain a specific plant community and associated wildlife species present on ecological sites. These desired plant communities are determined in the BLM planning process, or, where the desired plant community is not identified, a community may be selected that will meet the conditions of Fundamentals (a) and (b) and also adhere to laws and regulations. Arizona Standard 3 is written to comply with Fundamentals (c) and (d) and provide a logical combination of Standards and Guidelines for planning and management purposes.

STANDARD AND GUIDELINE DEFINITIONS

Standards are goals for the desired condition of the biological and physical components and characteristics of rangelands. Standards:

(1) are measurable and attainable; and

(2) comply with various Federal and State statutes, policies, and directives applicable to BLM Rangelands.

Guidelines are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

(1) typically identify and prescribe methods of influencing or controlling specific public land uses;

(2) are developed and applied consistent with the desired condition and within site capability; and

(3) may be adjusted over time.

IMPLEMENTING STANDARDS AND GUIDELINES

The authorized officer will review existing permitted livestock use, allotment management plans, or other activity plans which identify terms and conditions for management on public land. 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 significant progress toward meeting, the standards and are in conformance with the guidelines. The review will be interdisciplinary and conducted under existing rules which provide for cooperation, coordination, and consultation with affected individuals, federal, state, and local agencies, tribal governments, private landowners, and interested publics.

This review will use a variety of data, including monitoring records, assessments, and knowledge of the locale to assist in making the significant progress determination. Significance will be determined on a case by case basis, considering site potential, site condition, weather and financial commitment. It is anticipated there will be cases where numerous years will be needed to determine direction and magnitude of trend.

Upon completion of review, the authorized officer shall take appropriate action as soon as practicable but no later than the start of the next grazing year upon determining that the existing grazing management practices or level of use on public land are significant factors contributing to failure to achieve the standards and conform with the guidelines that are made effective under 43 CFR 4180.2. Appropriate action means implementing actions that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with guidelines.

Livestock grazing will continue where significant progress toward meeting standards is being made. Additional activities and practices would not be needed on such allotments. Where new activities or practices are required to assure significant progress toward meeting standards, livestock grazing use can continue contingent upon determinations from monitoring data that the implemented actions are effective in making significant progress toward meeting the standards. In some cases, additional action may be needed as determined by monitoring data over time.

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

ARIZONA STANDARDS AND GUIDELINES

Arizona Standards and Guidelines (S&G) for grazing administration have been developed through a collaborative process involving the Bureau of Land Management State S&G Team and the Arizona Resource Advisory Council. Together, through meetings, conference calls, correspondence, and Open Houses with the public, the BLM State Team and RAC prepared Standards and Guidelines to address the minimum requirements outlined in the grazing regulations. The Standards and Guidelines, criteria for meeting Standards, and indicators are an integrated document that conforms to the fundamentals of rangeland health and the requirements of the regulations when taken as a whole.

Upland sites, riparian-wetland areas, and desired resource conditions are each addressed by a standard and associated guidelines.

Standard 1: Upland Sites

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

Criteria for meeting Standard 1:

Soil conditions support proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including appropriate amounts of vegetative cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the potential of the site.

Ground cover in the form of plants, litter or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

As indicated by such factors as:

- Ground Cover
- litter
- live vegetation, amount and type (e.g., grass, shrubs, trees, etc.)
- rock
- Signs of erosion
- flow pattern

gullies
rills
plant pedestaling

Exceptions and exemptions (where applicable): none

Guidelines:

1-1. Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites within management units. The ground cover should maintain soil organisms and plants and animals to support the hydrologic and nutrient cycles, and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

1-2. When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

Standard 2: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

Criteria for meeting Standard 2:

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

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

The checklist for riparian areas is in Technical Reference 1737-9 "Process for Assessing Proper Functioning Condition." The checklist for wetlands is in Technical Reference 1737-11 "Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas."

As indicated by such factors as:

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

Dissipation of energy by vegetation

Exceptions and exemptions (where applicable):

Dirt tanks, wells, and other water facilities constructed or placed at a location for the purpose of providing water for livestock and/or wildlife and which have not been determined through local planning efforts to provide for riparian or wetland habitat are exempt.

Water impoundments permitted for construction, mining, or other similar activities are exempt.

Guidelines:

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.

2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

2-3. The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

Standard 3: Desired Resource Conditions

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

Criteria for meeting Standard 3:

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

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

As indicated by such factors as:

Composition
Structure
Distribution

Exceptions and exemptions (where applicable):

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

Guidelines:

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

3-2. Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance or restoration of their habitats.

3-3. Management practices maintain, restore, or enhance water quality in conformance with State or Federal standards.

3-4. Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant community objectives.

3-5. Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;

sufficient surface and subsurface soil moisture exists for continued plant growth;

serviceable waters are capable of providing for proper grazing distribution;

sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and

monitoring is conducted during grazing to determine if objectives are being met.

3-6. Management practices will target those populations of noxious weeds which can be controlled or eliminated by approved methods.

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

Appendix C – Belnap and Big Spring Pipeline Utilization and Monitoring Data

Belnap Allotment Updated Monitoring Data

Actual Use

Actual use as reported by the permittee annually. Total active preference for the allotment is 734 AUMs. Average annual AUMs used, during the ten-years 2010 – 2020, was 573 which is 78% of the total available. AUMs used ranged from 65% in 2013 to 90% in 2012.

Actual use was determined by annual actual use reports submitted to BLM. Total active preference for the allotment is 2,671 AUMs through 2006. In 2006, one pasture was transferred from this permittee and allotment which reduced the AUMs to 2557.

In the past decade, the permittee transports most of their cattle from public lands to private pasture between mid-spring to late summer. This gives all pastures in both the Belnap and Big Spring Pipeline allotments rest through the majority of the growing season.

Table C.1. Belnap Allotment Actual Use

Grazing Year	AUMs Used	Percent of Authorized AUMs Used
1986	320	60%
1987	441	83%
1988	440	82%
1989	456	85%
1990	343	64%
1991	0	0%
1992	334	63%
1993	237	44%
1994	352	66%
1995	408	76%
1996	461	86%
1997	376	70%
1998	428	80%
1999	405	76%
2000	400	75%
2001	0	0%
2006	388	73%
2007	276	52%
2008	0	0%
2009	213	40%
2010	0	0%
2011	203	38%
2012	0	0%
2013	208	39%
2014	124	23%

Grazing Year	AUMs Used	Percent of Authorized AUMs Used
2015	363	68%
2016	175	33%
2017	225	42%
2018	340	64%
2019	209	39%
2020	0	0%
2021	0	0%
2022	458	86%

Table C.2. Big Spring Pipeline Actual Use.

Grazing Year	AUMs Used	Percent of Authorized AUMs Used
1986	2,092	78%
1987	2,055	77%
1988	1,731	65%
1989	2,277	85%
1990	1,840	69%
1991	1,648	62%
1992	1,593	60%
1993	1,593	60%
1994	934	35%
1995	1,767	66%
1996	1,672	63%
1997	994	37%
1998	2,059	77%
1999	2,284	86%
2000	2,033	76%
2001	1,488	56%
2002	1,256	47%
2003	967	36%
2004	772	30%
2005	980	38%
2006	903	35%
2007	289	11%
2008	910	36%
2009	715	28%
2010	995	39%
2011	1360	53%
2012	1195	47%
2013	954	37%
2014	642	25%
2015	340	13%
2016	714	28%

Grazing Year	AUMs Used	Percent of Authorized AUMs Used
2017	994	39%
2018	600	23%
2019	768	30%
2020	571	22%
2021	552	22%
2022	1113	44%

Utilization

Utilization is defined as the proportion of the current year's forage production that is consumed or destroyed by grazing animals (both livestock and wildlife). The Grazed-Class Method was used to collect the data (Section 4.3.4 Monitoring). Utilization is read at or around key areas. Average utilization levels of key forage species for this allotment should not exceed 50% (BLM 2008a). Utilization data from 1992 – 2021 has been compiled in the following tables. Tables C.3 - C.10 show percent utilization of key forage species by year read at each key area. Average percent utilization by year is calculated by averaging the utilization readings for all key species read in a given year at a specific key area. No average utilization readings above 45% were recorded at any of the key areas. ND = No data collected, NU = Non-use, meaning livestock did not graze the pasture.

Table C.3. Belnap Allotment - North Pasture Utilization – Key Area #1

Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2006	2010	2011	2013	2014	2015	2017	2018	2019	2020	2021 & 22	Average
SPCR	38	32	52	44	57	43	36	33	43	38	0	18	25	23	16	10	0	10	10	0	26
SIHY	40	36	56	46	46	47	39	43	50	33	0	3	24	14	50	25	ND	10	10	0	30
BOER	23	32	48	36	48	41	36	27	33	39	0	ND	ND	ND	ND	ND	ND	ND	ND	0	33
HIJA/BOGR	20	36	35	41	55	42	38	34	46	32	0	0	2	5	11	10	10	10	10	0	22

Table C.4. Belnap Allotment – Belnap South Pasture - Utilization- Key Area #2

Species	1992	1993	1994	1995	1996	1997	1998	1999	2000	2002	2006	2010	2011	2013	2014	2015	2017	2018	2019	2020	2021 & 22	Average
SPCR	34	50	54	46	57	47	43	31	44	8	35	0	10	17	8	29	10	0	10	10	0	26
SIHY	22	18	51	43	60	42	45	33	49	17	38	0	0	45	36	49	10	0	10	10	0	28
BOER	17	22	47	33	44	37	34	24	43	31	27	0	0	ND	ND	ND	ND	ND	ND	ND	ND	28
HIJA/BOGR	8	38	51	40	40	45	45	43	54	16	44	0	0	10	0	27	10	0	10	10	0	23
ORHY	ND	ND	51	43	60	42	45	33	49	24	43	0	23	41	56	43	20	ND	ND	ND	ND	38

Table C.5. Big Spring Pipeline Allotment – Whitmore Point Pasture Key Species Utilization-Key Area #4

Species	1990	1992	1994	1998	1999	2000	2001	2002	2003	2013	2014	2018	2019	2020	2021 & 22	Average
HIJA	70	32	26	24	47	43	22	38	15	30	47	8	18	45	ND	33
SPCR	ND	16	25	25	50	44	37	34	11	50	27	ND	ND	47	ND	33
SIHY	ND	24	37	24	36	43	30	24	13	52	36	20	10	42	ND	30
ATCA	ND	50	37	18	58	48	38	44	25	53	50	14	20	48	ND	39

Table C.6. Big Spring Pipeline Allotment – Airstrip Pasture – Key Species Utilization – Key Area #5

Species	1990	1994	1997	1998	1999	2000	2001	2002	2003	2010	2013	2014	2018	2019	2020	2021	2022	Average
HIJA	62	45	NU	43	41	45	41	25	29	26	12	0	1	0	10	0	30	25
SPCR	64	53	NU	46	40	46	36	21	30	66	23	0	0	0	10	0	30	29
ATCA	ND	43	NU	48	38	47	44	43	33	10	30	ND	3	0	21	0	30	28
EPNE	ND	43	NU	49	40	46	59	41	23	41	30	19	5	0	21	0	30	30

Table C.7. Big Spring Pipeline Allotment – Upper Cole Pasture Utilization - Key Area #6

Species	1990	1991	1992	1994	1996	1997	1998	1999	2000	2001	2002	2003	2010	2014	2015	2018	2019	2020	2021	2022	Average
HIJA	51	28	14	37	41	21	10	46	NU	NU	32	35	0	10	8	0	10	20	0	10	21
BOGR	54	38	21	30	42	17	5	43	NU	NU	7	26	0	0	4	0	10	20	0	10	19
SIHY	ND	15	21	18	43	24	10	37	NU	NU	31	41	0	0	8	0	10	20	0	10	17
EPVI	ND	39	11	23	31	22	10	38	NU	NU	38	26	0	9	2	10	20	20	0	10	19

The Cole pasture has two key areas. The data displayed above represents upper Cole. The highest utilization recorded on key species occurred in 1999 at 41%. Use levels on individual key species above 50% did not occur during the evaluation period. The overall pasture average for all key species utilization is 8%.

Table C.8. Big spring Pipeline Allotment – Lower Cole Pasture Utilization - Key Area #7

Species	1990	1991	1994	1997	1999	2000	2001	2002	2003	2010	2013	2014	2018	2019	2020	2021	2022	Average
HIJA	44	37	44	43	37	36	NU	41	36	0	4	0	13	20	30	ND	38	28
SPCR	ND	38	49	44	34	31	NU	38	35	0	6	3	11	20	30	ND	40	26
SIHY	ND	ND	ND	43	40	29	NU	37	35	0	ND	ND	ND	ND	ND	ND	ND	31
BOGR	ND	ND	ND	32	25	24	NU	0	21	0	ND	ND	ND	ND	ND	ND	ND	17
ATCA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	21	3	10	10	ND	20	9
EPNE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	16	8	10	10	ND	10	10

Utilization at the lower Cole key area reached its highest levels in 1994 at 47%. Utilization on individual key species above the 50% allowable did not occur during the evaluation period. Overall utilization average is 38%.

Table C.9. Big Spring Pipeline Allotment - Lava Pasture Utilization - Key Area #10

Species	1994	1995	1997	1998	1999	2000	2001	2002	2003	2010	2013	2014	2015	2018	2019	2020	2021	2022	Average
HIJA	44	NU	33	23	40	37	NU	NU	NU	35	39	4	0	3	20	40	0	23	24
SPCR	53	NU	33	20	43	39	NU	NU	NU	44	45	8	0	3	17	43	0	20	27
EPNE	36	NU	37	25	55	30	NU	NU	NU	30	13	40	0	6	20	40	0	17	26
ATCA	ND	ND	ND	ND	ND	ND	ND	ND	ND	38	45	53	0	4	20	40	0	17	25

Utilization on individual key species above the 45% allowable occurred in 1994 and 1999 during the evaluation period. The highest utilization on all key species happened also in 1994 and 1999 at 45%. The Lava pasture combined utilization average is 36%.

Table C.10. Big Spring Pipeline Allotment – Chaparral Pasture Utilization - Key Area #11

Species	1998	1999	2000	2001	2002	2003	2013	2014	2018	2019	2020	2021	2022	Average
HIJA	48	38	39	NU	32	38	41	0	5	30	40	ND	41	31
SPCR	49	34	37	NU	35	38	11	0	7	30	40	ND	30	28
BOER	52	33	38	NU	34	31	12	0	5	17	23	ND	30	25
EPNE	ND	ND	ND	ND	ND	ND	46	0	5	30	30	ND	34	22

Key species utilization above 45% occurred once in 1998. In 1998, the highest utilization for all key species also occurred at 50%. The overall average for the Chaparral pasture is 38%.

Trend

Trend monitoring was conducted at two key areas in the Belnap Allotment. There are two pastures within the Belnap Allotment, the Belnap North Pasture and the Belnap South Pasture. There is one key area in each pasture (See Appendix A, Figure 2).

Data was collected using the Pace-Frequency method (Section 4.3.4 Monitoring). This method of monitoring measures the percent of bare ground, litter, rock and live vegetation/basal cover. In addition, this measures the presence and frequency of plant species. Key Areas #1 and #2 were established in 1982.

The trend of an area may be judged by noting changes in vegetation attributes such as species composition, density, cover, production, and frequency. Vegetation data is collected at different points in time on the same key area, and the results are then compared to detect change.

The key species frequency, which is the ratio between the number of sample units that contain key species and the total number of sample units, compares the most recent data to the base year. Detailed tables for each key area with data by year and species is available below in Tables C.6 - C.13. Overall trend at a key area is determined by assessing the sum percentages of the following attributes: key species, live vegetation cover/basal cover, and ground cover (surface litter). Both basal cover and surface litter are important attributes when evaluating Standard #1 (Upland Sites) of the Arizona Standards for Rangeland Health (Appendix B, BLM 1997). Overall trend at a key area is the direction of change in frequency observed between the initial reading (base year) and the current reading, as depicted by up, down, and no apparent change or static. The threshold for a change in trend is +/- 10 percent.

Ecological Site Inventory

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 DPC then becomes the objectives by which management actions would be measured (Section 3.4.2.3 DPC).

The "Dry Weight Rank" vegetative sampling method is used to determine species composition (4.3.4 Monitoring). The present composition and the potential for each key species are used to set composition objectives. The potential composition is determined by the applicable soil type and precipitation zone. These potentials are described in Ecological Site Guides provided by the Natural Resources Conservation Service.

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.

