

Mt. Logan Allotment Grazing Permit Renewal

Environmental Assessment

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Acronyms and Abbreviations

AGFD	Arizona Game and Fish Department
AMP	Allotment Management Plan
AMSL	Above Mean Sea Level
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
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
GMU	Game Management Unit
IBLA	Interior Board of Land Appeals
LHE	Land Health Evaluation
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NOFD	Notice of Final Decision
NOPD	Notice of Proposed Decision
NRCS	Natural Resources Conservation Service
OHV	Off-Highway Vehicle
PL	Public Law
PNC	Potential Natural Community
PRIA	Public Rangelands Improvement Act
p.z.	Precipitation Zone
RLH	Rangeland Health

RMP	Resource Management Plan
S&G	Standards and Guidelines
SWIFL	Southwestern Willow Flycatcher
UBWR	Utah Board of Water Resources
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management

NRCS List of plant codes and names for Mt. Logan Allotment from trend plots.

Perennial Grasses

BOGR = *Boutalua gracilis* blue gramma
 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 tridentate* big sagebrush

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
 PFFF (perennial forbs) unknown perennial forbs
 SSSS (other shrubs) unknown shrubs
 Purpose and Need for Action

1.0 Purpose and Need for Action

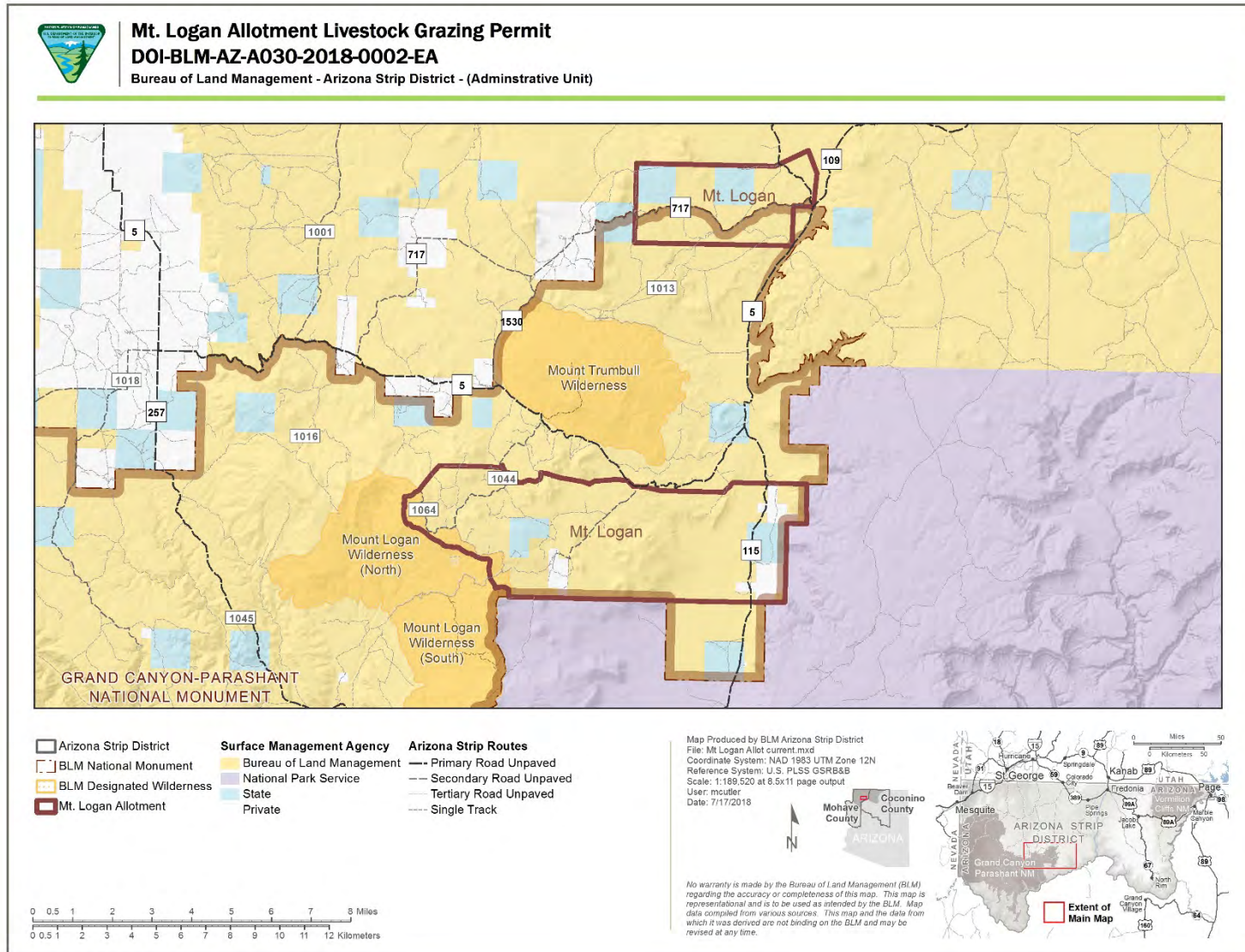
1.1 Introduction and Background

On January 3, 2007, the Bureau of Land Management (BLM), Grand Canyon Parashant National Monument (GCPNM) completed an evaluation of rangeland conditions on the Mt. Logan Allotment (AZ05218) (see Mt. Logan Current Allotment Boundary, Figure 1, page 4.). A detailed discussion on rangeland health for this allotment can be found in Chapter 3. The Interdisciplinary Assessment Team (IAT), during the land health evaluation process, determined that the Mt. Logan Allotment meets all applicable standards for rangeland health. In 2018, an interdisciplinary team re-evaluated the allotment utilizing Interpreting Indicators of Rangeland Health, Version 4 (BLM 2005) (as well as trend monitoring data). The team determined that the allotment continues to meet Arizona BLM Standards for Rangeland Health (Standards for Rangeland Health). The BLM is considering renewing the existing grazing permit on the Mt. Logan Allotment.

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 Mt. Logan Allotment. This analysis provides information as required by the BLM implementing regulations for the National Environmental Policy Act (NEPA), the Taylor Grazing Act (TGA), and the Federal Land Policy Management Act (FLPMA) to determine whether to authorize grazing within this allotment, and whether changes to current management are necessary. This EA also serves as a tool to help the authorized officer make an informed decision that is in conformance with the GCPNM Resource Management Plan (RMP) (BLM 2008). The action culminates an evaluation conducted on the allotments under the Standards for Rangeland Health (Appendix B). This EA determines 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 allotment 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 in project planning and 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 statement of “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 not, a decision record (DR) in accordance with 43 CFR 4160 may be signed for the EA approving the selected alternative. A DR, including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts (effects) beyond those already addressed in the RMP

Figure 1. Current Mt. Logan Allotment Boundary.



1.2 Need for the Proposed Action

A grazing permit renewal application has been received from Jimmie Bundy Hughes, the current permittee to renew the ten-year grazing permit on the Mt. Logan Allotment (AZ05218). The need for the proposed action is for the permittee to be able to continue livestock grazing on the allotment through utilization of forage at proper use levels while being in compliance with, or making significant progress towards meeting the Standards for Rangeland Health (Appendix B) and the RMP (BLM 2008). Other alternatives were developed by the IDT including analysis of discontinuing grazing on the allotment. These are described in Chapter Two.

1.3 Purpose of the Proposed Action

Livestock grazing is an accepted and valid use of the BLM range management program, as provided for by the TGA, FLPMA, and the Public Rangelands Improvement Act (PRIA), as amended. Regulations controlling livestock grazing on public lands found in 43 CFR 4100.0-2. 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 National Park Service (NPS) interdisciplinary team has 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.* This assessment was conducted by the IAT which consisted of resource specialists from: BLM, Natural Resource Conservation Service (NRCS), Arizona Game and Fish Department (AGFD), and Mohave County Extension. The IAT was assisted by the Rangeland Resource Team (RRT), a diverse group of local residents formed and appointed under the Resource Advisory Council.

The RRT, IAT, permittees and other interested parties were invited to attend an issue scoping meeting on October 27, 2004, and a field visit on June 8, 2005. At the conclusion of the field visit, the group determined that Arizona standards for rangeland health are being met.

The purpose of this EA is to process the term grazing permit on the Mt. Logan Allotment in accordance with all applicable laws, regulations, and policies. Because the grazing permit for the Mt. Logan Allotment expired on 2/28/2018, the BLM renewed the permit 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 and BLM Instruction Memorandum 2015-0122, pending compliance with applicable laws and regulations. This action resulted in a new permit being issued, with no changes 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 Mt. Logan Allotment. 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 allotment is achieving or making significant progress toward achievement of Standards for Rangeland Health and RMP objectives.

The GCPNM Manager is the authorized officer responsible for the decisions regarding management of public lands within this allotment. Based on the results of the NEPA analysis, the authorized officer will

issue a determination of the significance of the environmental effects and whether an EIS would be required. If the authorized officer determines that it is not necessary to prepare an EIS, the EA will be deemed sufficient and will provide information for the authorized officer to make an informed decision whether to renew, renew with modifications, or not renew the permit and if renewed, which management actions, mitigation measures, and monitoring requirements will be prescribed for the Mt. Logan Allotment to ensure management objectives and Standards for Rangeland Health are achieved.

1.4 Conformance with BLM Land Use Plan(s)

The alternatives described in Chapter 2 of this EA are in conformance and consistent with the GCPNM RMP, approved January 29, 2008 (BLM 2008).

The following management decisions (includes Desired Future Conditions (DFC)), Management Actions (MA), and Land Use allocations (LA) are from Table 2.12 GCPNM RMP regarding management of Livestock Grazing Management (GM), Vegetation DFC, and Wildlife Management (WF). This list of decisions is not intended to be all inclusive, but a list of the most applicable decisions found in the RMP.

Livestock Grazing

- **DFC-GM-02:** Livestock use and associated management practices will be conducted in a manner consistent with other resource needs and objectives to ensure that the health of rangeland resources is preserved or improved so that they are productive for all rangeland values. Where needed, public rangeland ecosystems will be improved to meet objectives.
- **LA-GM-01:** All allotments will continue to be classified as available for grazing by livestock under the principle of multiple use and sustained yield, except where specifically noted.¹
- **MA-GM-02:** Implementing the Arizona Standards for Rangeland Health will continue on all grazing allotments in accordance with established schedules and congressional requirements. The Arizona Standards for Rangeland Health and Guidelines for Grazing Management will apply to all livestock grazing activities. These guidelines address management practices at the grazing AMP-level and are intended to maintain desirable conditions or improve undesirable rangeland conditions within reasonable time frames.
- **MA-GM-03:** The interdisciplinary allotment evaluation process will continue to be used to provide specific guidance and actions for managing livestock grazing. Existing AMPs and other activity plans will be consistent with achieving the DFCs and standards for rangeland health. They will contain the site-specific management objectives, as well as actions, methods, tools, and appropriate monitoring protocols.
- **MA-GM-04:** Existing management practices and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet or are making progress toward meeting the Arizona Standards for Rangeland Health. Appropriate and timely actions will be implemented to deal with those areas not meeting the standards.
- **MA-GM-05:** The allotment management categorization process will continue to be used to define the level of management needed to properly administer livestock grazing according to management needs, resource conflicts, potential for improvement, and BLM funding/staffing constraints. The

¹ No restrictions are associated with the Mt. Logan Allotment.

allotment categories are Custodial, managed custodially to protect resource conditions and values; Maintain, managed to maintain current satisfactory resource conditions and are actively managed to ensure that the condition of resource values do not decline; and Improve, actively managed to improve unsatisfactory resource conditions.

The Mt. Logan Allotment is classified as Improve allotment; this classification will continue as is.

- **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, managed custodial to protect resource conditions and values; Maintain, managed to maintain current satisfactory resource conditions and are actively managed to ensure that the condition of resource values do not decline; and Improve, actively managed to improve unsatisfactory resource conditions.
- **MA-GM-07:** The category of grazing allotments will be changed as objectives are accomplished and/or conditions change. See Appendix D for current specific allotment category assignments, grazing systems, preference, etc.
- **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, then utilization is set at 45%².
- **MA-GM-08:** Any hay or other feed used in administering the livestock operation will be certified weed-free.

Fence Design to Reduce Wildlife Impacts

- **DFC-WF-05**
Fences will be the minimum necessary for effective livestock control or other administrative purposes. Fences will be wildlife passable, consistent with the species found in the area.
- **DFC-WF-19**
All fences in mule deer habitat will be deer passable.
- **DFC-WF-26**
All fences in pronghorn antelope habitat will be pronghorn passable and necessary for effective range management or other administrative functions.

1.5 Relationship to Statutes, Regulations, or Other Plans

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 authority for renewing grazing permits is provided for in 43 CFR 4100 where the objectives of the regulations are “....to promote healthy, sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions; to promote the orderly use, improvement and development of the public lands; to establish

² The Mt. Logan Allotment is managed under a rotational grazing system, so maximum utilization is set at 50%.

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 Mt. Logan Allotment is within the GCPNM. 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 Bureau of Land Management in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply...” (BLM 2008) 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 Fundamentals of Rangeland Health (43 CFR 4180.1) and Standards for Rangeland Health (Appendix B), which were developed through a collaborative process involving the Arizona Resource Advisory Council and the BLM State Standards and Guidelines team. The Secretary of the Interior approved the Standards and Guidelines in April 1997. These Standards for Rangeland Health were incorporated into the Grand Canyon-Parashant National Monument RMP (BLM 2008). 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 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 identified public lands within the Mt. Logan Allotment as available for domestic livestock grazing. Where consistent with the goals and objectives of the RMP and Standards for Rangeland Health, allocation of forage for livestock use 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 (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 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 allotment. No take of any such species is anticipated.

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

In addition, the proposed action 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.

- Endangered Species Act (ESA) of 1973, as amended
- Arizona Water Quality Standards, Revised Statute Title 49, Chapter II
- Section 106 of the National Historic Preservation Act of 1966, as amended
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001-3013; 104 Stat. 3048-3058)
- National Environmental Policy Act (NEPA) of 1969

1.6 Identification of Issues

Identification of issues was accomplished by considering the resources that could be affected by implementation of one of the alternatives. These issues were identified by the Rangeland Resources Team (RRT), Interdisciplinary Assessment Team (IAT), and livestock permittee during the Mt. Logan Allotment scoping meeting on October 27, 2004, and a field visit on June 8, 2005. At the conclusion of the field visit, the group determined that Standards for Rangeland Health are being met (BLM 2007 and BLM 2018). Input from the BLM and NPS interdisciplinary team can be found in Table 3-2 Elements/Resources of the Human Environment. The issues identified through the scoping process described above are:

- Invasive Species
- Livestock Grazing
- Soils
- Vegetation
- Wildlife

2.0 Proposed Action and Alternatives

2.1 Introduction

The grazing permittee submitted an application to renew the 10-year grazing permit with substantial changes. The BLM interdisciplinary team (IDT) explored and evaluated several different alternatives to determine whether the underlying need for the proposed action – providing for livestock grazing opportunities on public lands while ensuring that the allotment is achieving (or progressing toward meeting) land health standards – would be met. This EA analyzes three alternatives:

1. Alternative A (Proposed Action) – Change allotment boundaries and install fencing to facilitate better livestock management;
2. Alternative B (No Action) – Permit renewal with no changes to allotment boundaries or fencing;
3. Alternative C (No Grazing).

2.2 Terms and Conditions Common to Alternatives A and B

Standard Terms and Conditions which includes the season of use, active AUMs, and permitted numbers would apply to both action alternatives. Applicable to the action alternatives, would be the term and condition stating when 50 percent forage utilization is reached, livestock will move to another pasture or off the allotment. The Mt. Logan Allotment Management Plan (AMP) signed 11/7/1985 (BLM 1985) will continue to be followed as a term and condition for all action alternatives. This term and condition currently exists in the AMP. Incorporating this term and condition would essentially be no change in current guidelines for the permittee under the No Action alternative.

Both the no action and the proposed action includes adaptive management, which provides options for management that may be needed to adjust decisions and actions to meet desired conditions as determined through monitoring. The BLM resource specialists would periodically monitor the allotment over the ten-year term of the grazing permit, generally every 5 years for trend data and utilization variably by pasture use (Appendix C). Monitoring is to ensure that the fundamentals or conditions of rangeland health are being met or making progress towards being met, in accordance with 43 CFR 4180. If monitoring indicates that desired conditions are not being achieved and current livestock grazing practices are causing non-attainment of resource objectives, livestock management of the allotment would be modified in cooperation with the permittee(s). 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. An example of a situation that could call for adaptive management adjustments is drought conditions. If a permittee disagrees with the BLM's assessment of the resource conditions or the necessary modifications, the BLM may nevertheless issue a Full Force and Effect Grazing Decision to protect resources.

Any hay or other feed used in administering the livestock operation would be certified weed free and be approved by the authorized representative prior to use. Grand Canyon National Park (GCNP) adjoins portions of the current and proposed allotment boundaries. These lands are managed by the GCNP and are not authorized for grazing. BLM will continue to work with GCNP for future fencing needs if necessary.

2.3 Alternative A – Proposed Action

Alternative A – the proposed action is to renew the existing grazing permit for the Mt. Logan Allotment for a period of ten years. There would be no proposed change in number of livestock or season of use for the allotment. Livestock grazing would occur during the season of use, and with the number of Animal Unit Months (AUMs) limited to the current active preference (Table 2-1). The proposed changes to the permit would be to incorporate the neighboring Tuweep Forage Reserve - Kent Pasture (2522 acres) into

the Mt. Logan Allotment. This would add approximately 897 acres of the Paradise Canyon area to the Mt. Logan Allotment (see Appendix A Figure 3).

This incorporation would exclude any existing water developments in the Paradise Canyon area. Water from Nixon Spring currently used on the Tuweep Allotment would remain available to Tuweep Allotment. No additional water from Nixon Spring would be made available to the Mt. Logan Allotment. Water that is currently available to the Mt. Logan Allotment from the H&M Schmutz Pipeline would remain available to the current and proposed additions to the Mt. Logan Allotment. The addition of this parcel would require the construction of approximately 1.6 miles of new fence (see Appendix A Figure 6). In exchange for this inclusion, the Mt. Logan Head of Tuweep Pasture (4289 acres), would become a pasture in the Tuweep Forage Reserve. The acreage of the Forage Reserve would increase slightly (870) acres. The AUM's for the Head of Tuweep Pasture and the Kent Pasture including the additional parcel (Paradise Canyon) in Tuweep Forage Reserve are approximately equal. The percent Federal Range is reduced under this alternative, as the permittee would be credited for the unfenced private land within the allotment.

Table 2-1. Livestock Grazing Season and AUMs Proposed Under Alternatives A.

Allotment Name	No.	Kind	Season of Use	Active AUMs	Suspended AUMs	Public Land (acres)	% Federal Range
Mt. Logan	88	Cattle	03/01 - 2/28	930	519	17,859	86

Currently there are two Arizona state land sections within the Mt. Logan-Head of Tuweep Pasture that the current permittee leases from the State of Arizona. Under the proposed action, the permittee would relinquish these, but would continue to lease one state section in the Kent Pasture, as well as the two state sections in the main portion of the Mt. Logan Allotment (southern parcel).

The proposed action would make the Mt. Logan Allotment contiguous, and eliminate trailing across neighboring allotments for rotation purposes (see Figure 3).

A Rangeland Health Assessment for the Mt Logan Allotment was conducted in 2005 it was signed on January 3, 2007. At that time, this allotment was meeting Standards for Rangeland Health. This allotment continues to meet those standards as confirmed by allotment trend data and Standards for Rangeland Health update in 2018. The Tuweep Allotment, including the Kent Pasture, which is proposed for incorporation into the Mt. Logan Allotment is making progress toward meeting the applicable Standards for Rangeland Health. Based on recent trend monitoring data, the Kent Pasture within the Tuweep Allotment exhibits an upward trend. As necessary, additional key areas would be added to insure compliance with Terms and Conditions as well as continued attainment of Rangeland Health Standards throughout the allotment. Specifically, this would include establishment of a key area in the Torowweep Pasture, as well as evaluation of current key area location in the Kent Pasture.

Terms and Conditions of Proposed Action

- Permittees must submit the actual use report within 15 days after their billing year ends. Livestock may be moved to other pastures within the allotment 15 days before or after scheduled move dates.
- Use in the Paradise Canyon parcel would not be allowed until construction of the Paradise fence is completed.

- Use of nutritional livestock supplements is allowed, including protein, minerals and salt. However, any supplements used must be dispersed at a minimum of ¼ mile from any known water sources, and cultural or sensitive sites. Any hay or other feed used in administering the livestock operation must be certified weed-free and subject to approval prior to use.
- If any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (Public Law 101-601; 104 Stat. 3048; 25 U.S. Code 3001) are discovered in connection with allotment operations under the grazing permit, the permittee would be required to protect the immediate area of the discovery and immediately notify the BLM authorized officer or authorized representative.
- The Mt. Logan Allotment Management Plan (AMP) signed 11/7/1985 will continue to be followed.

2.4 Alternative B – No Action

Under Alternative B – the BLM would renew the existing grazing permit for the Mt. Logan Allotment for a period of ten years. There would be no proposed change in number of livestock or season of use for the allotment. Livestock grazing would occur during the season of use, and with the number of Animal Unit Months (AUMs)³ limited to the current active preference (Table 2-1).

Table 2-2. Livestock Grazing Season and AUMs Proposed Under Alternatives B.

Allotment Name	No.	Kind	Season of Use	Active AUMs	Suspended AUMs	Public Land (acres)	% Federal Range
Mt. Logan	88	Cattle	03/01 - 2/28	930	519	18,729	88

Allowable use on key forage species on the allotment (which implements a rotational grazing system) would be no more than 50% utilization of current year's production, removed through grazing or other loss (BLM 1999a). The allotment would be managed to achieve the Desired Plant Community (DPC) objectives listed in Section 3.5.2.1. The BLM would assess resource conditions through field inspections and determine, in consultation with the permittees, whether management changes (e.g., changes in livestock numbers, adjustment of move date, or other changes or use within the parameters identified under this alternative) may be implemented prior to reaching maximum utilization. Move dates (i.e., removal of livestock from a pasture) may be adjusted if monitoring indicates maximum utilization has been reached or due to unusual climatic conditions such as, fire, flood, or other acts of nature. If maximum utilization is reached on key species/areas in the allotment before a scheduled move date, the use of salt, herding, or other management options may be used to distribute livestock away from an area where maximum utilization has been reached, or livestock may be removed from the pasture (after consultation with the permittees), as deemed necessary by the BLM.

Existing range improvements would be maintained as currently required. Any new range improvements beyond those analyzed in this EA to assist in grazing practices and promote rangeland health would be considered through a separate NEPA process.

The livestock grazing management practices proposed under this alternative (i.e., season of use; utilization levels; and ecological condition and desired plant community objectives) were designed to manage the

³ 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.

overall rangeland resources present, provide for a diversity of wildlife and plant species, maintain functioning ecosystems, and maintain and/or improve ecological condition.

2.5 Alternative C – No Grazing

Alternative C is to reissue a ten-year term grazing permits on the Mt. Logan Allotment with 0 authorized AUMs for active preference – all AUMs would be suspended (i.e., livestock grazing would be deferred for the ten-year permit period). No new range improvement projects would be constructed and no modifications would be made to existing projects.

2.6 Alternative(s) Considered but Eliminated from Further Analysis.

The allotment continues to meet Standards for Rangeland Health. The monitoring data as well as input from the various specialists has not raised resource concerns. Conversely, the applicant did not request increased AUMs or seasonal adjustments. Taking these in to consideration, it is thought that the three alternatives carried forward for analysis provides the decision maker with a fairly broad range of alternatives.

3.0 Affected Environment

3.1 Introduction

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area as identified in the Interdisciplinary Team Checklist found in Table 3-1 and presented in Chapter 1 of this EA.