Table C.11. Belnap Allotment - North Pasture Frequency Trend #1

Ground Cover	07/07/82	08/14/84	09/30/87	09/20/90	10/21/93	10/12/07	08/29/11	09/14/16	08/16/21
Cryptogam							3	1	1
Litter	31	18	31	31	37	26	16	33	27
Live Basal Veg.	2	5	7	6	9	4	6	4	4
Key Species									
Achnatherum hymenoides			1	1		1	4	2	3
Bouteloua gracilis	34	31	31	33	21	16	24	25	25
Bouteloua eriopoda		1	3	4				1	
Elymus elymoides	2	3	8	13	11	8	19	20	13
Hilaria jamesii	36	27	41	45	43	27	31	44	23
Sporobolus cryptandrus		3	28	37	12	8	3	14	1
Hesperostipa comata	1	1	4	6	2		1	2	
Total	106	89	154	176	135	90	107	146	97

Overall Trend for Belnap North Key Area #1: Static.

Table C.12 Belnap Allotment – Ground Cover – South Frequency Trend #2

Ground Cover	07/07/82	12/04/86	09/29/88	09/19/91	10/21/93	10/12/07	09/01/11	09/14/16	08/09/21
Cryptogam						2			
Litter	28	38	41	29	41	26	37	50	36
Live Basal Veg.	4	8	8	20	11	11	8	5	16
Key Species									
Bouteloua gracilis	49	57	54	62	58	55	62	57	65
Hilaria jamesii	11	11	19	15	9	18	30	14	16
Elymus elymoides	2	15	19	4	4	5	33	6	
Sporobolus cryptandrus		13	12	14	19	10	10	21	
Total	94	142	153	144	142	127	180	153	133

Overall Trend for Belnap South Key Area #2: Upward.

Table C.13. Big Spring Pipeline – Whitmore Frequency Trend #4

Ground Cover	09/20/84	11/13/87	01/23/90	09/16/03	11/19/08	11/12/13	11/07/18
Cryptogam					1		
Litter	20	38	21	19	53	28	37
Live Basal Veg.	3	4	15	12	2	4	5
Key Species							
Bouteloua eriopoda		1			1	1	1
Hilaria jamesii	47	31	15	21	18	27	20
Oryzopsis hymenoides	1	4		1	1	1	2
Sitanion hystrix	12	25	4	13	5	15	
Sporobolus cryptandrus	6	3		6	1	3	
Total	89	106	55	72	82	79	65

Overall Trend for Whitmore Key Area #4: Down.

Table C.14. Big Spring Pipeline – Airstrip Frequency Trend #5

Ground Cover	09/20/84	01/11/90	02/02/00	12/04/03	11/17/08	11/14/13	11/06/18
Litter	21	3	30	36	39	35	17
Live Basal Veg.	6	2	8	2	5	8	20
Key Species							
Hilaria jamesii	32	45	34	10	15	27	32
Bouteloua eriopoda	2	3	4	1		2	
Sporobolus cryptandrus	23	8	29	3	4	24	9
Ephedra viridis	1	1	3	2	5	5	5
Total	84	61	105	52	63	96	78

Overall Trend for Airstrip Key Area #5: Static.

Table C.15. Big Spring Pipeline – Upper Cole (Cold Spring) Frequency Trend #6

Ground Cover	09/20/84	01/10/90	12/02/03	11/19/08	11/12/13	11/06/18
Litter	26	23	18	36	28	28
Live Basal Veg.	4	12	17	3	2	1
Key Species						
Hilaria jamesii	30	9	6	15	11	
Bouteloua gracilis	14	17	1	5	2	11
Sitanion hystrix	2			1	2	1
Total	76	61	42	60	45	41

Overall Trend for Upper Cole Key Area #6: Down.

Table C.16. Big Spring Pipeline – Lower Cole (Whitmore Canyon) Frequency Trend #7

Ground Cover	01/10/90	11/06/97	12/02/03	11/17/08	11/13/13	11/06/18
Cryptogam				2		
Litter	5	30	36	30	35	39
Live Basal Veg.	2	11	2	4	10	7
Key Species						
Bouteloua eriopoda					1	
Hilaria jamesii	49	44	42	50	75	61
Sporobolus cryptandrus	45	17	24	36	35	48
Total	101	102	104	122	156	155

Overall Trend for Lower Cole Key Area #7: Upward.

Table C.17. Big Spring Pipeline – Airstrip Frequency Trend #8 (no longer read due to existing trend (#5) in the Airport/Airstrip Pasture

Ground Cover	07/25/90	11/06/97	02/02/00	11/17/08
Litter	15	25	49	47
Live Basal Veg.	3	4	2	2
Key Species				
Hilaria jamesii	11	12	14	4
Sporobolus cryptandrus	33	19	41	7
Total	29	41	65	53

Overall Trend for Airstrip Key Area #8: Upward.

Table C.18. Big Spring Pipeline – Big Spring Frequency Trend #9.

Ground Cover	01/24/90	12/02/03	11/17/08	11/12/13	11/07/18
Cryptogam					
Litter	19	25	28	38	35
Live Basal Veg.	19	11	5	2	1
Key Species					
Bouteloua curtipendula				1	
Oryzopsis hymenoides				1	4
Sitanion hystrix		2	10	28	
Total	38	38	43	70	40

Overall Trend for Big Spring Key Area #9: Static.

Table C.19. Big Spring Pipeline – Lava Frequency Trend #10.

% Ground Cover	07/25/90	11/06/97	12/04/03	10/25/07	11/13/13	11/06/18
Cryptogam						
Litter	4	29	32	28	59	11
Live Basal Veg.	8	8	2	6	1	21
Key Species						
Hilaria jamesii	13	12	2	14	5	4
Sporobolus cryptandrus	28	2	2	12	87	77
Bouteloua eriopoda	75	79	18	23	17	27
Total	128	130	56	83	169	140

Overall Trend for Lava Key Area #10: Upward.

Table C.20. Big Spring Pipeline – Chaparral Frequency Trend #11.

% Ground Cover	07/27/90	11/06/97	12/04/03	12/11/08	11/14/13	11/07/18
Litter	6	11	2	26	57	13
Live Basal Veg.	3	8	1	2	1	16
Key Species						
Ephedra nevadensis	10	8	7	7	10	10
Hilaria jamesii	18	15	6	17	23	19
Bouteloua eriopoda	18	33	15	28	26	36
Sporobolus cryptandrus	58	36	3	23	34	14
Total	113	111	34	103	151	108

Overall Trend for Chaparral Key Area #11: Static.

Appendix D – Minimum Requirements Decision Guide (MRDG).

Under NPS policy (2006), Section 6.3.4.3 Environmental Compliance "...proposals having the potential to impact wilderness resources will be evaluated in accordance with NPS procedures for implementing the National Environmental Policy Act. Section 6.3.5 Minimum Requirement states that "All management decisions affecting wilderness must be consistent with the minimum requirement concept. This concept is a documented process used to determine if administrative actions, projects, or programs undertaken by the Service or its agents and affecting wilderness character, resources, or the visitor experience are necessary, and if so how to minimize impacts."

BLM Manual 6340 – Management of Designated Wilderness Areas (Public) (BLM 2012) provides BLM managers and staff with the general policies for administration and management of BLM Wilderness Areas designated by Congress.

The following MRDG meets agency policy requirements to ensure the congressional mandate to manage each Wilderness Area "to preserve its wilderness character" will be met.

ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE WORKBOOK

"…except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act…"

-- The Wilderness Act of 1964

Project Title: Belnap and Big Spring Pipeline Allotments Grazing Permit Renewal Environmental Assessment DOI-BLM-AZ-A030-2023-0002-EA/PEPC 111150

MRDG Step 1: Determination

*Determine if Administrative Action is **Necessary***

Description of the Situation
What is the situation that may prompt administrative action?

A grazing permit renewal application has been received from Superior Cattle, LLC. the current permittee, to renew the ten-year grazing permit on the Belnap Allotment (AZ04849) and Big Spring Pipeline Allotment (AZ04870). The ten-year permit would apply to both NPS and BLM managed lands within the two allotments. The need for the proposed action is for the permittee to be able to continue livestock grazing on the allotments through utilization of forage at proper use levels. A key component of the grazing permit includes maintenance of existing grazing infrastructure to control cattle movement and supply water.

Options Outside of Wilderness
Can action be taken outside of wilderness that adequately addresses the situation?

☐ YES **STOP – DO NOT TAKE ACTION IN WILDERNESS**
☒ NO **EXPLAIN AND COMPLETE STEP 1 OF THE MRDG**

Explain:
Big Spring Pipeline Allotment includes both proposed and designated wilderness where cattle graze and needed infrastructure exists.

Criteria for Determining Necessity
Is action necessary to meet any of the criteria below?

A. Valid Existing Rights or Special Provisions of Wilderness Legislation
*Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that **requires** action? Cite law and section.*

☒ YES ☐ NO

Explain: The Wilderness Act of 1964, Section 4(d)(4)(2) "The grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture."

B. Requirements of Other Legislation
*Is action necessary to meet the requirements of **other federal laws**? Cite law and section.*

☒ YES ☐ NO

Explain: The Taylor Grazing Act of 1934 and the Federal Land Policy and Management Act of 1976 provide for livestock grazing use of the public lands that have been classified as available for grazing. Grazing use must be consistent with good range management aimed at conservation and protection of the natural and cultural resources.

43 Code of Federal Regulations PART 6300—MANAGEMENT OF DESIGNATED WILDERNESS AREAS §6304.25 What special provisions apply to livestock grazing? (a) If you hold a BLM grazing permit or grazing lease for land within a wilderness area, you may continue to graze your livestock provided that you or your predecessors began such use under a permit or lease before Congress established the wilderness area. (b) Your grazing activities within wilderness areas, including the construction, use, and maintenance of livestock management improvements, must comply with the livestock grazing regulations in part 4100 of this chapter.
Public Rangelands Management Act of 1995 Section 852 104 Congress requires a cooperative agreement for installation and maintenance of range improvements on public land. Failure to comply with a term, condition, or stipulation of a range improvement cooperative agreement or range improvement permit may result in penalties including:
(A) withhold issuance of a grazing permit or lease.
(B) suspend the grazing use authorized under a grazing permit or lease, in whole or in part;
(C) cancel a grazing permit or lease and grazing preference, or other grazing authorization, in whole or in part.

In addition, Grand Canyon-Parashant National Monument Proclamation 7265 (114 Stat 3236) states: "The Bureau of Land Management shall continue to issue and administer grazing leases within the portion of the monument within the Lake Mead National Recreation Area, consistent with the Lake Mead National Recreation Area authorizing legislation. Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply to the remaining portion of the monument."

C. Wilderness Character

Is action necessary to preserve one or more of the five qualities of wilderness character?

UNTRAMMELED

☐ YES ☒ NO

Explain: This project is not necessary to preserve the untrammeled wilderness character.

UNDEVELOPED

☐ YES ☒ NO

Explain: This project is not necessary to preserve the undeveloped wilderness character.

NATURAL

☐ YES ☒ NO

Explain: This project is not necessary to preserve the natural wilderness character.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

☐ YES ☒ NO

Explain: This project is not necessary to preserve the solitude or primitive and unconfined recreation wilderness character.

OTHER FEATURES OF VALUE

☒ YES ☐ NO

Explain: Per the Grand Canyon-Parashant National Monument General Management Plan/Resource Management Plan "Sustainable, traditional ranching operations and associated interpretive activities showcase the Monument's historical lifestyles and enhance visitor experience." (pg 1-23)

Step 1 Determination
*Is administrative action **necessary** in wilderness?*

Criteria for Determining Necessity

A. Existing Rights or Special Provisions	☒ YES ☐ NO
B. Requirements of Other Legislation	☒ YES ☐ NO
C. Wilderness Character	
Untrammeled	☐ YES ☒ NO
Undeveloped	☐ YES ☒ NO
Natural	☐ YES ☒ NO
Solitude/Primitive/Unconfined	☐ YES ☒ NO
Other Features of Value	☒ YES ☐ NO

Is administrative action **necessary** in wilderness?
☒ YES **EXPLAIN AND COMPLETE STEP 1 OF THE MRDG**
☐ NO **STOP – DO NOT TAKE ACTION IN WILDERNESS**

Explain:
The current allotment boundaries included in the proposed action to renew the grazing permit on the Belnap Allotment (AZ04849) and Big Spring Pipeline Allotment (AZ04870) encompass areas within both Mount Logan Wilderness and NPS proposed wilderness. Several pieces of legislation, including the Wilderness Act of 1964, direct that grazing activities "shall be permitted to continue within wilderness subject to reasonable regulations, policies, and practices" if they occurred prior to the designation of the wilderness.

MRDG Step 2

*Determine the **Minimum** Activity*

Other Direction
*Is there "special provisions" language in legislation (or other Congressional direction) that explicitly **allows** consideration of a use otherwise prohibited by Section 4(c)?*

AND/OR

Has the issue been addressed in agency policy, management plans, species recovery plans, or agreements with other agencies or partners?

☒ YES **DESCRIBE OTHER DIRECTION**
☐ NO **SKIP AHEAD TO TIME CONSTRAINTS BELOW**

Describe Other Direction:

Grand Canyon Parashant National Monument General Management Plan/ Resource Management Plan (2008a) page 2-75:

> LA-GM-01- On BLM-administered lands, 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…
>
> MA-GM-01- On NPS-administered lands, livestock grazing will be administered within NPS policy, the proclamation, and Lake Mead NRA enabling legislation, and verified through the Vital Signs monitoring program. On NPS-administered lands, when appropriate, the implementation of BLM standards and guidelines may be modified for use on NPS-administered lands by incorporating NPS Vital Signs initiatives. Any land health standards applied on NPS-administered lands will be in compliance with NPS Management Policies (2006).

The Mt. Trumbull - Mt. Logan Wilderness Management Plan (1990) addresses grazing infrastructure:

> Management does not consider new structures or planned ignition fires as methods to achieve program objectives. As any existing structures require major reconstruction or costly maintenance, strong consideration is given to relocating the development outside the wilderness.

Under this plan, the majority of existing range improvement maintenance activities were determined to be non-motorized, however the plan allows for consideration for a motorized alternative if needed through the minimum tools and NEPA processes.

Time Constraints
What, if any, are the time constraints that may affect the action?

None

Components of the Action
What are the discrete components or phases of the action?

Component 1: Transportation of personnel to project site
Component 2: Transportation of materials to project site
Component 3: Fence maintenance
Component 4: Trough maintenance
Component 5: Pipeline maintenance
Component 6: Water catchment maintenance
Component 7: Spring maintenance
Component 8: Unfenced detention reservoir maintenance
Component 9: Storage tank maintenance
Component 10: Transportation of materials from site
Component 11: Transportation of personnel from site
Component 12: Livestock Grazing
Component 13: Existing Infrastructure

Proceed to the alternatives.
Refer to the **MRDG Instructions** regarding alternatives and the effects to each of the comparison criteria.

MRDG Step 2: Alternatives

Alternative 1: Alternative A – Proposed Action Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

Description of the Alternative
What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Associated maintenance of existing facilities and improvements relevant to the grazing operation would be required and authorized. On an as-needed basis, existing range infrastructure would be maintained.

Fence maintenance would be composed of replacement of posts, wire, braces, stays, gates and clearing vegetation from encroachment on and accessing the improvement. All fences would be "wildlife-friendly".

Authorized grazing would consist of the combining the Belnap and Big Spring Pipeline Allotments into one allotment that would then be renamed Big Spring Pipeline Allotment. The Belnap North and South pastures would become the Big Spring Pipeline Allotment North and South pastures. This would include extending the season of use from the current 12/1 – 5/15 use to year-round use in what is now the Belnap Allotment. This would allow grazing rotation between nine pastures rather than the current seven. There would be no proposed change in the total number of Animal Unit Months (AUM), limited to the current active preference and suspended AUMs for either allotment.

Water infrastructure maintenance would be composed of cleaning reservoirs, maintenance and/or replacement of troughs, pipelines, storage tanks and springs to maintain storage and water flow. Additional valves, floats, monitoring equipment may be replaced or installed at each location. Pipeline maintenance would involve replacement of pipeline and replacement or repair of valves. Replacement infrastructure components such as troughs and tanks would be hauled to the site and when possible, old infrastructure would be removed from site.

Component Activities
How will each of the components of the action be performed under this alternative?

Comp #	Component of the Action	Activity for this Alternative
1	Transportation of personnel to project site.	Personnel travel on established routes and then by foot or horseback to project sites.
2	Transportation of materials to project site.	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.
3	Fence maintenance	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.
4	Trough maintenance	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.
5	Pipeline maintenance	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.
6	Water catchment maintenance	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.
7	Spring maintenance	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.
8	Unfenced detention reservoir maintenance	Use skid steer, backhoe, or front-end loader to remove debris and silt.
9	Storage tank maintenance	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.
10	Transportation of materials from site	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.
11	Transportation of personnel from site	Personnel travel by foot from project sites and then on established routes.
12	Livestock Grazing	Season of use year-round on nine pasture rotation with 4700 AUMs.
13	Existing Infrastructure	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.

Wilderness Character
What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☐	☒
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☐	☐	☒
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.	☐	☐	☒
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☐	☐	☒
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☐	☐	☒
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☐	☐	☒
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☐	☐	☒
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☐	☐	☒
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☐	☒

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	Season of use year-round on nine pasture rotation with 4700 AUMs.	☒	☐	☐
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☒	☐
Total Number of Effects		1	1	NE
Untrammeled Total Rating		0		

Explain:
No new infrastructure would be constructed, components would only be maintained or replaced. Existing improvement components within the allotments would not impact what had previously been done and would not change it any further. While trammeling associated with grazing would continue, the effects of trammeling, including cattle trails and visible vegetation use by grazers, would be less concentrated due to a shift in grazing rotation between nine pastures rather than the current seven and would be a positive impact. Trammeling from the use of certain infrastructure by cattle would continue, a negative effect.

UNDEVELOPED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☐	☒
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☐	☐	☒
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.	☐	☒	☐
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☐	☒	☐

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☐	☒	☐
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☐	☒	☐
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☐	☒	☐
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☐	☒	☐
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☒	☐
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	Season of use year-round on nine pasture rotation with 4700 AUMs.	☐	☒	☐
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☒	☐
	Total Number of Effects	0	9	NE
Undeveloped Total Rating		-9		

Explain:
The use of motor vehicles and motorized equipment negatively impacts the undeveloped quality of wilderness character. The effect should be relatively short term and highly localized as the work would only occur at previous established installations within the allotment while repair activities are occurring. No new installations would be added, however existing installations would remain. The presence of cattle and the accompanying infrastructure have a negative effect on the undeveloped quality.

NATURAL

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☒	☐
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☐	☐	☒
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.	☐	☒	☐
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☐	☒	☐
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☐	☒	☐
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☐	☒	☐
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☐	☒	☐
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☐	☒	☐
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☒	☐
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒

12	Season of use year-round on nine pasture rotation with 4700 AUMs.	☒		
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☐	☒
Total Number of Effects		1	8	NE
Natural Total Rating		-7		

Explain:
The use of motor vehicles and/or motorized equipment negatively impacts the natural quality of wilderness character. The effect should be relatively short term and highly localized as the work would only occur at previous established installations within the allotment while repair activities are occurring. No new installations would be added. Shifting the grazing rotation between nine pastures than the current seven and extending the season of use rather would be a positive impact by potentially increasing the pasture rest period and allowing the native vegetation to grow with less frequent grazing pressure.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☒	☐
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☐	☐	☒
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.	☐	☒	☐
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☐	☒	☐
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and	☐	☒	☐

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
	place new liner. Use power hand tools as needed to attach valves.			
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☐	☒	☐
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☐	☒	☐
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☐	☐	☐
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☒	☐
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	Season of use year-round on nine pasture rotation with 4700 AUMs.	☐	☐	☒
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☒	☐
Total Number of Effects		0	8	NE
Solitude or Primitive & Unconfined Rec. Total		-8		

Explain:
During transitory operations, the sense of solitude would be negatively impacted by loud noises during some activities. Seeing grazing infrastructure may negatively impact the sense of solitude.

OTHER FEATURES OF VALUE

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☐	☒
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☒	☐	☐
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.	☒	☐	☐
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☒	☐	☐
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☒	☐	☐
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☒	☐	☐
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☒	☐	☐
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☒	☐	☐
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☐	☒
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	Season of use year-round on nine pasture rotation with 4700 AUMs.	☒	☐	☐

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs, and storage tanks.	☒	☐	☐
Total Number of Effects		9	0	NE
Other Features of Value Total Rating		9		

Explain:
Activities 3 through 9, 12 and 13 area necessary for the continued operations for proper grazing management in alignment with the intent of the GCPNM proclamation.

Summary Ratings for Alternative 1	
Wilderness Character	**Rating Summary**
Untrammeled	0
Undeveloped	-9
Natural	-7
Solitude or Primitive & Unconfined Recreation	-8
Other Features of Value	9
Wilderness Character Summary Rating	**-15**

MRDG Step 2: Alternatives

Alternative 2: Alternative B – No Action Renew Permit for Belnap and Big Springs Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

Description of the Alternative
What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Associated maintenance of existing facilities and improvements relevant to the grazing operation would be required and authorized. On an as-needed basis, range infrastructure would be maintained.

Fence maintenance would be composed of replacement of posts, wire, braces, stays, and gates. All fences would be "wildlife-friendly".

The BLM would renew the existing grazing permit for the Belnap and Big Spring Pipeline Allotments with no changes. There would be no proposed change in season of use for the Belnap Allotment. Livestock grazing would occur during the current season of use for each allotment, and with the number of AUMs limited to the current active preference (3986 AUMs on Big Spring Pipeline Allotment and 714 AUMs on Belnap Allotment).

Water infrastructure maintenance would be composed of digging out catchments, reservoirs, troughs, storage tanks and springs to maintain storage and water flow. Additional valves, floats, monitoring equipment may be replaced or installed at each location. Pipeline maintenance would involve replacement of pipeline and replacement or repair of valves. New infrastructure components such as tanks would be hauled to the site. When possible, old infrastructure would be removed from site.

Component Activities
How will each of the components of the action be performed under this alternative?

Comp #	Component of the Action	Activity for this Alternative
1	Transportation of personnel to project site	Personnel travel on established routes and then by foot or horseback to project sites.
2	Transportation of materials to project site	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.
3	Fence maintenance	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.

Comp #	Component of the Action	Activity for this Alternative
4	Trough maintenance	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened. .
5	Pipeline maintenance	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.
6	Water catchment maintenance	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.
7	Spring maintenance	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.
8	Unfenced detention reservoir maintenance	Use skid steer, backhoe, or front-end loader to remove debris and silt.
9	Storage tank maintenance	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.
10	Transportation of materials from site	When possible, equipment will be walked from site. If not possible, the smallest piece of equipment to transport materials will be used.
11	Transportation of personnel from site	Personnel travel by foot from project sites and then on established routes.
12	Livestock Grazing	No changes to current season of use, allotments remain on separate rotation, with 4700 AUMs.
13	Existing Infrastructure	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.

Wilderness Character
What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☐	☒
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☐	☐	☒
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened	☐	☐	☒
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☐	☐	☒
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☐	☐	☒
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☐	☐	☒
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☐	☐	☒
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☐	☐	☒
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☐	☒

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	No changes to current season of use, allotments remain on separate rotation, with 4700 AUMs.	☐	☒	☐
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☒	☐
Total Number of Effects		0	2	NE
Untrammeled Total Rating		-2		

Explain:
No new infrastructure would be constructed, components would only be maintained or replaced. Existing improvement components within the allotments would not impact what had previously been done and would not change it any further. Trammeling associated with grazing and the use of certain infrastructure by cattle would continue, a negative effect.

UNDEVELOPED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☐	☒
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☐	☐	☒
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.	☐	☒	☐
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☐	☒	☐

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☐	☒	☐
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☐	☒	☐
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☐	☒	☐
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☐	☒	☐
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☒	☐
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	No changes to current season of use, allotments remain on separate rotation, with 4700 AUMs.	☐	☒	☐
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☒	☐
Total Number of Effects		0	9	NE
Undeveloped Total Rating		-9		

Explain:
The use of motor vehicles and motorized equipment negatively impacts the undeveloped quality of wilderness character. The effect should be relatively short term and highly localized as the work would only occur at previous established installations within the allotment while repair activities are occurring. No new installations would be added, however existing installations would remain. The presence of cattle and the accompanying infrastructure have a negative effect on the undeveloped quality.

NATURAL

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☐	☒
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☐	☒	☐
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.	☐	☒	☐
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☐	☒	☐
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☐	☒	☐
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☐	☒	☐
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☐	☒	☐
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☐	☒	☐
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☒	☐
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	No changes to current season of use, allotments remain on separate rotation, with 4700 AUMs.	☐	☒	☐

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs, and storage tanks.	☐	☐	☒
Total Number of Effects		0	9	NE
Natural Total Rating		-9		

Explain:
The use of motor vehicles and/or motorized equipment negatively impacts the natural quality of wilderness character. The effect should be relatively short term and highly localized as the work would only occur at previous established installations within the allotment while repair activities are occurring. No new installations would be added. Continued cattle grazing would potentially limit or decrease the abundance and growth of vegetation.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☒	☐
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☐	☐	☒
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened	☐	☒	☐
5	Use trencher, skid steer, backhoe, or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☐	☒	☐
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☐	☒	☐
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☐	☒	☐

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☐	☒	☐
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☐	☐	☒
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☒	☐
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	No changes to current season of use, allotments remain on separate rotation, with 4700 AUMs.	☐	☐	☒
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs, and storage tanks.	☐	☒	☐
Total Number of Effects		0	8	NE
Solitude or Primitive & Unconfined Rec. Total		-8		

Explain:
During transitory operations, the sense of solitude would be negatively impacted by loud noises during some activities. Seeing grazing infrastructure may negatively impact the sense of solitude.

OTHER FEATURES OF VALUE

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	Personnel travel on established routes and then by foot or horseback to project sites.	☐	☐	☒
2	When possible, equipment will be walked into the site. If not possible, the smallest size of equipment necessary to perform the task will be used to transport material where it might be used for fence, trough and storage tank access and replacement.	☐	☐	☒
3	Replace fencing components such as t-posts, stays, slick and barbed wire using hand tools.	☒	☐	☐

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
4	Use power hand tools to ensure that connecting components such a valves and hose clamps are securely fastened.	☒	☐	☐
5	Use trencher, skid steer, backhoe or similar piece of machinery to run pipe in trench. Use power hand tools as needed to attach valves.	☒	☐	☐
6	Use apron plastic welder, skid steer or backhoe to remove old catchment liner and place new liner. Use power hand tools as needed to attach valves.	☒	☐	☐
7	Use skid steer or backhoe to remove debris from springhead. Use power hand tools as needed to attach valves.	☒	☐	☐
8	Use skid steer, backhoe, or front-end loader to remove debris and silt.	☒	☐	☐
9	Due to constant exposure out in the elements there would be a need to weld sections together that may need repairs.	☒	☐	☐
10	When possible, equipment will be walked from site. If not possible, the smallest size of equipment to transport materials will be used.	☐	☐	☒
11	Personnel travel by foot from project sites and then on established routes.	☐	☐	☒
12	No changes to current season of use, allotments remain on separate rotation, with 4700 AUMs.	☒	☐	☐
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☒	☐	☐
	Total Number of Effects	9	0	NE
Other Features of Value Total Rating		9		

Explain: Necessary for the continued operations for proper grazing management during activities 3-9.

Summary Ratings for Alternative 2	
Wilderness Character	**Rating Summary**
Untrammeled	-2
Undeveloped	-9
Natural	-9
Solitude or Primitive & Unconfined Recreation	-8
Other Features of Value	9
Wilderness Character Summary Rating	**-19**

Alternative 3: Alternative C – No Grazing

Description of the Alternative
What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

No maintenance of grazing infrastructure would occur, including boundary fences. Reissue a grazing permit on the Belnap and Big Spring Pipeline Allotments with zero authorized AUMs for active preference – all AUMs would be suspended (i.e., livestock grazing would be deferred for the ten-year permit period). In ten years, the allotments would be re-evaluated. Range improvements would not be maintained by the permittee for this ten-year term.

Component Activities
How will each of the components of the action be performed under this alternative?

Comp #	Component of the Action	Activity for this Alternative
1	Transportation of personnel to project site	None
2	Transportation of materials to project site	None
3	Fence maintenance	None
4	Trough maintenance	None
5	Pipeline maintenance	None
6	Water catchment maintenance	None
7	Spring maintenance	None
8	Unfenced detention reservoir maintenance	None
9	Storage tank maintenance	None
10	Transportation of materials from site	None
11	Transportation of personnel from site	None
12	Livestock Grazing	None
13	Existing Infrastructure	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.

Wilderness Character
What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	None	☐	☐	☒
2	None	☐	☐	☒
3	None	☐	☐	☒
4	None	☐	☐	☒
5	None	☐	☐	☒
6	None	☐	☐	☒
7	None	☐	☐	☒
8	None	☐	☐	☒
9	None	☐	☐	☒
10	None	☐	☐	☒
11	None	☐	☐	☒
12	None	☒	☐	☐
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☒	☐
Total Number of Effects		1	1	NE
Untrammeled Total Rating		0		

Explain:
While trammeling associated with grazing would cease for the duration of the ten-year permit, the effects of trammeling, including cattle trails would decrease, a positive impact. Trammeling from the continued presence of certain infrastructure would continue, a negative effect.

UNDEVELOPED

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	None	☐	☐	☒
2	None	☐	☐	☒
3	None	☐	☐	☒
4	None	☐	☐	☒

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
5	None	☐	☐	☒
6	None	☐	☐	☒
7	None	☐	☐	☒
8	None	☐	☐	☒
9	None	☐	☐	☒
10	None	☐	☐	☒
11	None	☐	☐	☒
12	None	☐	☐	☒
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs, and storage tanks.	☐	☒	☐
Total Number of Effects		0	1	NE
Undeveloped Total Rating		-1		

Explain:
Grazing infrastructure is not proposed to be removed. The negative effect of the infrastructure would continue to impact the undeveloped quality of wilderness character.

NATURAL

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	None	☐	☐	☒
2	None	☐	☐	☒
3	None	☐	☐	☒
4	None	☐	☐	☒
5	None	☐	☐	☒
6	None	☐	☐	☒
7	None	☐	☐	☒
8	None	☐	☐	☒
9	None	☐	☐	☒
10	None	☐	☐	☒

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
11	None	☐	☐	☒
12	None	☒	☐	☐
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs, and storage tanks.	☐	☐	☒
Total Number of Effects		1	0	NE
Natural Total Rating		1		

Explain:
Removing cattle grazing would be a positive impact by allowing the native vegetation to grow without grazing pressure.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	None	☐	☐	☒
2	None	☐	☐	☒
3	None	☐	☐	☒
4	None	☐	☐	☒
5	None	☐	☐	☒
6	None	☐	☐	☒
7	None	☐	☐	☒
8	None	☐	☐	☒
9	None	☐	☐	☒
10	None	☐	☐	☒
11	None	☐	☐	☒
12	None	☐	☐	☒
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☒	☐
Total Number of Effects		0	1	NE
Solitude or Primitive & Unconfined Rec. Total		-1		

Explain:
Seeing grazing infrastructure may negatively impact the sense of solitude.

OTHER FEATURES OF VALUE

Activity #	Component Activity for this Alternative	Positive	Negative	No Effect
1	None	☐	☐	☒
2	None	☐	☐	☒
3	None	☐	☒	☐
4	None	☐	☒	☐
5	None	☐	☒	☐
6	None	☐	☒	☐
7	None	☐	☒	☐
8	None	☐	☒	☐
9	None	☐	☒	☐
10	None	☐	☐	X
11	None	☐	☐	X
12	None	☐	☒	
13	Twenty-two existing pieces of infrastructure including fences, troughs pipelines, water catchments, developed springs, reservoirs and storage tanks.	☐	☐	x
	Total Number of Effects	0	8	NE
Other Features of Value Total Rating		-8		

Explain:
Removing grazing for a period of ten years, while not maintaining grazing infrastructure, would negatively impact the grazing management intent in the monument proclamation for the area.

Summary Ratings for Alternative 3	
Wilderness Character	**Rating Summary**
Untrammeled	0
Undeveloped	-1
Natural	1
Solitude or Primitive & Unconfined Recreation	-1
Other Features of Value	-8
Wilderness Character Summary Rating	**-9**

MRDG Step 2: Alternatives Not Analyzed

Alternatives Not Analyzed
What alternatives were considered but not analyzed? Why were they not analyzed?

We did consider the use of helicopters to sling load materials to locations within allotment, however it was not analyzed due to the proximity of existing roads in the vicinity of the allotment.

We did consider dynamite for the creation of replacements and maintenance of water catchments; however, it was found that this tool is not necessary for the terrain.

Alternative to permanently close or retire the two subject allotments was considered. The need for the proposed action is for the permittee to be able to continue livestock grazing on the allotments through utilization of forage at proper use levels. This alternative would not meet the purpose and need of this analysis, which is for the BLM to evaluate an application to renew the grazing permit for the two subject allotments for a ten-year term. Monitoring data and recent land health evaluations support the conclusion that the two allotments are either making significant progress towards or meeting land health standards. Therefore, this alternative was not carried forward for further analysis.