3.2 General Setting

The Mt. Logan Allotment is located approximately 55 miles south of Colorado City, Arizona on the Arizona Strip. The allotment is within the boundaries of T.34 N. and T. 35 N., R. 7 W. and R. 8 W. on Mt. Logan and in Tuweep Valley. Elevations range from 4,800 feet in the grassland valleys of Tuweep to 7,600 feet on the ponderosa pine slopes of Mt. Logan. Water for livestock on the allotment is provided by a combination of catchments; developed springs and pipelines; and reservoirs.

The proposed action analyzed in this EA includes exchange of the Mt. Logan Allotment Head of Tuweep Pasture for the Tuweep Allotment Kent Pasture (see Appendix A Figure 3). The Tuweep Allotment is classified as a forage reserve and managed by the Grand Canyon-Parashant National Monument. Early homesteaders on the Arizona Strip and specifically in the Toroweap area, included the Schmutz Brothers, whom were early ranchers in this area dating back to 1887. Remnants of their early homestead are found in Paradise Canyon. Early dry land farmer/rancher in this area also included Walter Kent from the same era. The Kent Pasture which is being evaluated for exchange includes the old Kent homestead.

In the 1970's, the Grand Canyon National Park (GCNP) began studies to determine whether some areas including the Toroweap Valley, which were then within the Grand Canyon National Monument (GCNM), should be included in the GCNP, or remain as grazing lands in the Monument. Due to the rich cultural history, geology, and ecological resources, the determination was made to include this as well as Tuckup Point and Jensen Tank which were also within the Monument in the GCNP. On Jan. 3, 1975 Pres. Gerald Ford signed in to law the enlargement of the GCNP. At this time there were a few grazing permittees that were allowed to continue use of their grazing permit on the newly created Park through a "grandfather" clause. This included the Schmutz Brothers. In 1981, John Schmutz whom had a permit for the Tuckup Point and Toroweap Valley grazing areas, passed away. This permit was then closed and grazing within the GCNP was closed.

The lands neighboring the GCNP in the Tuweep Valley area include the Mt. Logan Allotment, and the Tuweep Forage Reserve. The Tuweep Allotment was an active allotment up until the year 2000. Anthony Heaton and his family had the Tuweep grazing permit during this time period, when this permit was acquired by the Conservation Fund, a nonprofit corporation. This grazing permit was relinquished by the Conservation Fund to the BLM for use as a forage reserve in 2000 (NPS 1976). The forage reserve continues to be used for conservation purposes including light periodic grazing use when permittees or other qualified applicants are displaced due to fire or vegetation treatments. Other conservation uses include wildlife refugia both when used by livestock and when rested from livestock use. The Mt. Logan Allotment remains an active allotment as evaluated in this EA.

3.3 Rangeland 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 Bureau of Land Management (BLM) conducted field evaluations of rangeland health conditions on the Mt. Logan Allotment in 2005, the evaluations were completed and signed in 2007 (see maps in Appendix A). The allotment was revisited by an interdisciplinary team in 2018 in order to update the evaluation. Both evaluations were made in accordance with the applicable Standards for Rangeland Health (Appendix B). The 2018 evaluation was completed by conducting Interpreting Indicators of Rangeland Health Version 4 ((BLM 2005).

Attempting to monitor 100% of any given rangeland is not always practical. Instead, representative study sites are selected based on their ability to predict range conditions over much larger areas (University of Arizona 2010). Evaluation sites, or key areas as defined in Technical Reference 1734-4 (BLM 1999b), were selected (location and amount) using professional judgment based upon terrain, past uses of the area, and location of waters. Specific locations of key areas are available in the project file. Existing trend studies, ecological condition data, actual use, and utilization studies for the allotment was analyzed (see Section 3.5.2.1). The trend identified in the rangeland health assessment survey assessed erosion status, vegetative cover, vigor, species diversity, and location of the most palatable plants in relation to access to a grazing animal. Much of this is discussed in detail in Section 3.5.2.1, the vegetation and Invasive, Non-Native Species section of Chapter 3, and data used for summary and analysis found in Appendix C.

The rangeland health evaluations confirmed that the allotment was meeting standards in 2007 and continues to meet standards in 2018.

3.4 Elements/Resources of the Human Environment

The BLM is required to consider many authorities when evaluating a Federal action. Those elements of the human environment that are subject to the requirements specified in statute, regulation, or executive order, are considered below in Table 3-1.

Table 3-1. Elements/Resources of the Human Environment

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

Resource	Determination	Rationale for Determination
Air Quality	NI	The Mt. Logan Allotment is included in an area that is unclassified for all pollutants and has been designated as Prevention of Significant Deterioration Class II. Air quality in the area is generally good. Exceptions include short-term pollution (particulate matter) resulting from vehicular traffic on unpaved roads. Fugitive dust is also generated by winds blowing across the area, coming from roads and other disturbed areas. 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.
Areas of Critical Environmental Concern	NP	After review of GIS and the Grand Canyon-Parashant National Monument RMP 2008, there are no Areas of Critical Environmental Concern within the Mt. Logan Allotment.
BLM or State Sensitive Plant Species	NP	No known BLM or State Sensitive Plant Species occur in the Mt. Logan Allotment.

Resource	Determination	Rationale for Determination
Cultural Resources	NI	<p>Livestock grazing has continued as an historic use of the public land in this allotment. The BLM would manage the allotment to ensure that livestock grazing would continue to be in compliance with Section 106 of the National Historic Preservation Act (36 CFR 800.3). Cultural resources project files (CRPR# AZ BLM-110-2006-2) contain documentation of compliance with Section 106 of the National Historic Preservation Act.</p> <p>Site surveys for the proposed fence has been conducted. In addition, the BLM followed the Cultural Resource Compliance on Grazing Permit/Lease Renewals guidance contained within BLM Arizona’s “Guidelines for Protecting Cultural Resources” handbook (Arizona H-8120, Appendix 12) in reviewing potential impacts to cultural resources on the Mt. Logan Allotment. The BLM used existing data, including site records and data from the sites in the allotment, to consider the potential for impacts to cultural resources across the allotment. This data was extrapolated from the existing site records and from on-the-ground observations provided by archaeologists, qualified archaeological volunteers, range specialists, and permittees. Since no impacts to significant and vulnerable cultural resources have been documented, no additional cultural resources inventory was recommended by the Arizona Strip Field Office archaeologist.</p> <p>In the event that significant archaeological resources (standing walled historic or prehistoric structures, rock art, or other sites potentially eligible to the National Register of Historic Places) are found to be adversely impacted by cattle, preventative and mitigation measures will be implemented including but not limited to fencing, recordation, data collection, and monitoring as is standard operating procedure under the National Historic Preservation Act. "If in connection with allotment operations under this authorization, any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (NAGPRA) (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001) are discovered, the permittee shall stop operations in the immediate area of the discovery, protect the remains and objects, and immediately notify the Authorized District Manager (Timothy Burke (435-216-8933)). The permittee shall continue to protect the immediate area of the discovery until notified by the Authorized Officer that operations may resume."</p> <p>The 43 CFR 10 regulations 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 NAGPRA (see 43 CFR 10.4(g). The actual requirement for persons to notify the federal official and protect the discovery is in 43 CFR 10.4(b) and (c)). The renewal of grazing permits, in the absence of any construction of new range improvements, therefore does not constitute a potential adverse effect to cultural resources.</p>
Environmental Justice	NI	<p>The alternatives would have no disproportionately high or adverse human health or other environmental effects on minority or low income segments of the population. Also, continued livestock grazing would have no effect on low income and minority populations because there are none in the area.</p>
Farmlands (Prime or Unique)	NP	<p>There are no prime or unique farmlands within the allotment following a review of GIS data.</p>

Resource	Determination	Rationale for Determination
Floodplains	NI	No actions are proposed that result in permanent fills or diversions, or placement of permanent facilities, in floodplains or special flood hazard areas. Continued properly managed livestock grazing use would not affect the function of the floodplains within the allotment.
Fuels / Fire Management	NI	The alternatives would have no disproportionately high or adverse effects on fire management or fuels. Since there are no vegetation treatments or no increases in AUMs, there would be no new impacts to fire and fuels.
Geology / Mineral Resources / Energy Production	NI	Upon GIS review of the project area, all proposed activities occur in the absence of any meaningful surface geologic or mineral resources (mines). Energy production facilities such as hydrocarbon, solar, wind or geothermal infrastructure are not present. Furthermore, continuing livestock grazing would not alter subterranean geological features nor affect mineral resources. Upon designation, Grand Canyon-Parashant National Monument lands were withdrawn from location, entry, and patent under the mining laws, subject to valid existing rights and from disposition under all laws relating to mineral and geothermal leasing. There are no active mining claims or other minerals related authorizations in the Monument.
Invasive, Non-native Species	PI	Scotch Thistle, a noxious weed, is known to Mt. Logan Allotment. Scotch thistle is treated on a regular basis utilizing integrated weed management. Cheatgrass, an invasive weed, is present in the allotment. Cheatgrass is not on the Arizona Noxious Weed list, however it is a very invasive non-native annual grass species. Cheatgrass is a ubiquitous weed, and is only treated on a site specific limited basis. Proposed ground disturbing activities including fence construction will be closely monitored before and after disturbance for any weed establishment. Weed treatments will occur as necessary. This resource is further addressed in Vegetation section Chapters 3 and 4.
Lands / Access	NI	Access to public lands would not be altered or impaired by implementation of the alternatives. The few authorizations in the area would not be altered or impaired. No other issues have been identified in connection with the alternatives.
Livestock Grazing	PI	Permit renewal is required to allow continued livestock use on the allotment. Alternatives consider have the potential to effect livestock grazing in this allotment, this issue is therefore analyzed in detail later in this EA.
Native American Religious Concerns	NP	During consultations with the American Indian Tribes that claim cultural affiliation to northern Arizona, no Native American religious concerns have been identified in relation to livestock grazing within this allotment.
Paleontology	NI	While common marine invertebrate fossils and micro-fossils, typical of the Late Paleozoic Era, are found in limited portions of the exposed geologic strata of the proposed area, significant paleontological resources are not present. Overall, continuing livestock grazing nor the proposed cattle developments would have no effect on any potential paleontological resources.
Recreation	NI	The project area is within the Grand Canyon-Parashant Special Recreation Management Area (SRMA) and part of the Shivwits Frontier Recreation Management Zone (RMZ). Continuing livestock grazing would not impact the opportunities for visitors to recreate in the area. Recreation goals and objectives within the SRMA and RMZ will continue to be achieved in coordination with livestock grazing operations.
Socio-economic Values	NI	Issuance of a new term grazing permit would allow the permittee to continue grazing operations with some degree of predictability during the 10-year period of the term. The proposed action would have no overall effect on the economy of the county since tourism and recreational uses are contributing increasing amounts to the economy of the region and cattle ranching is no longer a substantial contributor.

Resource	Determination	Rationale for Determination
Soils	PI	The continuance of grazing along with the proposed cattle developments are likely to impact soils through ground disturbance and vegetation community changes typically associated with this activity.
Threatened, Endangered, or Candidate Animal Species	NI	<p>The California condor is the only known federally listed animal species that may occur within this allotment – condors may occasionally fly over or feed in this allotment at any time of year. California condors are federally listed as endangered and a population of these condors was reintroduced on the Arizona Strip in 1996. This population is designated as experimental non-essential under Section 10(j) of the Endangered Species Act.</p> <p>Condors are strictly scavengers and prefer to eat large, dead animals such as mule deer, elk, pronghorn, bighorn sheep, cattle, and horses. Condors range widely, easily covering over 100 miles in a day, and their current range includes the entire Arizona Strip. Although condors may either fly over or feed within the allotment, they have not been observed doing so. There is no evidence that rangeland health on this allotment is limiting or restricting condor population growth. Thus, no effect to this species is expected from any of the alternatives.</p>
Threatened, Endangered, or Candidate Plant Species	NP	<p>No known threatened, endangered, or candidate plant species occur in the Mt. Logan Allotment.</p> <p>A review of SEINET data was conducted to confirm that the absence of special status plants on the allotment, see web address: http://swbiodiversity.org/seinet/collections/index.php#</p>
Vegetation	PI	Grazing has a direct impact on vegetation resulting from livestock eating and trampling plants within the allotment. This issue is therefore analyzed in detail later in this EA. Invasive, non-native species will also be discussed in the Vegetation section in Chapter 3.
Visual Resources	NI	The project area includes VRM Class 2, 3, and 4. Livestock grazing 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 alternatives are not expected to impact the various VRM class objectives.
Wastes (hazardous or solid)	NP	<p>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.</p> <p>No chemicals subject to reporting under Superfund Amendments and Reauthorization Act, Title III in an amount equal to or greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with any of the alternatives. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, would be used, produced, stored, transported, or disposed of in association with any of the alternatives.</p>
Water Quality (drinking/ground)	NI	Site visits to the allotment (during rangeland health evaluations and subsequent monitoring) did not indicate that current livestock use is altering water quality – no surface water within this allotment is used for domestic drinking water. Thus, no effect to water quality is expected from the alternatives.
Wetlands/ Riparian Zones	NI	There are no classified wetland or riparian zones within this allotment. The Mt. Logan Meadows, as identified in the GCPNM RMP are within the allotment,

Resource	Determination	Rationale for Determination
		however no ground disturbing projects are proposed in these locations. Monitoring is ongoing in these areas, continued attainment of Rangeland Health Standards will address any livestock grazing concerns in these fragile systems.
Wild Horses and Burros	NI	There are no wild horse or burro herd areas or herd management areas within the Mt. Logan Allotment. (BLM 2008a).
Wild and Scenic Rivers	NP	There are no river segments within the allotment that are designated, eligible, or suitable as wild, scenic, or recreational under the Wild and Scenic Rivers Act.
Wilderness	NI	After review of GIS and the Grand Canyon-Parashant National Monument RMP 2008, there is a small portion of the Mt. Logan Wilderness located on the west side of the grazing allotment. The proposed action would continue to allow grazing in the Mt. Logan Wilderness. Grazing practices would continue to be monitored to ensure that no major impacts to wilderness values and character occurs.
Wilderness Characteristics	NP	After review of GIS and the Grand Canyon-Parashant National Monument RMP 2008, there are no Areas Managed to Maintain Wilderness Characteristics within the proposed additions to the Mt. Logan Allotment.
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	Ponderosa Pine, and Pinyon/juniper woodlands occur on the allotment, but are not largely impacted by livestock grazing.

3.5 Resources/Issues Brought Forward for Analysis

3.5.1 Livestock Grazing

The analysis area for livestock grazing is the Mt. Logan Allotment and proposed additional parcels currently within the Tuweep Allotment.

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

Improve (I)

- a. Present range condition is unsatisfactory.
- b. Allotments have high to moderate resource production potential and are producing at low to moderate levels.
- c. Serious resource-use conflicts/controversy exists.

- d. Opportunities exist for positive economic return from public investments.
- e. Present management appears unsatisfactory.
- f. Other criteria appropriate to the ES area.

Table 3-2. Land Ownership (from Rangeland Administrative System (RAS) database*).

Ownership	Mt. Logan Allotment
Federal	18,996 acres
State	1,120 acres
Total	20,116 acres

*data analysis is primarily conducted utilizing Global Information System (GIS). There is sometimes a slight discrepancy in the GIS acreage totals when compared to RAS. The BLM is in the process of addressing and resolving these discrepancies.

The permittee runs a cow/calf operation on the Mt. Logan Allotment. The grazing system on Mt. Logan is a 4-pasture rest-rotation system. Pastures included in the grazing rotation are Little Spring, Little Oak, Toroweap, and Head of Tuweep. The Lower Kent (state) and Holding pasture (private/state) also receive grazing use in the rotation.

Little Spring serves as the summer/early fall (July 1-October 30) grazing unit. Little Oak, Toroweap, Head of Tuweep, Lower Kent (state), and Holding pasture are grazed and rotated through the late fall/spring (November 1-June 30) period. This grazing rotation is designed and intended to provide spring grazing rest, summer growing season deferment, trampling and planting of disseminated seed, seedling establishment, vigorous plant communities, and livestock production.

A. Acreage

The allotment contains:

- 18,996 acres of federal land
- 1,120 acres of state land, plus 640 acres of uncontrolled state land
- 1,200 acres of private land, plus 320 acres of uncontrolled other private land

B. Total grazing privileges, Season of use, and Kind and Class of livestock see Table 2.1.

C. Percent federal range

The Logan Allotment is 88% federal range. The private and state lands within the allotment boundaries are grazed in conjunction with federal lands and are included in the Allotment Management Plan (AMP) grazing rotation.

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. Actual use represents the use submitted by the permittee and the use that is billed for on an annual basis. The actual use within the Mt. Logan Allotment has varied between 73 percent and 92 percent of permitted use in the past decade (2007-2016) with an average for that time period of 83 percent. Non-use reflects seasonally dry periods, drought years, or annual operation fluctuation. Actual use tables can be found in Appendix C - Livestock Actual Use Table 7-4.

Utilization as well as compliance checks are conducted throughout the grazing season using accepted methods (BLM 1999a). There are four utilization key areas within this allotment. Average utilization

readings dating back to 1994 to present for this allotment is 32 percent. Data by pasture and year is available in Appendix C – Utilization Tables 7-6 to 7-9.

The trend index, which combines percent frequency of key forage species, percent litter, and percent live vegetation (basal cover) into one numerical value. There are four trend studies within this allotment. Trend studies for this allotment were established in the early 1980's and have been re-read every five years. The trend indices are upward at three of the four key areas, and downward at key area number 2. The data in Appendix C – Trend Tables 7-10 to 7-13, indicates there is a strong correlation between increase in sagebrush, juniper, and pinyon pine cover and corresponding decrease in perennial grass cover. Sagebrush cover at this site has increased from 2 percent in 1981 to 40 percent in 2014; juniper has increased over this same time period from 2 percent to 30 percent; pinyon pine has increased from 2 percent to 9 percent. The perennial grass decline at this site tracks the increase in sagebrush and tree cover. Perennial grass cover at site 2 in 1981 was over 80 percent, in 2014 it has declined to less than 1 percent. See discussion below concerning trend and seral stage for this site.

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 seral stage. 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 four key areas within the Mt. Logan Allotment that have frequency and composition data have been classified as to seral stage based on plant composition when compared to the site potential. Site potential is based on soils, elevation, climate, etc. All of the sites for this allotment are classified as PNC. Site 2 as addressed above, is showing a downward trend due to perennial grass reduction and tree and shrub expansion. This is thought to be the natural progression for this site as it moves closer to PNC.

The DPC is covered in the Vegetation and Invasive, Non-Native Species section of this chapter. The DPC are management objectives that have been proposed in the RMP 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 even aesthetics, such as managing for aspen, which is an early seral species. An aspen grove occurs in this allotment and we manage for continuation of this grove on GCPNM.

3.5.2 Range Improvements

The Mt Logan Allotment contains a number of structural range improvements, as shown in Appendix D - Tables 7-19 to 7-26 and on the Range Improvement map in Appendix A. The existing range improvements consist of approximately 36 miles of fences (boundary and pasture); 11 miles of pipeline; numerous water troughs (wildlife and livestock), reservoirs, cattleguards, and a corral. For analysis of the proposal, range improvements are shown for the Mt. Logan Allotment, Kent Pasture, and Head of Tuweep Pasture. Proposed Paradise fence would be approximately 1.6 miles.

3.5.3 Vegetation and Invasive, Non-Native Species

The analysis area for vegetation, including invasive and non-native species, is the Mt. Logan Allotment and the proposed additions to and exclusions from the current allotment area.

The analysis area is entirely within the Colorado Plateau physiographic province and ecoregion. The higher elevation areas of the allotment are currently dominated by pinyon-juniper woodlands (11655 acres) and ponderosa pine woodlands (1876 acres) with pockets of Gambel oak and aspen. As elevation decreases to the Tuweep Valley, the dominant vegetation shifts to sagebrush shrublands (5287 acres) and grasslands (2764 acres). In the areas that may be added to the allotment (Paradise Canyon and Kent), all within the Tuweep Valley, the major vegetation types are sagebrush shrublands (1750 acres) and grasslands (1350 acres).

Non-native invasive species are known to the allotment. These have been introduced and include two classified noxious weed species. Three Scotch thistle (*Onopordum acanthium*) sites approximately 100 acres each are known to the allotment. This species is classified as a noxious weed in Arizona. There is varying densities of Scotch thistle within these known patches. They are treated with herbicides on an annual basis and this will continue as long as staffing and resources remain available. These sites were visited and treated this year (2018) and the patches have been reduced from historic infestations. There is a 100 acre patch of morning glory (*Ipomoea* spp.), also classified as a noxious weed in Arizona within the allotment. This species is treated as well and treatments will continue on a regular basis, based on staffing priorities. Russian thistle and cheatgrass are also known to the allotment. These species although non-native and invasive are common and widespread and are not classified as noxious weeds in Arizona. These species are not typically treated due to resource constraints.

As is common elsewhere, the occurrence of specific vegetative types and species is largely dictated by a combination of local weather patterns, elevation, soils and past human manipulation. Grasses become more common in low lying areas with relatively deep soils, while the higher elevations show a mosaic of forest, woodlands, shrublands and meadows, reflecting the underlying and surface lava flows, historic logging, experimental manipulation of the ponderosa pine forests and continuing cattle grazing.

Table 3.3. Acres of major vegetation types for the current allotment and the areas under consideration for addition. Data derived from BLM sources.

Table 3-3. Mt. Logan Current Allotment Vegetation Types

Vegetation Type	Acres	Location
Pinyon-Juniper Woodland	11655	Current Mt. Logan Allotment
Sagebrush Shrubland	5287	Current Mt. Logan Allotment
Grassland	2764	Current Mt. Logan Allotment
Ponderosa Pine Woodland	1876	Current Mt. Logan Allotment
Badlands/Rock Outcrop	538	Current Mt. Logan Allotment
Sagebrush Shrubland	1477	Kent Pasture
Grassland	950	Kent Pasture
Grassland	400	Paradise Canyon Pasture
Sagebrush Shrubland	273	Paradise Canyon Pasture

A comparison can be made between the existing dominant vegetation types and the plant community potential derived from the NRCS Ecological Site Descriptions (ESD). ESDs are based primarily on soil information and incorporate climate, water and physiographic factors in determining the plant species and dominance most likely to occur at a particular location. Both are on a scale coarser than the key area

information and provide a general view of the vegetation on the allotment. Not all ESDs were available, however, the dominant one to two taxa have been determined for nearly all of the areas where ESDs with a full taxa description has not been completed by NRCS.

Table 3-4. Mt. Logan Allotment potential dominant vegetation based on Ecological Site Descriptions and equivalent categories for current dominant vegetation type mapping.