MRDG Step 2: Alternative Comparison

Alternative 1: Alternative A – Proposed Action Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

Alternative 2: Alternative B – No Action Renew Permit for Belnap and Big Springs Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

Alternative 3: Alternative C – No Grazing

Wilderness Character	Alternative 1+	Alternative 1-	Alternative 2+	Alternative 2-	Alternative 3+	Alternative 3-
Untrammeled	1	1	0	2	1	1
Undeveloped	0	9	0	9	0	1
Natural	1	8	0	9	1	0
Solitude/Primitive/Unconfined	0	8	0	8	0	1
Other Features of Value	9	0	9	0	0	8
Total Number of Effects	11	26	9	28	2	11
Wilderness Character		-15		-19		-9

MRDG Step 2: Determination

Refer to the **MRDG Instructions** before identifying the selected alternative and explaining the rationale for the selection.

Selected Alternative

Alternative 1: Alternative A – Proposed Action Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment

Alternative 2: Alternative B – No Action Renew Permit for Belnap and Big Springs Pipeline Allotments with No Changes in Season of Use or Combination of Allotments

Alternative 3: Alternative C – No Grazing

Explain Rationale for Selection:

Describe Monitoring & Reporting Requirements:

Approvals

Which of the prohibited uses found in Section 4(c) of the Wilderness Act are approved in the selected alternative and for what quantity?

Approved?	Prohibited Use	Quantity
☐	Mechanical Transport:	
☐	Motorized Equipment:	
☐	Motor Vehicles:	
☐	Motorboats:	
☐	Landing of Aircraft:	
☐	Temporary Roads:	
☐	Structures:	
☐	Installations:	

Record and report any authorizations of Wilderness Act Section 4(c) prohibited uses according to agency policies or guidance.

Refer to agency policies for the following signature authorities:

Prepared:
Name Greg Page Position Outdoor Recreation Planner

Signature _____ Date _____

Recommended:
Name Jennifer Fox Position Ecologist

Signature _____ Date _____

Approved:
Name Ben Roberts Position Superintendent

Signature _____ Date _____

Approved:
Name Brandon Boshell Position Monument Manager

Signature _____ Date _____

Historical Precipitation Report

Field Office 100 Alcorn **Precipitation Rain Gauge. Rain Gauge Number: 01**

Seasonal Precipitation Amounts						Annual Average					Percent of Normal				
Year	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.76	10.00	2.40	2.65	16.81	1.53	3.68	1.96	4.75	11.91	115%	272%	122%	56%	141%
1979	3.85	5.10	2.77	3.86	15.58	1.53	3.68	1.96	4.75	11.91	252%	139%	141%	81%	131%
1980	0.35	5.90	2.62	5.45	14.32	1.53	3.68	1.96	4.75	11.91	23%	160%	133%	115%	120%
1981	0.92	1.72	3.85	7.05	13.54	1.53	3.68	1.96	4.75	11.91	60%	47%	196%	149%	114%
1982	1.12	3.98	1.92	8.80	15.82	1.53	3.68	1.96	4.75	11.91	73%	108%	98%	185%	133%
1983	3.06	3.84	2.46	6.87	16.23	1.53	3.68	1.96	4.75	11.91	201%	104%	125%	145%	136%
1986	2.61	1.10	3.11	6.07	12.89	1.53	3.68	1.96	4.75	11.91	171%	30%	158%	128%	108%
1987	1.38	2.38	2.76	4.10	10.62	1.53	3.68	1.96	4.75	11.91	90%	65%	141%	86%	89%
1988	4.05	2.13	3.78	2.55	12.51	1.53	3.68	1.96	4.75	11.91	265%	58%	193%	54%	105%
1989	0.64	2.68	1.13	2.10	6.55	1.53	3.68	1.96	4.75	11.91	42%	73%	58%	44%	55%
1990	0.29	1.86	2.00	6.42	10.57	1.53	3.68	1.96	4.75	11.91	19%	51%	102%	135%	89%
1991	0.48	4.00	1.34	5.33	11.15	1.53	3.68	1.96	4.75	11.91	31%	109%	68%	112%	94%
1992	0.91	4.75	6.30	3.09	15.05	1.53	3.68	1.96	4.75	11.91	60%	129%	321%	65%	126%
1993	2.10	9.78	3.38	1.74	17.00	1.53	3.68	1.96	4.75	11.91	138%	266%	172%	37%	143%
1994	1.81	2.94	2.50	3.25	10.50	1.53	3.68	1.96	4.75	11.91	119%	80%	127%	68%	88%
1995	1.96	6.19	5.35	3.00	16.50	1.53	3.68	1.96	4.75	11.91	128%	168%	273%	63%	138%
1996	0.12	3.88	0.87	2.63	7.50	1.53	3.68	1.96	4.75	11.91	8%	105%	44%	55%	63%
1997	2.13	3.38	2.24	7.13	14.88	1.53	3.68	1.96	4.75	11.91	140%	92%	114%	150%	125%
1998	1.63	4.32	1.30	10.00	17.25	1.53	3.68	1.96	4.75	11.91	107%	117%	66%	211%	145%
1999	2.47	1.28	0.75	7.45	11.95	1.53	3.68	1.96	4.75	11.91	162%	35%	38%	157%	100%
2000	0.00	2.75	0.25	3.25	6.25	1.53	3.68	1.96	4.75	11.91	0%	75%	13%	68%	52%
2001	2.83	3.92	0.88	5.12	12.75	1.53	3.68	1.96	4.75	11.91	185%	107%	45%	108%	107%
2002	0.37	1.38	0.00	2.75	4.50	1.53	3.68	1.96	4.75	11.91	24%	37%	0%	58%	38%
2003	1.50	3.00	1.28	3.72	9.50	1.53	3.68	1.96	4.75	11.91	98%	82%	65%	78%	80%
2004	0.81	2.56	1.49	4.39	9.25	1.53	3.68	1.96	4.75	11.91	53%	70%	76%	93%	78%
2005	7.38	8.00	2.37	2.63	20.38	1.53	3.68	1.96	4.75	11.91	484%	217%	121%	55%	171%
2006	1.00	1.13	2.37	7.63	12.13	1.53	3.68	1.96	4.75	11.91	66%	31%	121%	161%	102%
2007	1.00	0.75	0.87	5.81	8.43	1.53	3.68	1.96	4.75	11.91	66%	20%	44%	122%	71%
2008	0.18	5.32	0.72	5.53	11.75	1.53	3.68	1.96	4.75	11.91	12%	145%	37%	117%	99%
2009	1.81	3.94	1.25	1.50	8.50	1.53	3.68	1.96	4.75	11.91	119%	107%	64%	32%	71%
2010	0.24	4.76	1.75	1.63	8.38	1.53	3.68	1.96	4.75	11.91	16%	129%	89%	34%	70%
2011	3.75	3.93	1.58	6.25	15.50	1.53	3.68	1.96	4.75	11.91	246%	107%	80%	132%	130%
2012	1.50	1.50	1.00	6.00	10.00	1.53	3.68	1.96	4.75	11.91	98%	41%	51%	126%	84%
2013	0.88	2.13	0.68	10.58	14.25	1.53	3.68	1.96	4.75	11.91	57%	58%	34%	223%	120%
2015	0.00	4.38	2.50	4.80	11.68	1.53	3.68	1.96	4.75	11.91	0%	119%	127%	101%	98%
2016	4.20	0.69	1.63	8.43	14.95	1.53	3.68	1.96	4.75	11.91	275%	19%	83%	178%	125%
2017	1.00	6.38	0.75	5.38	13.50	1.53	3.68	1.96	4.75	11.91	66%	173%	38%	113%	113%
2018	0.13	2.00	1.88	5.00	9.00	1.53	3.68	1.96	4.75	11.91	8%	54%	96%	105%	76%
2019	0.63	7.00	1.63	1.50	10.75	1.53	3.68	1.96	4.75	11.91	41%	190%	83%	32%	90%
2020	0.00	5.25	2.75	0.13	8.13	1.53	3.68	1.96	4.75	11.91	0%	143%	140%	3%	68%
2021	0.25	1.00	1.25	3.00	5.50	1.53	3.68	1.96	4.75	11.91	16%	27%	64%	63%	46%
2022	1.00	1.63	0.75			1.53	3.68	1.96	4.75	11.91	66%	44%	38%		

Historical Precipitation Report

Field Office 300 **Bundyville Precipitation Rain Gauge. Rain Gauge Number: 01**

Seasonal Precipitation Amounts						Annual Average					Percent of Normal				
Year	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1988	4.38	1.18	4.75	4.70	15.01	1.55	3.24	2.11	4.68	11.58	282%	36%	226%	100%	130%
1989	0.30	1.80	1.23	3.42	6.75	1.55	3.24	2.11	4.68	11.58	19%	56%	58%	73%	58%
1990	1.08	0.85	2.82	5.18	9.93	1.55	3.24	2.11	4.68	11.58	69%	26%	134%	111%	86%
1991	0.45	3.70	0.44	3.77	8.36	1.55	3.24	2.11	4.68	11.58	29%	114%	21%	81%	72%
1992	0.71	1.80	5.00	1.08	8.59	1.55	3.24	2.11	4.68	11.58	46%	56%	237%	23%	74%
1993	1.08	4.70	2.00	4.50	12.28	1.55	3.24	2.11	4.68	11.58	69%	145%	95%	96%	106%
1994	3.75	2.50	2.24	2.50	10.99	1.55	3.24	2.11	4.68	11.58	241%	77%	106%	53%	95%
1995	0.00	4.00	4.82	4.20	13.02	1.55	3.24	2.11	4.68	11.58	0%	123%	229%	90%	112%
1996	0.04	4.63	0.96	3.94	9.57	1.55	3.24	2.11	4.68	11.58	3%	143%	46%	84%	83%
1997	1.60	2.38	2.21	7.61	13.80	1.55	3.24	2.11	4.68	11.58	103%	73%	105%	163%	119%
1998	1.00	3.50	3.30	7.50	15.30	1.55	3.24	2.11	4.68	11.58	64%	108%	157%	160%	132%
1999	2.70	1.35	2.15	7.10	13.30	1.55	3.24	2.11	4.68	11.58	174%	42%	102%	152%	115%
2000	0.00	1.84	1.30	0.00	3.14	1.55	3.24	2.11	4.68	11.58	0%	57%	62%	0%	27%
2001	4.32	1.34	3.77	0.92	10.35	1.55	3.24	2.11	4.68	11.58	278%	41%	179%	20%	89%
2002	1.50	0.62	0.60	3.50	6.22	1.55	3.24	2.11	4.68	11.58	97%	19%	28%	75%	54%
2003	1.03	3.60	2.30	6.00	12.93	1.55	3.24	2.11	4.68	11.58	66%	111%	109%	128%	112%
2004	1.18	3.85	1.90	3.30	10.23	1.55	3.24	2.11	4.68	11.58	76%	119%	90%	71%	88%
2005	5.77	10.05	3.70	6.15	25.67	1.55	3.24	2.11	4.68	11.58	371%	310%	176%	131%	222%
2006	2.00	0.65	3.00	6.38	12.03	1.55	3.24	2.11	4.68	11.58	129%	20%	142%	136%	104%
2007	1.20	2.00	1.00	6.24	10.44	1.55	3.24	2.11	4.68	11.58	77%	62%	47%	133%	90%
2008	0.18	4.38	0.39	4.75	9.70	1.55	3.24	2.11	4.68	11.58	12%	135%	19%	102%	84%
2009	1.84	4.00	1.40	3.95	11.19	1.55	3.24	2.11	4.68	11.58	118%	123%	66%	84%	97%
2010	0.24	6.24	2.00	0.75	9.23	1.55	3.24	2.11	4.68	11.58	15%	192%	95%	16%	80%
2011	4.00	5.00	2.20	5.50	16.70	1.55	3.24	2.11	4.68	11.58	257%	154%	104%	118%	144%
2012	1.65	2.30	1.91	6.50	12.36	1.55	3.24	2.11	4.68	11.58	106%	71%	91%	139%	107%
2013	0.44	2.50	0.50	7.00	10.44	1.55	3.24	2.11	4.68	11.58	28%	77%	24%	150%	90%
2015	1.40	4.50	2.12	5.15	13.17	1.55	3.24	2.11	4.68	11.58	90%	139%	101%	110%	114%
2016	1.04	2.50	3.15	6.40	13.09	1.55	3.24	2.11	4.68	11.58	67%	77%	150%	137%	113%
2017	1.75	5.75	0.00	6.25	13.75	1.55	3.24	2.11	4.68	11.58	113%	177%	0%	134%	119%
2018	0.00	3.74	0.00	6.10	9.84	1.55	3.24	2.11	4.68	11.58	0%	115%	0%	130%	85%

Historical Precipitation Report

Field Office 300 Pa's Pocket **Precipitation Rain Gauge. Rain Gauge Number: 11**

Seasonal Precipitation Amounts						Annual Average					Percent of Normal				
Year	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1978	1.94	8.00	2.68	2.09	14.71	1.82	3.70	1.82	3.50	10.84	107%	216%	147%	60%	136%
1979	3.83	5.60	3.40	4.98	17.81	1.82	3.70	1.82	3.50	10.84	210%	152%	186%	142%	164%
1980	3.36	7.22	2.12	4.11	16.81	1.82	3.70	1.82	3.50	10.84	185%	195%	116%	117%	155%
1981	1.04	1.97	0.97	5.29	9.27	1.82	3.70	1.82	3.50	10.84	57%	53%	53%	151%	86%
1982	1.42	4.53	2.21	4.35	12.51	1.82	3.70	1.82	3.50	10.84	78%	123%	121%	124%	115%
1983	3.30	2.62	3.25	1.98	11.15	1.82	3.70	1.82	3.50	10.84	181%	71%	178%	57%	103%
1984	1.29	1.83	0.45	5.90	9.47	1.82	3.70	1.82	3.50	10.84	71%	50%	25%	169%	87%
1985	1.62	4.89	1.13	4.04	11.68	1.82	3.70	1.82	3.50	10.84	89%	132%	62%	115%	108%
1986	2.90	0.92	2.57	4.23	10.62	1.82	3.70	1.82	3.50	10.84	159%	25%	141%	121%	98%
1987	1.53	3.62	1.39	2.75	9.29	1.82	3.70	1.82	3.50	10.84	84%	98%	76%	79%	86%
1988	3.40	2.13	3.78	2.50	11.81	1.82	3.70	1.82	3.50	10.84	187%	58%	207%	71%	109%
1989	0.40	2.50	1.32	2.40	6.62	1.82	3.70	1.82	3.50	10.84	22%	68%	72%	69%	61%
1990	1.24	1.65	1.78	6.46	11.13	1.82	3.70	1.82	3.50	10.84	68%	45%	98%	185%	103%
1991	0.34	3.05	0.45	1.43	5.27	1.82	3.70	1.82	3.50	10.84	19%	83%	25%	41%	49%
1992	0.96	2.70	5.90	1.35	10.91	1.82	3.70	1.82	3.50	10.84	53%	73%	323%	39%	101%
1993	2.50	10.30	1.79	2.50	17.09	1.82	3.70	1.82	3.50	10.84	137%	279%	98%	71%	158%
1994	1.96	2.50	2.25	1.60	8.31	1.82	3.70	1.82	3.50	10.84	108%	68%	123%	46%	77%
1995	4.80	4.72	4.23	2.82	16.57	1.82	3.70	1.82	3.50	10.84	264%	128%	232%	81%	153%
1996	0.20	4.38	0.77	1.34	6.69	1.82	3.70	1.82	3.50	10.84	11%	119%	42%	38%	62%
1997	1.15	2.50	1.50	3.50	8.65	1.82	3.70	1.82	3.50	10.84	63%	68%	82%	100%	80%
1998	1.72	3.83	3.08	6.00	14.63	1.82	3.70	1.82	3.50	10.84	94%	104%	169%	171%	135%
1999	2.05	1.15	2.20	4.70	10.10	1.82	3.70	1.82	3.50	10.84	113%	31%	121%	134%	93%
2000	0.00	1.79	1.24	1.41	4.44	1.82	3.70	1.82	3.50	10.84	0%	48%	68%	40%	41%
2001	3.30	1.32	3.32	1.25	9.19	1.82	3.70	1.82	3.50	10.84	181%	36%	182%	36%	85%
2002	0.72	0.60	0.40	2.35	4.07	1.82	3.70	1.82	3.50	10.84	40%	16%	22%	67%	38%
2003	2.35	4.00	2.00	4.35	12.70	1.82	3.70	1.82	3.50	10.84	129%	108%	110%	124%	117%
2004	1.39	2.80	1.32	2.07	7.58	1.82	3.70	1.82	3.50	10.84	76%	76%	72%	59%	70%
2005	5.07	9.50	2.50	5.30	22.37	1.82	3.70	1.82	3.50	10.84	278%	257%	137%	151%	206%
2006	1.00	0.77	2.25	4.00	8.02	1.82	3.70	1.82	3.50	10.84	55%	21%	123%	114%	74%
2007	0.90	1.00	0.85	5.00	7.75	1.82	3.70	1.82	3.50	10.84	49%	27%	47%	143%	71%
2008	0.18	5.00	0.00	1.75	6.93	1.82	3.70	1.82	3.50	10.84	10%	135%	0%	50%	64%
2009	1.35	3.75	0.60	1.45	7.15	1.82	3.70	1.82	3.50	10.84	74%	101%	33%	41%	66%
2010	0.27	7.73	0.82	1.95	10.77	1.82	3.70	1.82	3.50	10.84	15%	209%	45%	56%	99%
2011	3.85	5.15	2.00	2.63	13.63	1.82	3.70	1.82	3.50	10.84	211%	139%	110%	75%	126%
2012	1.75	2.25	1.15	6.50	11.65	1.82	3.70	1.82	3.50	10.84	96%	61%	63%	186%	107%
2013	1.39	2.20	0.10	6.15	9.84	1.82	3.70	1.82	3.50	10.84	76%	60%	5%	176%	91%
2015	1.33	4.00	1.60	5.50	12.43	1.82	3.70	1.82	3.50	10.84	73%	108%	88%	157%	115%
2016	1.00	2.50	1.80	5.00	10.30	1.82	3.70	1.82	3.50	10.84	55%	68%	99%	143%	95%
2017	2.20	7.15	0.00			1.82	3.70	1.82	3.50	10.84	121%	193%	0%		