Table 3-4. Mt. Logan Allotment Potential Dominant Vegetation Types

Eco Class	Dominant Vegetation	Acres Eco class	Eco class %	BLM Mapping Equivalent
Basalt Upland 10-14" p.z.	Artemisia tridentata ssp. wyomingensis-Atriplex canescens/Poa fendleriana-Bouteloua gracilis	1709	6.2%	Sagebrush Shrubland/Grassland
Cinder Hills 13-17" p.z. (PIED)	Pinus edulis	2972	10.7%	Pinyon-Juniper Woodland
Cinder Upland 13-17" p.z. (PIED, JUOS)	Pinus edulis-Juniperus osteosperma/	2774	10.0%	Pinyon-Juniper Woodland
Clay Loam Upland 10-14" p.z.	Artemisia tridentata ssp. tridentata-Atriplex canescens/Bouteloua gracilis-Pascopyrum smithii	3589	12.9%	Sagebrush Shrubland/Grassland
Clay Loam Upland 13-17" p.z. Gravelly (PIED, JUOS)	Pinus edulis-Juniperus osteosperma/Artemisia tridentata ssp. wyomingensis-Purshia stansburiana/Poa fendleriana-Bouteloua gracilis	7966	28.7%	Pinyon-Juniper/Sagebrush Shrubland
Limestone Hills 13-17" p.z. (PIED, JUOS)	Pinus edulis-Juniperus osteosperma/Artemisia tridentata ssp. wyomingensis-Purshia stansburiana/Poa fendleriana-Bouteloua gracilis	400	1.4%	Pinyon-Juniper/Sagebrush Shrubland
Limestone/Sandstone Upland 10-14" p.z.	Atriplex confertifolia/Achnatherum hymenoides-Pleuraphis jamesii	1123	4.1%	Shadscale/Saltbrush
Loamy Terrace 17-25" p.z. (PIPO)	Pinus ponderosa	1529	5.5%	Ponderosa Pine Woodland
Loamy Upland 10-14" p.z.	Artemisia tridentata ssp. wyomingensis/Pascopyrum smithii-Bouteloua gracilis	2693	9.7%	Sagebrush Shrubland/Grassland
Loamy Upland 13-17" p.z.	Artemisia tridentata ssp. wyomingensis-Artemisia tridentata ssp. vaseyana/Bouteloua gracilis-Pascopyrum smithii	378	1.4%	Sagebrush Shrubland/Grassland
Loamy Upland 17-25" p.z. (PIPO)	Pinus ponderosa-Quercus gambelii/Artemisia tridentata ssp. wyomingensis-Ceanothus fendleri/Poa fendleriana-Carex rossii	1329	4.8%	Ponderosa Pine Woodland
Loamy Upland 7-11" p.z.	Atriplex cordifolia-Atriplex canescens/Elymus elymoides ssp. elymoides-Achnatherum hymenoides	44	0.2%	Shadscale/Saltbrush
Null	Unknown	555	2.0%	Unknown

Sedimentary Cliffs 10-14" p.z.	Juniperus monosperma/Artemisia tridentata ssp. wyomingensis-Atriplex canescens/Hesperostipa comata-Poa fendleriana	541	2.0%	Pinyon-Juniper/Sagebrush Shrubland
Silty Upland 7-11" p.z.	Atriplex confertifolia-Krascheninnikovia lanata/Pleuraphis jamesii-Achnatherum hymenoides	123	0.4%	Shadscale/Saltbrush

The rough equivalencies in vegetation types between the ESDs (Table 3-4) and the actual mapping show pinyon-juniper woodland, the most common vegetation type on the Mt Logan Allotment, is slightly more prevalent now than predicted. The ESD does not categorize, based on dominant species, any true grassland in the allotment. While the BLM vegetation mapping does, the scale of that mapping is too coarse to tease apart shrubby forbs from grasses. In addition, the ESD categorizes in most cases the sagebrush dominant areas with either a forb or a grass. This confounds the question of how do the percentage of grasslands compare with the percentage of sagebrush shrublands and with the actual versus potential vegetation. In this case, in general it can be said that the combined grasslands and sagebrush shrublands actual percentage (36%) is very close to the potential acreage (30%). To further increase the complexity of comparing current and potential vegetation, areas categorized as pinyon-juniper woodland can also be mixed pinyon-juniper woodland interspersed with sagebrush. In the Mt. Logan Allotment, the potential percentage of pinyon-juniper and pinyon-juniper sagebrush (53%) is the same percentage as the current vegetation.

In the Head of Tuweep pasture of the Mt. Logan Allotment an entire fairly discrete vegetation category is missing from the current vegetation assemblage – shadscale/saltbrush and pinyon-juniper woodland is considerably most predominant than expected (62% versus 9%). While this woodland may include scattered sagebrush, nearly all of it would need to be such a mix to approach the potential vegetation of the area. Recent site visits suggest this is not the case.

For the two areas under consideration as an addition to the Mt. Logan Allotment, Paradise Canyon (Table 3-5) and Kent Pasture (Table 3-6), the same caveats concerning the ability to differentiate between sagebrush shrubland and grassland apply. If those two categories of current vegetation are combined, the current vegetation aligns with the potential vegetation in the Paradise Canyon area. In the case of Kent Pasture, additional information about specific species of plants, collected as part of the Rangeland Health Evaluation, shows that the sagebrush component of the sagebrush shrubland is far too dominant for the site. The difference between the ESD and current mapping reflect this, showing that the pasture has become dominated by a single species. Treatments analyzed and approved for the Tuweep Valley may correct this imbalance (see 4.3.1 section Uinkaret Mountains Landscape Restoration Project).

Table 3-5. Kent Pasture Potential Dominant Vegetation Types.

Eco Class	Dominant Vegetation	Acres Eco class	Ecoclass %	BLM Mapping Equivalent
Clay Loam Upland 10-14" p.z.	Artemisia tridentata ssp. tridentata-Atriplex canescens/Bouteloua gracilis-Pascopyrum smithii	365	15%	Sagebrush Shrubland
Basalt Upland 10-14" p.z.	Artemisia tridentata ssp. wyomingensis-Atriplex canescens/Poa fendleriana-Bouteloua gracilis	15	1%	Sagebrush Shrubland

Sedimentary Cliffs 10-14" p.z.	Juniperus monosperma/Artemisia tridentata ssp. wyomingensis-Atriplex canescens/Hesperostipa comata-Poa fendleriana	270	11%	Sagebrush Shrubland
Silty Upland 7-11" p.z.	Atriplex confertifolia-Krascheninnikovia lanata/Pleuraphis jamesii-Achnatherum hymenoides	1196	49%	Mixed shrub/Grassland
Loamy Upland 7-11" p.z.	Atriplex cordifolia-Atriplex canescens/Elymus elymoides ssp. elymoides-Achnatherum hymenoides	585	24%	Mixed shrub/Grassland

Table 3-6. Paradise Canyon Potential Dominant Vegetation Types.

Eco class	Dominant Vegetation	Acres Eco class	Eco class %	BLM Mapping Equivalent
Basalt Upland 10-14" p.z.	Artemisia tridentata ssp. wyomingensis-Atriplex canescens/Poa fendleriana-Bouteloua gracilis	1	0%	Sagebrush Shrubland
Clay Loam Upland 10-14" p.z.	Artemisia tridentata ssp. tridentata-Atriplex canescens/Bouteloua gracilis-Pascopyrum smithii	109	16%	Sagebrush Shrubland
Sedimentary Cliffs 10-14" p.z.	Juniperus monosperma/Artemisia tridentata ssp. wyomingensis-Atriplex canescens/Hesperostipa comata-Poa fendleriana	273	43%	Sagebrush Shrubland
Loamy Upland 10-14" p.z.	Artemisia tridentata ssp. wyomingensis/Pascopyrum smithii-Bouteloua gracilis	291	41%	Sagebrush Shrubland

Within the Mt. Logan Allotment, long term monitoring at the pasture level allows us to view the individual interplay between the dominant species that make up the large scale vegetation mapping blocks. While this data cannot be directly correlated to the large scale information, it does suggest some general trends and provides insight on appropriate actions that may be taken to rectify an imbalance that may also exist in similar ecological sites. Four key areas, used in the Rangeland Health Evaluation described previously, are discussed – Little Oak Springs, Little Springs, Little Springs B and Head of Tuweep. Little Oak Springs shows a fairly stable woody species assemblage with a general increase since 2004 and 2009 respectively of juniper and pinyon pine. This key area also shows a marked decrease in species diversity of grasses, forbs and annuals as the area is reverting to a pre-treatment state. Little Springs has seen a dramatic increase in sagebrush since monitoring began in 1983 and a comparable dramatic decrease in oak species. Some turnover in grass species has been seen, smooth brome, a perennial non-native grass species seeded in the 1970s continues to do well at the site. This grass species has displaced much of the native perennial grass species. Little Springs B is very similar to Little Springs for grasses and forbs while the woody species have remained fairly stable. Head of Tuweep, not considered in the Desired Plant Community Objectives below, is fairly stable in its woody species composition, though since 1981, pines have decreased. Two species of grasses have become more dominant while the annuals and forbs have declined. (See Trend Tables 7-10 to 7-13 in Appendix C)

Non-native invasive species are known to the allotment. These have been introduced and include two classified noxious weed species. Three Scotch thistle (*Onopordum acanthium*) sites approximately 100 acres each are known to the allotment. This species is classified as a noxious weed in Arizona. There is varying densities of Scotch thistle within these known patches. They are treated with herbicides on an annual basis and this will continue as long as staffing and resources remain available. These sites were visited and treated this year (2018) and the patches have been reduced from historic infestations. There is a 100 acre patch of morning glory (*Ipomoea* spp.), also classified as a noxious weed in Arizona within the allotment. This species is treated as well and treatments will continue on a regular basis, based on staffing priorities. Russian thistle and cheatgrass are also known to the allotment. These species although non-native and invasive are common and widespread and are not classified as noxious weeds in Arizona. These species are not typically treated due to resource constraints.

3.5.4 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 Grand Canyon-Parashant National Monument RMP. In addition, ecological site descriptions from the Natural Resources Conservation Service (NRCS) were used to determine the soil and vegetation attributes that are within the site potential for the key area. The Desired Plant Community objectives for each allotment are found in the allotment evaluations. 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.

Desired Plant Community (DPC) Objectives for Mt. Logan Allotment by Pasture. For plant code definitions and common plant names, see Acronyms and abbreviations following the Table of Contents in this document.

Key Area #1 – Head of Tuweep Pasture (Loamy Upland 10-14”pz)

Maintain the perennial grass composition between 20 to 50% through the year 2035 by:

- Maintaining BOGR CBW at between 15 and 30%
- Increasing HIJA CBW to between 1 and 5%
- Maintaining SIHY CBW at between 2 and 7%
- Maintaining SPCR CBW at between 1 to 3%

Maintain shrub/tree composition between 15 to 45% through the year 2035 by:

- Decreasing ARTR CBW to between 5 and 20%
- Maintaining JUOS CBW at between 0 and 5%
- Maintaining PIED CBW at between 0 and 5%

Maintain forbs CBW at between 5 to 15% through the year 2035.

Maintain ground litter at between 30 and 50% through 2035.

Maintain basal cover at between 5 and 15% through 2035.

Rational: The ecological site for this key area is a Loamy Upland 10-14” precipitation zone and is within the Great Basin Ecoregion identified in the Draft Grand Canyon-Parashant National Monument Environmental Impact Statement/Land Use Plan (GCPNM EIS/LUP). This draft LUP proposes the ecoregion is to be managed for a mosaic of early and mid-seral vegetation communities.

Sagebrush currently exceeds the 5 to 15% CBW allowable in the site guide, and while sagebrush is important for wildlife, it can often be too dominant. 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. Juniper in particular provides both cover and forage for mule deer in winter.

The grass species listed individually are components of the ecological site and are recognized as key species. The site guide allows from 15 to 30 % CBW for BOGR, 1 to 5% for HIJA, 2 to 7% for SIHY, and 1 to 3% for Spcr. In this semi-arid climate, maintaining basal cover at between 5 and 15% is realistic under normal weather conditions. 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. In general forbs are very important for wildlife, but 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 #2 – Little Oak Spring Pasture (Cinder Upland; Woodland 13-17”pz)

Maintain the perennial grass composition between 2 to 15% through the year 2035 by:

- Maintaining seeded Agropyron species CBW at between 1 and 3%
- Maintaining BRIN CBW at between 1 and 3%
- Maintaining SIHY CBW at between 1 and 5%

Maintain shrub/tree composition between 15 to 45% through the year 2035 by:

- Decreasing ARTR CBW to between 20 to 40%
- Maintaining JUOS CBW at between 5 to 15%
- Maintaining PIED CBW at between 5 to 15%

Maintain forbs CBW at between 5 to 15% through the year 2035.

Maintain ground litter at between 25 and 45% through 2035.

Maintain basal cover at between 2 and 8% through 2035.

Rational: The ecological site for this key area is a Cinder Upland (Woodland) 13-17” precipitation zone and is within the Great Basin Ecoregion identified in the Draft Grand Canyon-Parashant National Monument Environmental Impact Statement/Land Use Plan (GCPNM EIS/LUP). This draft LUP proposes the ecoregion is to be managed for a mosaic of early and mid seral vegetation communities.

This key area is in an old pinyon-juniper treatment which has re-grown with fairly thick tree and shrub cover. The site produces predominantly woody vegetation and very little grass has been found during monitoring. Without subsequent treatment or wildfire, little change is expected.

Key Area #3A – Little Oak Pasture (Loamy Upland; POPI 17-22”pz)

Maintain the perennial grass composition between 40 to 80% through the year 2035 by:

- Maintaining seeded Agropyron species CBW at between 30 and 65%
- Maintaining BRIN CBW at between 5 and 10%

Maintaining SIHY CBW at between 5 and 10%
Maintaining POPR CBW at between 1 to 5%
Maintain shrub/tree composition between 20 to 45% through the year 2035 by:
Maintaining ARTR CBW at between 10 to 20%
Maintaining QUGA CBW at between 5 to 10%
Maintaining PIPO CBW at between 1 to 5%
Maintain forbs CBW at between 2 to 10% through the year 2035.
Maintain ground litter at between 35 and 50% through 2035.
Maintain basal cover at between 5 and 15% through 2035.

Rational: The ecological site for this key area is a Loamy Upland (Ponderosa pine) 17-25" precipitation zone and is within the Ponderosa Pine Ecological Zone identified in the Draft Grand Canyon-Parashant National Monument Environmental Impact Statement/Land Use Plan (GCPNM EIS/LUP). This draft LUP proposes the ecological zone to be managed for a mosaic of tree densities, age classes, and openings with a mix of grasses, forbs and shrubs.

Key Area #3A is located in a park opening on the edge of the ponderosa pine forest. The area was plowed and seeded with a mix of wheat grasses, smooth brome, and forbs in the late 1970's. These open park areas provide important foraging areas for mule deer, turkey, and various avian species living in and around the ponderosa pine forest.

Key Area #3B – Little Oak Pasture (Loamy Upland; POPI 17-22"pz)

Maintain the perennial grass composition between 65 to 85% through the year 2035 by:
Maintaining seeded Agropyron species CBW at between 60 and 80%
Maintaining BRIN CBW at between 1 and 5%
Maintaining SIHY CBW at between 1 and 5%
Maintaining POPR CBW at between 1 to 5%
Maintain shrub/tree composition between 5 to 15% through the year 2035 by:
Maintaining ARTR CBW at between 5 to 10%
Maintaining other shrubs CBW at between 1 to 5%
Maintain forbs CBW at between 2 to 10% through the year 2035.
Maintain ground litter at between 40 and 55% through 2035.
Maintain basal cover at between 5 and 15% through 2035.

Rational: The ecological site for this key area is a Loamy Upland (Ponderosa pine) 17-25" precipitation zone and is within the Ponderosa Pine Ecological Zone identified in the Draft Grand Canyon-Parashant National Monument Environmental Impact Statement/Land Use Plan (GCPNM EIS/LUP). This draft LUP proposes the ecological zone to be managed for a mosaic of tree densities, age classes, and openings with a mix of grasses, forbs and shrubs.

Like Key Area #3A, #3B is also located in a park opening on the edge of the ponderosa pine forest. The area was also plowed and seeded with a mix of wheat grasses, smooth brome, and forbs in the late 1970's. Mule deer, turkey, and various avian species living in and around the ponderosa pine forest make frequent use of the open park area for foraging requirements.

The updated DPC Determination can be found in Appendix C, - Tables 7-15 to 7-18.

3.5.5 Wildlife (including Big Game, Migratory Birds, and Sensitive Species)

The area of analysis for wildlife, including big game, migratory birds and sensitive species, is the current Mt. Logan Allotment boundary, the proposed additions to the current allotment area, and the area between the Head of Tuweep Pasture and the other pastures through which livestock are trailed.

Big Game

The Mt. Logan Allotment is located in AGFD's Game Management Unit (GMU) 13A. Mule deer can be found throughout this allotment. Pronghorn are likely to occur in 70% of the allotment.

Mule deer (*Odocoileus hemionus*)

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. GMU contains extensive Great Basin short grass prairie, extensive pinyon-juniper woodlands, grassland pinyon-juniper association, and a ponderosa pine ecotype in the Mt. Logan and Mt. Trumbull areas. Mule deer inhabit most of the unit; total numbers of mule deer in the habitat area generally range from 125 to 175 with the majority of animals occupying summer range to the north in Utah and south towards Mt. Trumbull. 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 Mt. Logan Allotment is categorized by AGFD as 47% yearlong habitat, 19% summer habitat, 31% summer crucial habitat, and 3% winter crucial habitat for mule deer. While no population estimates are available specifically for this allotment, AGFD considers the mule deer population in GMU 13A to be stable but low.

Pronghorn (*Antilocapra americana*)

Pronghorn typically occupy grassland/desert scrub habitats; pronghorn habitat in Unit 13A consists primarily of Great Basin grasslands with areas of sagebrush, juniper and shrub encroachment (AGFD 2009a). In areas dominated by shrubs, sufficient forbs preferred by pronghorn are often lacking. This is most likely related to available precipitation. In years with adequate rainfall, sufficient forbs are produced for pronghorn. During winter months when forbs are not available, pronghorn rely on browse species for forage, such as fourwing saltbush. Some dietary overlap may occur with livestock during winter months, although the level of this overlap is not known. Habitat for pronghorn on this allotment is considered to be a mix of moderate quality (4% of the allotment); low quality (10%); and poor quality (86%). Pronghorn distribution is widespread in Unit 13A and varies seasonally depending on weather and range conditions. Transplants of pronghorn to this GMU occurred in the 1960s through the 1980s with animals originating from Arizona, Montana, and Colorado. Generally, pronghorn are found in Antelope Valley, Clayhole Valley, and areas south of Colorado City. Since reintroduction, pronghorn populations have been cyclic in this unit, with herd numbers increasing and decreasing in a direct relationship to precipitation – during periods of drought, poor fawn survival results in low recruitment, while during normal to above normal precipitation years, fawn survival and recruitment increase.

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 (AGFD 2009a), 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.

Migratory Birds

Executive Order 13186 requires the BLM and other federal agencies to work with the USFWS to provide protection for migratory birds. These species are protected by law and it is important to maintain habitat for these species so migratory patterns are not disrupted. All migratory birds are protected under the 1918 Migratory Bird Treaty Act (16 USC 703), which prohibits the taking of any migratory birds, their parts, nests, or eggs unless specifically permitted by regulation. Additional protection is provided by the Neotropical Migratory Bird Conservation Act of 2000 (16 USC Chapter 80). Birds found within the allotment are typical of ponderosa pine, pinyon-juniper, sagebrush, grassland, and rocky outcrop habitats such as burrowing owl, ferruginous hawk, golden eagle, peregrine falcon, prairie falcon, gray vireo, juniper titmouse, Bendire’s thrasher, Brewer’s sparrow, Cassin’s finch, black-chinned sparrow, and pinyon jay.

Sensitive Species

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

1. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or
2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk."

All federally-designated candidate species, proposed species, and delisted species in the 5 years following delisting are included as BLM sensitive species. Based on occurrence records and monitoring data, the sensitive species that may occur within the Mt. Logan Allotment and that may be affected by actions proposed in one of the alternatives presented in Chapter 2 are displayed in Table 3-7.

Table 3-7. Sensitive Species Associated with the Mt. Logan Allotment

Species	Potential for Occurrence
Allen’s Big-eared Bat (<i>Idionycteris phyllotis</i>)	potential
Townsend’s Big-eared Bat (<i>Corynorhinus townsendii</i>)	verified
Greater Western Mastiff Bat (<i>Eumops perotis californicus</i>)	potential
Spotted Bat (<i>Euderma maculatum</i>)	potential
American peregrine falcon (<i>Falco peregrinus</i>)	potential
Golden eagle	potential

(<i>Aquila chrysaetos</i>)	
Ferruginous hawk (<i>Buteo regalis</i>)	potential
Northern Goshawk (<i>Accipiter gentilis</i>)	verified
Western burrowing owl (<i>Athene cunicularia hypugea</i>)	verified
Pinyon Jay (<i>Gymnorhinus cyanocephalus</i>)	verified
Monarch Butterfly (<i>Danaus plexippus</i>)	potential

Additional sensitive species may also occur within the analysis areas. 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 3-8 lists the sensitive species that will not be discussed in further detail, along with the rationale for their exclusion from further analysis. Additionally, impacts to sensitive species found outside the analysis areas were not analyzed.

Table 3-8. Sensitive Species Excluded from Further Analysis

Species	Rationale for Excluding from Further Analysis
House Rock Valley Chisel-toothed Kangaroo Rat (<i>Dipodomys microps leucotis</i>)	This species is endemic to the House Rock Valley on the eastern side of the Arizona Strip and is not present within (or near) the allotment.
Northern Leopard Frog (<i>Lithobates pipiens</i>)	This species has a limited range on the Arizona Strip and currently only occupies Soap Creek Tank on the Paria Plateau and possibly Kanab Creek. Habitat for this species is not present in or near the allotment.
Arizona Toad (<i>Anaxyrus microscaphus</i>)	Found on the Arizona Strip only along the Virgin River and tributaries. Habitat for this species is not present in or near the allotment.
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Bald eagles may be found in the project area during the winter months. Carrion and easily scavenged prey items provide important sources of winter food in terrestrial habitats that are away from open water, such as in the allotment. The proposed action and alternatives would have no impact on carrion food sources. No nests are located on the Arizona Strip and nesting habitat (large trees near bodies of water) is non-existent.
Native Fish (5 species)	These species are restricted to the Virgin River, Paria River, and Kanab Creek. Habitat for these species does not occur within or near the allotment.
Spring Snails (4 species)	These species are restricted to very small ranges at spring sites along the Virgin River and are not present within or near the allotment.

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

Allen’s big-eared bat usually inhabits forested areas of the mountainous southwest and is relatively common in pine-oak forested canyons and coniferous forests; however, it also may occur in non-forested, arid habitats. At most sites where this species occurs, cliffs, outcroppings, boulder piles, or lava flows are

found nearby. Day roosts may include rock shelters, caves, trees and mines. Their elevational distribution ranges from 1,320 to 9,800 feet, and their main food source is small moths gleaned from surfaces or in flight (AGFD 2001). These bats are known to use stock ponds as water and food sources but are theorized as too large-bodied to drink from water catchments (Herder 1996).

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

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

In Arizona, summer day roosts are found in caves and mines from desert scrub up to woodlands and coniferous forests. Night roosts may often be in abandoned buildings. In winter, they hibernate in cold caves, lava tubes and mines mostly in uplands and mountains from the vicinity of the Grand Canyon to the southeastern part of the state (AGFD 2003a). These bats prefer to hang from open ceilings in caves or mines and do not use crevices.

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

Greater Western Mastiff Bat (*Eumops perotis californicus*)

Found in desert scrub near cliffs, preferring rugged rocky canyons with abundant crevices. They prefer crowding into tight crevices a foot or more deep and two inches or more wide. Colonies prefer crevices even deeper, to ten or more feet. These bats prefer to wedge themselves in the backs of cracks or crevices where they narrow down considerably. Entrances to roosting crevices are usually horizontal but facing downward which facilitates entry and exit (AGFD 2002a). They are known to forage at least 15 miles from the nearest likely roosting sites.

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

Spotted Bat (*Euderma maculatum*)

Spotted bats are found from low desert in southwestern Arizona to high desert and riparian habitats in northwestern Arizona and Utah to conifer forests in northern Arizona and other western states. They are found in desert scrub, riparian, pinyon-juniper, and montane coniferous forests at elevations up to 8,670 feet. They roost in small cracks found in cliffs and stony outcrops. They forage on large flying insects, primarily moths (AGFD 2003b).

The allotment contains extensive pinyon-juniper woodlands as well as high cliffs and rocky outcrops which may provide suitable roosting habitat. Spotted bats have been captured a few miles west of the allotment. The presence of livestock reservoirs in the allotment may attract spotted bats for drinking and foraging opportunities.

American Peregrine Falcon (*Falco peregrinus anatum*)

Peregrine falcons utilize areas that range in elevation from sea level to 9,000 feet and breed wherever sufficient prey is available near cliffs. Preferred habitat for peregrine falcons consists of steep, sheer cliffs that overlook woodlands, riparian areas, and other habitats that support a high density of prey species. Nest sites are usually associated with water. In Arizona, peregrine falcons now occur in areas

that had previously been considered marginal habitat, suggesting that populations in optimal habitats are approaching saturation (AGFD 2002b).

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 2002a).

Potential nesting habitat is found along the steep cliff faces and canyons in the eastern section of the allotment.

Golden Eagle (*Aquila chrysaetos*)

Golden eagles are typically found in open country, prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions. 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. Golden eagles forage over a large area and utilize the allotments for hunting and scavenging.

Potential nesting sites are found along the steep cliff faces along the eastern boundary of the allotment.

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 occurs in 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.

Ferruginous hawks may use open areas within the allotment, especially during the winter. Nesting habitat is available within the allotment, especially in areas where lone trees are located among wide areas of open country.

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 2003c). 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 (approximately 2,000 acres) to potentially support 4 nesting territories. The allotment also contains approximately 12,000 acres of pinyon-juniper woodlands which may contain suitable nest sites for goshawks as well as components desirable for foraging or winter use.

Western Burrowing Owl (*Athene cunicularia hypugea*)

Burrowing owls occupy a wide variety of open habitats including grasslands, deserts, or open shrublands. Burrowing owls do not dig their own burrows and must rely on existing burrows dug by prairie dogs, ground squirrels, badgers, skunks, coyotes, and foxes but will also use manmade and other natural openings. Nest-site fidelity is high and burrows are often reused for several years if not destroyed (Haug et al. 1993). Moderate grazing can have a beneficial impact on burrowing owl habitat by keeping grasses and forbs low (MacCracken et al. 1985) but the control of burrowing rodent colonies in grazed areas is believed to be a significant factor in the burrowing owl's decline (Desmond and Savidge 1996). Burrowing owls can be generally tolerant of some human presence, often nesting in close proximity to urban or suburban areas in agricultural fields, vacant lots, golf courses, or areas cleared for construction (AGFD 2009b). Burrowing owls are infrequently encountered on the Arizona Strip likely due to the lack of prairie dog or other large rodent colonies.

Burrowing owl habitat is present in the Toroweap Valley portion of the allotment.

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 (Gabalton 1979, 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). Pinyon jays place nests in roughly equal proportions in pinyon and juniper trees and usually select trees that are significantly taller and larger in diameter when compared to random plots (Johnson et al. 2015).

Pinyon-juniper woodlands are extensive in the allotment and may support multiple nesting colonies of pinyon jays, although nests have not been documented.

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 petition presented substantial scientific or commercial information indicating that the petitioned actions may be warranted and is currently reviewing the status of the species (USFWS 2014).

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 allotment, although documentation is lacking. Milkweed species are present, including showy milkweed. Migrating monarchs have been observed on the Arizona Strip in the fall in areas outside of those analyzed in this EA.

3.5.6 Soils

The project area is mostly located over three soil types spanning an elevated landscape consisting of gentle sloping hillsides with 5-10 degree slopes, to abrupt basalt ridges and steep outcrops, before subsiding into a valley floor at its lowest extent.

The upland portion of this project primarily hosts the Wutoma Soil series. A test pit in this soil was conducted on June 27th 2018, at LHA (Rangeland Health Assessment) #Little Springs 3A (see Appendix A figure 8), provided further observations. Located in Ponderosa and Pinyon/Juniper transition zone, this soil unit is typically intermixed with nearby pyroclastic cinders and basalt outcrops. The dominant features include deep <1 meter depth, 10YR 4/3-1/3 brown loam with approximately 1/3 of gravel. Carbonates were not evident as expected as this soil unit is located in the lower member of the Moenkopi geologic unit, largely comprised of silt and sandstone members. An obvious soil A-B horizon is evident at 4-6 inches, with fine root structures giving way to more moderately spaced medium roots. Worth noting is the precipitation in this area includes a typical 24-36 inches of annual snowpack, contributing to the 15 inches of annual rainfall. Overall, with this soil having a shallow pyroclastic surface horizon, along with intermixed gravel in the lower sections allow this soil to have abundant resilience to physical weathering such as surface runoff from snow melt and wind driven erosion.

Moving towards the remainder of the project area and into the lower elevations, the remaining two soils units emerge as the vegetation transitions to Great Basin sageland with average occurrence of Pinyon/Juniper tree communities. Precipitation is an average 12 inches with occasional snowfalls. Gentle hillsides and broad planar features are typical in this area along weathered basalt outcrops and pyroclastic materials observed at the surface. The dominant soil unit in this area is the Curhollow Prieta unit, with the Showlow Thimble unit having a lesser presence along the northern edges of the project area.

In the Curhollow Prieta unit, a second test pit was conducted at LHA #Historic Pipeline Area (see Appendix A figure 9). These soils occur within alluvial deposits stemming from nearby Kaibab and Toroweap Permian limestone geologic units, producing petrocalcic horizons that effervescent readily due to abundant carbonates. The test pit revealed a shallow A horizon fine sandy loam, with abundant gravel of both carbonate and basalt origins. Coloration was 7.5YR 5/4, with fine roots, giving way to the lower soil horizon Bk1, and Bk2, both of which are a blockier version of the initial sandy loam, with well sorted gravel components. Soil consistency is best described as devoid of moisture, un-compacted, and easily handled. The soil resilience is considerable, largely due to the presence of pyroclastic and carbonate gravel at the upper horizon, 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 sandy loam.

Lastly located along the upper fringes of the project are is the third most common occurring soil unit, Sholow Soil series. Located along 5000ft -6000 ft. alluvial fans with steeper slopes, descending into Tuweep Valley, these Sholow soils are largely a gravely loam at the surface, providing good drainage, before transitioning into more clay rich versions in the lower horizons. The Sholow soil stems 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, colluvial, pyroclastics, and basalt remnants. Soil resilience is observed to be ample, given the abundant gravel content, surface composition, and adequate drainage.

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 have considered effects to the component and found the proposed action would have minimal or no effects (see Table 3-1). The intent of this analysis is to provide the scientific and analytical basis for the environmental consequences.

4.2 Direct and Indirect Impacts

4.2.1 Livestock Grazing

4.2.2 Direct and Indirect Impacts of Alternative A – Proposed Action

The proposed action would directly affect the livestock grazing permittee on the Mt. Logan Allotment by potential improved operation. New term grazing permits would be issued for a ten-year term. However, implementation of this alternative would have a long-term improved operation on the management of the permittees livestock operation.

Implementation of the Proposed Alternative would likely reduce unauthorized use by the Mt. Logan grazing permittee as it will eliminate trailing across neighboring allotments. Through exchange of Head of Tuweep Pasture for Kent Pasture, livestock would have access to neighboring private grazing land and reliable water. This neighboring private land is owned and controlled by the current Mt. Logan permittee. No increase in AUMs or grazing season is proposed under this alternative, resulting in no change to permitted use.

4.2.3 Direct and Indirect Impacts of Alternative B – No Action

The No Action alternative would affect the livestock grazing permittee on the Mt. Logan Allotments by renewing the 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. 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 applications to fully process and renew permits 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. It is likely that cattle would continue to disperse as they are trailed back and forth across neighboring allotments to reach summer and winter grounds. This adds labor time and costs to livestock movement. Particularly when other livestock are in the Tuweep Allotment, as mixing of various owners livestock may occur. This also adds regulatory complexities to the BLM in regards to permit regulation.

4.2.4 Direct and Indirect Impacts of Alternative C – No Grazing

This alternative would negatively affect the livestock grazing permittee on the Mt. Logan Allotment by not authorizing any active preference under the term grazing permits. The action would cancel the current level of livestock grazing numbers and seasons of use authorized. This would not provide current or future use, stability and compatibility for the permittee's livestock operation because he would not be authorized to use the allotment. This would force him to seek alternate arrangements for his 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, as well as the Grand Canyon-Parashant National Monument RMP (BLM 2008), and the need to respond to applications to fully process and renew permits to graze livestock on public land.

4.2.5 Vegetation and Invasive, Non-Native Species

4.2.6 Direct and Indirect Impacts of Alternative A – Proposed Action

Under this alternative, the permit would be renewed with modification to the permit boundaries. The current main area of the allotment would continue to be grazed while the disjunction Head of Tuweep Pasture would be moved to the Tuweep Forage Reserve, to be used only under certain circumstances. Two areas adjoining the main allotment would be removed from the Tuweep Forage Reserve and used for regular grazing by the permittee. The current Mt. Logan Allotment would continue its trajectory, as illustrated by the key area pasture monitoring, toward a pre-treatment state with some pastures becoming dominated by woody species; while the other pastures would fluctuate in the species composition and relative abundance of vegetative categories such as annuals. The Head of Tuweep Pasture, removed from grazing pressure, would most likely see a gradual, over ten years or more, increase in the annuals and forbs and may see an increase in the diversity of the grasses as more mature plants and seeds would be available for propagation of future generations. This would help bring the site closer to the potential expected vegetation. Paradise Canyon, currently predominantly sagebrush shrubland and grassland, would most likely continue with similar vegetation types. The Kent Pasture would continue to not align with the potential vegetation until the current vegetation treatment plan takes effect. This treatment was approved under the Uinkaret Mountains Landscape Restoration Project EA (DOI-BLM-AZ-A030-2013-0001-EA). This EA analyzed and approved up to 940 acres of Tebuthiuron treatment in the Lower Toroweap Pasture of the Mt. Logan Allotment, and the Kent Pasture of the Tuweep Allotment (see Vegetation Cumulative Effects section for more information). Kent Pasture would be more likely to see an increase in the low stature mixed shrub/grassland category faster than the Head of Tuweep Pasture due to its predominant soil types and precipitation patterns.

4.2.7 Direct and Indirect Impacts of Alternative B – No Action

Under alternative B, the allotment would be maintained in its current configuration. No changes in number of livestock or season of use would occur. Paradise Canyon and Kent Pasture would continue to be used as part of the forage reserve plan. The main area of the allotment would continue its trajectory as illustrated by the key area pasture monitoring toward a pre-treatment state with some pastures becoming increasingly dominated by woody species while other pastures would fluctuate in the species composition and relative abundance of vegetative categories such as annuals. The Head of Tuweep Pasture would continue to move further from the diversity of forbs and grasses found during monitoring through the early 2000s. With the decline in pinyon and juniper, it is likely the pasture will become primarily a sagebrush shrubland. Paradise Canyon would likely remain in a similar state as it currently is. The Kent Pasture would continue to not align with the potential vegetation until the current treatment plan takes effect (see 4.3.1, Uinkaret Mountains Landscape Restoration Project).

4.2.8 Direct and Indirect Impacts of Alternative C – No Grazing

Under this alternative, grazing would be suspended for ten years on the Mt. Logan Allotment. Paradise Canyon and Kent Pasture would continue to be used as part of the forage reserve plan. Paradise Canyon

would most likely remain in a state similar to the current one. The Kent Pasture would continue to not align with the potential vegetation until the current treatment plan takes effect (see Proposed Action section which addresses approved treatments previously analyzed and approved). The Mt. Logan Allotment would most likely see an increase in forbs and annuals in the long term. Depending on the available seedbank and forage behavior of wildlife, this may cause areas of monoculture to appear amongst the grasses, especially in those pastures where one grass species, smooth brome, a perennial non-native grass (planted species) is already predominant. Head of Tuweep Pasture would most likely see a gradual, over 10 years or more, increase in the annuals and forbs and may see an increase in the diversity of the grasses as more mature plants and seeds would be available for propagation of future generations. This would bring the site closer to the potential expected vegetation.

4.2.9 Wildlife (including Big Game, Migratory Birds, and Sensitive Species)

Herbaceous vegetation provides forage and concealment cover for wildlife species, particularly during the spring breeding period when calving, fawning, nesting, and rearing of young occurs. Livestock grazing reduces the height and amount of herbaceous vegetation. The presence of livestock and the movement of livestock between areas of use could result in the direct disturbance or displacement of some wildlife from preferred habitats, 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 Alternatives A and B would limit utilization to 50% in the project area, which would help maintain vegetative condition, and therefore wildlife habitat components.

4.2.10 Direct and Indirect Impacts of Alternative A – Proposed Action

Under this alternative, the permit would be renewed with modification to the permit boundaries. The current Mt. Logan Allotment would continue to be grazed while the disjunction Head of Tuweep Pasture would be moved to the Tuweep Forage Reserve, to be used only during certain circumstances. Two areas, the Paradise Canyon area, and the Kent Pasture would be removed from the Tuweep Forage Reserve and used for regular grazing by the Mt. Logan Allotment permittee. Livestock would no longer need to be trailed between the Head of Tuweep Pasture and the other pastures.

Big Game

Mule Deer

Changes in the allotment boundary proposed in this alternative would result in some deer habitat (3,419 acres) receiving more livestock grazing and other areas (4,289 acres) receiving less. Both areas are classified as mostly poor habitat, but a small amount of summer habitat would be removed from the allotment and a small amount of winter crucial habitat would be added to the allotment. The presence of livestock and the trailing of livestock between use areas could displace some wildlife from preferred habitats and/or water sources. However, this displacement would only be temporary. It is expected that livestock grazing proposed under this alternative would minimally affect habitat for mule deer, and ecological condition of that habitat would be maintained. Since utilization on vegetation would be limited to 50%, competition for forage between livestock and deer should be minimal. The proposed action would therefore not affect meeting habitat (i.e., forage) objectives for mule deer.

Pronghorn

Changes in the allotment boundary proposed in this alternative would result in some pronghorn habitat (3,419 acres) receiving more livestock grazing and other areas (3,630 acres) receiving less. The entire area to be removed from the allotment is classified as poor habitat. The area to be added to the allotment is a mix of poor (2,151 acres), low (639 acres), and moderate (629 acres) habitat. As described in Chapter

3, pronghorn distribution is widespread in Unit 13A. The allotment consists of mostly poor and low quality habitat for this species. 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. Also, the consolidation of the allotment into contiguous pastures should make the movement of livestock less disruptive, since livestock would not be trailed over a longer distance.

Since utilization on vegetation would be limited to 50%, competition for forage between livestock and pronghorn should be minimal. Livestock grazing proposed under this alternative would minimally affect vegetation (i.e., habitat for pronghorn), and ecological condition of that habitat would be maintained. Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Rangeland Health Standards, changes to the grazing use would be made. The proposed action would therefore not affect meeting habitat (i.e., forage) objectives for pronghorn.

Migratory Birds

Properly managed livestock grazing is designed to cause minimal impacts to rangeland resources, including wildlife habitat. Managing the allotments to achieve DPC objectives and implementation of the proposed utilization levels would result in maintaining the ecological condition of the allotment. The trailing of livestock could result in temporary disturbance to migratory birds due to human activity. Implementation of the proposed action may only result in minor impacts to any species of migratory bird known or suspected to occur on the allotment. The consolidation of the allotment into contiguous pastures should make the movement of livestock less disruptive to wildlife, since livestock would not be trailed over a longer distance. No take of any migratory bird species is anticipated.

Sensitive Species

Bats

Utilization on vegetation by livestock may impact resources for insect populations which in turn provide food for bats. However, properly managed livestock grazing is designed to cause minimal impacts to rangeland resources, including vegetation. Livestock grazing would not affect roost sites or hibernacula since these sites tend to be inaccessible to livestock. Range improvements, such as water sources, provide water that is important for bat populations. Implementation of this alternative is therefore unlikely to measurably impact any sensitive bat species known or suspected to occur within the allotments.

Peregrine Falcon and Golden Eagle

Nesting sites for peregrine falcons or golden eagles would not be impacted by livestock within the allotment because these sites are located on ledges in cliff faces that are inaccessible to livestock. Prey species for peregrine falcons, such as mourning doves and band-tailed pigeons, 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 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 peregrine falcon. Managing the allotment to achieve DPC objectives and implementation of the proposed utilization level would result in maintaining or improving the ecological condition of the allotments. Disturbance to nest sites from livestock management operations is unlikely given the remote and inaccessible locations these species choose for nesting. Implementation of the proposed action is not likely to impact peregrine falcon or golden eagle habitat or nesting success.

Ferruginous Hawk

Nesting sites and habitat for ferruginous hawk prey species have the potential to be impacted by livestock grazing within the allotment. Isolated nest trees used by this species could be impacted through rubbing of the trunk or by damaging the root system from congregations of cattle seeking shade. Habitat for prey species, such as black-tailed jackrabbits, could be adversely impacted if overutilization occurs. However, the effects of moderate grazing can be negligible to slightly beneficial for many prey species (Olendorff 1993). Changes in the allotment boundary proposed in this alternative would result in some ferruginous hawk habitat (3,419 acres) receiving more livestock grazing and other areas (approximately 1,600 acres) receiving less.

Vegetation in the allotment is sufficient to provide food and shelter requirements for populations of prey species for the ferruginous hawk. Managing the allotment to achieve DPC objectives and implementation of the proposed utilization level would result in maintaining or improving the ecological condition of the allotment. Ferruginous hawks are sensitive to disturbance near the nest site. However, no nesting has been documented in this allotment so impacts to nesting are unlikely and would not lead to a trend toward listing.

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. In this alternative the Head of Tuweep Pasture, which is approximately 60% pinyon-juniper habitat, would be removed from allotment and experience less grazing as part of the forage reserve. The pastures proposed to be added to the allotment contain no pinyon-juniper habitat. Therefore the changes in the allotment boundary could slightly beneficial the northern goshawk.

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. Changes in the allotment boundary proposed in this alternative would result in some burrowing owl habitat (3,419 acres) receiving more livestock grazing and other areas (approximately 1,600 acres) receiving less.

Prey species are numerous in the allotment and include small mammals, insects, and reptiles. Vegetation in the allotment 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 allotment.

Pinyon Jay

Livestock grazing on the allotments is not likely to impact pinyon jay nesting or foraging. Pinyon jays nest in trees within dense pinyon-juniper forest which typically has less forage available for livestock. Pinyon jays rely heavily on pinyon nuts as a food source which are not consumed by livestock. Some minor, short-term disturbance from livestock management operations may impact nesting pinyon jays but this would be expected to be negligible. In this alternative the Head of Tuweep Pasture, which is approximately 60% pinyon-juniper habitat, would be removed from allotment and experience less grazing as part of the forage reserve. The pastures proposed to be added to the allotment contain no pinyon-juniper habitat. Therefore the changes in the allotment boundary could be slightly beneficial the pinyon jay.

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 system 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.

4.2.11 Direct and Indirect Impacts of Alternative B – No Action

Under this alternative, the allotment would be maintained in its current configuration. No changes in number of livestock or season of use would occur. Paradise Canyon and Kent Pasture would continue to be used as part of the forage reserve plan. Livestock would continue to be trailed the approximately six miles between the Head of Tuweep Pasture and the other pastures.

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 boundary of the allotment would not occur under this alternative. Under this alternative livestock trailing between the Head of Tuweep Pasture and the other pastures would cause added disturbance to wildlife.

4.2.12 Direct and Indirect Impacts of Alternative C – No Grazing

Under this alternative, grazing would be suspended for ten years on the Mt. Logan Allotment. Paradise Canyon and Kent Pasture would continue to be used as part of the forage reserve plan.

Since no livestock grazing would occur on the current allotment, plants would only be minimally grazed (by wildlife). Vegetation would therefore have the most rest and recovery as compared to the other alternatives. Since this alternative would result in the least grazing on vegetation, plants would have the maximum amount of energy compounds in their stems for survival and reproduction; plant communities would continue to provide more than sufficient forage and shelter for wildlife. There would be no conflicts between wildlife and livestock for water within the allotment and no disturbance from livestock operations. In addition, nesting sites for birds would not be impacted by livestock within the allotment.

Impacts to wildlife would primarily be beneficial in the form of increased vegetation for forage and cover and no disturbance from livestock operations. Removal of grazing could also involve not maintaining or even the removal of range improvements. Removing range improvements could result in temporary disturbance to wildlife from human activity. Removal of water developments could also result in less water available to wildlife. No take of any migratory bird species would be anticipated from implementation of this alternative.

4.2.13 Soils

4.2.14 Direct and Indirect Impacts of Alternative A – Proposed Action

The proposed action would continue grazing operations and modify the designated project areas by expanding and reducing portions (swap-out) of the allotment while also installing a fence line adjacent to a designated roadway (see Appendix A Figure 6).

Direct impacts would include, increased 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 cattle infrastructure, and cattle foraging corridors. Installation of the new fence line would have minimal impact as it would be constructed along disturbed soils adjacent to a road surface.

Indirect impacts of the proposed alternative would be minimal with some upper horizon soil loss. This is due to ruts and gullies created in part by livestock. This may result in increased soil depositions, outside the project area. These sediment dispositions would be susceptible to wind driven erosion and further seasonal fluvial erosion.

4.2.15 Direct and Indirect Impacts of Alternative B – No Action

The No Action Alternative would leave the allotment and the project area under its current grazing operations with no changes to its boundaries.

Direct impacts, which are presently observable, would be largely soil compaction in areas where cattle congregate frequently, and the vehicle access roads which create artificial surfaces that reduce soils ability to resist erosion. Gullies, ruts and head-cutting erosion features emerge alongside these road surfaces.

Indirect impacts include, accelerated 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 largely the same between Alternative A and Alternative B.

4.2.16 Direct and Indirect Impacts of Alternative C – No Grazing

Direct impacts to no grazing in the proposed project area would reduce the presence of human activity, vehicle usage, and soil compaction due to hoof motion. Access road surfaces would still produce direct localized erosion features (gullies & ruts) due to the removal of upper soil horizons, revealing the highly erodible lower soil horizons.

Indirect impacts with no grazing would result with increased vegetative growth which would benefit with some top soil retention and erosion abatement. However, the bulk of erosional features stem from artificial access road surfaces (largely public use) which would remain a common feature in all proposed alternatives. Therefore, impacts to soils would be less than those described in Alternative A and B based on increased.

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.

4.3.1 Livestock Grazing

The area of analysis for cumulative impacts to livestock grazing is the Mt. Logan Allotment and the portions of the Tuweep Allotment that are analyzed for exchange in this EA (see Figure 4 and 5 Appendix A).

Livestock grazing in the region has evolved and changed considerably since it began in the 1860s, and is one factor that has created the current environment. At the turn of the century, large herds of livestock grazed on unreserved public domain in uncontrolled open range. Eventually, the range was stocked beyond its capacity, causing changes in plant, soil, and water relationships. Some speculate that the changes were permanent and irreversible, turning plant communities from grass and herbaceous species to brush and trees. Protective vegetative cover was reduced, and more runoff brought erosion, rills, and gullies.

In response to these problems, livestock grazing reform began in 1934 with the passage of the Taylor Grazing Act. Subsequent laws, regulations, and policy changes have resulted in adjustments in livestock numbers, season-of-use changes, and other management changes. Given the past experiences with livestock impacts on public land resources, as well as the cumulative impacts that could occur on the larger ecosystem from grazing on various public and private lands in the region, management of livestock grazing is an important factor in ensuring the protection of public land resources. Past, present, and reasonably foreseeable actions within the analysis area would continue to influence range resources, watershed conditions and trends. The impact of vegetation treatments, 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.

A proposed vegetation treatment analyzed and approved in the Uinkaret Mountains Landscape Restoration Project EA would treat up to 940 acres within the project area analyzed within the Mt. Logan Allotment. This treatment would be through the application of Tebuthiuron to treat a 350 meter swath adjacent to the Toroweap Road (CR 115). This treatment would not directly impact the livestock operation as it would not require alteration of the current livestock rotation.

The effects of livestock grazing on resources in the allotments are analyzed in Chapter 4. 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.

4.3.2 Vegetation and Invasive, Non-native Species

The area of analysis is the Tuweep Valley and the Mount Trumbull and Mt. Logan areas encompassing the entire Mt. Logan Allotment, the portion of the Tuckup allotment in the Tuweep Valley and the Tuweep Forage Reserve. The temporal scope extends forward 10 years until the next permit renewal cycle.