Historical Precipitation Report

Field Office 300 Pa's Pocket (Lava) **Precipitation Rain Gauge. Rain Gauge Number: 11**

Seasonal Precipitation Amounts						Annual Average					Percent of Normal				
Year	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
2018	0.00	3.24	0.00	2.90	6.14	0.00	3.24	0.00	2.90	6.14	#Num	100%	#Num!	100%	100%

Historical Precipitation Report

Field Office 300 Side of Mt **Precipitation Rain Gauge. Rain Gauge Number: 14**

Seasonal Precipitation Amounts						Annual Average					Percent of Normal				
Year	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual	Fall	Winter	Spring	Summer	Annual
1992	2.50	2.29	6.10	5.35	16.24	2.22	4.08	2.18	4.67	13.15	113%	56%	280%	115%	124%
1993	1.87	6.15	2.12	3.83	13.97	2.22	4.08	2.18	4.67	13.15	84%	151%	97%	82%	106%
1994	5.40	3.00	2.20	2.50	13.10	2.22	4.08	2.18	4.67	13.15	243%	74%	101%	54%	100%
1995	9.99	5.75	4.77	3.40	23.91	2.22	4.08	2.18	4.67	13.15	450%	141%	219%	73%	182%
1996	0.19	4.73	0.94	3.74	9.60	2.22	4.08	2.18	4.67	13.15	9%	116%	43%	80%	73%
1997	1.80	2.50	2.10	8.60	15.00	2.22	4.08	2.18	4.67	13.15	81%	61%	96%	184%	114%
1998	1.00	5.25	3.73	7.70	17.68	2.22	4.08	2.18	4.67	13.15	45%	129%	171%	165%	134%
1999	2.25	1.75	2.65	6.50	13.15	2.22	4.08	2.18	4.67	13.15	101%	43%	122%	139%	100%
2000	0.00	2.13	1.50	1.89	5.52	2.22	4.08	2.18	4.67	13.15	0%	52%	69%	40%	42%
2001	4.43	2.67	4.07	1.08	12.25	2.22	4.08	2.18	4.67	13.15	200%	65%	187%	23%	93%
2002	1.49	0.60	0.65	1.85	4.59	2.22	4.08	2.18	4.67	13.15	67%	15%	30%	40%	35%
2003	1.85	4.20	2.20	4.92	13.17	2.22	4.08	2.18	4.67	13.15	83%	103%	101%	105%	100%
2004	1.32	4.35	1.72	2.35	9.74	2.22	4.08	2.18	4.67	13.15	59%	107%	79%	50%	74%
2005	7.15	11.05	4.00	5.00	27.20	2.22	4.08	2.18	4.67	13.15	322%	271%	184%	107%	207%
2006	1.75	0.65	3.37	5.00	10.77	2.22	4.08	2.18	4.67	13.15	79%	16%	155%	107%	82%
2007	1.20	2.00	1.00	6.50	10.70	2.22	4.08	2.18	4.67	13.15	54%	49%	46%	139%	81%
2008	0.18	5.85	0.55	4.90	11.48	2.22	4.08	2.18	4.67	13.15	8%	143%	25%	105%	87%
2009	1.67	4.50	1.20	4.14	11.51	2.22	4.08	2.18	4.67	13.15	75%	110%	55%	89%	88%
2010	0.37	8.63	1.70	0.85	11.55	2.22	4.08	2.18	4.67	13.15	17%	211%	78%	18%	88%
2011	4.22	7.05	2.40	5.00	18.67	2.22	4.08	2.18	4.67	13.15	190%	173%	110%	107%	142%
2012	1.50	2.30	1.38	5.75	10.93	2.22	4.08	2.18	4.67	13.15	68%	56%	63%	123%	83%
2013	0.65	2.00	1.00	6.50	10.15	2.22	4.08	2.18	4.67	13.15	29%	49%	46%	139%	77%
2015	1.40	4.73	2.30	6.20	14.63	2.22	4.08	2.18	4.67	13.15	63%	116%	106%	133%	111%
2016	1.04	2.50	2.95	6.25	12.74	2.22	4.08	2.18	4.67	13.15	47%	61%	136%	134%	97%
2017	2.50	5.63	0.00	5.40	13.53	2.22	4.08	2.18	4.67	13.15	113%	138%	0%	116%	103%
2018	0.00	3.85	0.00	6.15	10.00	2.22	4.08	2.18	4.67	13.15	0%	94%	0%	132%	76%

Appendix F - Desired Plant Community/Ecological Site Description comparison tables for the Belnap and Big Spring Pipeline Allotments/Key Areas

Desired Plant Community Objectives

Desired Plant Community Objectives (DPC) were developed during the evaluation process by an interdisciplinary team of specialists (BLM 2002 and BLM 2006). These DPCs are to replace the 1990 AMP allotment specific vegetation frequency and cover objectives which focus on livestock forage needs. These objectives focus on the ecological site and its potential, which is a reflection of the biodiversity of the area. DPCs include Species Composition by Weight (CBW) using the Dry Weight Ranking method of data collection and live vegetative ground cover using the point step method of data collection to measure vegetative basal cover (4.3.4 Monitoring). DPCs will be used, from this point forward, to assess effectiveness of management actions (BLM 2002 and BLM 2006). Although canopy cover is included in the objectives it is not part of the data that is collected in the key area trend monitoring.

NRCS List of plant codes and names for Belnap and Big Spring Pipeline Allotments.

Perennial Grasses
BOGR = *Boutalua gracilis*
BRIN = *Bromus inermis* smooth brome
ORHY (ACHY)= *Oryzopsis hymenoides* = *Achnatherum hymenoides* Indian ricegrass
PLJA (HIJA) = *Pleuraphis jamesii* = Hilaria jamesii galleta
POPR = *Poa pratensis* bluegrass
SIHY (ELELE) = *Sitanion hystrix* = *Elymus elymoides* subsp. *elymoides* squirreltail
SPCR = *Sporobolus cryptandrus* sand dropseed
STIPA = *Stipa* sp. needlegrass

Forbs
ASTER = *Aster* sp. aster
CALOC = *Calochortus* sp. mariposa lily
CICHO = *Cichorium* sp. chicory
CRYPT = *Cryptantha* sp. cryptantha
ERIOG = *Eriogonum* sp. buckwheat
ESCHS = *Eschscholzia* sp. California poppy
EUPHO = *Euphorbia* sp. spurge

OENOT = *Oenothera* sp. evening primrose
PLANT = *Plantago* sp. plantain
SPHAE = *Sphaeralcea* sp. globemallow

Shrubs
ARTR2 = *Artemisia tridentata*

Trees
JUOS = *Juniperous osteosperma* Utah juniper
PIED = *Pinus edulis* Pinyon pine
QUGA = *Quercus gambelli* Gambel oak
PIPO = *Pinus ponderosa* Ponderosa pine

Others
AAGG (annual grasses) all lumped together
AAFF (annual forbs) all lumped together
PPFF (perennial forbs) unknown perennial forbs
SSSS (other shrubs) unknown shrubs

Table F.1. Belnap North Pasture Frequency Key Area #1 Desired Plant Community Objectives Determination Table
ESD: Loamy Upland 10-14" p.z.. (R035XC113AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community	DPC objective status
Woody Species						
Artemisia tridentata	15.70	7%	18%	15.7	7-18	met
Chrysothamnus	1.40	1%	6%	1.4	1-5	met
Cylindropuntia whipplei		0%	0%			
Gutierrezia sarothrae	1.10	1%	6%	1.1	1-5	met
Juniperus osteosperma	12.70	0%	7%	7	2-10	slightly exceeds, not met

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community	DPC objective status
Lycium		0%	0%			
Grasses Perennial						
Achnatherum hymenoides	4.60	14%	26%	4.6	5-15	slightly low, not met
Bouteloua gracilis	28.70	21%	36%	28.7	20-30	met
Elymus elymoides	8.60	6%	12%	8.6	5-15	met
Hilaria jamesii	23.50	9%	18%	18	20-30	met
Sporobolus cryptandrus		0%	0%			
Annuals						
Euphorbia parryi	0.80	0%	1%	0.8	0-1	met
Euphorbia serpyllifolia	2.90	0%	1%	1	0-1	exceeds, not met
Total				86.9		

Current Score total 86.9 Seral state = PNC

Table F.2. Belnap South Pasture Frequency Key Area #2 Desired Plant Community Objectives Determination Table
ESD: Loamy Upland 10-14" p.z. (R035XC113AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community	DPC objective status
Woody Species						
Artemisia tridentata	8.45	7%	18%	8.45	7-18	met
Juniperus osteosperma	1.45	0%	7%	1.45	2-10	low, not met
Grasses						
Bouteloua gracilis	26.45	21%	36%	26.45	20-30	met
Hilaria jamesii	7.35	9%	18%	7.35	20-30	low, not met
Forbs - Perennial/Biennial						

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community	DPC objective status
Mirabilis linearis		0%	6%		0-1	
Sphaeralcea parvifolia	1.35	0%	6%	1.35	0-5	met
Annuals						
Euphorbia exstipulata	2.35	0%	1%	1	0-1	exceeds, not met
Euphorbia serpyllifolia	14.05	0%	1%	1	0-1	exceeds, not met
Kallstroemia parviflora	0.15	0%	1%	0.15	0-1	met
Munroa squarrosa	0.40	0%	1%	0.4	0-1	met
Portulaca oleracea	4.35	0%	0%			
Sanvitalia abertii	33.65	0%	1%	1	0-1	exceeds, not met
Total				48.6		

Current Score total 48.6 = Mid-seral state

Table F.3. Big Spring Pipeline, Whitmore Pasture Frequency Key Area #4 -Desired Plant Community Objectives Determination Table

ESD: Loamy Upland 10-14" p.z. (R035XC113AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community (DPC)	DPC objective status
Woody Species						
big sagebrush	34.46	7%	18%	18.00	20-30	exceeds, not met
Fremont's mahonia	5.45	0%	4%	4.00	--	--
Mormon tea		1%	12%		--	--
broom snakeweed	28.51	1%	6%	6.00	--	--

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community (DPC)	DPC objective status
Utah juniper	0.30	0%	7%	0.30	0-5	met
banana yucca	2.67	1%	6%	2.67	--	--
Grasses - Perennial						
Fendler threeawn	0.30	0%	4%	.30		
black grama	0.99	0%	4%	0.99	1-5	met
James' galleta	15.35	9%	18%	15.35	5-15	met
Indian ricegrass	1.09	14%	26%	1.09	1-5	met
Forbs Perennial/Biennial						
globemallow	10.89	0%	6%	5.00	1-5	exceeds, not met
Total				53.70		

Current Score total 53.70 = Late seral

Table F.4. Big Spring Pipeline Airstrip Pasture Frequency Key Area #5 Desired Plant Community Objectives Determination Table

ESD: Clay Loam Upland 7-11" p.z. (R035XD414AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community	DPC objective status
Woody Species						
Nevada jointfir	6.18	0%	1%	1	5-10	met
broom snakeweed	9.31	2%	5%	5.00	--	--
water jacket	1.96	0%	2%	1.96	--	--
pricklypear	1.18	0%	1%	1.18	--	--
banana yucca	1.27	0%	1%	1.00	--	--
Grasses - Perennial						
Fendler threeawn	3.43	3%	8%	3.43		

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community	DPC objective status
James' galleta	60.69	16%	31%	31.00	30-60	slightly exceeds
burrograss	1.96	10%	16%	1.96		
sand dropseed	14.02	2%	7%	7.00	2-10	slightly exceeds
Annuals						
sixweeks grama		0%	3%			
redstem stork's bill		0%	0%			
little hogweed			0%			
Total				53.53		

Current Score total 53.53 = Mid-seral

Table F.5. Big Spring Pipeline, Upper Cole Pasture Frequency Key Area #6 Desired Plant Community Objectives Determination Table

ESD: Loamy Upland 10-14" p.z. (R035XC113AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community	DPC objective status
Woody Species						
big sagebrush	26.98	7%	18%	18.00	20-30	met
Fremont's mahonia	2.71	0%	4%	2.71	--	--
Mexican cliffrose	1.55	1%	12%	1.55	--	--
broom snakeweed	30.78	1%	6%	6.00	--	--
Utah juniper	13.80	0%	7%	7.00	2-10	exceeds, not met
prickly pear	0.23	1%	6%	0.23		
Two needle pinyon	1.55	0%	7%	1.55	2-10	slightly less, not met
Grasses - Perennial						
Fendler threeawn	4.65	0%	4%	4.00		
blue grama	13.57	21%	36%	13.57	5-15	met

squirreltail	0.16	6%	12%	0.16	1-10	not met
sand dropseed	0.23	0%	4%	0.23		
Forbs - Perennial/Biennial						
Eriogonum - perennial forb #1	3.80	0%	6%	3.80	1-5	met
Total				58.80		

Current Score total 58.80

Table F.6. Big Spring Pipeline, Lower Cole Pasture Frequency Key Area #7 Desired Plant Community Objectives Determination Table

ESD: Sandy Loam Upland 7-11" p.z. (R035XD414AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community (DPC)	DPC objective status
Woody Species						
big sagebrush	0.30	0%	0%	0.00	--	--
fourwing saltbush	1.70	3%	8%	1.70	--	--
winterfat	0.10	1%	5%	0.10	--	--
yellow rabbitbrush	12.70	0%	1%	1.00	--	--
broom snakeweed	6.40	1%	2%	2.00	--	--
prickly pear	0.30	0%	1%	0.30	--	--
Grasses - Perennial						
James' galleta	44.70	20%	36%	36.00	30-45	met
sand dropseed	33.80	5%	15%	15.00	25-40	met
Total				56.10		

Current Score total 56.10 = Late seral.

Table F.7. Big Spring Pipeline, Big Spring Pasture Frequency Key Area #9 Desired Plant Community Objectives Determination Table

ESD: Clay Loam Upland Gravelly 13-17" p.z. (R035XF611AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community (DPC)	DPC objective status
Woody Species						
big sagebrush	7.35	0%	5%	5.00	5-15	met
Mexican cliffrose	1.06	0%	5%	1.06	1-5	met
broom snakeweed	34.39	0%	5%	5.00	--	--
Utah juniper	30.53	0%	5%	5.00	1-10	exceeds, not met
prickly pear	16.74	0%	5%	5	--	--
Whipple cholla	0.83	0%	5%	0.83	--	--
Two needle pinyon	5.83	0%	5%	5.00	--	--
Grasses - Perennial						
squirrel tail					1-5	not met
Indian ricegrass	2.50	0%	5%	2.50	0-5	met
Forbs - Perennial/Biennial						
globemallow	0.76	0%	5%	0.76		
Total				30.15		

Current Score total 30.15 = Mid-seral. Juniper exceeds site guide and DPC, resulting sparse understory.