4.3.3 Past and Present Actions

Grazing and vegetation manipulation has occurred in the area since before current monitoring efforts began in the early 1980s. The area, originally part of Dixie National Forest, was initially managed for timber harvest and cattle operations. Chaining, later also used to provide wildlife

habitat, seeding and herbicide application have occurred in the area as land use priorities shifted. In 1908, to the south, and the south-eastern end of the Tuweep Valley, the area has been converted to Grand Canyon National Park, managed for no grazing and minimal vegetation manipulation. Vegetation treatments now focus on minimizing invasive plants and maintaining a healthy diverse vegetative community while providing adequate forage for cattle and wildlife alike.

4.3.4 Reasonable Foreseeable Actions

The current trend in managing and monitoring vegetative communities to meet rangeland health standards is expected to continue as is the current vegetative management policy of the adjoining National Park. The Kent Pasture treatments, part of the Uinkaret Mountains Landscape Restoration Project, would treat 940 acres of sagebrush with herbicide, reducing overstory and providing an opportunity for greater grass and forb growth. This would help bring the Kent Pasture closer to desired conditions.

The proposed action would shift the grazing pressure from an area that is slowly moving further away from the potential vegetative community due in part to grazing (Head of Tuweep) to an area that is better adapted to grazing (Paradise Canyon) and another area, while not meeting that site's potential vegetative community, is more likely to be able to be manipulated, even while in use by livestock, to regain vegetative diversity. The No Action alternative would continue the pressure on Head of Tuweep Pasture, possibly pushing the vegetation further from the site potential and decreasing the species and structural diversity. The No Grazing Alternative, while releasing the entire allotment from grazing pressure, may have unintended consequences to areas that have come into a fairly steady state of vegetative composition but are out of site potential.

4.3.5 Wildlife (including Big Game, Migratory Birds, and Sensitive Species)

The area of analysis for wildlife, including big game, migratory birds and sensitive species, is the current Mt. Logan Allotment, the proposed additions to the current allotment area, and the area between the Head of Tuweep Pasture and the other pastures through which livestock are trailed. The temporal scope extends forward 10 years until the next permit renewal cycle.

4.3.6 Past and Present Actions

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 Rangeland health standards are being met or are progressing toward being met.

Vegetation manipulation has occurred in the area since before current monitoring efforts began in the early 1980s. The area, originally part of Dixie National Forest, was initially managed for timber harvest and cattle operations. Chaining, later also used to provide wildlife habitat, seeding and herbicide application have been occurring in the area as land use priorities shifted. In 1908, to the south, and the south-eastern end of the Toroweap Valley, the area has been converted to Grand Canyon National Park, managed for no grazing and minimal vegetation manipulation. Vegetation treatments now focus on

minimizing invasive plants and maintaining a healthy diverse vegetative community while providing adequate forage for cattle and wildlife alike.

Recreational pursuits, particularly off-highway vehicle (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.

4.3.7 Reasonably Foreseeable Actions

The current trend in managing and monitoring vegetative communities to meet rangeland health standards is expected to continue as is the current vegetative management policy of the adjoining National Park. The Kent Pasture treatments, part of the Uinkaret Mountains Landscape Restoration Project (DOI-BLM-AZ-A030-2013-0001-EA), would treat 940 acres of sagebrush with herbicide, reducing overstory and providing an opportunity for greater grass and forb growth. This will help bring the Kent Pasture closer to desired conditions. Livestock grazing is reasonably expected to continue into the future in the analysis area. Recreational activities and their resultant impacts are reasonably expected to increase in the future.

It is anticipated that the proposed action would have incremental cumulative impacts to wildlife, particularly when added to other past, present, and reasonably foreseeable activities in the area.

4.3.8 Soils

The project area is mostly located over two soil types largely positioned along the existing topography, consisting of a 5-50 degree slopes along the base of Tuweep Valley incorporating the Curhollow Prieta soil series which is juxtaposed with the second unit Showlow Thimble soil series. A third soil type Wutoma Lozinta soil series become prominent in the uplands elevated portions of the project area.

The cumulative impact area of analysis for soil resources issues consists of the general project area to include the original allotment boundaries as well as the separate allotment area for the proposed modification which would allow a swap of acreage. The temporal scope of analysis extends 20 years into the future. This temporal scope was chosen because 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.

4.3.9 Past and Present Actions

Past and present actions include recreation activities such as seasonal hunting, camping, and OHV use. The most pertinent past and present use of the project area has been the implementation of a bounded grazing allotment with typical cattle based modifications 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, food troughs, corrals and fence lines -largely due to hoof weight on soil surfaces, OHV vehicles used to wrangle cattle, and repetitive travel on foraging cattle corridors. As distance increases away from these cattle 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 erosions is also accelerated in the project area by placement of road surfaces serving access for recreation and grazing activities -most

notable in the lower portion of the proposed allotment in the Curhollow Preita Soil series. These artificial 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 the lower portion of the proposed project area.

In the upland portion of the proposed project area, similar issues of soil compaction remain, however, in the presence of an upper elevation Ponderosa grassland dominated environment, the cattle practice a less confined foraging pattern which alleviates repetitive hoof contact on soils, resulting with less soil compaction. However, these upper elevation Wutoma Lozinta soils also contain a sizable amount of organic material which would be susceptible to impacts due to over-grazing. Over grazing would modify the organic cycle of decaying material nutrients reaching the soil surface and upper horizons. The indirect impact over grazing on soil organics would be difficult to estimate given these natural landscapes in the project area were naturally devoid of bovine animals.

4.3.10 Reasonable Foreseeable Actions

As stated, the proposed action seeks to supplement the current allotment with additional acreage, relinquish an equal amount of less accessible acres, (acreage swap) and implement a roadside fence line. The proposed acreage swap would have limited impact as these land units are within direct proximity of each other, and have had similar land use history. The soil conditions would remain the same as no new cattle structures would be introduced, and cattle foraging behavior would be non-repetitive, and likely to be intermittent/opportunistic in nature. Existing soil compaction would continue at the established cattle 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.

Introduction of the proposed roadside fence line, is anticipated to have no direct nor indirect impacts. Placement of fence materials would be along pre-disturbed road side soils. Short duration soil compaction would result from construction activities, placement of materials, and vehicles. Indirect soil impacts would be minimal.

When comparing the proposed action to the no action alternative, the outcome would be the same, considering acreage swap would not reduce soil quality in both Alternative A and Alternative B (no Action), and placement of additional fence line would take place in pre-disturbed road side areas with no indirect soil impacts. Considering the proposed actions of Alternative A, in terms of soil resources, there would be limited unwanted cumulative effect. Limited soil compaction would continue to be present due to the presence of cattle and human activity, similarly limited soil erosion would continue due to physical weathering and disturbed soil surfaces. Overall, the cumulative effects for Alternative A would be similar to Alternative B (No Action).

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

This section summarizes the process used to involve individuals, organizations, tribes, and government agencies in the preparation of this EA. The EA was posted on the BLM's Register ePlanning for review to those persons and groups listed on the Arizona Strip interested publics/persons mailing list; a Notice of Public Comment Period letter was sent out to those individuals to direct them to the web page address. The document was available for Public Comment from 10/1/2018 to 10/31/2018. A summary of comments received and comment response is found in Appendix F pages 7-90 to 7-105. A Notice of Proposed Decision (NOPD) and a FONSI for this EA was signed December 20, 2018, just prior to the partial government shutdown. Consequently, the NOPD was not received by interested parties until after the shutdown ended. Western Watersheds Project received notification on February 1, 2019 and submitted a timely protest to the NOPD on February 15, 2019. The protest reasons are addressed in the decision record.

5.3 List of Preparers and Reviewers

The following tables list persons who contributed to preparation of this EA.

Table 5.1 List of BLM Preparers/Reviewers

Name	Title	Resource Area(s) of Specialty
Gloria Benson	Tribal Liaison	Native American Religious Concerns
Michael Cutler	Rangeland Management Specialist	Invasive, Non-Native Species, Range
Mark Wimmer	Monument Manager	Project Oversight
Jeff Young/Shawn Langston	Wildlife Biologist	Special Status Animals, Wildlife
Jace Lambeth	Rangeland Management Specialist	Special Status Plants
David Van Alfen	Archaeologist	Cultural Resources
Amanda Herrington	Realty Specialist	Lands/Realty/Minerals
Michael Cutler	Rangeland Management Specialist	Range/Vegetation/Weeds/S&G
John Sims	Supervisory Law Enforcement	Law Enforcement
Brian McMullen and Eathan McIntyre	Soil Scientist and Physical Scientist	Soils, Water, Air
Braden Yardley	Recreation Planner	Recreation/Wilderness/VRM

Name	Title	Resource Area(s) of Specialty
Amber Hughes	Environmental Coordinator	NEPA Compliance
Jennifer Fox	Ecologist	Vegetation

Table 5.2 Non-BLM Agency Reviewers

Name	Title	Agency/Organization
Luke Thompson	Field Supervisor	Arizona Game and Fish
Rob Nelson	Habitat Evaluation and Lands Program Manager	Arizona Game and Fish
Peter Bungart	Senior Archaeologist	Hualapai Tribe
Daniel Bullets	Environmental Program Director	Kaibab Paiute Tribe
Dawn Hubbs	Cultural Staff	Hualapai Tribe

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7.0 APPENDICES

Appendix A – Allotment Maps.

Appendix B – Arizona Standards for Rangeland Health and Guidelines for Grazing Administration.

Appendix C – Livestock Actual Use, Utilization, and Trend Monitoring Data.

Appendix D – Existing and Proposed Range Improvements.

Appendix E – Rangeland Health Determination.

Appendix F – Public Comment and Response.

7.0 APPENDIX A. Allotment Maps.

Figure 1. Current Mt. Logan Allotment Boundary (See Section 1.1, pg. 1-7)

Figure 2. Mt. Logan Existing Range Improvements.

Figure 3. Current and Proposed Mt. Logan Allotment Boundary.

Figure 4. Proposed Mt. Logan Allotment Ecological Sites. (See Table 7-1 for corresponding dominant vegetation for each Eco Class (southern units))

Figure 5. Current and Proposed Mt. Logan Allotment Ecological Sites. (See Table 7-1 for corresponding dominant vegetation for each Eco Class (northern unit))

Figure 6. Proposed Mt. Logan Paradise Fence

Figure 7. Location of Test Pit 1 in the Wutoma Soil, at Land Health Evaluation (LHE) Site #3A.

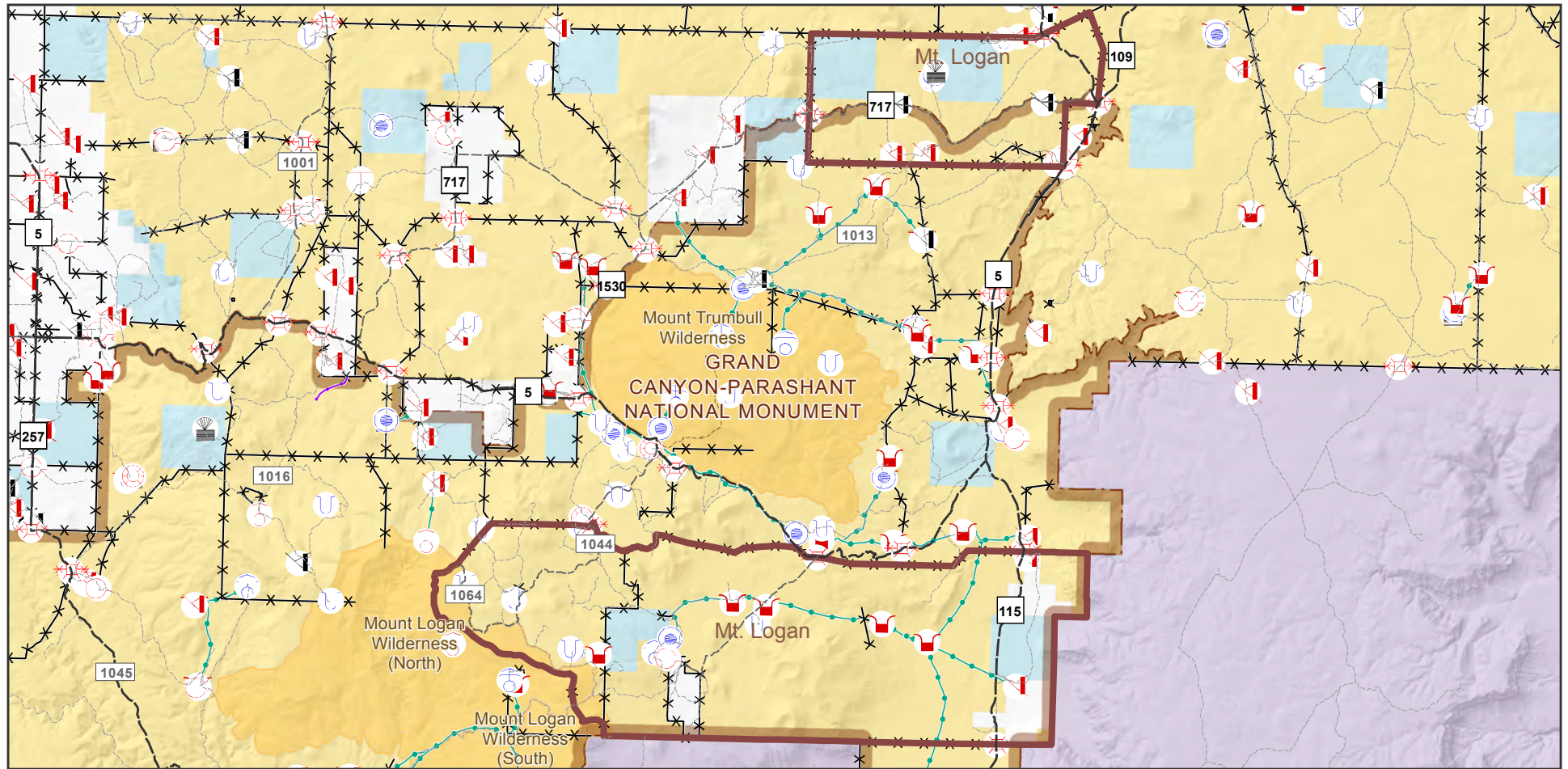
Figure 8. Location of Test Pit 2 in the Curhollow Prieta Soil, at LHE Pipeline Site.



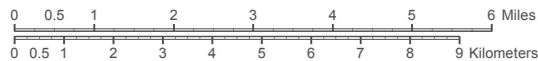
Figure 2. Mt. Logan Allotment Existing Range Improvements.

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



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|---------------------|---------------------|---------------|----------------------------------|
| Bucket Precip Gauge | Livestock Catchment | Fence | Arizona Strip District |
| Cattleguard | Livestock Trough | Pipeline | BLM National Monument |
| Corral | Slickrock Catchment | Dike | BLM Designated Wilderness |
| Detention Dam | Undeveloped Spring | Detention Dam | Surface Management Agency |
| Developed Spring | Unfenced Reservoir | | Bureau of Land Management |
| Fenced Reservoir | Water Storage Tank | | National Park Service |
| | Wildlife Drinker | | State |
| | | | Private |
| | | | Mt. Logan Allotment |



Map Produced by BLM Arizona Strip District
 File: Existing Mt Logan RIPS.mxd
 Coordinate System: NAD 1983 UTM Zone 12N
 Reference System: U.S. PLSS GSRB&B
 Scale: 1:153,000 at 8.5x11 page output
 User: mcutler
 Date: 11/19/2018



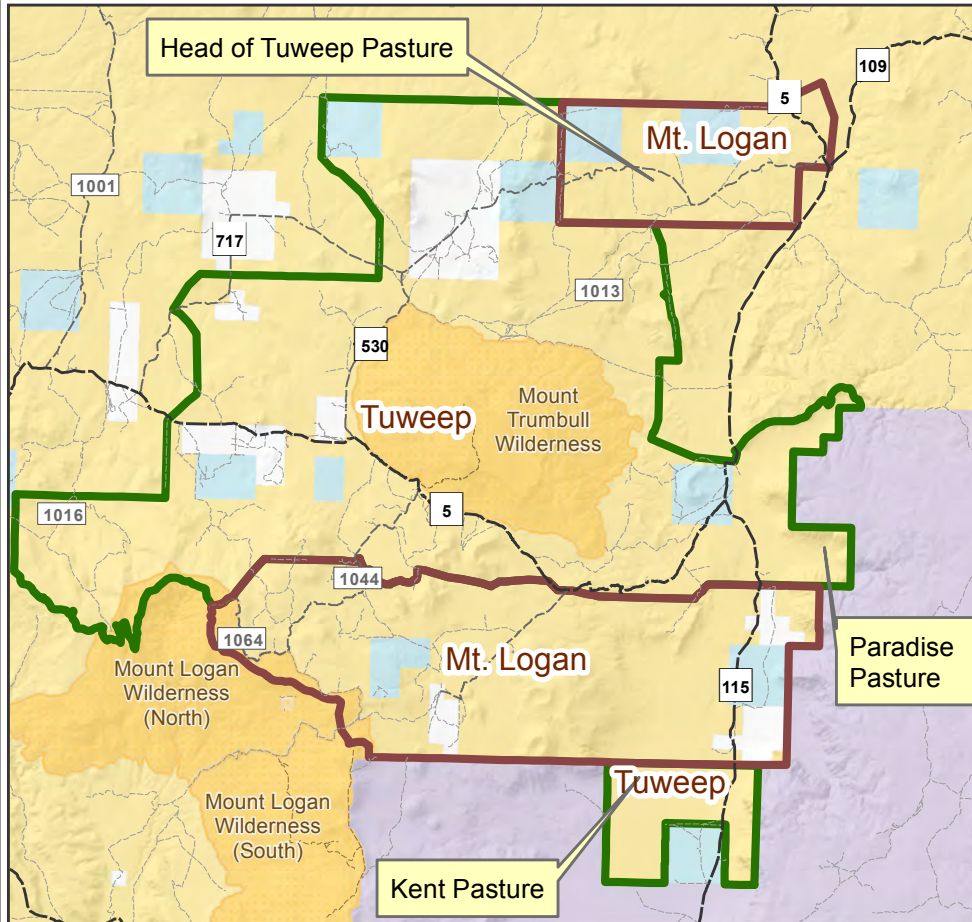
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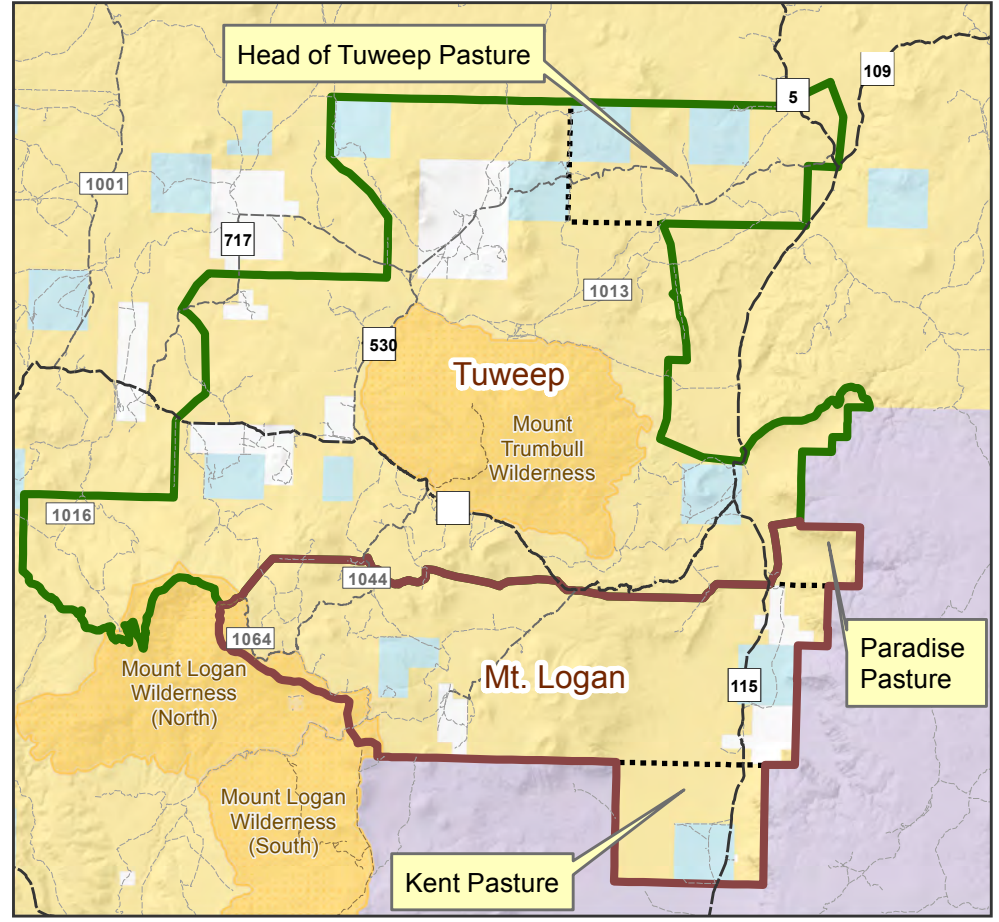
Figure 3. Mt. Logan Allotment - Current and Proposed Boundary.

DOI-BLM-AZ-A030-2018-0002-EA

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

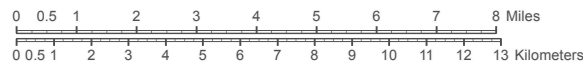


Current Allotment Boundary - No Action



Proposed Allotment Boundary - Proposed Action

- | | | |
|------------------------------|---------------------------|-----------------------------|
| Arizona Strip District | Surface Management | Arizona Strip Routes |
| BLM Designated Wilderness | Bureau of Land Management | Primary Road Unpaved |
| Tuweep Allotment Boundary | National Park Service | Secondary Road Unpaved |
| Mt. Logan Allotment Boundary | State | Tertiary Road Unpaved |
| | Private | Single Track |



Map Produced by BLM Arizona Strip District
 File: Mt Logan comparison.mxd
 Coordinate System: NAD 1983 UTM Zone 12N
 Reference System: U.S. PLS GSRB&B
 Scale: 1:202,951 at 8.5x11 page output
 User: mwimmer
 Date: 4/11/2019

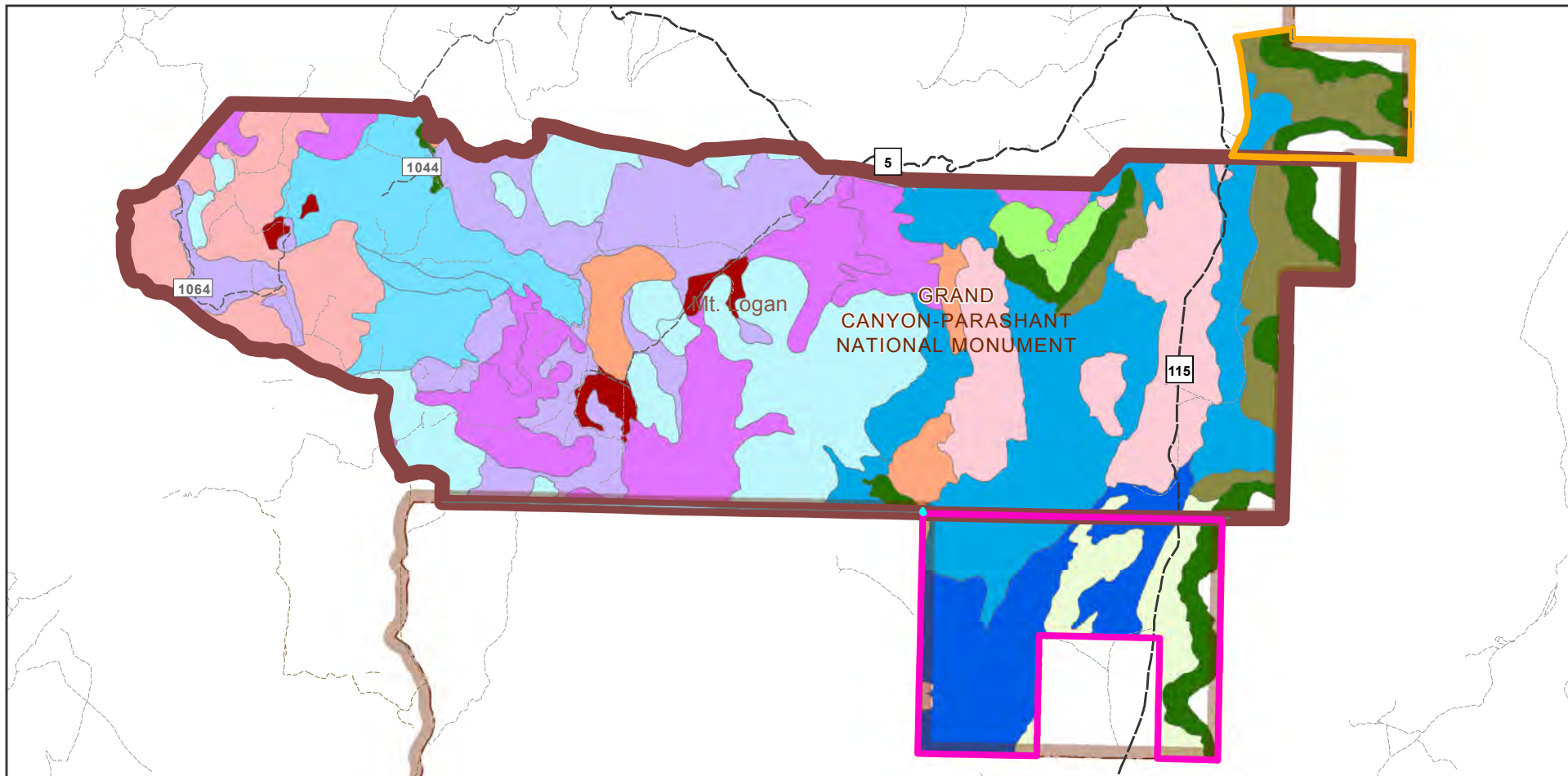


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Figure 4. Mt. Logan Allotment - Current and Proposed Ecological Sites
 (southern unit). DOI-BLM-AZ-A030-2018-0002-EA
 Bureau of Land Management - Arizona Strip District - Grand Canyon-Parashant National Monument



Mt Logan ESI ecoclassname

lava/rock outcrop

Basalt Upland 10-14" p.z.

Cinder Hills 13-17" p.z. (PIED)

Cinder Upland 13-17" p.z. (PIED, JUOS)

Clay Loam Upland 10-14" p.z.

Clay Loam Upland 13-17" p.z. Gravelly (PIED, JUOS)

Limestone/Sandstone Upland 10-14" p.z.

Loamy Terrace 17-25" p.z. (PIPO)

Loamy Upland 10-14" p.z.

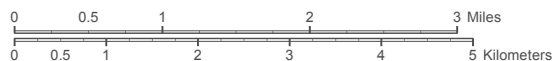
Loamy Upland 13-17" p.z.

Loamy Upland 17-25" p.z. (PIPO)

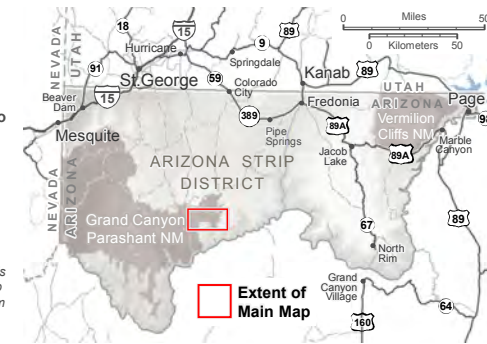
Loamy Upland 7-11" p.z.

Sedimentary Cliffs 10-14" p.z.

Silty Upland 7-11" p.z.



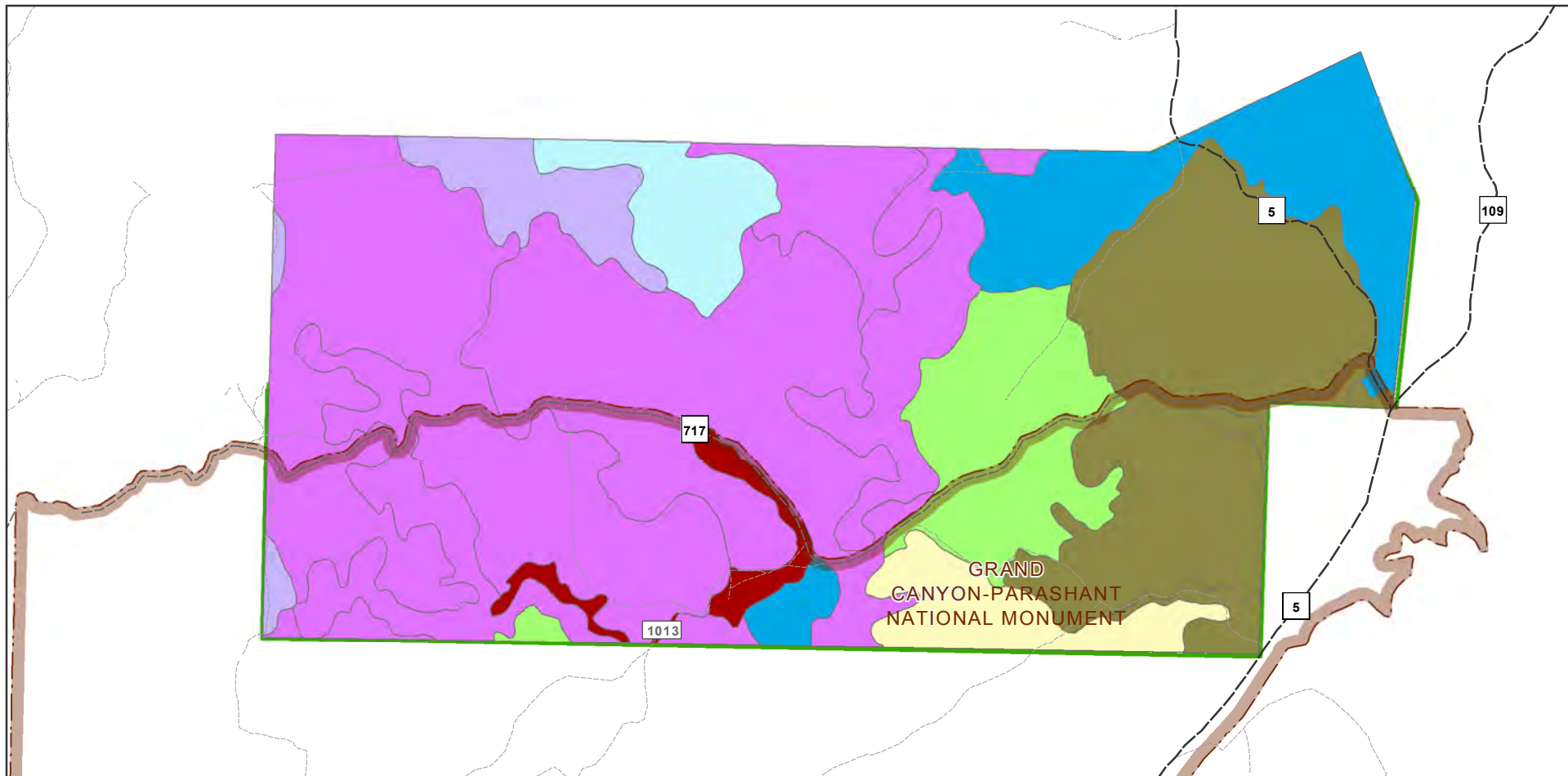
Map Produced by BLM Arizona Strip District
 File: MtLogan_07172018_esi.mxd
 Coordinate System: NAD 1983 UTM Zone 12N
 Reference System: U.S. PLSS GSRB&M
 Scale: 1:82,444 at 8.5x11 page output
 User: mcutler
 Date: 9/11/2018



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Figure 5. Mt. Logan Allotment - Current and Proposed Ecological Sites (northern unit). DOI-BLM-AZ-A030-2018-0002-EA
 Bureau of Land Management - Arizona Strip District - Grand Canyon Parashant National Monument



Mt Logan ESI ecoclassname

- Cinder Hills 13-17" p.z. (PIED)
- Cinder Upland 13-17" p.z. (PIED, JUOS)

- Clay Loam Upland 10-14" p.z.
- Clay Loam Upland 13-17" p.z. (PIED, JUOS)
- Limestone Hills 13-17" p.z. (PIED, JUOS)

- Limestone/Sandstone Upland 10-14" p.z.
- Loamy Upland 10-14" p.z.
- Loamy Upland 13-17" p.z.



Map Produced by BLM Arizona Strip District
 File: MtLogan_07172018_esi.mxd
 Coordinate System: NAD 1983 UTM Zone 12N
 Reference System: U.S. PLSS GSR&M
 Scale: 1:39,661 at 8.5x11 page output
 User: mcutler
 Date: 7/17/2018



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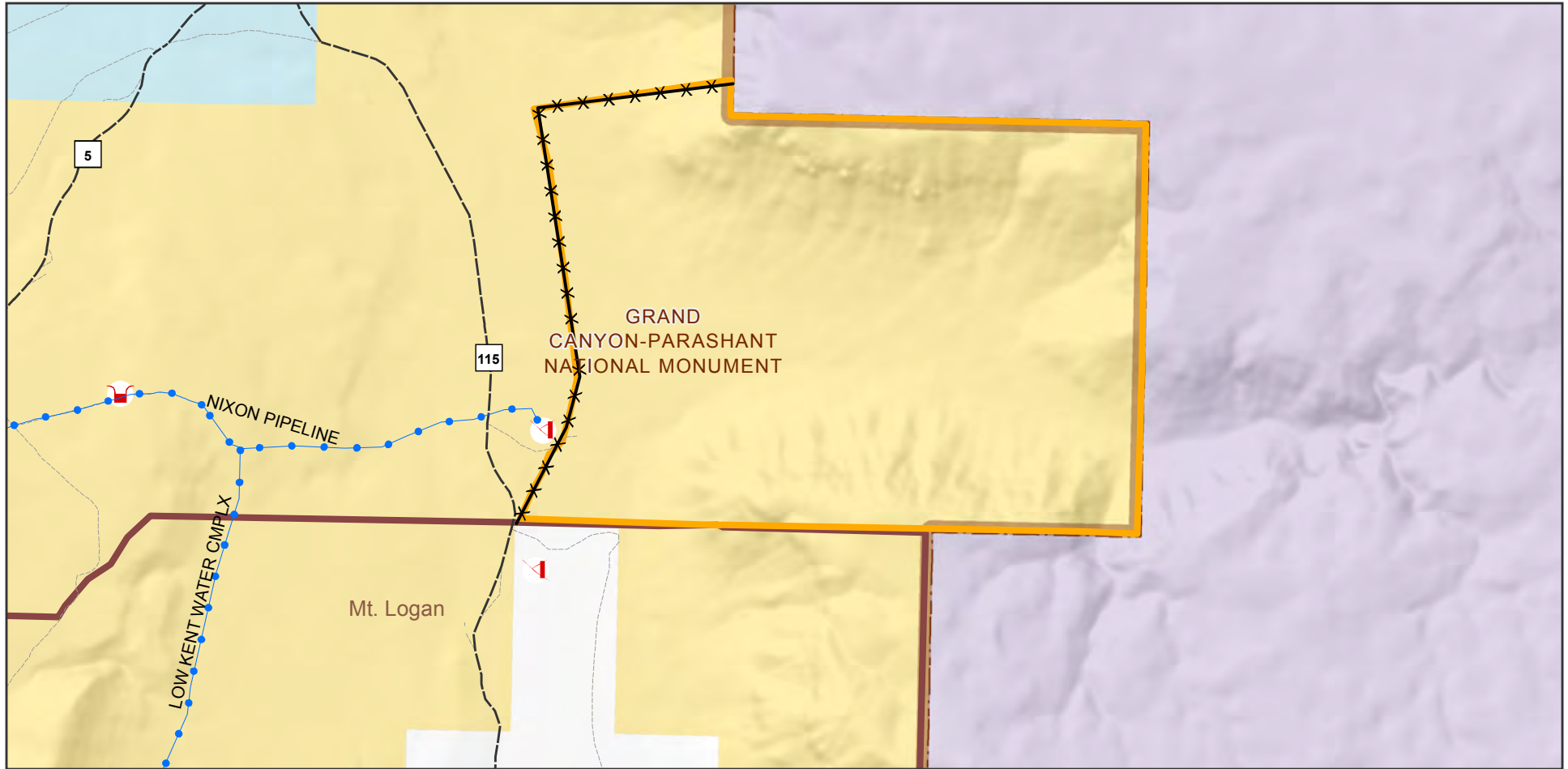




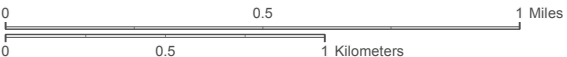
Figure 6. Mt. Logan Allotment - Proposed Fence Construction in Paradise Canyon.

DOI-BLM-AZ-A030-2018-0002-EA

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



- | | | | | | |
|--|--------------------------------------|----------------------------------|---------------------------|--|-----------------------|
| | Livestock Trough | | Arizona Strip District | | Primary Road Unpaved |
| | Unfenced Reservoir | | BLM National Monument | | Tertiary Road Unpaved |
| | Paradise proposed fence | Surface Management Agency | | | |
| | proposed Paradise fence polygon 2018 | | Bureau of Land Management | | National Park Service |
| | | | State | | Private |



Map Produced by BLM Arizona Strip District
 File: Proposed Mt Logan Paradise fence.mxd
 Coordinate System: NAD 1983 UTM Zone 12N
 Reference System: U.S. PLSS GSRB&B
 Scale: 1:23,674 at 8.5x11 page output
 User: mcutler
 Date: 11/19/2018



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Figure 7. Location of Test Pit 1 in the Wutoma Soil, at Land Health Evaluation (LHE) Site #3A.

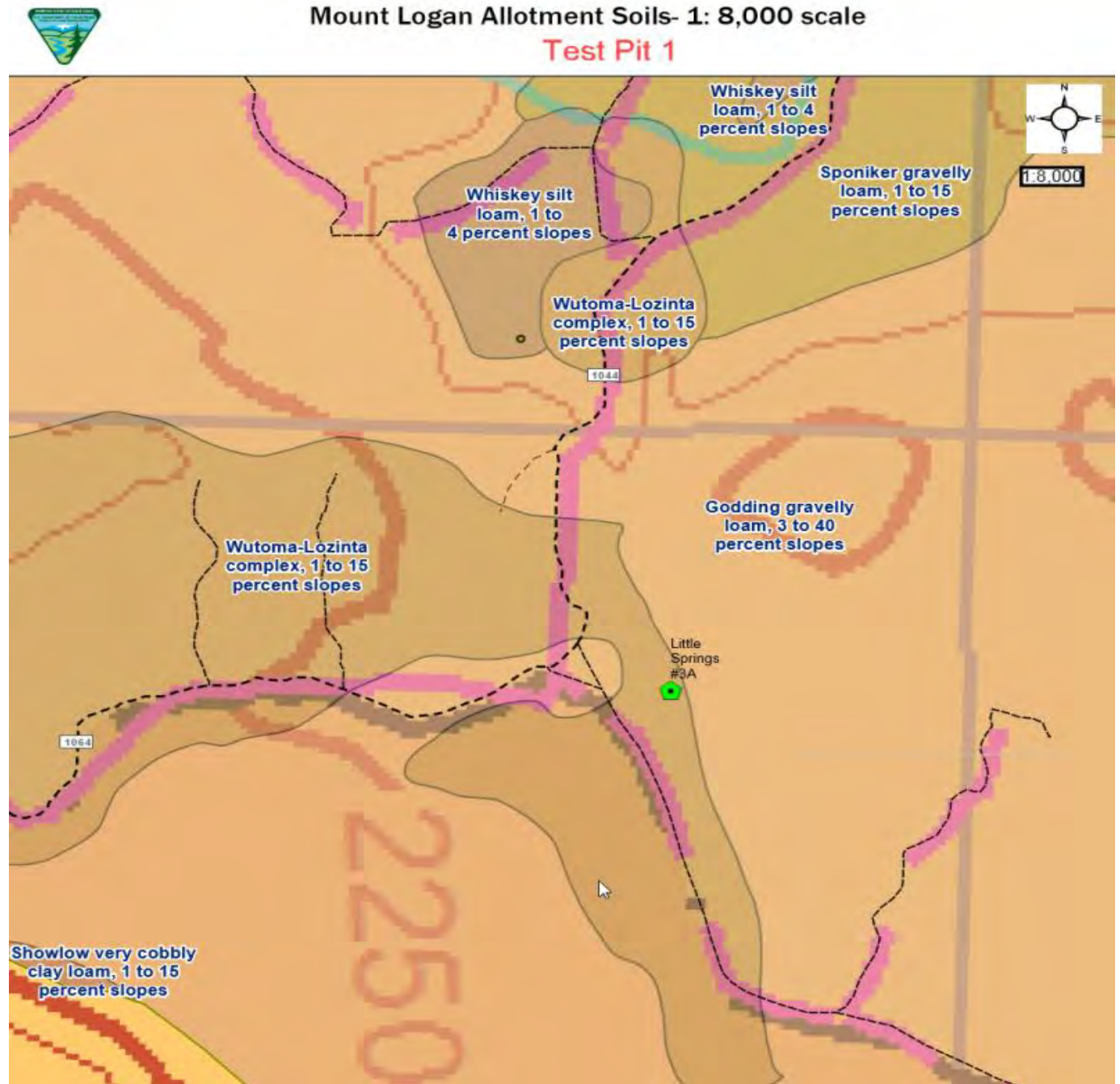
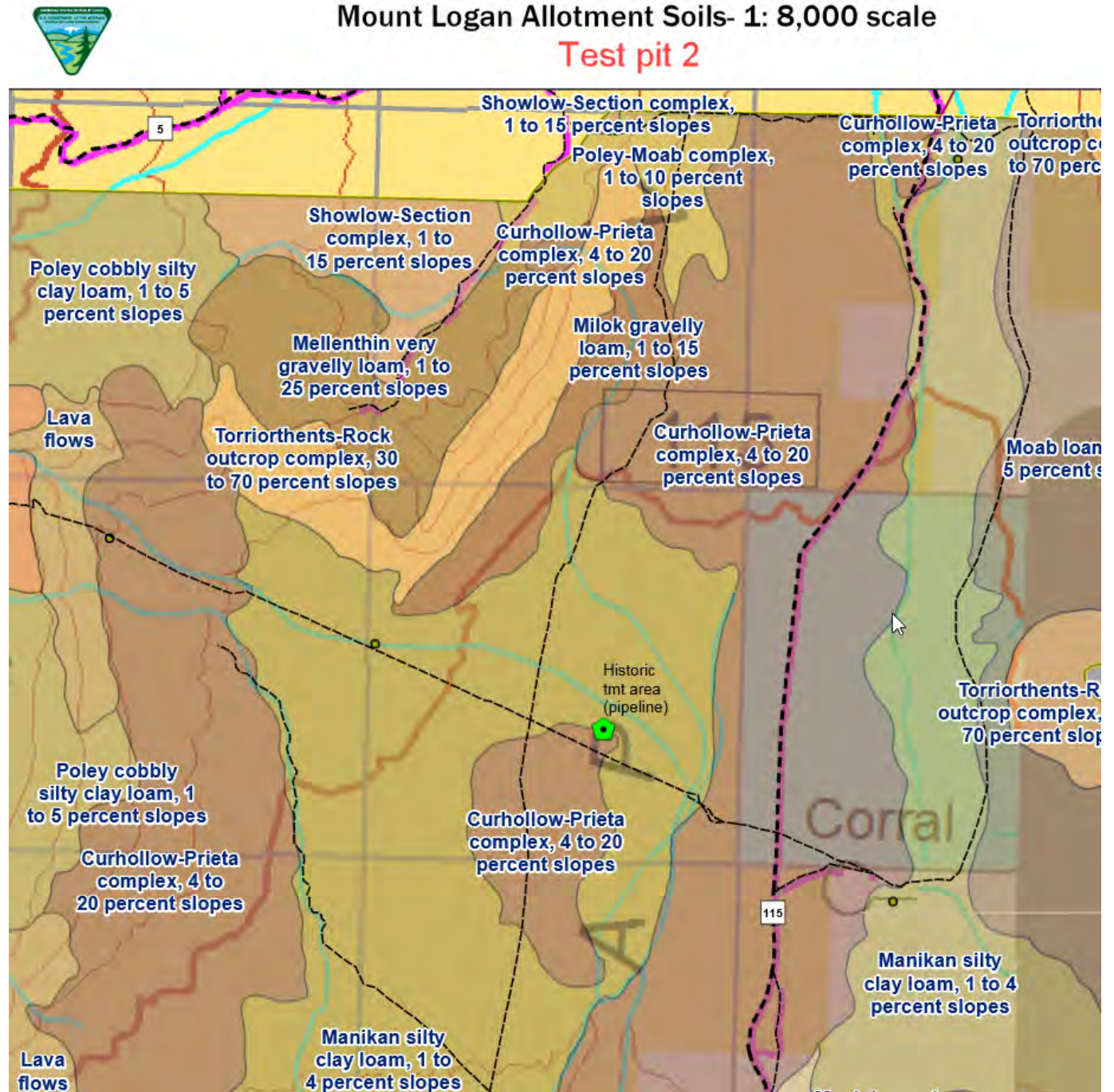


Figure 8. Location of Test Pit 2 in the Curhollow Prieta Soil, at LHE Pipeline Site.



7.1 APPENDIX B. Arizona Standards for Rangeland Health and Guidelines for Grazing Administration.

Arizona Standards for Rangeland Health and Guidelines for Grazing Administration

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.

7.2 APPENDIX C. Livestock Actual Use, Utilization and Trend Monitoring Data.

1. Livestock Actual Use

Actual use was determined from licensed use. Total active preference for the allotment is 930 AUMs.

Table 7-1. Mt. Logan Actual Use

Grazing Year	AUMs Used	Total Active AUMs available	% Active AUMs Used
2007	763	930	82
2008	814	930	88
2009	736	930	79
2010	677	930	73
2011	743	930	80
2012	738	930	79
2013	811	930	87
2014	738	930	79
2015	835	930	90
2016	853	930	92
Average	771		83

Precipitation

Average annual precipitation over the allotment varies greatly between Mount Logan and Tuweep Valley. The Mount Logan Remote Automated Weather Station (RAWS) is located within the Mount Logan Allotment. This station represents the higher elevations of the allotment. There is no rain gauge within the allotment that represents the Tuweep Valley portion of the allotment. Therefore, the Tuweep Ranger Station rain gauge, which is approximately 2.5 miles south of the allotment is referenced to represent precipitation in this portion of the allotment.

The Mt. Logan RAWS station is located in T34N, R8W, Sec. 18 within the Little Springs Pasture and is representative of the allotments higher elevations. Average precipitation is ~18.88" annually. Approximately 16% (2.97") comes in the fall, 35% (6.60") in the winter, 19% (3.55") in the spring and 30% (5.75") in the summer. There is also the Mt. Trumbull rain gauge which is located approximately 0.25 miles north of the allotment, which is also representative of the higher elevations of the Mt. Logan Allotment. That data is presented as well in the precipitation tables below. The Mt. Trumbull rain gauge is located in T34N, R8W, Sec. 5. Long term annual precipitation for this rain gauge is 12.9 inches.

The Tuweep gauge is located in T33N, R8W, Sec. 5 approximately 2.5 miles south of the allotment at the National Park Service Tuweep Ranger Station. Average long term annual precipitation for this gauge is ~13.06". Approximately 13% (1.7") comes in the fall, 29% (3.8") in the winter, 21% (2.7") in the spring, and 37% (4.8%) in the summer.

Table 7-2. Mt. Logan Rain Gauges.