Table F.8. Big Spring Pipeline, Lava Pasture Frequency Key Area #10 Desired Plant Community Objectives Determination Table

ESD: Sandy Loam Upland 7-11"p.z. inclusions of Sandy Loam Upland Gypsic 7-11" p.z. (R035XD414AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community (DPC)	DPC objective status
Woody Species						
broom snakeweed	0.89	0%	0%		--	--
Prickly pear	1.68	0%	1%	1.68	--	--
Grasses - Perennial						
black grama	16.63	11%	29%	16.63	55-70	not met
James' galleta		51%	57%		2-10	not met
sand dropseed	80.20	32%	44%	44.00	5-15	exceeds
Forbs - Perennial/Biennial						
globemallow	0.59	0%	1%	0.59	1-5	
Total				62.90		

Current Score total 62.90 = Late seral.

Table F.9. Big Spring Pipeline, Chaparral Pasture Frequency Key Area #11 Desired Plant Community Objectives Determination Table

ESD: Clay Loam Upland 7-11" p.z. (R035XD421AZ)

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community (DPC)	DPC objective status
Woody Species						
Nevada jointfir	7.60	0%	1%	1.00	15-30	not met
broom snakeweed	15.00	2%	5%	5.00	--	--
water jacket	3.40	0%	2%	2.00	--	--
banana yucca		0%	1%		--	--
Grasses - Perennial						

Species	Current Percent Composition	Site Guide Percent Composition (range)		Current Score	Desired Plant Community (DPC)	DPC objective status
black grama	31.60	2%	7%	7.00	5-15	exceeded, not met
James' galleta	19.00	16%	31%	19.00	2-10	exceeded, not met
bush muhly	0.30	0%	1%	0.3	--	--
burrograss	1.00	10%	16%	1.00	--	--
sand dropseed	5.10	2%	7%	5.10	2-10	met
low woollygrass	15.90	0%	1%	1		
Forbs - Perennial/Biennial						
globemallow	0.10	0%	2%	0.1		
Total				41.5		

Current Score total 41.5 = Mid-seral.

Appendix G - Existing Range Improvements

Table G.1. Belnap Allotment Existing Range Improvements

Range Improvement Type	Description/Quantity
Corral	• George's Corral (1) • Sullivan Corral (1) Shared with Big Spring Pipeline Allotment
Cattleguards	• Cattleguards (6)
Fenced Reservoirs	• Black Knoll Tank (1) • Belnap Resort Reservoirs (2)
Unfenced Reservoirs	• Un-named Reservoir (1)
Livestock Troughs	• Belnap Catchment Pipeline Trough (1) • Sullivan Draw Pipeline Extension Trough (1)
Precipitation Gauge	• Big Spring Pipeline precipitation gauge is on the allotment boundary fence between Belnap Allotment and Big Spring Pipeline Allotment. It is on the Belnap side of the fence.
Wildlife Catchments (Water for Wildlife)	• Belnap Wildlife Catchment and exclosure fence • Hobble Wildlife Catchment

No developed springs

Table G.2. Belnap Allotment Existing Fences

Range Improvement Type	Name	Miles
Fence	Anderson-Layton Division Fence	1.8
Fence	Hobble Canyon Division Fence	3.9
Fence	Big Spring Pipeline Division Fence 1 *	0.9
Fence	Big Spring Pipeline Division Fence 1 *	1.9
Fence	Big Spring Pipeline Division Fence 1 *	2.4
Fence	Belnap Division Fence	2.3
Fence	Whiterock Belnap Division Fence	5.7
Fence	FENCE-A BRINK EST	4.0
Fence	Big Spring Pipeline Division Fence 1 *	1.9
Fence	DIV F #2-SULL TANK	0.9
Fence	Atkin-Blake-Brinkerhoff Division Fence	7.5
Fence	Belnap Wildlife Catchment Exclosure	0.3
Fence	Belnap West Boundary Fence	3.1
Fence	Anderson-Layton Division Fence	0.9
Fence	Whiterock Belnap Division Fence	0.9
Total		38.4

*Fence shared between Belnap and Big Spring Pipeline Allotments.

Table G.3. Belnap Allotment Existing Pipelines

Range Improvement Type	Name	Miles
Pipeline	PIPELINE-LAYTON	1.1
Pipeline	Belnap Catchment Pipeline	0.9
Pipeline	Sullivan Draw Pipeline Extension	0.4
Total		2.4

Table G.4. Big Spring Pipeline Allotment Existing Range Improvements

Range Improvement Type	Description/Quantity
Corral	• Sullivan Corral (1) Shared with Belnap Allotment • Post Office Corral and Chute (1)
Cattleguard	• Cattleguards (2)
Fenced Reservoirs	• Cox Pond (1) • Hobble Pond (1) • Sullivan Reservoirs (2)
Unfenced Reservoirs	• Post Office Tank (1) • Sullivan Reservoir (1)
Livestock Troughs	• Post Office Water Trough (1) • Sullivan Draw Pipeline Extension Trough (1)

*No developed springs.

Table G.5. Big Spring Pipeline Allotment Existing Fences

Range Improvement Type	Name	Miles
Fence	Big Spring Pipeline Division Fence 1 *	0.9
Fence	Jump Sullivan Division Fence	3.6
Fence	Big Spring Pipeline-Jump Fence	5.7
Fence	Big Spring Pipeline Division Fence 1 *	1.9
Fence	Big Spring Pipeline Division Fence 1 *	2.4
Fence	Sullivan Draw Fence	8.1
Fence	Big Spring Pipeline Division Fence 1 *	1.9
Fence	Division Fence 2-Big Spring Pipeline	0.9
Fence	South Sullivan Pasture Fence	2.1
Total		27.5

*Fence shared between Belnap and Big Spring Pipeline Allotments.

Table G.6. Big Spring Pipeline Allotment Existing Pipelines

Range Improvement Type	Name	Miles
Pipeline	Sullivan Draw Pipeline Extension	7.9
Total		7.9

Table G.7. Existing Range Improvements within Designated or Proposed Wilderness Area.
*The list below is believed to capture all range improvement projects within Designated or Proposed Wilderness; however, it is possible there might be some inadvertently excluded due to mapping or administrative records errors.

Wilderness Type	Allotment	Wilderness Name	Range Improvement Type	RIP Name	miles
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Unfenced Detention Reservoir	UNKNOWN	NA
NPS Proposed Wilderness	Big Spring Pipeline	Lava	Trough	Big Spring Pipeline Addition 01 trough	NA
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Trough	Big Spring Pipeline Addition 01 trough	NA
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Trough	Big Spring Pipeline Addition	NA
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Supplemental Storage Tank	Big Spring Pipeline Addition	NA
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Trough	Big Spring Pipeline Addition Trough	NA
NPS Proposed Wilderness	Big Spring Pipeline	Lava	Fence (Unspecified)	UNKNOWN	0.7
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Pipeline	Anderson Wood Pipeline	2.2
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Fence (Unspecified)	UNKNOWN	2.4

Wilderness Type	Allotment	Wilderness Name	Range Improvement Type	RIP Name	miles
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Fence (Unspecified)	UNKNOWN	1.5
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Fence (Unspecified)	Fence-Lam & Wood	0.3
NPS Proposed Wilderness	Big Spring Pipeline	Lava	Fence (Unspecified)	UNKNOWN	0.5
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Pipeline	Big Spring Pipeline Addition	1.7
NPS Proposed Wilderness	Big Spring Pipeline	Lava	Fence (Unspecified)	CR Fen-Lava Flow	1.0
NPS Proposed Wilderness	Big Spring Pipeline	Whitmore Point	Fence (Unspecified)	UNKNOWN	1.2
BLM Designated Wilderness	Big Spring Pipeline	Mt. Logan	Fence (Unspecified)	Fence	1.0
BLM Designated Wilderness	Big Spring Pipeline	Mt. Logan	Pipeline	PIPELNE-WOOD AND&LAR	1.4
BLM Designated Wilderness	Big Spring Pipeline	Mt. Logan	Pipeline	Big Spring Pipelline	2.1
BLM Designated Wilderness	Big Spring Pipeline	Mt. Logan	Fence (Unspecified)	Fence	0.2
BLM Designated Wilderness	Big Spring Pipeline	Mt. Logan	Pipeline	PIPELINE-C WOOD	0.3
BLM Designated Wilderness	Big Spring Pipeline	Mt. Logan	Fence (Unspecified)	Cold Forest Boundary Fence	0.2
BLM Designated Wilderness	Big Spring Pipeline	Mt. Logan	Fence (Unspecified)	COLD LITTLE FENCE	0.4

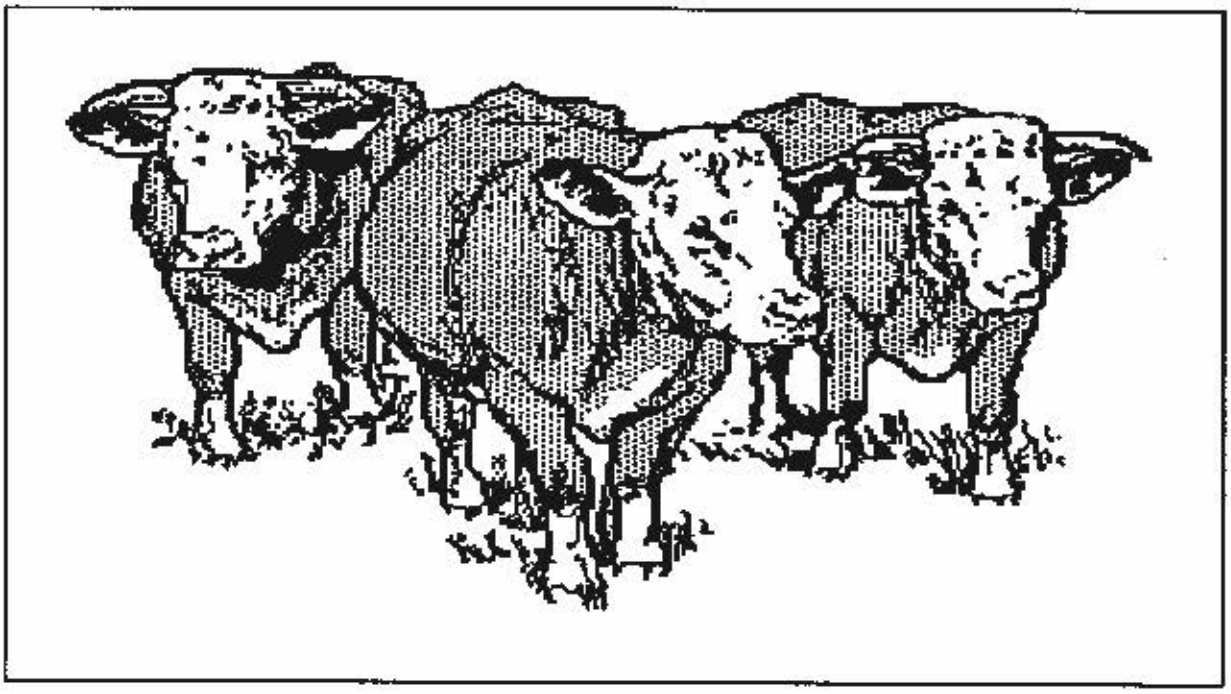
Wilderness Type	Allotment	Wilderness Name	Range Improvement Type	RIP Name	miles
BLM Designated Wilderness	Big Spring Pipeline	Mt. Logan	Fence (Unspecified)	COLD FOREST BDY FENCE	2.0

ALLOTMENT MANAGEMENT PLAN

Big Spring Allotment

Prepared by

Shivwits Resource Area
Arizona Strip District
Bureau of Land Management



July 1990

ALLOTMENT MANAGEMENT PLAN

Big Spring Pipeline — Allotment Title

Shivwits — Planning Unit

Shivwits — Resource Area

Arizona Strip — District

Prepared by: Lee E Hefner (Name) — District Ranger Co (Title)

Concurrence: (Permittee/ Lessee) Anthony G. Heaton (Name) — 7/23/90 (Date)

(Name) — (Date)

(Name) — (Date)

Approved by: [signature] (Name) — Area Mgr. (Title) — 5/2/94 (Date)

(Name) — (Title) — (Date)

Included in Permit/ Lease by Decision of: (Title) — (Date)

REVISIONS

Prepared by: (Name) — (Title)

Concurrence: (Permittee/ Lessee) (Name) — (Date)

(Name) — (Date)

(Name) — (Date)

Approved by: (Name) — (Title) — (Date)

(Name) — (Title) — (Date)

ALLOTMENT MANAGEMENT PLAN

Big Springs Allotment

I. GUIDANCE FROM THE LAND USE PLAN

Guidance from the Shivwits Resource Area Management Framework Plan offers this guidance:

- Any given area may not be grazed more than one spring growing period (green-up to seed-ripe) during a three-year period.
- Any given area may not be grazed more than two summer growing periods (green-up to seed-ripe) during a three-year period.
- Pasture movement dates will be based on phenological requirements of all key species found on an allotment.
- At least one full year's rest for a portion of the allotment will be required during each grazing cycle.
- Grazing will not begin in areas above 6,000 feet before June of each year.
- Grazing will be restricted to the estimated livestock carrying capacity of the range.
- Utilization of key forage species will be limited to an average of 50 percent of the current year's growth (considering only areas identified for use in any given year).
- Provide protection to the Penstemon distans, a category 2 rare plant. Current monitoring shows no effects to the plant from grazing or trampling. This is due to its unique habitat--steep, north-facing slopes.

II. GRAZING MANAGEMENT PROBLEMS

See allotment evaluation in back of this document.

A. Lack of Dependable Livestock Waters

At latest count (January 1990) there were seven locations on the allotment with water. The total count of livestock water developments are about 25 on the allotment. The other 18 locations were dry earthen water tanks and troughs on pipelines. Some earthen tanks are small and are not expected to provide long term water. Others are large tanks but are shallow due to accumulated silt and thus hold little water and evaporate quickly or drain or just fail to catch water. Several water troughs on existing pipelines appear abandoned.

B. Lack of Sufficient Livestock Forage

All pastures lack cool season grasses and browse. Death Valley and Big Spring pastures lack all grasses and browse. All other pastures have significant quantities of warm season grasses. These grasses according to the trend data are showing down trend with some stable trend. The lack of cool season grasses and browse in the high country of the allotment has lowered the carrying capacity of the allotment. The loss of the browse and grasses occurred many years ago. The exact time period, of course, is unknown. The large amount of all grasses and browse on Whitmore Point indicates the sagebrush areas of this allotment could support much more grass.

C. Heavy Utilization of Whitmore Canyon Bottom Vegetation

The grasslands in the canyon bottom have heavy to severe utilization. Key area #5, #7 and #8 are all in the canyon bottom. In 1989-90 key area #5 had 52 percent and 62 percent, key are #7 had 66 percent, key area #8 had 84 percent. There is a cover of warm season grasses on the canyon bottom but heavy utilization exposes soil to erosion. Trampling of soil is extreme.

III. OBJECTIVES

A. General

The general objective is to increase perennial grasses and browse in the grazed areas of the allotment.

B. **Specific**

Key Area #4 - Whitmore (Ecological Site: Shallow Loamy 10-14)

- Increase cool season perennial grasses from a frequency of 4 percent (1990) to 30 percent in 15 years.
- Increase the frequency of warm season perennial grasses from 15 to 35 percent.
- Increase the frequency of browse from 0 percent to 10 percent in 15 years.

Key Area #5 - Lava Canyon Bottom

- Increase the frequency of cool season perennial grass from 0 percent to 10 percent in 15 years.
- Maintain warm season perennial grass at present levels.
- Increase the frequency of browse from 1 percent to 10 percent in 15 years.

Key Area #6 - Cole Spring (Ecological Site: Shallow Loamy 10-14)

- Increase the frequency of cool season perennial grass from 0 percent to 10 percent in 15 years.
- Increase the frequency of warm season perennial grass from 25 percent to 45 percent in 15 years.
- Increase browse from 0 percent to 10 percent in 15 years.

Key Area #7 - Canyon Bottom

- Increase the frequency of cool season perennial grass from 0 to 10 percent in 15 years.
- Increase the frequency of browse from 0 to 10 percent in 15 years.
- Decrease the frequency of shrubs/trees from 95 percent to 50 percent in 15 years.

Key Area #8 - Canyon Bottom Airstrip

- Increase warm season perennial grasses from 44 to 55 percent in 15 years.
- Increase browse from less than 1 percent to 20 percent in 15 years.
- Increase cool season grass from 0 to 5 percent in 15 years.

This is an auxiliary #5 only photo point and utilization transect.

Key Area #9 - Big Spring (Ecological Site: Basaltic Uplands?)

- Increase the frequency of cool season perennial grasses from 0 percent to 10 percent in 15 years.
- Increase the frequency of warm season perennial grasses from 0 to 10 percent in 15 years.
- Increase the frequency of browse from 0 to 20 percent in 15 years.
- Decrease the frequency of sagebrush (45%), pinyon and juniper (10%) from ~~100~~ (55%) percent to ~~50~~ (35%) percent in 15 years.

All of the above in Key Area #9 would be dependent on prescribed land treatment or a wildfire occurrence. With neither done, the frequency would not change from the present (1990).

Key Area #10 - Canyon Bottom

- Maintain warm season perennial grasses at present levels.
- Increase browse from <1 to 10 percent in 15 years.
- Increase cool season grasses from <1 to 5 percent in 15 years.

Key Area #11 - Canyon Bottom

- Maintain warm season perennial grasses at present levels.
- Increase browse from 10 to 15 percent in 15 years.

- Increase cool season perennial grasses from 0 to 5 percent in 15 years.

Key areas may be added as the need arises.

IV. KEY SPECIES AND PHENOLOGY

KEY SPECIES	DEVELOPMENTAL STAGES			
	START GROWTH	FLOWER-ING	SEED RIPE	SEED DISSEM.
Shrubs:				
Range ratany	3/1	5/1-5/15	8/1-9/15	10/1
Cliffrose	4/1	5/15	7/1	8/1*
Fourwing saltbush	3/15	6/15	11/1	12/1
Winterfat	3/1-4/15	3/20-6/1	8/1-9/15	10/1-12/1
Mormon tea	3/1-5/1	6/1-7/20	8/1-9/15	10/1-12/1
Bursage	2/15-3/1	5/1-5/15	8/1-9/15	10/1
Grasses:				
Blue & black grama	6/1	8/1	9/15	10/10
Indian rice grass	2/15-3/1	5/1-6/1	7/15	8/15
Galleta	3/15-5/1	5/1-6/1	8/15	10/15
Squirreltail	2/15-3/1	6/1	7/1	8/1
Wheatgrasses	3/1	5/15	7/1	8/15
Sand dropseed	4/1	6/20	7/15	8/30
Russian wildrye	3/1	5/15	7/1	8/15
Needlegrass	3/1	5/15	7/1	8/1

* Following year

V. PLANNED GRAZING USE

See Potential Pasture map.

A. **Winter Country** (Whitmore Canyon and other Canyon Bottoms)

ORDER OF USE	PERIOD OF USE			
	OCTOBER 16 ---------- TO ---------- APRIL 15			
A First 10/16 - 11/30	45% util.	Rest	Rest	Rest
B Second 12/1 - 1/15	Rest	45% util.	Rest	Rest
C Third 1/16 - 2/28	Rest	Rest	45% util.	Rest
D Fourth 3/1 - 4/15	Rest	Rest	Rest	45% util.

PASTURES	1991	1992	1993	1994	ETC.
Cold Spring	A	D	C	B	Repeat
Airstrip	B	A	D	C	Cycle
Lava	C	B	A	D	" "
Chaparral	D	C	B	A	" "

The winter grazing system would operate from when the livestock are brought into the Whitmore Canyon bottom from October 16 to April 15. Livestock would move first into the pasture designated A. Once utilization levels at a key area reaches 45 percent (average use level for key species) the livestock would move to the pasture designated for B use. When utilization level reaches 45 percent at the key area in that pasture the livestock would be moved to the pasture designated for C use and so on through pasture D. Should the cattle use up the forage to 45 percent in all pastures before April 15 the livestock would be moved to a summer country pasture (Whitmore, Cole Springs). If this happens two years in a row, livestock numbers would be reduced to a level that the canyon bottom forage can support up to 45 percent utilization levels on key species.

B. **Summer Country**

TREATMENT	PERIOD OF USE	
	APRIL 16 ---------- TO ---------- OCTOBER 15	
A 4/16 - 7/15	50% util.	Rest
B 7/16 - 10/15	Rest	50% util.

PASTURES	1991	1992	1993	1994	ETC.
Whitmore Cole Spring Kinney Flat Meadow*	A B	B A	A B	B A	Repeat Cycle

Whitmore and Cole Spring pastures would be on a deferred grazing system with use alternating each year as to order of use. Use in these pastures would last until an average of 50 percent utilization is reached on the key species at key areas, then livestock would be moved. The Kinney Flat* Meadow would be managed the same way. When utilization reaches 50 percent on the meadow at transect locations the livestock would be moved out into Cole Spring pasture and the gates closed. If utilization persists above the 50 percent level on the average for two years, livestock numbers or time spent in the pastures would be reduced to bring utilization levels to 50 percent.

C. **Special Pastures**

Big Spring and Death Valley pastures are currently used little as forage production is precluded by tree and shrub production. These pastures will be used as spillover pastures. If the other summer pastures reach 50 percent utilization prior to October 15, one of these pastures can be used. This would be during the July to October period. However, during the following year the pastures would be rested during the period of time when it was used the previous year.

D. **Rationale**

This grazing system would provide opportunity to the perennial grasses and browse to increase to their potential in the foreseeable future. The allotment in all of its pastures lacks cool season grasses and browse; and other pastures like Big Spring and Death Valley have little or no forage. Variety of vegetation is poor on the allotment. The rest periods and adherence to utilization levels will allow forage plants to grow, store root and twig reserves, and reproduce in the areas grazed by livestock. The canyon bottoms should respond to rest quickly with average moisture. Warm season grasses should do well. Cool season grasses and browse would be far slower to respond because of their low numbers and reproduction potential.

VI. NORMAL OPERATION

The operation is licensed as follows:

LIVESTOCK #	PERIOD OF USE	% PUBLIC LAND
222 Cattle	October 1 to September 30	83
2 Horses	October 1 to September 30	83

The above is the normal operation; however, stocking level is controlled by water availability and forage quantities. When an area's forage becomes unavailable due to dry reservoirs or other non-functioning water sources, the stocking level needs to be decreased. The same applies to forage availability. When all factors are in place the cattle can be increased. This all needs close coordination between the rancher and the BLM.

VII. FLEXIBILITY

The grazing move dates for livestock would be as shown on the grazing schedules. Moving cattle would be triggered by utilization levels shown and described in the grazing system section. If the move date (April 15, winter country; October 15, summer country) is reached before attaining the 45 percent or 50 percent utilization, then the move would occur on the date. If the utilization level set is reached before the move date, the move always occurs with reaching the utilization level. The only flexibility on these two criteria is if the situation arises where the average utilization level is below 45 percent or 50 percent and the move date (April 15, October 15) is reached; then it can be arranged with the area manager to stay up to two weeks longer. Stocking rate increases or decreases would be determined through the monitoring studies, and/or through coordination when weather conditions require or allow immediate changes.

Within the winter country pastures or summer country pastures, when the utilization level reaches 45 percent or 50 percent and the cattle are to be moved to the next pasture, but the next pasture is not in condition to be grazed; it can be arranged with the area manager to move the cattle to the best looking pasture.

VIII. RANGE IMPROVEMENTS

A. Existing Range Improvements

See Existing Range Improvements table.

This allotment has numerous range improvements. The fences are numerous as are the water developments. The interior pasture fences in Whitmore Canyon all need some work where they cross washes and at other locations in order to operate the proposed grazing system. The fence around Kinney Flat Meadows needs work regardless of which grazing system is chosen. Most boundary fences are adequate. The pipelines and reservoirs need work, but, the reservoirs have a poor record of holding water. This due to substrate or other factors. This makes grazing hard to operate.

B. Proposed Range Improvements

See Proposed Range Improvements table.

1. One and one-half miles of new gap fences are needed to close Cole Spring pasture from Cold Spring pasture. One fence involving state and private land would be in T34N R9W Sections 32 and 33. If built on BLM land it would involve Sections 28, 29 and 30.

2. Finish the fence between Cole Spring and Big Spring.

3. Build two catchments, one at the north end of Whitmore Point pasture and one on the NPS land at the south end of the pasture. BLM would build the north one and the permittee would build the south one or vice versa.

No land treatments will be proposed in this plan due to many costs and complications now associated with this practice. Land treatment will be treated on a case-by-case opportunity.

IX. BILLING PROCEDURE

An advance billing will be issued each year in February and must be paid for by March 1, which is the beginning of the new grazing year.

Actual use billing will not be allowed until a consistent record of timely payment is established.

X. STUDIES AND EVALUATIONS

The studies and evaluations on this allotment will be done in conformance with the District Monitoring Plan of December 1, 1988.

A. Utilization

Grazed Class Method - Utilization will be done to ascertain livestock moves as outlined in the grazing system and to ascertain the final utilization immediately after the livestock are moved out of a pasture. This at first would require much coordinated utilization readings. Utilization reading frequency can be reduced in number when utilization levels reach a 45 percent and 50 percent average of the key forage plants as designated in the grazing system section.

Trend - Trend, using methods described in the district monitoring plan, should be read every other year in the deferred pastures (Whitmore and Cole Spring). The Whitmore Canyon pastures (winter country) should be set up on a staggered four-year schedule. One pasture would be read each year over a four-year cycle. This can be scheduled by the range conservationist in the study file.

Ecological Site Condition - Species composition by weight through the dry weight ranking method. This composition would then be aligned with the ecological site description in the soil survey. See district monitoring plan.

Climate - Would continue as described in the monitoring plan and the rain gauge data gathering would be done on existing time schedules.

Actual Use - The permittee will submit actual use records by September 30 each year to the area manager, showing accurate numbers of livestock on the allotment and dates of use in each pasture.

B. Evaluation and Modifications

Evaluation of actual use, trend, utilization, weather, ecological condition data would be correlated and interpreted to determine future livestock numbers.

After two full years of utilization data, the same data would be evaluated to determine carrying capacity. This would continue every two years until a satisfactory stocking level is reached and that would be as outlined in the grazing system section (45 percent or 50 percent utilization.

A full evaluation using trend, actual use, utilization, condition and other professional judgments in coordination with the rancher would be done after six years of signing this plan. This would determine needed changes in the AMP and new range improvements and subsequent livestock number changes also.

EXISTING RANGE IMPROVEMENTS

PROJECT NAME	PROJECT #	UNITS	LOCATION	COST		MAINTENANCE RESPONSIBILITY
				BLM	PERM.	
Lava Flow Cross Fence	1491	1.4 mile	T33N R9W S23,26	519	655	Permittee
Cole Spring Reseeding	0601	1.5 mile	T34N R9W S6-7	242	358	BLM
Wood-Schumitz Fence	0631	.3 mile	T35N R9W	37	140	Permittee
Cole Spring Excl. Reseeding	0690	200 acres	T34N R9/10W S7,12	416	—	BLM
WLA Whitmore #2 Wash Fence	0693	1.0 mile	T33N R9W S10	182	430	Permittee
Wood-Anderson-Larson Drift Fn	0904	1.0 mile	T33N R9W S10	181	500	Permittee
Bundy-Lamoreaux Fence	0308	3.0 miles	T34N R10W	—	1278	Permittee
H. Carroll-Bundy Fence	0451	3.8 miles	T34N R9/10W	760	1743	Permittee
Lower Cole Spring Trail	4253	2.0 miles	T34N R9W S20,29	—	?	Permittee
Pocket Air Strip	4103	?	T34N R10W S12	---	225	Permittee
Cold Springs	4420	1	T34N R9W S9 NE4SW4	—	?	Permittee
Cold Forest Boundary Fence	4425	6.8 miles	T35N R9W S33-35; T34N R9W S4,9-10; T34N R8W S19-20	---	?	Permittee
Cold Little Fence	4424	1.4 mile	T34N R8W S17,20	—	?	Permittee
Nixon Cold Fence	4423	1.5 mile	T34N R9W S2; T35N R9W S35 SW4	---	?	Permittee
Big Springs Juniper Erad. ★	0993		T33N R8W S6,18	6840	—	
Wood-Bundy Division Fence	0752		T34N R9W S5 N2	113	—	
Big Spring Pipeline ★	0543	1.5 mile	T33/34N R8/9W S2	---	680	Permittee
Fence	1200	2.0 miles	T33N R9W S14,23	---	1278	Permittee
Fence & Water Storage	1201	.5 mile	T33N R9W S22	—	650	Permittee
Reservoir	1350	4050 cu yd	T34N R10W S12	---	810	Permittee
Pipeline & Troughs	1520	2.25 miles	T33N R9W S2,11,14,22	---	3500	Permittee
Reservoir	1522	1500 cu yd	T34N R10W S27	---	300	Permittee
Reservoir	1655	3600 cu yd	T33N R9W S4	—	720	Permittee
Reservoir/Storage Tank	1656	5000 cu yd	T34N R10W S12	---	1000	Permittee
Pipeline & Steel Tanks	1681	.5 mile	T34N R9W S8,17	—	310	Permittee
Pipeline	1683	2.0 miles	T33N R9W S2-4	—	450	Permittee
Pipeline	1665	2.0 miles	T33N R9W S27,34	—	450	Permittee
Hells Hollow Pipeline/Two (2) Tanks ★	1745	2.5 miles	T34N R9W S24-27	---	2000	Permittee
Pipeline/Steel Tanks	1747	1.5 mile	T34N R9W S8,17,20	—	1500	Permittee
Reservoir ★	0668	1250 cu yd	T33N R9W S13	—	250	Permittee
Reservoir	0671	2500 cu yd	T34N R10W S33	---	500	Permittee
Reservoir	0672	2500 cu yd	T34N R10W S34	—	500	Permittee
Reservoir	0674	2000 cu yd	T33N R9W S2	---	400	Permittee
Reservoir	0676	1000 cu yd	T34N R9W S35	—	200	Permittee
Corral & Chute	0679	1	T34N R9W S7	---	350	Permittee
Reservoir ★	0682	750 cu yd	T34N R8W S31	—	150	Permittee
Reservoir ★	0684	1450 cu yd	T34N R8W S32	---	350	Permittee
Line Corral	4260	1.0	T34N R9W S20 SW4NE4	—	355	Permittee

★ = Range Improvements inside Wilderness Area

PROPOSED RANGE IMPROVEMENTS

PRIORITY	PROJECT NAME	UNITS	APPROXIMATE COST/UNIT	TOTAL COST	MAINTENANCE RESPONSIBILITY	CONSTRUCTION COST	ESTIMATED DATE OF COMPLETION
1*	Cold Spring Pasture Fence	1.5 mi.	5,000/mile	$7,500	Permittee	BLM-Material Permittee-Build	April 15, 1991
2*	Cattleguard	1	2,000/each	$2,000	Permittee	BLM-Total	April 15, 1991
3	North Whitmore Catchment	30,000	35,000/each	$35,000	Permittee & BLM	BLM	When funds are available
4	South Whitmore Catchment	30,000	35,000/each	$35,000	Permittee	Permittee	When funds are available

*Projects on private and state land would be done by permittee with help from the SCS and Grazing Advisory Board. The fence and cattleguard, if located on BLM land, will have materials provided. If built on state or private land, the permittee would have to fund the project or with SCS.

Appendix I – Public Scoping Comment and Response Table.