Annual Precipitation 1989-1996								
Rain Gauge	1989	1990	1991	1992	1993	1994	1995	1996
Mt Logan	6.73''	10.71''	13.51	14.49	21.07	9.52	12.74	13.64
Mt. Trumbull	14.03''	19.62''	17.10''	20.25''	30.29''	15.38''	35.88''	17.00''
Tuweep	8.85''	11.90''	7.96''	14.44''	9.93''	10.40''	19.43''	10.05''
Annual Precipitation 1997-2004								
Rain Gauge	1997	1998	1999	2000	2001	2002	2003	2004
Mt. Logan	13.62	20.19	10.31	8.23	8.45	8.82	13.62	18.82
Mt. Trumbull	23.38''	18.25''	17.58''	9.69''	18.50''	9.00''	16.25''	16.38''
Tuweep	12.52''	15.33''	10.98''	6.89''	12.18''	4.70''	9.40''	13.06''*
Annual Precipitation 2005-2012								
Rain Gauge	2005	2006	2007	2008	2009	2010	2011	2012
Mt. Logan	19.05	10.02	14.92	21.82	7.29	11.22	8.54	9.77
Mt. Trumbull	37.82''	13.62''	13.75''	19.56''	16.25''	17.50''	22.63''	18.00''
Tuweep	13.06''*	13.06''*	13.06''*	13.06''*	13.06''*	13.06''*		
Annual Precipitation 2013-2017								
Rain Gauge	2013	2014	2015	2016	2017			
Mt. Logan	15.53	12.11	17.21	ND	9.27			
Mt. Trumbull	18.95''	15.00''	21.50''	20.90''	14.48''			

*annual data not available for Tuweep Station past 2003. After 2003, long term annual average precipitation is represented for 1981-2010.

Utilization

Utilization is the portion or amount of a key plant species current year’s growth that is consumed or destroyed by animals. Utilization data from 1994-2018 has been compiled in the following tables. The Key Species Grazed Class method was used to collect the data. Utilization is read at or around the designated key area for each pasture. ND = No data collected, NU = Non-use, meaning livestock did not graze the pasture.

Table 7-3. Head of Tuweep Pasture Utilization.

Percent Utilization of Key Species at Key Area #1 (Head of Tuweep Pasture)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Bogr	18	NU	37	39	38	38	NU	NU	NU	7	29	NU
Hija	0	NU	10	43	34	40	NU	NU	NU	31	25	NU
Sihy	20	NU	41	46	36	43	NU	NU	NU	15	39	NU
Spcr	20	NU	39	20	32	46	NU	NU	NU	30	41	NU

Percent Utilization of Key Species at Key Area #1 (Head of Tuweep Pasture)													
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bogr	ND	ND	ND	ND	NU	ND	ND	4	5	ND	ND	ND	3
Hija	ND	ND	ND	ND	NU	ND	ND	0.2	3	ND	ND	ND	3
Sihy	ND	ND	ND	ND	NU	ND	ND	22	20	ND	ND	ND	20
Spcr	ND	ND	ND	ND	NU	ND	ND	20	52	ND	ND	ND	10

Utilization levels on a key species in the Head of Tuweep pasture has exceeded the 50% utilization threshold once during the evaluation period from 1994 through 2018. Overall key species utilization in the pasture for the evaluation period was 27%.

Table 7-4. Little Oak Pasture Utilization.

Percent Utilization of Key Species at Key Area #2 (Little Oak Pasture)												
Species	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hija	40	50	50	34	47	45	NU	NU	NU	48	45	ND
Sihy	44	46	54	40	50	48	NU	NU	NU	44	22	ND
Bogr	30	45	45	34	46	41	NU	NU	NU	24	23	ND

Percent Utilization of Key Species at Key Area #2 (Little Oak Pasture)													
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Hija	ND	ND	ND	ND	ND	ND	ND	NU	ND	ND	ND	ND	23
Sihy	ND	ND	ND	ND	ND	ND	ND	NU	ND	ND	ND	ND	10
Bogr	ND	ND	ND	ND	ND	ND	ND	NU	ND	ND	ND	ND	16

Utilization levels on a key species in the Little Oak pasture exceeded the 50% allowable once during the evaluation period from 1994 through 2018. That use occurred in 1996 on squirrel tail at 54%. Overall key species utilization in the pasture for the evaluation period was 39%.

Table 7-5. Little Spring Pasture Utilization.

Percent Utilization of Key Species at Key Area #3A (Little Spring Pasture)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Agro	40	31	33	45	44	31	NU	NU	24	21	26	25
Brin	53	34	39	54	47	32	NU	NU	28	25	27	31
Poa	51	28	40	ND	ND	34	NU	NU	24	27	22	25

Percent Utilization of Key Species at Key Area #3A (Little Spring Pasture)													
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Agro	29	28	ND	ND	ND	19	24	46	24	ND	ND	25	10
Brin	31	19	ND	ND	ND	34	41	28	35	ND	ND	18	10
Poa	22	23	ND	ND	ND	0	0	0	0	ND	ND	0	0

Utilization levels on a key species at Key Area #3A in the Little Spring Pasture exceeded the 50% allowable three times during the evaluation period from 1994 through 2018. That use occurred on smooth brome and Poa spp. at 53% and 51% in 1994, and again on smooth brome at 54% in 1997. Overall utilization at the key area for the evaluation period was 28%.

Table 7-6. Little Spring Pasture Utilization.

Percent Utilization of Key Species at Key Area #3B (Little Spring Pasture)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Agro	ND	32	47	52	46	26	NU	NU	35	27	31	26
Brin	ND	33	50	53	47	28	NU	NU	26	26	35	26
Poa	ND	38	50	49	46	22	NU	NU	29	28	28	33

Percent Utilization of Key Species at Key Area #3B (Little Spring Pasture)													
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Agro	29	30	ND	ND	ND	42	42	58	45	ND	ND	26	17
Brin	28	38	ND	ND	ND	75	60	53	42	ND	ND	26	21
Poa	28	18	ND	ND	ND	0	0	0	0	ND	ND	0	0

Utilization levels on a key species at Key Area #3B in the Little Spring pasture exceeded the 50% allowable two times during the evaluation period from 1994 through 2004. That use occurred on Agropyron spp. and smooth brome at 52% and 53% in 1997. Utilization was exceeded in three years in the 2005 to present period. Overall key species utilization at the key area for the evaluation period was 32%.

Trend

Trend monitoring was conducted at four key areas over the allotment. The Head of Tuweep, Little Oak, and Little Spring pastures have key area locations where trend data is collected. Two of the four key areas are located in the Little Spring Pasture.

Data was collected using the Pace-Frequency method. This method of monitoring measures the percent of bare ground, litter, rock and live vegetation/basal cover. In addition, it measures the occurrence frequency of plant species. Key areas #1 and #2 were established in 1981 and Key Areas #3A and #3B were established in 1983.

The trend index, which combines percent frequency of key forage species, percent litter, and percent live vegetation (basal cover) into one numerical value, shows Key Areas # 2 is in a downward trend, and #'s 1, 3A, and 3B are in an upward trend. At a majority of the key areas, there appears to be a strong correlation between increase in sagebrush cover, which is not a key species, and decrease in perennial grass cover, many of which are key species. This may explain the downward trend at Site 2. Key species are identified with an asterisk (*).

Sites/Locations: • 1 -- BLM > Arizona State Office > Arizona Strip District > Arizona Strip Field Office > Mt. Logan Allotment > Head of Tuweep Pasture. Upward Trend 2014.

Table 7-7. Head of Tuweep Frequency Trend.

Site 1 % Frequency								
Quadrat Size: 40x40 cm								
Species	Events							
	1	1	1	1	1	1	1	1
	08/24/81	05/29/85	06/22/88	08/13/91	08/26/97	09/29/04	07/15/09	07/02/14
Woody Species								
Artemisia tridentata	56	37	34	54	62	37	51	63
Berberis fremontii				1		1	2	
Cowania mexicana				1				
Echinocereus							1	
Gutierrezia sarothrae	11	11	19	7	7	13	9	9
Juniperus osteosperma		8	12	4	4	6	7	2
Mahonia trifoliolata								1
Opuntia	1		1	1	1	2	1	1
Opuntia - Cholla				2			1	1
Pinus edulis					2	4	10	
Pinus monophylla	1	7	5	5			1	
Grasses - Perennial								
Aristida		1	3	1		1		
Aristida longiseta							1	
Bouteloua gracilis*	91	75	64	84	79	54	46	69
Hilaria jamesii*	1	6	8	5	3	2		2
Muhlenbergia torreyi	1						1	
Oryzopsis hymenoides*					1			1
Sitanion hystrix*	4	2	4	1	5	8	5	30
Sporobolus contractus								1
Sporobolus cryptandrus*	2		1	2		2	1	1
Stipa comata			1					
Tridens pulchellus						3		
Forbs - Perennial/Biennial								
Site 1 cont. % Frequency								
Quadrat Size: 40x40 cm								
Species	Events							
	1	1	1	1	1	1	1	1
	08/24/81	05/29/85	06/22/88	08/13/91	08/26/97	09/29/04	07/15/09	07/02/14
Eriogonum - perennial forb #1			3	1				
Lotus utahensis							1	

Penstemon			1	2				
Sphaeralcea	1		1	1	1	4	1	5
Annuals								
Amaranthus					20			
Annual forb(s)					20	9	1	
Erigeron concinnus								1
Euphorbia					8			
Unclassified								
Berberis								
Muhlenbergia								
Portulaca						41		
Total Key Spp. Comp. %	98							103
Litter %	6.5							35
Live Veg. Cover %	22							9
Total	126.5							147

Sites/Locations: • 2 -- BLM > Arizona State Office > Arizona Strip District > Arizona Strip Field Office > Mt. Logan Allotment > Little Oak Springs Pasture. Downward Trend 2014.

Table 7-8. Little Oak Springs Frequency Trend.

Site 2 % Frequency		Quadrat Size: 40x40 cm						
Species	Events							
	2	2	2	2	2	2	2	2
	08/25/81	05/29/85	06/22/88	07/03/91	07/28/97	09/29/04	07/21/09	07/02/14
Woody Species								
Artemisia tridentata	2	19	17	25	26	48	46	30
Chrysothamnus	4	18	21	26	27			
Chrysothamnus nauseosus						11	10	7
Juniperus osteosperma	2	2	4	3	4	4	7	17
Pinus edulis	2	1	1	2	2	3	3	8
Purshia tridentata			1		1	1		
Rhus trilobata		2					2	2
Grasses - Perennial								
Agropyron*		10	22					
Agropyron cristatum*	6							
Agropyron intermedium*	12							1
Agropyron smithii*	54							
Agropyron trachycaulum*				9	8			
Bromus inermis*	13	19	7	3	3			
Elymus junceus*	2							
Hilaria jamesii*				3	2			
Oryzopsis hymenoides*	1		1					
Sitanion hystrix*	3	6	3	4	3	4		1
Sporobolus cryptandrus*				1	1			
Forbs - Perennial/Biennial								
Aster arenosus								1
Chamaesaracha coronopus							3	
Eriogonum - perennial forb #1			3	1				
Eriogonum inflatum								3

Site 2 cont. % Frequency		Quadrat Size: 40x40 cm						
Species	Events							
	2 08/25/81	2 05/29/85	2 06/22/88	2 07/03/91	2 07/28/97	2 09/29/04	2 07/21/09	2 07/02/14
Eriogonum umbellatum							1	
Hymenopappus filifolius								5
Lotus plebeius								1
Lupinus				1	2		1	1
Penstemon	11	16	8	6	7	6	5	4
Perennial forb#1				4				
Perennial forb#2				3				
Perennial forb#3				1				
Perennial forb#4				1				
Perennial forb#5				1				
Perennial forb(s)						4	1	
Phlox longifolia							2	
Physalis	2	4						
Sphaeralcea	1	3	2	1				1
Viguiera multiflora						16		
Annuals								
Annual forb(s)						1	1	1
Bromus tectorum	3			5	7			
Cordylanthus parviflorus						6	2	
Eriogonum - annual forb #1					1			
Eriogonum pharnaceoides						2		
Euphorbia	5						5	3
Glyptopleura setulosa								1
Oenothera	3	1	1		1			
Salsola kali	1							
Solanum triflorum							1	
Unclassified								
Aster				1				
Composite perennial forb #1				6	5			

Site 2 cont. % Frequency		Quadrat Size: 40x40 cm						
Species	Events							
	2 08/25/81	2 05/29/85	2 06/22/88	2 07/03/91	2 07/28/97	2 09/29/04	2 07/21/09	2 07/02/14
Marrubium		5				1	4	
Mentzelia				1				
Nicotiana	1		1	1	2			
Perennial forb(s)-mint labiate			1	2	3		2	
Ribes						1		
Senecio						9		
Unknown 1				2				1
Verbascum	1	29	4					
Total Key Spp. Comp. %	91							2
Litter %	11							43
Live Veg. Cover %	5							1
Total	108							46

Sites/Locations: • 3A -- BLM > Arizona State Office > Arizona Strip District > Arizona Strip Field Office > Mt. Logan Allotment > Little Springs Pasture. Upward Trend 2014.

Table 7-9. Little Spring Frequency Trend.

Site 3A % Frequency		Quadrat Size: 40x40 cm						
Species	Events							
	3A	3A	3A	3A	3A	3A	3A	
	10/20/83	09/06/89	09/14/93	06/25/98	09/28/04	07/15/09	07/07/14	
Woody Species								
Artemisia tridentata	5	6	17	22	42	34	32	
Ceanothus martinii					1			
Pinus ponderosa		2	2	1	1	5	6	
Purshia tridentata		1	1	1	1			
Quercus gambelii	7	9		6	4	2	4	
Quercus turbinella			10					
Robinia neomexicana			1		1	1		
Grasses - Perennial								
Agropyron*	92	87	91	92	91	59		
Agropyron cristatum*			1			1		
Agropyron intermedium*							84	
Agropyron smithii*						75	17	
Bouteloua gracilis*						1		
Bromus inermis*	6	20	20	20	11	15	16	
Carex	11	5	2					
Elymus junceus	2	1	1					
Poa fendleriana*							2	
Poa pratensis*	1	11	8	11	1	1		
Sitanion hystrix*	6	6	5	2	16	1		
Forbs - Perennial/Biennial								
Comandra umbellata							1	
Leonurus cardiaca						1		
Lotus utahensis						1		
Lupinus		1	2	4	1	2	6	

Site 3A cont. % Frequency		Quadrat Size: 40x40 cm					
Species	Events						
	3A	3A	3A	3A	3A	3A	3A
	10/20/83	09/06/89	09/14/93	06/25/98	09/28/04	07/15/09	07/07/14
Machaeranthera canescens					1		1
Perennial forb(s)	2	1	1				
Tragopogon							2
Verbascum thapsus	30						
Annuals							
Annual forb(s)			17	8	7		1
Bromus tectorum			4	3	1		
Eriastrum			3	1			
Unclassified							
Andropogon				1			
Astragalus		7	3				
Convolvulus	1		1	2	1		
Ipomoea					2		
Marrubium					1		
Medicago sativa				1			
Mentzelia			3	1			
Poa					1		
Tragopogon dubius						1	
Verbascum		2	2	1			
Total Key Spp. Comp. %	105						119
Litter %	40						64
Live Veg. Cover %	4						3
Total	149						186

Sites/Locations: • 3B -- BLM > Arizona State Office > Arizona Strip District > Arizona Strip Field Office > Mt. Logan Allotment > Little Springs Pasture. Upward Trend 2014.

Table 7-10. Little Spring Frequency Trend.

Site 3B % Frequency		Quadrat Size: 40x40 cm						
Species	Events							
	3B	3B	3B	3B	3B	3B	3B	
	10/21/83	09/20/89	09/14/93	06/24/98	09/28/04	07/14/09	07/07/14	
Woody Species								
Artemisia tridentata	9	7	8	13	11	6	9	
Robinia neomexicana	2	1	3	3	1	7	2	
Grasses - Perennial								
Agropyron*	71	86	94	90	97	98		
Agropyron intermedium*							91	
Agropyron smithii*							5	
Bromus inermis*	7	10	14	21	6	11	15	
Elymus junceus*	1							
Poa fendleriana*							2	
Poa pratensis*	13	15	14	13		1		
Sitanion hystrix*	3	4	2	1	13			
Forbs - Perennial/Biennial								
Convolvulus arvensis						18		
Linum lewisii	2					4		
Lupinus	12	13	25	11	8	6	4	
Machaeranthera canescens					1			
Perennial forb(s)	1				3	1	2	
Tragopogon							1	
Verbascum thapsus	1					2		
Annuals								
Annual forb(s)			17	4	10		2	
Bromus tectorum				1	5		7	
Euphorbia				1				
Polygonum aviculare						3		

Site 3B cont. % Frequency		Quadrat Size: 40x40 cm					
Species	Events						
	3B	3B	3B	3B	3B	3B	3B
	10/21/83	09/20/89	09/14/93	06/24/98	09/28/04	07/14/09	07/07/14
Polygonum douglasii						25	
Verbena bracteata						5	1
Unclassified							
Astragalus			1				
Convolvulus	26			6	3		17
Ipomoea			18		18		
Lappula echinata						4	
Phlox				1			
Senecio	1						
Stellaria		4	1				
Tragopogon dubius						1	
Total Key Spp. Comp. %	95						113
Litter %	57						59
Live Veg. Cover %	6						3
Total	158						175

1. 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 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 7-11. Head of Tuweep Composition.

Key Area #1. Loamy Upland 10-14” p.z., Late seral (79% of PNC)

Key Area #1 Plant Spp	Site Guide Allowable Composition	1991 Composition	2004 Composition	2014 Composition	Desired Composition Objective	
Grasses						
Bogr*	15-30%	58%	32%	47%	15-30%	30
Hija*	5-15%	T	T	1.2%	1-5%	1
Sihy*	5-10%	1%	3%	6%	2-7%	6
Arlo	0-5%	5%	1%	0.10		
Spcr*	1-3%	T	T	0.7	1-3%	1
Trpu		0%	3%			
Forbs						
Sphae	5-10%	T	2%	3	1-5%	3
Eriog.	5-10%	T				
Penst.		T				
AAFF	5-10%	T		0.5	5-10%	0.5
Shrubs						
Artr	5-15%	58%	40%	37	15-40%	37
Gusa	0-5%	1%	10%	1.3		
Pied	0-5%	T	3%	0	0-5%	0
Juso	0-5%	T	2%	0	0-5%	0
Opuntia	0-10%	T	2%	0.10		
Algerita	0-3%	T	2%			
Total						79

Table 7-12. Little Oak Springs Composition.

Key Area #2, Cinder Upland (Woodland) 13-17” p.z.; Ecological site guide places the site in the herbaceous/shrub stage based on present vegetation composition. This stage is defined as shrub dominated with medium amounts of forbs and small trees and minor amounts of grasses. It is considered 82% PNC based on the current composition. The earlier seral stage of this site has much more perennial grass cover and less shrub and tree cover.

Key Area #2 Plant Spp	Site Guide Allowable Composition	1991 Composition	2004 Composition	2014 Composition	Desired Composition Objective	
Grasses						
Agropy.*	Up to 5%	1%	T	0	1-3%	0
Brin*	Up to 5%	5%	T	0	1-3%	0
Sihy*	0-10%	1%	2%	0.10%	1-5%	0.10
Forbs						
Vimu	0-10%	7%	19%			
Sphae	0-5%	T	T	0.30%		
Penst.	0-5%	4%	3%	6%		
PPFF	0-10%	17%	6%	4.9%	5-10%	10
AAFF	0-5%	T	T	T	1-5%	0
Shrubs						
Artr	25-49%	36%	55%	39.9%	20-40%	40
Erph2	0-10%	T	T			
Pied	Up to 25%	T	T	8.6%	5-15%	8.6
Juso	Up to 25%	4%	4%	29.8%	5-15%	15
Chryso.	Up to 25%	25%	11%	8.7%	5-15%	8.7
Total						82

Table 7-13. Little Springs Composition.

Key Area #3A. Loamy Upland (Pipo-Woodland) 17-25” p.z.; Ecological site guide places the site in the herbaceous/shrub stage based on present vegetation composition. This stage is defined as being dominated by grasses and shrubs with a few tree seedlings and forbs present. 95% of PNC

Key Area #3A Plant Spp.	Site Guide Allowable Composition	1989 Composition	2004 Composition	2014 Composition	Desired Composition Objective	
Grasses						
Agropy.*	NA	45%	62%	71	30-65%	65
Brin*	NA	13%	5%	7	5-10%	7
Sihy*	0-2%	5%	7%		5-10%	0
Popr*	0-5%	2%	1%	0.4	1-5%	0.4
Carex	NA	T	T			0

Forbs						0
Vetch	0-2%	2%	T			0
Lupine	0-1%	T	T			0
Mullen	NA	1%	0%			0
PPFF	0-5%	3%	1%	1%	1-5%	1
AAFF	0-5%	T	T		1-5%	0
Shrubs						0
Artr	0-5%	3%	17%	14	10-20%	14
Quga	0-3%	26%	7%	0.10	5-10%	0.10
Putr	0-1%	T	T		0-1%	0
Pipo	1-10%	T	T	7.4	1-5%	7.4
Ceanothus	0-5%	0%	T		0-5%	0
Locust	0-1%	0%	T		0-1%	0
Total						94.9

Table 7-14. Little Springs Composition.

Key Area #3B, Loamy Upland (Pipo-Woodland) 18-30" p.z.; Ecological site guide places the site in the herbaceous/shrub stage based on present vegetation composition. This stage is defined as being dominated by grasses and shrubs with a few tree seedlings and forbs present. 96% of PNC.

Key Area #3B Plant Spp.	Site Guide Allowable Composition	1989 Composition	2004 Composition	2014 Composition	Desired Composition Objective	
Grasses						
Agropy.*	NA	77%	75%	83.5	60-80%	80
Brin*	NA	5%	3%	9.2	1-5%	5
Sihy*	0-2%	1%	6%		1-5%	0
Popr*	0-5%	14%	1%	1	1-5%	1
Forbs						0
Lupine	0-1%		1%	3.5		0
PPFF	0-5%	2%	9%		1-5%	5
AAFF	0-5%	T	T		1-5%	0
Shrubs						0
Artr	0-5%	T	5%	4.5	1-5%	4.5
Locust	0-2%	1%	1%	0.80		0
Total						95.5

7.3 APPENDIX D. Existing and Proposed Range Improvements.

Existing and Proposed Range Improvements.

Table 7-15. Mt. Logan Allotment Existing Range Improvements.

Type	number
Developed Spring	1
Fenced Res	2
Livestock trough	8
Water Stock Tank	4
Unfenced Res	6
Wildlife Drinker	7
Corral	1
Cattleguard	2

Table 7-19. Mt Logan RIP lines

Type	Name	Length (miles)
Fence	Lil Oak Springs Fen	0.2
Fence	Mt Trumbull Segregation Fence	0.5
Fence	Fence	0.0
Fence	DR Fence-H Schmutz	1.4
Fence	Logan Fern Clayhole Fence	3.9
Fence	Howard div fence	1.3
Fence	Craig div fence	6.2
Fence	Sch-Ltl-Tuweep Div Fence	1.5
Fence	Poverty Trumbull Wildlife Exclosure	0.1
Fence	Fence	1.7
Fence	Cold Little Fence	0.4
Fence	Fence	0.6
Fence	High Meadow Fence	2.3
Fence	Div Fence.Oak Spring Nixon Spring	3.4
Fence	Fence	1.2
Fence	Allotment Fences	2.5
Fence	Fence	0.6
Fence	Head of Tuweep Catchment Exclosure	0.4
Fence	Div Fence.Oak Spring Nixon Spring	2.4
Fence	Mt Trumbull #8	0.2
Fence	Div Fence.Oak Spring Nixon Spring	0.5
Fence	Arkansas Ranch	1.4
Fence	Arkansas Ranch	2.0
Fence		0.3

Type	Name	Length (miles)
Fence	Fence	0.5
Fence total		35.5
Pipeline	Pipeline-h&m schmutz	6.4
Pipeline	Pipeline	0.5
Pipeline	Pipeline	0.1
Pipeline	Low Kent Water Cmplx	3.3
Pipeline	Pipeline	0.1
Pipeline	Head of Tuweep Catchment Pipeline	0.1
Pipeline total		10.5

*allotment, pasture/division, corrals, and waterlot/reservoir fences.