Commenter Name	Comment Category	Comment	Response
Spotts WWP	Additional alternatives	Comments were received regarding providing additional alternatives including the elimination of livestock grazing: "additional alternative would be similar to Alternative C but would involve pursuing the willing seller acquisition of these two allotments' ten year grazing permits." "The Bureau should consider an alternative that would close the allotment and retire the permit. Additionally, the Bureau should include a voluntary grazing permit retirement provision" "the agencies must consider a no-grazing alternative."	The permittee submitted an application to renew their grazing permit with the change of season described in 2.3.1 Alternative A - Proposed Action. See 1.2 Purpose and Need. The EA includes three alternatives that are fully analyzed, including 2.3.4 Alternative C - No Grazing alternative. The three alternatives are fully analyzed in Chapters 3 and 4 of the EA. Taylor Grazing Act (TGA) of 1934 gave the Secretary of the Department of the Interior the authority to create grazing districts on unclaimed public lands, issue grazing permits, charge grazing fees, and to establish various rules and regulations to administer the federal grazing program. FLPMA, enacted in 1976, established the multiple-use mandate for federal public lands to serve present and future generations. FLPMA further defines "principal and major uses" of federal public land to include livestock grazing. When enacting FLPMA, Congress expressly protected the grazing permit system first contemplated in the TGA. (Leonard 2019). The authority to amend these laws remains with Congress (see 2.3.4 Alternatives considered but not carried forward for analysis)
Spotts WWP	Additional Information	Comments concerning information about trend, utilization, compliance, other monitoring of the allotments that are covered by the proposed action. "Over the past ten years, were there	Appendix C (Utilization and Monitoring data) was provided during the public scoping period. Exceedance of utilization objectives are provided in text below the utilization table for the specific pasture. As trend is a snapshot in time, there can be fluctuations from year to

Commenter Name	Comment Category	Comment	Response
		any violations of these grazing permits and/or did livestock utilization ever exceed permitted maximums?" "There are a few sites we believe are trending down that are reported as static. Some key areas have high numbers of unpalatable species which indicates they could be overgrazed but it is not clear from the information available during the scoping period that the analysis will reflect this possibility."	year based on variables including annual precipitation/drought, as well as variability in monitoring. The key areas where the trend is established and read encompasses the general area and each transect is not permanently marked. To capture these variabilities, significant change in trend is evaluated as a change in frequency observed between the initial reading (base year) and the current reading. This is depicted by up, down, and no apparent change or static. The threshold for a significant change in trend is +/- 10 percent. An important attribute reflected in trend calculations are changes in frequency of key species. Key species are defined as plant species that are palatable and consumed by the authorized kind of livestock, in this case cattle and horses.
Spotts Anonymous WWP	Additional Information	Comments concerning the amount of forage, water, required by livestock. "Over the next ten years, how much water would be used for livestock, what are its sources, and how much water may not otherwise be available for native species? " "If the permittee wants to potentially increase use at other times of the year, how will this allow the agencies to maintain healthy perennial grass populations?	Animal Unit Month (AUM) is defined in Section 2.3.1 Alternative A – Proposed Action on page 12. AUM is a unit of measurement indicating how much forage is eaten by a cow/calf pair in one month. Approximately 26 lbs. of dry matter/day. Table 2.2 illustrates the authorized AUMs for each allotment. There have been various water developments on both allotments that benefit both wildlife and livestock (see Appendix A, Figure 2 and 3). Water consumption for both livestock and wildlife vary by time of year. Section 4.3.1 describes reductions by the current permittee during drought conditions. As stated in both the proposed action and no action alternatives, as well as in 2.3.1.1 Grazing System most of the livestock are removed from federal grazing lands during the growing season,

Commenter Name	Comment Category	Comment	Response
			therefore not competing with wildlife for forage or water during that time. Water developments that benefit both wildlife and livestock for the two allotments are displayed in Appendix A, Figure 8. Concerning year-long use proposal, 2.3.1 Alternative A – Proposed Action states "Currently, the permittee removes most of their cattle off these allotments to private summer pastures allowing almost complete growing season rest for all pastures within these allotments. The permittee would continue to do this but is requesting to combine the two Belnap pastures, (North and South) with the Big Spring Pipeline Allotment." This is evident from compliance checks as well as Actual Use submitted which date back to the mid-1980s for both allotments. Actual Use for the period when the livestock remained on the Big Spring Pipeline and Belnap allotments through the growing season is approximately 54-59% (respective, of permitted use i.e., 40%+ non-use).). Actual use tables can be found in Appendix C, Table C.1 Belnap Allotment Actual Use and Table C.2 Big Spring Pipeline Actual Use. The proposal to convert the Belnap Allotment to a year-round grazing allotment will likely not affect current utilization or Actual Use levels, as it is evident that the livestock will not be on either allotment during the majority of the growing season. This proposal will allow the permittee additional flexibility to better manage their livestock for the period they are on the allotments." There is no proposal to increase AUMs.

Commenter Name	Comment Category	Comment	Response
Ingram WWP	Additional Information	Comments regarding the economics of grazing livestock on pubic land; including grazing fees, grants, subsidies, livestock infrastructure costs, and cost benefit analysis of grazing on public lands	Grazing fees are adjusted nationally on an annual basis using a formula that factors the average annual change in beef cattle prices, leasing rates for grazing on private land in the western states, and the costs of livestock production. See 2.3.1 Alternative A – Proposed Action; no new range improvements are proposed or analyzed in this EA. Infrastructure labor is performed primarily by the grazing permittee but can include others including youth groups American Conservation Experience (ACE). Material costs are shared by a wide variety of sources including the permittee, federal agencies including BLM and Natural Resource Conservation Service (NRCS), state agencies including Arizona Game and Fish Dept. (AGFD), non-profit organizations including Arizona Association of Conservation Districts (AACD), Pheasants and Quail Forever, hunting groups, and others. It is beyond the scope of this grazing permit renewal to determine the vast inputs and outputs associated with managing public lands.
Spotts Anonymous	Biological Soil Crust	Comments were received regarding protection and preservation for Biological Soil Crusts (BSC). "Over the next ten years, how would livestock grazing contribute to the loss of essential biological soil crusts?"	Frequency trend monitoring of key areas includes detection and monitoring of BSC. Trend of BSC is taken into account when determining the long-trend for a site, see Appendix C, Tables C11 – C20.
WWP Spotts	Issues - Impact Analysis	Comments concerning climate change and drought. "drought and climate impacts are a concern" "Please review the attachments that provide relevant information on the climate change and	See Table 3.1 to see resources analyzed and discussion of Green House Gases. Climate change is a global phenomenon that is thought to result from a multitude of factors, including global

Commenter Name	Comment Category	Comment	Response
		other adverse impacts from commercial livestock grazing on public lands." "During the prolonged drought over the past decade, to what extent was livestock grazing on these allotments reduced or suspended?"	GHG emissions. GHGs include water vapor, carbon dioxide, nitrous oxide, methane, and carbon monoxide. Projected climate change impacts include air temperature increases and decreases, sea level rise, changes in the timing, location, and quantity of precipitation, and increased frequency of extreme weather events such as heat waves, droughts, and floods. These changes would vary regionally and affect renewable resources, aquatic and terrestrial ecosystems, and agriculture. The proposed alternatives would be a minute source of carbon dioxide (CO2) and other GHGs, which would have a negligible effect on local, regional, and global climate change. During drought years, the number of cattle grazed on the allotment are reduced to prevent them from adversely affecting vegetation. It is important to note that the BLM has existing measures in place to reduce grazing during drought (EA 2.2.2 Monitoring and Adaptative Management). Monitoring is conducted regularly on both allotments which would indicate whether vegetation conditions are being affected by grazing or other factors. This monitoring is conducted regardless of climatic conditions. The proposed action includes a grazing system (EA 2.3.1.1) which has a deferred pasture rotation, summer/fall rest, allowable utilization of up to 50 % of the current year's growth. When 50% forage utilization is reached, livestock would be moved to another pasture or off the allotment completely. These management

Commenter Name	Comment Category	Comment	Response
			practices, combined with adaptive management options that allows the BLM to adjust the timing, intensity, frequency, and duration of grazing; the grazing management system; and livestock numbers temporarily or on a more long-term basis, as deemed necessary. These actions, pasture rotation, utilization limit, and rest from grazing during the growing season are key to reducing impacts to vegetation, soils, and wildlife.
Spotts WWP	Livestock Compliance	"Please provide all information related to compliance with grazing permit terms and conditions on these allotments for the past 10 years."	Compliance and monitoring are addressed in 3.4.1 Livestock Grazing and 4.4 Monitoring sections and Appendix C Actual Use and Utilization sections. Text associated with utilization tables by allotment and pasture cites known exceedance of objectives for that period.
Ingram Spotts WWP Anonymous	Monument Object Effects and Monument Proclamation	Several comments were received regarding impacts to Monument Objects.. "strongly support the protection and restoration of the specific objects and values set forth in the GCPNM Proclamation." "On the Grand Canyon-Parashant National Monument grazing is a discretionary use, and grazing is not a Monument object to be protected in the Monument Proclamation," "legal need to protect monument objects" "[l]ivestock grazing on public lands is managed according to grazing regulations found in the Code of Federal Regulations (CFR) at 43 CFR Part 4100" and mentions National	See Section 1.6 Relationships to Statutes, Regulations, or Other Plans "The GCPNM is responsible for grazing management of both allotments (BLM 2008a). Designation of the Monument did not, in and of itself, require modification of the current grazing practices. The presidential proclamation states that "Laws, regulations, and policies followed by the BLM in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply…" (BLM 2008a; USGPO 2000) Under the Antiquities Act, the BLM must protect objects identified in the presidential proclamation that established the national monument. Therefore, if the BLM determines that any monument objects are harmed by current management then management (including permit terms and conditions) will be modified accordingly. The analysis of impacts

Commenter Name	Comment Category	Comment	Response
		Environmental Policy Act (NEPA), Federal Land Policy Management Act (FLPMA), and the Taylor Grazing Act (TGA). However, the project website does not mention BLM Manual 6100 or 6220, nor does it mention that NEPA, FLPMA and the TGA, require the Bureau to determine *whether or not* to authorize grazing within these allotments and whether changes to current management are necessary. the NLCS regulations to ensure Monument objects are protected *if* the Bureau authorizes livestock grazing. Where grazing is not compatible with such protections, it should be eliminated." "Under the appropriate legal framework, the protection of these monument objects and values is the "dominant reservation" and supersedes FLPMA multiple use management when any conflicts may occur" "proposed new route in this area affect the same objects, values, and resources that may be affected by this livestock grazing or the administration of these allotments?"	to specific resources constitutes the analysis of impacts to monument objects in this EA". Section 1.6 further states "The BLM has prepared this EA for the Belnap and Big Spring Pipeline Allotments Grazing Permit Renewal in compliance with NEPA and FLPMA. The statutes that govern public land rangeland management are the TGA of June 28, 1934, as amended (43 U.S.C. 315, 315a–315r); section 102 of the FLPMA of 1976 (43 U.S.C. 1740) as amended by the PRIA of 1978 (43 U.S.C. 1901 et seq.)." The manuals cited provide further guidance to BLM staff for management of National Monuments (BLM Manual 6220) and National Landscape Conservation System (NLCS) (BLM Manual 6100).
Ingram	Multiple Use	"A single commercial use for this Grand Canyon related region, when there are so many other national options for grazing, needs considerably	See 1.6 Relationship to Statutes, Regulations, or Other Plans. The presidential proclamation states that "Laws, regulations, and policies followed by the BLM in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply…"

Commenter Name	Comment Category	Comment	Response
		more justification than is indicated by just a plan for nine pastures." "It is not apparent that the grazing activities and priorities in the area indicated in the scoping notice give proper acknowledgement to the matter of protection of park-value and recreation resources for the area."	See Table 3.1 for section addressing recreation. See 3.4.3 Wilderness and 4.2.3 Wilderness sections and Appendix D for MRDG.
WWP	NEPA Process	"We encourage the Bureau to take a step back and provide for at least 30 days for the public to provide comments on this scoping notice."	A scoping period is required for an Environmental Impact Statement (EIS), but is optional for an EA (see H-1790-1NEPA Handbook Section 6.3.2), The BLM and NPS solicits public input through the scoping process prior to the development of an EA. Usually, the length of the scoping period coincides with the complexity or potential controversial level of a proposal. The comments received from the recent scoping period as well as those received during the land health evaluations for both allotments are being considered in developing this EA. Additionally, the public will be given additional time to comment once the EA is released to provide additional information that may impact the final decision.
WWP	NEPA Process	"has an Environmental Analysis (EA) already been prepared, or will it be prepared?"	Public scoping proceeds drafting of an EA. The Preliminary Project Summary was provided to the public for the purposes of background information, purpose and need for the project, and preliminary proposed actions, issues and alternatives developed during internal scoping. See BLM Handbook H1790-1-2008 sections 7.1 and 7.2, and NPS NEPA Handbook (2015) section 1.5.E for

Commenter Name	Comment Category	Comment	Response
			more information about appropriate information to be shared with the public during public scoping.
WWP	NEPA Process	Comments addressing cumulative effects analysis. "The cumulative impacts analysis for this project should include all projects on these allotments, including wells, nearby solar project, any other past, known, or anticipated losses of public lands on this allotment or impacting this permittee, and any other known and related or connected projects." Commenter identified the following projects approved during the past 10 year permit cycle: "Belnap allotment cattleguard installation" "catchment would be located on the Big Springs Pipeline and Belnap allotment boundary" "Belnap, Big Springs Pipeline, and Pa's PocketAllotment Grazing Permit" transfer "it seems the Bureau is breaking up the projects for this allotment into small parts in order to avoid a full NEPA analysis"	See cumulative impacts analysis sections in Chapter 4 for each issue analyzed in depth (Sections 4.3). An EA is considered the proper level of initial analysis for this proposal. The EA process is used to determine if a higher level of analysis is required. Proper level of NEPA analysis was completed for the projects cited on these two allotments including catchment, cattleguard, and transfers. Transfers and cattleguards are demand driven i.e., increase off road vehicle recreation requires more cattleguards to reduce resource conflicts. Water development proposal i.e., lack of reliable water is cited in 1994 Big Spring Pipeline AMP. Workload and funding may delay implementation of range improvements.
WWP	Permittee Qualifications	"provide information and documentation that the permittees for these allotments have the required base water for this permit."	There are various requirements that must be documented to be granted a BLM livestock grazing permit. These requirements are analyzed prior to permit transfers, as well as during the permit renewal process. The

Commenter Name	Comment Category	Comment	Response
			permittee for these two allotments has met those requirements. Water rights are administered by the Arizona Department of Water Rights.
WWP	Proposed Action	Proposed Action "Currently, the pasture is technically year-round but the permittee only uses it in the winter. The permittee wants the flexibility to use it more. Thus the question the Bureau and Park Service must ask and answer is - how much more? And exactly when? Will spring grazing be authorized? If the Bureau and Park Service institute a 9-pasture rotation system, this will require a significant amount of new fencing probably water sources." "If the permittee wants to potentially increase use at other times of the year, how will this allow the agencies to maintain healthy perennial grass populations?" "Will the impacts of the grazing infrastructure harm Monument objects and cause a violation of federal laws?"	See 2.3.1 Alternative A – Proposed Action. "*Combine Belnap and Big Spring Pipeline Allotments, Extend the Season of Use for the Belnap Pastures, Implement a Nine-Pasture Rotation System, and Rename and Renew Permit for the New Combined Big Spring Pipeline Allotment".* This alternative does not analyze or authorize additional AUMs, it would allow use of the existing Belnap North and South pastures for year-round use rather than current late fall through early spring use. The seven existing Big Spring Pipeline pastures in addition to the existing two Belnap pastures would be the nine pastures of use. No new infrastructure or range improvements are proposed in this alternative.
WWP	Range Improvements	"How many wells has the Bureau approved construction for on this allotment in the last 10 years? Please provide maps identifying all of the range infrastructure on this allotment." "Please disclose how much fencing and other grazing infrastructure, including	No wells have been authorized for either allotment. Map of existing range improvements for both allotments is found in Appendix A, Figure 8. See 2.3.1 Alternative A- Proposed Action. No new range improvements or roads are proposed.

Commenter Name	Comment Category	Comment	Response
		wells, troughs, and pipelines will be necessary to implement the Proposed Action, Alternative A. Will new roads be created?"	
Spotts WWP	Special Status Species	"current status and trend of any ESA listed or other special status species that may occur in these allotments" "efforts to protect from the impacts of livestock grazing" "Bureau and NPS must carefully consider and make efforts to protect from the impacts of livestock grazing: Penstemon distans Mt. Trumbull Beardtongue"	See 3.4.4.3 Sensitive Animal Species; section 3.4.2 Vegetation Including Special Status and Invasive, Non-Native Plant Species (specifically 3.4.2.4).
Bundy	Support for proposed action.	"the improvements that the permittees have done on these allotments and the good stewards they are and I think it is a good proposed action."	Comment noted.
Spotts	Vegetation	Comments regarding the spread and control of invasive and noxious weeds. "Over the next ten years, how would livestock grazing contribute to ground disturbance and the spread of cheatgrass and other harmful invasives that change fuel loads and fire ecology?"	Invasive or noxious weeds were cited by the team as deviating none to slight at three of the four LHE sites, and moderate at a fourth site. Table 3.1, ASDO fuels specialist cites "no Fire Management/Fuels issues in the project area." The GCPNM has an integrated vegetation management program including treatment of noxious and invasive vegetation. These treatments adhere to both the BLM national EIS for weed treatments and the ASDO Weed EA. 3.4.1.2 Desired Plant Community Objectives analyzes the current vegetation to the Ecological Site Description. See 3.2.2 and 3.4.2 Vegetation Including Special Status and Invasive, Non-Native Plant Species

Commenter Name	Comment Category	Comment	Response
Spotts	Vegetation	Comments received addressing history of vegetation treatments within these allotments.	See 3.4.2.1 Historic Vegetation Treatments and Appendix A Figure 5 and 6.
Ingram	Wilderness	"It is not clear why this section of the N.R.A. has not been favored with such appropriate management consideration, given its clear wilderness, recreational, park, and public access values." "Mt. Logan Wilderness Area……..is of particular concern"	See 4.2.3 Wilderness and Appendix D – Minimum Requirements Decision Guide (MRDG).