Table 7-20. Kent Past RIPS water

Type	Name	Number
Unfenced Res	W A Kent Reservoir	1
Water Storage Tank	Kent Pasture Storage Tank	1
Unfenced Res	Helen Trent Reservoir	1

Table 7-21. Kent Pasture RIP lines

Type	Name	Miles
Fence	Allotment Fences	2.5
Fence	Kent pasture fence	1.0
Fence		2.0
Fence		4.5
Fence		1.0

Table 7-162. Kent Pasture RIP non-water

Type	Name
Cattleguard	TOROWEAP C.G.

Table 7-173. Head of Tuweep RIP water

Type		Number
URS	Unfenced Res	4
FRS	Fenced Res	2
LVT	Livestock trough	1
WLD	Wildlife drinker	2
STK	Water storage tank	1
LVC	Livestock catchment	1

Table 7-184. Tuweep RIP lines

Name	Miles
Dr Fence-H Schmutz	1.4
Craig Div Fence	6.2
Sch-Ltl-Tuweep Div Fence	1.5
Total Fence	9.1
Head of Tuweep Catchment Pipeline	0.1
Total Pipeline	0.1

Table 7-195. Paradise Proposed fence.

Name	Length (mile)
Paradise proposed fence	1.6

7.4 APPENDIX E – Rangeland Health Determination

Site/Area: Mt. Logan Allotment

BLM Acres: 18,996

Compliance with Rangeland Health Standards:

Standard	Standard Met?	Progress Towards Meeting?	Rationale: <i>(Summarize the evidence and indicators used to reach conclusions regarding meeting, not meeting and the progress towards meeting each Standard.)</i>
# 1 Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site)	Yes	Not applicable	A summary of field observations indicate that the majority of soil/site stability Indicators showed a “none to slight” departure from expected ecological conditions.
# 2 Riparian and wetland areas are in properly functioning condition	Not applicable	Not applicable	None on BLM Lands
# 3 Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.	Yes	Not applicable	A summary of field observations indicate that all of the biotic integrity indicators showed a “none to slight” departure from expected ecological conditions.

Determination Summary

Based on my review of the Assessment Team’s recommendation, Evaluation of Rangeland Health Standards and other relevant information, and as indicated in this document I have determined that the Mt. Logan Allotment meets Arizona’s Standards for Rangeland Health and that current grazing practices are in conformance with Arizona’s Guidelines for Grazing Management.

Signature: Mark Wimmer  Digitally signed by Mark Wimmer
Date: 2018.09.18 11:27:47 -06'00'

Title: Grand Canyon-Parashant Monument Manager

7.5 APPENDIX F – Public Comments and Response

BLM NEPA Handbook (H-1790-1, pg. 65-67) provides guidance on comment analysis and response. While not all comments were considered to be substantive, BLM considered these during the decision making process.

Commenter	Comment #	Public Comment	Response to comment
Western Watersheds Project (WWP)	1	As stated in the EA, “[t]he need for the proposed action is for the permittee to be able to continue livestock grazing on the allotment through utilization of forage at proper levels while being in compliance with, or making significant progress towards meeting the Standards for Rangeland Health (Appendix B) and the RMP (BLM 2008).” EA at 1-9. It is important for the BLM to recognize that the need for this project should be to determine whether or not to continue livestock grazing on the allotment, not to simply provide for livestock grazing on public lands. Alternative A, which would change allotment boundaries, isn’t even within the stated need for this project and belies the true but unacknowledged need for this project, which is to make livestock grazing on this allotment easier for the permittee by consolidating the allotment boundaries and eliminate the need for trailing livestock between the boundaries.	In this EA, the Purpose and Need is for BLM to respond to a grazing application and to provide for public lands grazing through FLPMA and associated laws and regulations. Refer to Section 1.3 of the EA which further explains the purpose of the project. All alternatives are within the scope of the purpose and need.

Commenter	Comment #	Public Comment	Response to comment
WWP	2	<p>The stated purpose for this project is “analyzing the potential effects of livestock grazing on resources that may be affected across the allotments described in the proposed action.” EA at 1-9. But, the stated purpose is also “to process the term grazing permit on the Mt. Logan Allotment in accordance with” applicable laws, regulations, and policies. EA at 1-9. The permit for this allotment has already been renewed for a 10 year term, with the same terms and conditions as existed prior. EA at 1-9. Clearly, the actual purpose of this EA is to paper over the already made decision to continue to The stated purpose for this project is “analyzing the potential effects of livestock grazing on resources that may be affected across the allotments described in the proposed action.” EA at 1-9. But, the stated purpose is also “to process the term grazing permit on the Mt. Logan Allotment in accordance with” applicable laws, regulations, and policies. EA at 1-9. The permit for this allotment has already been renewed for a 10 year term, with the same terms and conditions as existed prior. EA at 1-9. Clearly, the actual purpose of this EA is to paper over the already made decision to continue to allow grazing on this allotment for the next 10 (or more) years.</p>	<p>Under FLPMA, and clarified and explained on page 1.9 of the EA, the permit was renewed in the short term to allow for continued livestock grazing as per IM 2015-0122. In the interim, the BLM prepared this EA with alternatives to address issues within the scope of the purpose and need.</p>
WWP	3	<p>For the proposed action, Alternative A, BLM proposes no changes to the numbers of livestock or season of use, despite the fact the allotment remains in an “Improve” status. EA at 2-14. Changes to the permit are to incorporate the Tuweep Forage Reserve from Kent Pasture into the Mt. Logan allotment. There is an exchange of the Tuweep Reserve Kent Pasture (2436 acres) for the Mt. Logan Head of Tuweep pasture (4287 acres) which will become a pasture in the Tuweep Forage Reserve. The AUMs don’t change. EA at 2-14. This exchange is to prevent trailing across neighboring allotments for rotational purposes. EA at 2-15. This does not fit within the stated purpose and need and is designed simply to make livestock grazing easier on the permittee.</p>	<p>See comment response for comment #1.</p>

Commenter	Comment #	Public Comment	Response to comment
WWP	4	<p>As we noted above, this allotment is classified as “Improve,”¹ which means it should be actively managed to improve unsatisfactory resource conditions. EA at 1-11. If this allotment has been in the “Improve” classification since 2004 or earlier, the obvious question is how can the BLM justify continuing to allow livestock grazing when the past 14 years have demonstrated that the livestock management on this allotment is not improving conditions on the ground? The EA does not offer any justification for continuing to allow livestock grazing in light of the never-ending “Improve” classification and offers no rationale for continuing to fail to actually improve this allotment. Another unanswered question is how, in 2007, the IAT found the allotment met all applicable standards for rangeland health, but at the same time the allotment remains in an “Improve” classification. EA at 1-7. The EA does not explain how, in 2018, the IDT also found this allotment met the Arizona BLM Standards for Rangeland Health while remaining in the “Improve” classification. EA at 1-9. Either the standards for rangeland health are extremely low, or the BLM has not accurately analyzed or described the conditions on the allotment.</p>	<p>The Mt. Logan Allotment is categorized as a Management Status “improve” (I) allotment as described in the GCPNM RMP (BLM 2008). Any one of these criteria (found on pg. 3-23-24) may identify the allotment as an “I” allotment, and does not necessarily mean that allotment conditions are universally unsatisfactory. A number of conditions could exist to retain or change an allotment management category.</p>
WWP	5	<p>The data regarding the rangeland health of the public lands subject of the proposed action are from 2005 and 2007. EA at 1-7. EA at 1-7. Further, the BLM has a duty to explain how the BLM determined that in 2004 and 2005 Standards for Rangeland Health from 2007 and 2018 were being met. EA at 1-13. While the EA indicates that an IDT “revisited” the allotment in 2018 to “update” the evaluation, there is no explanation for what was done during this “visit.” EA at 3-17.</p>	<p>Comment noted, see Section 3.3 of the EA which describes the method used to complete the land health assessment for the allotment. Based on the assessment, a determination document is now attached to the EA in Appendix E.</p>
WWP	6	<p>FLMPA and PRIA require “regular” inventories. Please explain whether the BLM believes that monitoring once every 10 (or more years) is considered “regular?” If yes, please explain how that “regular” evaluation will allow for adaptive management during a 10-year lease term?</p>	<p>Comment noted, see Section 2.4.1 of the EA for a description of the monitoring cycle and Appendix C for the existing monitoring data.</p>

Commenter	Comment #	Public Comment	Response to comment
WWP	7	It is unclear whether the BLM has compared the known plant species in the project area to the Arizona rare plant list or the BLM sensitive species list. We have included, as Attachment A, a list of plant collections from the Mt. Logan allotment from the SEINet database (http://swbiodiversity.org/seinet/collections/index.php# accessed 10/19/18). The BLM should compare this list to the Arizona rare plant list and the BLM Sensitive Species list to see if there are any plants that require further analysis.	Comment noted, Table 3.1 was updated on pg. 3-22 to reflect this review.
WWP	8	There is no information on whether supplemental feeding of livestock will be permitted and if so, exactly how this will be managed.	Comment noted, Section 2.2 was updated to reflect the existing term and condition on the permit and is applicable to all action alternatives.
WWP	9	The EA should analyze the degree to which trespass occurs and assess the likelihood of it occurring under each of the alternatives.	Trespass actions are addressed through administrative actions as per 43 CFR 4150.
WWP	10	It is unclear if there were alternatives considered but eliminated from analysis. EA at 2-16. Please clarify.	As per Section 2-16, no other alternatives were considered for analysis.
WWP	11	The information on monitoring is inadequate. The EA indicates “BLM resource specialists would periodically monitor the allotment over the ten-year term of the grazing permit to ensure that the fundamentals or conditions of rangeland health are met or making progress towards being met...” EA at 2-16. What does “periodically” mean?	See response for comment #6.
WWP	12	There is no information on how BLM will identify how 50 percent utilization is determined, nor how often monitoring for that level of utilization will happen. This information must be disclosed.	Comment noted, Section 3.5.1 described utilization standards and monitoring as is referenced in the Literature Cited Section as BLM 1999a.

Commenter	Comment #	Public Comment	Response to comment
WWP	13	<p>Monitoring is an important tool for measuring “actual use.” Information on “actual use” is found at 7.4 Appendix D, Livestock Actual Use as reported by the permittee. (Emphasis added.) However, forage utilization is not reported for 10 of the past 20 years. Table 0-6 shows ND (no data) collected for the Head of Tuweep Pasture for 2006, 2007, 2008, 2009, 2011, 2012, 2015, 2016, 2017. The statement that “overall key species utilization in the pasture for the evaluation period was 27%” is not accurate and is based on only a fraction of the data necessary to make that determination. EA at 7-74. Conflicting utilization information exists in the EA as well: actual use, as submitted by permittee, varies between 73-92 percent for the past decade (2007-2016), average is 83 percent. EA at 3-24. But, mysteriously, average utilization is 32 percent. EA at 3-25. The information, or lack of information, is similar for Little Oak Pasture where ND5 were collected in 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2014, 2015, 2016, and 2017. Table 0-7, EA at 7-74. For both the Head of Tuweep and Little Oak pastures the BLM states that 50 percent utilization was exceeded only once on each pasture. However, that is not an accurate statement because 50 percent utilization was only documented once on each pasture and there are 10-12 years for which data was not collected and it is unknown what the utilization levels were for those pastures for those years. Notably, for the Little Spring pasture data were collected more often and more utilization levels above 50 percent are recorded. Table 0-8 and 0-8, EA at 7-82. It is likely that there were years in which utilization levels exceeded 50 percent for the Head of Tuweep and Little Oak pastures as well. Consistent, systematic monitoring by the agency designated to manage these allotments for the public would provide confirmation of these utilization rates.</p>	<p>The actual use data is limited to the number of livestock reported by the permittee and does not directly translate into utilization percentages.</p>

Commenter	Comment #	Public Comment	Response to comment
WWP	14	<p>There are several issues that were not analyzed in the EA (identified as “NI”) and WWP believes this is in error.</p> <p>Air Quality (EA at 3-18) – this issue was determined to be NI, with the rationale that the air quality in the area is generally good and that livestock cause fugitive dust only where they congregate at waters, making the dust impacts localized and temporary. This analysis fails to acknowledge that livestock grazing removes vegetation from large swaths of the landscape, hoof action disturbs desert soil crusts, and the potential for fugitive dust related to livestock grazing covers the entire allotment acreage.⁶ Therefore, air quality impacts should have been analyzed in the EA.</p> <p>Fuels/Fire Management (EA at 3-20) – this issue was determined to be NI. However, the BLM should analyze the impacts of livestock grazing on fuel loads such as invasive or fire-prone grasses (e.g., cheatgrass and scotch thistle).</p> <p>Access (EA at 3-20) and Recreation (EA at 3-21) – this issue was determined to be NI, but this is likely because the EA fails to discuss how livestock grazing displaces those public lands visitors who are put off by livestock, cow dung, and landscapes degraded by livestock. Additionally, fencing can make the public feel they are not allowed access to certain areas. These issues related to access and recreation should be analyzed.</p> <p>Visual Resources (EA at 3-22) – this issue was determined to be NI, but the EA fails to acknowledge that removal of vegetation on thousands of acres of land by livestock, as well as the concomitant fencing and roads/two tracks, do have an impact on visual resources.</p>	<p>Table 3.1 adequately addresses the issues raised by the comment</p> <p><u>Air Quality:</u> WWP’s opinion is that vegetation is removed from large tracts of land. Land Health data, trend data, and professional knowledge of the area indicate that vegetation remains intact on the lands BLM manages. Observations of sparsely vegetated private and state lands within the Mt. Logan Allotment have been made by BLM and the National Park Service. These areas are not managed by BLM. Consequently, the rationale put forth in Table 3.1 explaining why Air Quality was not analyzed in detail.</p> <p><u>Fuels/Fire Management:</u> Invasive species are cited as a concern with regard to fuels/fire management. Although not addressed under fuels/fire management, invasive species impacts are addressed in section 3.5.3 and 4.2.5 Vegetation and Invasive, Non-Native Species. Invasive species are also discussed in the Rangeland Health evaluation as cited in Table 3.1. Rangeland health evaluations noted that some invasive and noxious weed species are present on the allotment. The land health team determined that departures from normal conditions were none to slight for the majority of sites evaluated. One site did have a moderate increase in</p>

Commenter	Comment #	Public Comment	Response to comment
			<p>broom snakeweed, a native invasive shrub, but within parameters expected for the site. BLM monitors and treats for invasive species and noxious weeds across the Arizona Strip using local personnel and through contracting. Invasive plants and noxious weeds were considered when making the determination of the allotment meeting Rangeland Health Standards.</p> <p><u>Access/Recreation:</u> Table 3.1 indicates that livestock operations do not prohibit recreation and access. These multiple uses are compatible across the BLM.</p> <p><u>Visual Resources:</u> The rationale for determination regarding visual resources is documented in Table 3.1.</p>
WWP	15	<p>A sentence at 3-30 needs to be corrected: (regarding smooth brome) “This grass species has displaced some much of the native perennial grass species.” Please clarify to state whether smooth brome has displaced some or much of the native grasses.</p>	<p>BLM thanks WWP for pointing out this error and has corrected the EA (Section 3.5.3, Vegetation and Invasive, Non-Native Species), explaining that the site was seeded in the 1970s with smooth brome, a non-native perennial grass species. This species continues to dominate much of the site.</p>

Commenter	Comment #	Public Comment	Response to comment
WWP	16	<p>Information in the EA indicate that deer are especially reliant on shrubs for forage during critical winter months and fawn production is closely tied to the abundance of forage during the spring and summer months. EA at 3-33, 3-34. There is some dietary overlap between livestock and pronghorn that can occur during winter months. EA at 3-34. Many miles of fence do not meet game standards and are restricting pronghorn movement and survival. EA at 3-34, citing AGFD 2009a. However, there is inadequate information about, or analysis of, the conflicts between livestock and game animals on this allotment and no site specific information on where fencing does not meet standards nor any site specific information on where forage production is impacting fawn production or whether or where forage production is impacted by livestock grazing.</p>	<p>It is correct that there is some dietary overlap between cattle and pronghorn species. With a 50% use stipulation on the allotment, adequate amounts of forage are available for pronghorn. Trend monitoring data shows that forage species for both livestock and wildlife are present. Land health assessments do not indicate a lack of forage for wildlife.</p> <p>Also noted are the standards for the fencing in the EA. The Land Use Plan Conformance section requires that all newly constructed fences be wildlife friendly. See Section 1.4 and Appendix 6 for the fencing specifications.</p>
WWP	17	<p>The analysis of impacts to soils is largely a simple recitation of soil types within the project area. EA at 3-40. The analysis found at section 4.3.9 adds very little to the analysis other than to state, generally, that livestock can trample and compact soils and new fences would have minimal impacts. EA at 4-47. While failing to identify access roads or livestock related roads as issues in the impacts analysis of Alternative A, these impacts are identified in the impacts analysis for Alternative B and C, and seem to be the focus of the impacts analysis of Alternative C. This is misleading and implies that soils are going to be equally impacted in all alternatives, or possibly more impacted in Alternative C. EA at 4-47.</p>	<p>Revisions were made to the Final EA in Section 4.2.13-16 for Soils. Alternatives A and B would result in similar impacts to soils except in different areas of the allotment based on changes in fencing and livestock operations. Section 4.2.16 discloses the impacts to soils from implementing Alternative C, No Grazing, by indicating increased vegetative growth with the absence of grazing, although impacts from existing roads and trails largely used by the public would remain at present conditions. These differences were taken into consideration when making this final decision.</p>

Commenter	Comment #	Public Comment	Response to comment
WWP	18	The EA states that Monarch butterflies are found in the project areas. EA at 3-39. Are any range management actions impacting milkweed populations? Does the BLM use herbicides to control milkweed?	See Page 4-48 for the analysis regarding monarch butterflies. The BLM does not recognize milkweed as a noxious weed and therefore does not treat with herbicides.
WWP	19	Please explain how utilization of 50 percent of the vegetation results in a minimal impact to species dependent on that vegetation, such as pronghorn. EA at 4-44. It appears that one species (livestock) get to use 50 percent of the forage available on the landscape while all other wildlife – game species, non-game species, insects, rodents, birds – everything else – are expected to share the remaining 50 percent. EA at 4-46.	See Section 3.3.5., which discloses that competition would be minimal based on varying dietary needs of each species. As noted in response for Comment #16, trend data and land health assessments do not indicate a problem with a lack of forage for wildlife. The amount of forage for livestock is not all the same forage that wildlife use. Generally, browsers (deer and pronghorn) don't consume the same forage as grazers (cattle, bison, and elk), although some dietary overlap exists without substantial impacts on either livestock or wildlife. On the Mt. Logan Allotment, it has been determined that there is ample vegetation for deer, livestock, and pronghorn.
WWP	20	Please provide a scientific reference for the statement that burrowing owls “often do well in moderately grazed areas.” EA at 4-45. This is an important issue because under Alternative A 3,197 acres of burrowing owl habitat will receive more livestock grazing. EA at 4-45. The EA should also have analyzed the impacts of livestock grazing on prairie dogs because burrowing owls are strongly associated with colonial sciurids.	See section 3.5.5 where a similar statement is made with reference to MacCracken et al. 1985. While more acres of burrowing owl habitat would receive more livestock grazing the grazing would not be intense and result in only minor impacts to burrowing owl habitat. This section also states that burrowing owls use the burrows of

Commenter	Comment #	Public Comment	Response to comment
			many different mammals besides prairie dogs. Since there are few prairie dogs in the Arizona Strip the impacts of the proposed action on prairie dogs is not of particular importance.
WWP	21	In Table 5.3 the Title and Agency/Organization columns appear to be mixed up for most of the non-agency reviewers. EA at 5-54.	Comment noted and table corrected.
WWP	22	The use of an EA for this project fails to comply with National Environmental Policy Act requirements. The allotment is adjacent to, or overlapping with, important areas such as the Mt. Turnbull Wilderness, the Mt. Logan Wilderness North and South, and the Grand Canyon Parashant National Monument. These areas require a higher level of analysis in light of the intensity and context of this specific project. See 40 C.F.R. §§ 1508.27(a) (context), b (intensity)).	This comment refers to regulations that apply when an agency is making a finding of no significant impacts. The EA is to inform the decision maker, not make the decision or finding in and of itself.
WWP	23	Finally, it is important that the BLM properly characterize what the Grand Canyon-Parashant National Monument Proclamation said about livestock grazing on the monument. EA at 1-11, 1-12. The Monument's proclamation discussed preserving historic ranching infrastructure and identified as objects to be protected a number of outstanding biological resources including the wildlife. Proclamation 7265. It further says that, "[l]aws, 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." There is nothing in this proclamation that requires livestock grazing to continue.	The proclamation does state that livestock grazing shall continue.

Commenter	Comment #	Public Comment	Response to comment
WWP	24	Where FLPMA requires that goals and objectives for public lands be established by law as guidelines for public land use planning, and that management is on the basis of multiple use and sustained yield, it adds, “unless otherwise specified by law.” §102(a) (7). And “multiple use” is specifically defined in the statute as, in part, “making the most judicious use of the land for some or all of these resources... the use of some land for less than all of the resources... with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.” §103(c). Simply because the overarching RMP describes these allotments as “available” for grazing doesn’t preclude the agency from taking a hard look at the balance of uses at the site-specific level.	In this EA, the Purpose and Need is for BLM to respond to a grazing application and to provide for public lands grazing through FLPMA and associated laws and regulations. Refer to Section 1.3 of the EA which further explains the purpose of the project.
Craig Ranch and Riffey's Roost	25	Assigning it to a single user would cause undue hardship to other ranchers and likely subject the Tuweep Forage area to regular (Oct-May), intensive grazing from which recovery is not likely in our lifetimes.	Please note that no alternative would assign the forage reserve to a single user. Refer to Figure 3 in Appendix A for proposed allotment boundary changes.
Janet Balsom Grand Canyon National Park	26	GCNP requests that the portion of the Park included in the Mt. Logan Allotment be removed and that specific actions are identified and required in any new or adjusted alternative. This needs to include proper fencing, maintenance, and access, as well as management requirements that protect Park resources (archaeological, vegetation, wildlife, soils, air shed, T&E species). GCNP requests that the Kent/Tuweep Pastures be maintained within the Tuweep Forage Reserve under the current management objectives (and responsible permittees) and not converted to a regular pasture.	Comment noted, the 2008 GCPNM RMP Allotment Map 2.10 verifies that no portion of the Grand Canyon National Park lies within the Mt. Logan Allotment. Consequently, the maps in the EA were revised to accurately reflect the allotment boundary.

Commenter	Comment #	Public Comment	Response to comment
Ron Henderson	27	Without Lower Kent the rotation with Broad Canyon will be affected. Then if Paradise Canyon is removed also, the prospects for keeping Broad Canyon healthy become greatly limited. There will highly likely be water conflict with the available water from Nixon Spring that runs to the Smutz trough (one rancher) and running the same water source to the Paradise trough (another rancher.) The transfer of Lower Kent makes some logistical sense although it is a very fine pasture that I would hate to see abused.	Comment noted, The proposed action has been clarified to reflect the retention of waters in the forage reserve.
Sherre Finicum	28	My other concern is the distribution of water from Nixon Spring. This spring, as is, is barely adequate for the Administrative Site and the other pastures it services which are, Iversons drinker and reservoir, Smutz tank and drinker, and Paradise trough and reservoir. By splitting this water again between Paradise Canyon in the valley and Smutz and Iversons on top leaves room for potential conflict and insufficient water in the future for other users. By not including Paradise Canyon, as Alternative A proposes, this will avert this problem for the future. This proposed change also negatively impacts the grazing management of The TuWeep Forage Reserve by not allowing better rotational management between Paradise Canyon and Broad Canyon.	See response for comment #27.